Search on Telegram @apna_pdf

Index

Click Here To Join our Telegram Channel

S.N.	Chapter Name		Name and Exam conducted year	No. of Questions	Day wise schedule	Page No.
1.	Number System	Concepts	-	-	1	1 - 3
		Varieties Questions TCS	-	58		3 - 5
		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	1	2	5
			SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	5		5
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	45		5 - 7
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	32	3	7 - 8
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	2		8
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	34		8 - 9
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	5	4	9
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	16		9 - 10
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	4		10
			SSC CHSL 2022 Tier 2 (26.06.2023)	2		10
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	2		10
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	18		10 - 11
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	1		11
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	15	5	11
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	10		11 - 12
			SSC CGL 2021 Tier 2 (08.08.2022)	6		12
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	4		12
			SSC MTS 2021 Tier 1 (05.07.2022 to 26.07.2022)	2		12
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	7		12
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	2		12
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	5		12 - 13
			SSC MTS 2020 Tier 1 (05.10.2021 to 02.11.2021)	5		13
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	1		13
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	2		13

These ebooks are free of cost, Join our telegram channel: @apna_pdf

Search on Telegram @apna_pdf

			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	2		13
		Answer key	-	-	-	13 - 14
		Solutions	-	-	-	14 - 27
2.	HCF and LCM	Concepts	-	-	6	28 - 29
		Varieties Questions	-	29		29 - 30
		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	2		30
			SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	12		30
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	19		30 - 31
			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	10	7	31
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	1		31
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	1		31
			SSC CHSL 2022 Tier 2 (26.06.2023)	1		31
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	11		31 - 32
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	2		32
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	2		32
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	3		32
			SSC MTS 2021 Tier 1 (05.07.2022 to 26.07.2022)	4		32
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	1		32
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	1		32
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	1		32
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	1		32
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	1		33
			SSC CGL 2019 Tier 2 (15.11.2020 to 18.11.2020)	2		33
		Answer key	-	-	-	33
		Solutions	-	-	-	33 - 36
3.	Simplification	Concepts	-	-	8	37 - 38
		Varieties Questions	-	30		38 - 39
		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	2		39
			SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	1		39
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	22		39 - 40

Search on Telegram @apna_pdf

			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	18		40
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	35		40 - 41
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	8		41 - 42
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	2		42
			SSC CGL 2023 Tier 2 (26.10.2023)	1		42
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	4		42
			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	3		42
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	6		42
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	6		42
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	1		42
			SSC CHSL 2022 Tier 2 (26.06.2023)	1		42
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	5		43
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	4	9	43
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	2		43
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	3		43
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	2		43
			SSC CGL 2021 Tier 2 (08.08.2022)	5		43
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	2		43
			SSC MTS 2021 Tier 1 (05.07.2022 to 26.07.2022)	2		43
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	9		43 - 44
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	2		44
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	3		44
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	2		44
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	2		44
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	2		44
		Answer key	-	-	-	44 - 45
		Solutions	-	-	-	45 - 53
4.	Trigonometry	Concepts	-	-		54 - 55
		Varieties Questions	-	85	10	55 - 58

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	2		58
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	88	11 - 12	58 - 61
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	26		61 - 62
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	29	13	62 - 63
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	16		63
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	15		63 - 64
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	56	14	64 - 66
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	46	15	66 - 67
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	5		67
			SSC CHSL 2022 Tier 2 (26.06.2023)	1		67
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	27		67 - 68
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	1	16	68
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	49		68 - 70
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	19		70 - 71
			SSC CGL 2021 Tier 2 (08.08.2022)	4		71
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	5	17	71
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	13		71
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	13		71 - 72
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	9		72
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	1		72
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	19		72 - 73
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	26		73 - 74
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	2		74
		Answer key	-	-	-	74 - 75
		Solutions	-	-	-	75 - 105
5.	Height and Distance	Concepts	-	-		106
		Varieties Questions	-	19		106 - 107
		TCS Previous Year : Practice Questions	SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	1		107
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	2		108

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	2	18	108
			SSC CGL 2023 Tier 2 (26.10.2023)	1		108
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	3		108
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	2		108
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	3		108
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	1		108
			SSC CGL 2021 Tier 2 (08.08.2022)	1		108
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	1		108
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	5		108 - 109
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	1		109
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	1		109
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	2		109
		Answer key	-	-	-	109
		Solutions	-	-	-	109 - 112
6.	Mensuration	Concepts	-	-	19	113 - 116
		Varieties Questions	-	99	20 - 21	116 - 120
		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	4		120
			SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	43		120 - 122
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	50	22	122 - 124
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	82	23 - 24	124 - 127
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	30		127 - 129
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	31		129 - 130
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	5	25	130
			SSC CGL 2023 Tier 2 (26.10.2023)	2		130
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	17		130 - 131
			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	16		131 - 132
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	16		132

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	32	26	132 - 134
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	9		134
			SSC CHSL 2022 Tier 2 (26.06.2023)	1		134
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	51		134 - 136
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	21	27	136 - 137
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	6		137
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	26		137 - 138
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	19		138 - 139
			SSC CGL 2021 Tier 2 (08.08.2022)	6		139 - 140
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	4		140
			SSC MTS 2021 Tier 1 (05.07.2022 to 26.07.2022)	38		140 - 142
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	31	28	142 - 143
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	12		143
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	10		143 - 144
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	42		144 - 146
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	5		146
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	10		146
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	7		146 - 147
		Answer key	-	-	-	147- 148
		Solutions	-	-	-	148 - 185
7.	Geometry	Concepts	-	-	29	186 - 190
		Varieties Questions	-	131	30 - 31	190 - 196
		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	4		196
			SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	4		196
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	90	32	196 - 199
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	64	33	200 - 202
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	9	34	202 - 203
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	17		203
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	4		203

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

			SSC CGL 2023 Tier 2 (26.10.2023)	2		204
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	13		204
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	64	35	204 - 207
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	28		207 - 208
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	3		208
			SSC CHSL 2022 Tier 2 (26.06.2023)	2		208
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	28	36	208 - 209
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	7		209 - 210
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	40		210 - 211
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	6		211 - 212
			SSC CGL 2021 Tier 2 (08.08.2022)	4		212
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	6		212
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	14		212 - 213
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	27		213 - 214
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	14	37	214 - 215
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	1		215
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	28		215 - 216
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	24		216 - 217
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	1		217
		Answer key	-	-	-	217 - 218
		Solutions	-	-	-	218 - 261
8.	Algebra	Concepts	-	-	38	262 - 263
		Varieties Questions	-	70	39	263 - 265
		TCS Previous Year : Practice Questions	SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	49	40	265 - 267
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	7		267
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	20		267 - 268
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	10		268
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	2	41 - 42	268
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	12		268 - 269

Search on Tg: @apna_pdf

Search on Telegram @apna_pdf

			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	1		269
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	60		269 - 271
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	51		271 - 273
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	12	43	273
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	33		273 - 274
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	2		274
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	72	44	274 - 277
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	20	45	277
			SSC CGL 2021 Tier 2 (08.08.2022)	4		277 - 278
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	17		278
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	57	46	278 - 280
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	19	47	280 - 281
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	9		281
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	2		281
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	31		281 - 282
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	37		282 - 283
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	4		283 - 284
		Answer key	-	-	-	284 - 285
		Solutions	-	-	-	285 - 314
9.	Ratio and Proportion	Concepts	-	-	48	315 - 316
		Varieties Questions	-	45		316 - 318
		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	1	49	318
			SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	12		318
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	22		318 - 319
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	28		319 - 320
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	11		320 - 321
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	21	50	321
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	3		322
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	2		322
			SSC MTS 2023 Tier 1	13		322

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

			(01/09/2023 to 14/09/2023)			
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	14		322 - 323
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	10		323
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	9		323 - 324
			SSC CHSL 2022 Tier 2 (26.06.2023)	1		324
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	6		324
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	8		324
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	2		324
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	4		324 - 325
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	3		325
			SSC CGL 2021 Tier 2 (08.08.2022)	3		325
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	2		325
			SSC MTS 2021 Tier 1 (05.07.2022 to 26.07.2022)	19	51	325 - 326
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	6		326
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	2		326
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	7		326 - 327
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	22		327 - 328
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	3		328
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	3		328
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	2		328
		Answer key	-	-	-	328 - 329
		Solutions	-	-	-	329 - 342
10.	Partnership	Concepts	-	-		343
		Varieties Questions	-	13		343 - 344
		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	1		344
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	1		344
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	1	52	344
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	1		344
			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	2		344
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	2		344

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	1		344
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	1		344
			SSC CHSL 2022 Tier 2 (26.06.2023)	1		344
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	3		344 - 345
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	3		345
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	3		345
			SSC CGL 2021 Tier 2 (08.08.2022)	1		345
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	1		345
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	1		345
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	1		345
		Answer key	-	-	-	345
		Solutions	-	-	-	345 - 347
11.	Mixture and Alligation	Concepts	-	-	53	348
		Varieties Questions	-	21		348 - 349
		TCS Previous Year : Practice Questions	SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	6		349
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	9		349 - 350
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	3		350
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	5		350
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	7		350
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	1		351
			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	5		351
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	6		351
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	3		351
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	2		351
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	4		351 - 352
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	1		352
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	2		352
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	2		352
			SSC CGL 2021 Tier 2 (08.08.2022)	1		352
			SSC MTS 2021 Tier 1	3		352

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

			(05.07.2022 to 26.07.2022)			
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	1		352
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	1		352
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	3		352
		Answer key	-	-	-	352 - 353
		Solutions	-	-	-	353 - 357
12.	Work and Time	Concepts	-	-		358 - 359
		Varieties Questions	-	47		359 - 361
		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	1	54	361
			SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	5		361
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	3		361 - 362
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	32		362 - 363
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	13	55	363 - 364
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	23		364 - 365
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	1		365
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	13		365
			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	26		365 - 367
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	17	56	367
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	32		367 - 369
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	5		369
			SSC CHSL 2022 Tier 2 (26.06.2023)	1		369
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	13		369 - 370
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	8		370
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	1		370
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	9		370 - 371
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	2	57	371
			SSC CGL 2021 Tier 2 (08.08.2022)	2		371
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	5		371
			SSC MTS 2021 Tier 1 (05.07.2022 to 26.07.2022)	5		371 - 372
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	3		372

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	6		372
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	3		372
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	9		372 - 373
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	8		373
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	4		373 - 374
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	2		374
		Answer key	-	-	-	374
		Solutions	-	-	-	374 - 393
13.	Pipe and Cistern	Concepts	-	-		394
		Varieties Questions	-	28		394 - 395
		TCS Previous Year : Practice Questions	SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	20		395 - 396
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	1		397
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	1		397
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	3		397
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	2		397
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	1		397
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	1		397
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	1	58	397
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	1		397
			SSC MTS 2021 Tier 1 (05.07.2022 to 26.07.2022)	1		397
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	2		397
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	4		397 - 398
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	1		398
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	1		398
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	1		398
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	1		398
		Answer Key	-	-	-	398
		Solutions	-	-	-	398 - 403
14.	Time , Speed	Concepts	-	-		404 - 405

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

	and Distance	Varieties Questions	-	54	59	405 - 408
		TCS Previous Year : Practice Questions	SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	22	60	408 - 409
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	10		409 - 410
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	28		410 - 411
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	20		411 - 412
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	26		412 - 413
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	1	61	413
			SSC CGL 2023 Tier 2 (26.10.2023)	1		414
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	10		414
			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	23		414 - 415
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	11		415 - 416
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	16		416 - 417
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	3		417
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	23		417 - 418
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	16	62	418 - 419
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	17		419 - 420
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	6		420
			SSC CGL 2021 Tier 2 (08.08.2022)	1		420
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	4		420
			SSC MTS 2021 Tier 1 (05.07.2022 to 26.07.2022)	15		420 - 421
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	10		421 - 422
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	2		422
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	5		422
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	18		422 - 423
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	2		423
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	5		423
			SSC CGL 2019 Tier 2 (15.11.2020 to 18.11.2020)	2		423
			SSC CHSL 2019 Tier 1 (17.03.2020 to 26.10.2020)	5		423 - 424
			SSC CGL 2019 Tier 1 (03.03.2020 to 09.03.2020)	4		424

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

		Answer key	-	-	-	424 - 425
		Solutions	-	-	-	425 - 444
15.	Linear/Circular Race	Concepts	-	-	63	445
		Varieties Questions		15		445 - 446
		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	1		446
			SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	6		446
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	6		446 - 447
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	3		447
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	6		447
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	2		447
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	2		447
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	8		447 - 448
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	1		448
			SSC CHSL 2022 Tier 2 (26.06.2023)	1		448
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	1		448
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	3		448
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	3		448
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	2		448
			SSC MTS 2021 Tier 1 (05.07.2022 to 26.07.2022)	3		448 - 449
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	4		449
		Answer key	-	-	-	449
		Solutions	-	-	-	449 - 453
16.	Boat and Stream	Concepts	-	-		454
		Varieties Questions	-	15		454 - 455
		TCS Previous Year : Practice Questions	SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	4		455
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	9		455
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	5		455 - 456
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	5		456
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	4		456
			SSC CHSL 2023 Tier 2	1		456

Search on Telegram @apna_pdf

			(02.11.2023 and 10.01.2024)		64	
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	3		456
			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	5		456 - 457
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	2		457
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	5		457
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	2		457
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	1		457
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	1		457
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	3		457
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	2		457
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	1		457
			SSC MTS 2021 Tier 1 (05.07.2022 to 26.07.2022)	2		457 - 458
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	1		458
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	2		458
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	1		458
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	1		458
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	1		458
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	1		458
		Answer key	-	-	-	458
		Solutions	-	-	-	458 - 463
17.	Percentage	Concepts	-	-	65	464
		Varieties Questions	-	56		464 - 467
		TCS Previous Year : Practice Questions	SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	17		467 - 468
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	25	66 - 67	468 - 469
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	73		469 - 472
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	26		473 - 474
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	32		474 - 475
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	4		475
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	6		476
			SSC MTS 2023 Tier 1	4		476

Search on Telegram @apna_pdf

			(01/09/2023 to 14/09/2023)			
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	9	68	476
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	14		477
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	7		477 - 478
			SSC CHSL 2022 Tier 2 (26.06.2023)	3		478
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	10		478
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	15		478 - 479
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	4		479
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	17	69	479 - 480
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	5		480
			SSC CGL 2021 Tier 2 (08.08.2022)	1		480
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	6		480 - 481
			SSC MTS 2021 Tier 1 (05.07.2022 to 26.07.2022)	13		481 - 482
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	13		482
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	4		482
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	3		483
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	6		483
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	7		483
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	3		483 - 484
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	4		484
		Answer key	-	-	-	484 - 485
		Solutions	-	-	-	485 - 505
18.	Profit and Loss	Concepts	-	-	70	506
		Varieties Questions	-	62		506 - 509
		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	1		509
			SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	17	71 - 72	509 - 510
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	29		510 - 511
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	42		511 - 513
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	18		513 - 514
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	31		514 - 515

Search on Tg: @apna_pdf

Search on Telegram @apna_pdf

			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	3		515
			SSC CGL 2023 Tier 2 (26.10.2023)	1	73	515
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	13		515 - 516
			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	21		516 - 517
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	31		517 - 518
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	10		518 - 519
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	7		519
			SSC CHSL 2022 Tier 2 (26.06.2023)	1		519
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	19		519 - 520
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	15	74	520 - 521
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	9		521
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	7		521
			SSC CGL 2021 Tier 2 (08.08.2022)	2		522
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	4		522
			SSC MTS 2021 Tier 1 (05.07.2022 to 26.07.2022)	17		522 - 523
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	8		523
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	5		523
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	1		523
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	7		523 - 524
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	3		524
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	3		524
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	1		524
		Answer key	-	-	-	524 - 525
		Solutions	-	-	-	525 - 545
19.	Discount	Concepts	-	-	75	546
		Varieties Questions	-	34		546 - 548
		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	2		548
			SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	11		548 - 549
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	18		549

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	12		549 - 550
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	5	76	550
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	19		550 - 551
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	2		551
			SSC CGL 2023 Tier 2 (26.10.2023)	1		551
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	7		551 - 552
			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	1		552
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	19		552
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	19		553
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	10		553 - 554
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	13		554 - 555
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	8	77	555
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	2		555
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	10		555 - 556
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	4		556
			SSC CGL 2021 Tier 2 (08.08.2022)	2		556
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	2		556
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	22		556 - 557
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	7		557
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	4		558
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	7		558
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	10		558 - 559
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	7		559
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	3		559
		Answer key	-	-	-	559 - 560
		Solutions	-	-	-	560 - 571
20.	Simple Interest	Concepts	-	-	78	572
		Varieties Questions	-	44		572 - 574
		TCS Previous Year : Practice	SSC CHSL 2024 Tier 2 (18/11/2024)	1		574
			SSC MTS 2024 Tier 1	10		574

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

		Questions	(30/09/2024 - 14/11/2024)			
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	16	79	574 - 575
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	18		575 - 576
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	5		576
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	15		576 - 577
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	2		577
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	4		577
			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	11		577 - 578
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	13		578
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	8		578 - 579
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	3		579
			SSC CHSL 2022 Tier 2 (26.06.2023)	1	80	579
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	13		579 - 580
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	5		580
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	2		580
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	6		580
			SSC CGL 2021 Tier 2 (08.08.2022)	1		580
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	1		580
			SSC MTS 2021 Tier 1 (05.07.2022 to 26.07.2022)	4		580 - 581
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	1		581
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	2		581
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	4		581
		Answer key	-	-	-	581
		Solutions	-	-	-	581 - 590
21.	Compound Interest	Concepts	-	-	81	591
		Varieties Questions	-	46		591 - 593
		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	1		594
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	2		594
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	1		594

Search on Telegram @apna_pdf

			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	5		594
			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	24		594 - 595
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	22		595 - 596
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	15		596 - 597
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	7		597
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	1		597
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	1		597
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	2		597
			SSC CGL 2021 Tier 2 (08.08.2022)	1		597
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	2	82	597
			SSC MTS 2021 Tier 1 (05.07.2022 to 26.07.2022)	4		597
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	4		598
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	2		598
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	1		598
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	7		598
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	8		598 - 599
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	5		599
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	1		599
		Answer key	-	-	-	599
		Solutions	-	-	-	599 - 608
22.	Installment	Concepts	-	-		609
		TCS Previous Year : Practice Questions	SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	2		609
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	4		609 - 610
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	2		610
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	10	83	610
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	3		610
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	2		610
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	6		610 - 611
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	1		611

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	4		611
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	1		611
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	1		611
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	1		611
			SSC CGL 2018 Tier - 2 (11.09.2019 to 13.09.2019)	2		611
			SSC CGL 2018 Tier - 1 (04.06.2019 to 13.06.2019)	1		611
		Answer key	-	-	-	611
		Solutions	-	-	-	612 - 614
23.	Average	Concepts	-	-	84	615
		Varieties Questions	-	66		615 - 618
		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	3		618 - 619
			SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	28	85	619 - 620
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	15		620
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	14		621
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	3		621
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	21		621 - 622
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	4		622
			SSC CGL 2023 Tier 2 (26.10.2023)	1		622
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	3		622 - 623
			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	17		623
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	4		623 - 624
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	2		624
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	4		624
			SSC CHSL 2022 Tier 2 (26.06.2023)	1		624
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	9		624
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	16		624 - 625
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	2		625
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	8		625
			SSC CPO 2022 Tier 1	5		625 - 626

Search on Telegram @apna_pdf

			(09.11.2022 to 11.11.2022)		86	
			SSC CGL 2021 Tier 2 (08.08.2022)	2		626
			SSC Selection Post (X) (01.08.2022 to 05.08.2022)	5		626
			SSC MTS 2021 Tier 1 (05.07.2022 to 26.07.2022)	35		626 - 628
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	18		628
			SSC CGL 2021 Tier 1 (11.04.2022 to 21.04.2022)	5		628 - 629
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	2		629
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	17		629 - 630
			SSC CGL 2020 Tier 1 (13.08.2021 to 24.08.2021)	6		630
			SSC CHSL 2020 Tier 1 (12.04.2021 to 12.08.2021)	7		630
			SSC CPO 2020 Tier 1 (23.11.2020 to 26.11.2020)	2		630
			SSC CGL 2019 Tier 2 (15.11.2020 to 18.11.2020)	2		630
		Answer key	-	-	-	630 - 631
		Solutions	-	-	-	631 - 647
24.	Data Interpretation	Concepts	-	-	87	648
		TCS Previous Year : Practice Questions	SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	3		648
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	5		648 - 649
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	8		649 - 650
			SSC CPO 2024 Tier 1 (27/06/2024 - 29/06/2024)	2		650
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	4		650 - 651
			SSC CPO 2023 Tier 1 (03/10/2023 to 05/10/2023)	5		651
			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	2		651
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	5		651 - 652
			SSC CGL 2023 Tier 1 (14.07.2023 to 27.07.2023)	2		652
			SSC Selection Post (XI) (26.06.2023 to 30.06.2023)	1		652
			SSC MTS 2022 Tier 1 (02.05.2023 to 20.06.2023)	1		652
			SSC CHSL 2022 Tier 1 (09.03.2023 to 21.03.2023)	2		652
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	2		653
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	1		653
		Answer key	-	-	-	653

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

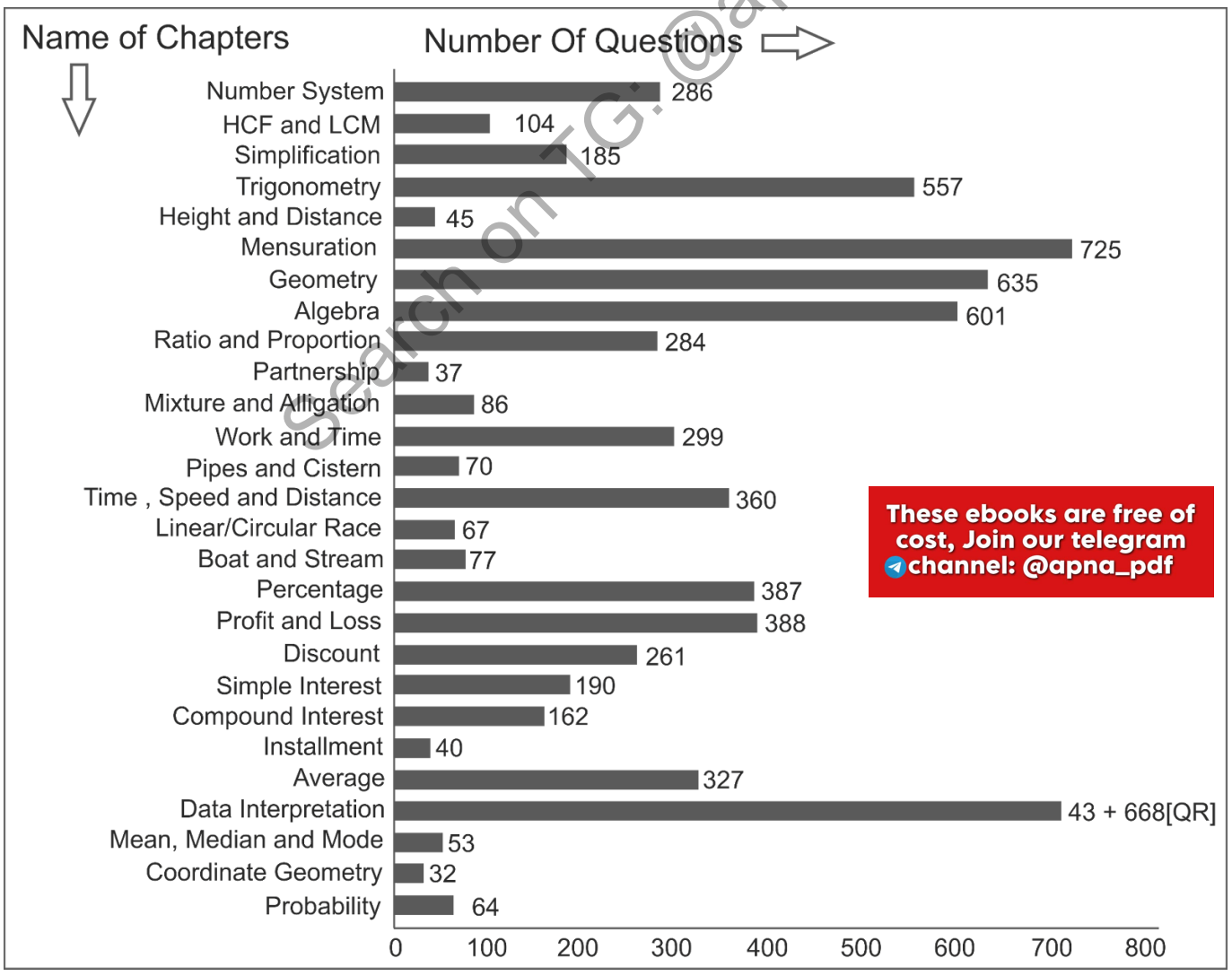
		Solutions	-	-	-	653 - 655
		QR Code	-	668	-	655
25.	Mean, Median & Mode	Concepts	-	-	88	656
		Varieties Questions	-	14		656 - 657
		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	1		657
			SSC CGL 2024 Tier 1 (09/09/2024 - 26/09/2024)	1		657
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	2		657
			SSC Selection Post (XII) (20/06/2024 - 26/06/2024)	1		658
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	3		658
			SSC CGL 2023 Tier 2 (26.10.2023)	1		658
			SSC MTS 2023 Tier 1 (01/09/2023 to 14/09/2023)	1		658
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	1		658
			SSC CHSL 2022 Tier 2 (26.06.2023)	2		658
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	4		658
			SSC CGL 2022 Tier 1 (01.12.2022 to 13.12.2022)	1		658
			SSC CPO 2022 Tier 1 (09.11.2022 to 11.11.2022)	1		658
			SSC CHSL 2021 Tier 1 (24.05.2022 to 10.06.2022)	2		658
			SSC MTS 2020 Tier 1 (5.10.2021 to 02.11.2021)	18		659
		Answer key	-	-	-	659
		Solutions	-	-	-	659 - 662
26.	Coordinate Geometry	Concepts	-	-	89	663
		Varieties Questions	-	4		663
		TCS Previous Year : Practice Questions	SSC MTS 2024 Tier 1 (30/09/2024 - 14/11/2024)	1		663
			SSC CHSL 2024 Tier 1 (01/07/2024 - 11/07/2024)	11		663 - 664
			SSC CHSL 2023 Tier 1 (02/08/2023 to 17/08/2023)	1		664
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	1		664
			SSC CGL 2021 Tier 2 (08.08.2022)	1		664
			SSC CGL 2020 Tier 2 (29.01.2022 & 03.02.2022)	3		664
			SSC CGL 2019 Tier 2 (15.11.2020 to 18.11.2020)	5		664
			SSC CGL 2018 Tier 2 (11.09.2019 to 13.09.2019)	5		664

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

		Answer key	-	-	-	664
		Solutions	-	-	-	664 - 666
27.	Probability	Concepts	-	-	90	667 - 668
		TCS Previous Year : Practice Questions	SSC CHSL 2024 Tier 2 (18/11/2024)	1		668
			SSC CHSL 2023 Tier 2 (02.11.2023 and 10.01.2024)	2		668 - 669
			SSC CGL 2023 Tier 2 (26.10.2023)	2		669
			SSC CHSL 2022 Tier 2 (26.06.2023)	1		669
			SSC CGL 2022 Tier 2 (02.03.2023 to 07.03.2023)	4		669
			Practice Questions	54		669 - 671
		Answer key	-	-	-	671
		Solutions	-	-	-	671 - 674
	Total Questions			**7033**	-	-

Distribution of Questions



These ebooks are free of cost, Join our telegram channel: @apna_pdf
Search on TG: @apna_pdf
Search on Telegram @apna_pdf

Number System

Basics of Number System

(1). Face Value : It is nothing but the number itself about which it has been asked.
Eg: In the number 23576, face value of 5 is 5 and face value of 7 is 7.

(2). Place Value : The place value of a number depends on its position in the number. Each position has a value 10^n, the places to its right.
Eg: In the number 23576, place value of 5 is 500 and place value of 3 is 3000.

Types of Numbers

(1). Natural Numbers (N) :
All positive counting numbers. (0 is not included in it.)
Examples: 1, 2, 3, 4 … etc.

(2). Whole Numbers (W): All non-negative numbers are all whole numbers.
Examples: 0, 1, 2, 3, 4… etc.

(3). Integer Numbers (I): All positive numbers and negative numbers including zero. Positive numbers are called positive integers and negative numbers are called negative integers.
I = ….. , -4, - 3, - 2, - 1, 0, 1, 2, 3, 4 ……

(4). Even Numbers : 2, 4, 6, 8, 10….. [Divisible by 2 completely]

(5). Odd Numbers : 1, 3, 5, 7, 9, 11….. [Not divisible by 2 completely]

(6). Rational Numbers : Numbers whose exact value can be determined. Also a number which can be written in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$ is called a rational number. For example,
Examples : $\frac{3}{4} = 0.75$, $\frac{4}{5} = 0.8$, $\frac{9}{-5}$, $\frac{22}{7}$

(7). Irrational Numbers : Numbers whose exact value cannot be determined.
Example : $\pi = 3.142857142857$ …

(8). Prime number : A number which is divisible by 1 and itself. 2 is only an even prime number.
Example : 2, 3, 5, 7, 11, etc.
Note:-
Total prime no. between 1 - 50 ⇒ 15
Total prime no. between 1 - 100 ⇒ 25
Total prime no. between 1 - 500 ⇒ 95
Total prime no. between 1 - 1000 ⇒ 168

(9). Composite number : If we remove all prime numbers from natural numbers then whatever is left is called Composite numbers.
Example : 4, 6, 8, 9, 10, 12 etc.
Note :- 1 is neither prime nor composite.

(10). Co - prime number : Two numbers are called Co-prime numbers if their HCF is 1.
Example : (2 and 3), (6 and 11).
Note : Two prime numbers are always co-prime numbers to each other. Any two consecutive integers are always co-prime numbers to each other.

Factors

The factors of a number are the numbers that divide it completely without leaving any remainder.

Example : 24 can be completely divided by 1, 2, 3, 4, 6, 8, 12 and 24, so these numbers are factors of 24.

Prime factorisation of a number : When a number is written in the form of multiplication of its prime factors, it's called prime factorisation.
Prime factorisation of 24.

2	24
2	12
2	6
	3

24 → 2 × 2 × 2 × 3 or $2^3 \times 3^1$

Number of factors : To find the number of factors we write the number in the form of prime factors and then add +1 to the exponent of prime factors and multiply them.
For example: $24 = 2^3 \times 3^1$
Number of factors of 24 → (3 + 1)(1 + 1) = 4 × 2 = 8.
With the help of an example, we try to find the sum of all factors of a number.
$24 = 2^3 \times 3^1$,
Sum of all factors = $(2^0 + 2^1 + 2^2 + 2^3) \times (3^0 + 3^1) = 15 \times 4 = 60$.

Number of even factors of a number : To find the number of even factors of a number, we add +1 to the exponents of prime numbers except 2.
(Note : If a number doesn't have 2 as its factor it will have 0 even factors)
Que. Find the number of even factors of 120.
Ans. $120 = 2^3 \times 3^1 \times 5^1$
Number of even factors = 3 × (1 + 1) × (1 + 1) = 3 × 2 × 2 = 12
Note :- To find **the sum of even factors**, we shall ignore 2^0,
Que. Find the sum of even factors of 120.
Sol:-Sum of even factors = $(2^1 + 2^2 + 2^3)(3^0 + 3^1)(5^0 + 5^1) = 14 \times 4 \times 6 = 336$.
Number and Sum of odd factors of a number : to find the number and sum of odd factors of a number, we have to ignore the exponents of 2.

Que. Find the number of odd factors 120.
Sol:- $120 = 2^3 \times 3^1 \times 5^1$
Required number = (1 + 1)(1 + 1) = 4
The exponent of 2 is completely ignored.
Sum of odd factors of 120 = $(3^0 + 3^1)(5^0 + 5^1) = 4 \times 6 = 24$

Some Important Results of Factors:
1001 = 7 × 11 × 13
1001 × abc = abcabc
1001 × 234 = 234234

Que: Which of the following is a factor of 531531?
(a) 15 (b) 13 (c) 11 (d) both b and c
Sol:- 531531 = 1001 × 531
= 7 × 11 × 13 × 531 So, both 11 and 13 are factors of 531531.
111 = 37 × 3 , 1001 × 111 = 111111,
When a single digit is written 6 times, 3, 7, 11, 13, and 37 are factors of it.

Que. Which of the following is a factor of 222222 ?
(a) 17 (b) 57 (c) 68 (d) 74
Sol:- 222222 = 2 × 111111
= 2 × 3 × 7 × 11 × 13 × 37
Clearly, 2 × 37 = 74 is one of the factors.

→ If a, b and c are prime numbers, then the number of prime factors of $a^x \times b^y \times c^z$ is (x + y + z).

Recurring Decimal

Recurring decimals are referred to as numbers that are uniformly repeated after the decimal. Some rational numbers produce recurring decimals after converting them into decimal numbers, but all irrational numbers produce recurring decimals after converting them into decimal form.
Examples :
(1) $\frac{1}{3} = 0.3333333 \ldots = 0.\overline{3}$
(2) $0.\overline{9} = \frac{9}{9} = 1$
(3) $0.53\overline{27} = \frac{5327 - 53}{9900} = \frac{5274}{9900}$
(4) $2.53\overline{27} = 2 + \frac{5327 - 53}{9900} = 2\frac{5274}{9900}$

Divisibility Test

By 2:- When last digit is 0 or an even

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

number eg: 520, 588

By 3:- Sum of digits is divisible by 3
eg: 1971, 1974

By 4:- When last two digits are divisible by 4 or, they are zeros eg: 1528, 1700

By 5 :- When last digit is 0 or 5
eg: 1725, 1790

By 6 :- When the number is divisible by 2 and 3 both. eg: 36, 72

By 7 : - Subtract twice the last digit from the number formed by the remaining digits. Like 651 divisible by 7
65 - (1 × 2) = 63. Since 63 is divisible by 7, so is 651.

By 8 :- When the last three digits are divisible by 8. eg: 2256

By 9 :- When sum of digit is divisible by 9
eg: 9216

By 10 :- When the last digit is 0. eg: 452600

By 11:- When the difference between the sum of odd and even place digits is equal to 0 or multiple of 11 .
eg: 217382
Sum of odd place digits = 2 + 7 + 8 = 17
Sum of even place digits = 1 + 3 + 2 = 6
17 – 6 = 11, hence 217382 is divisible by 11.

By 13 : - If adding four times the last digit to the number formed by the remaining digits is divisible by 13, then the number is divisible by 13. Like 1326 is divisible by 13
132 + (6 × 4) = 156. Repeat the same process for 156 .
15 + (6 × 4) = 39.so 39 is divisible by 13

BY 17 :-The divisibility rule of 17 states, "If five times the last digit is subtracted from a number made up of the remaining digits and the remainder is either 0 or a multiple of 17, then the number is divisible by 17".
Like 221: 22 − 1 × 5 = 17.

Prime Number Test

For finding whether any number is a prime number or not, we need to find the nearest square root of given number, then we need to find out whether the given number is divisible by any prime number less than the obtained number or not. If it is divisible then it is not a prime number and if not divisible then it is a prime number.
Example : Find whether 177 is a prime number or not.
Soln : Nearest square root of 177 is 13. Now we need to check whether 177 is divisible by prime numbers less than 13. On checking we find that 177 is divisible by 3. Hence, 177 is not a prime number.

Important Formulas

1. Sum of first n natural number
s = $\frac{n(n+1)}{2}$

2. Sum of first n odd numbers = n^2

3. Sum of first n even numbers
= $n(n+1)$

4. Sum of square of first n natural numbers = $\frac{n(n+1)(2n+1)}{6}$

5. Sum of cubes of first n natural number = $(\frac{n(n+1)}{2})^2$

6. $(x^m - a^m)$ is divisible by $(x - a)$ for every natural number m.

7. $(x^m - a^m)$ is divisible by $(x + a)$ and $(x - a)$ for even values of m.

8. $(x^m + a^m)$ is divisible by $(x + a)$ for odd values of m.

9. Number of prime factors of a^p, b^q, c^r, d^s is $p + q + r + s$ when a, b, c, d are all prime numbers.

10. HCF of $(a^m - 1)$ and $(a^n - 1)$ = $[(a^{HCF(m,n)} - 1)]$

Number of Zeros in an expression

We shall understand this concept with the help of an example.
Let's find the number of zeros in the following expression: 24 × 32 × 17 × 23 × 19 = $(2^3 \times 3^1) \times 2^5 \times 17 \times 23 \times 19$
Notice that a zero is made only when there is a combination of 2 and 5. Since there is no '5' here there will be no zero in the above expression.
Example:-
$8 \times 15 \times 23 \times 17 \times 25 \times 22 =$
$2^3 \times (3^1 \times 5^1) \times 23 \times 17 \times 5^2 \times 2^1 \times 11$
In this expression there are 4 twos and 3 fives. From this 3 pairs of 5×2 can be formed. Therefore, there will be 3 zeros in the final product.

Que. Find the number of zeros in the value of:
$2^2 \times 5^4 \times 4^6 \times 10^8 \times 6^{10} \times 15^{12} \times 8^{14} \times 20^{16} \times 10^{18} \times 25^{20}$.

Sol:-
$2^2 \times 5^4 \times 4^6 \times 10^8 \times 6^{10} \times 15^{12} \times 8^{14} \times 20^{16} \times 10^{18} \times 25^{20}$=
$2^2 \times 5^4 \times 2^{12} \times 2^8 \times 5^8 \times 2^{10} \times 3^{10} \times 3^{12} \times 5^{12} \times 2^{42} \times 2^{32} \times 5^{16} \times 2^{18} \times 5^{18} \times 5^{40}$
Zeros are possible with a combination of 2 × 5 Here the number of 5's are less so the number of zeros will be limited to the number of 5's.
In this expression number of fives are: $5^4 \times 5^8 \times 5^{12} \times 5^{16} \times 5^{18} \times 5^{40}$;
i.e. 4 + 8 + 12 + 16 + 18 + 40 = 98

The number of Zeros in n!

To find the number of zeros in n!, we divide "n" by 5 until we get a number less than 5, and then we add all the quotients so obtained.

Que. Find the number of zeros in 36! .

5	36	
5	7	(1)
	1	(2)

The number of zeros = 7 + 1 = 8.

Remainder Theorem

Que. What will be the remainder when 17 × 23 is divided by 12?

Ans :- We can express this as:
17 × 23 = (12 + 5) × (12 + 11)
= 12 × 12 + 12 × 11 + 5 × 12 + 5 × 11
In the above expression we will find that remainder will depend on the last term i.e. 5 × 11
Now, $rem.(\frac{5 \times 11}{12})$= 7.
So, $\frac{12 \times 12 + 12 \times 11 + 5 \times 12 + 5 \times 11}{12}$
and $\frac{5 \times 11}{12}$ remainder is same in both cases which is 7.

Example:- Remainder when
$1421 \times 1423 \times 1425$ is divided by 12?
$rem(\frac{1421 \times 1423 \times 1425}{12})$
$= rem(\frac{5 \times 7 \times 9}{12}) = rem(\frac{35 \times 9}{12})$
$= rem(\frac{11 \times 9}{12}) = 3$

Negative Remainder

Taking a negative remainder will make our calculation easier.
Examples
(i) *rem* $(\frac{7 \times 8}{9})$ = *rem* $(\frac{-2 \times -1}{9})$
= − 2 × − 1 = 2
(ii) *rem* $(\frac{55 \times 56}{57})$ = *rem* $(\frac{-2 \times -1}{57})$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= -2 \times -1 = 2$

(iii) $rem\ (\frac{7 \times 10}{9}) = rem(\frac{-2 \times 1}{9})$

$= -2 \times 1 = \ -2\ or,\ 7$

Large Power Concepts

Look at the following examples:

(i) rem $(\frac{28^{12345}}{9}) = rem(\frac{(27+1)^{12345}}{9})$

= rem $(\frac{1^{12345}}{9}) = 1^{12345} = 1$

(ii) rem $(\frac{26^{12345}}{9})$

$= rem\ (\frac{(27-1)^{12345}}{9})$

= rem $(\frac{-1^{12345}}{9})$ = - 1^{12345} = - 1 or 8

Application of Remainder Theorem

Que. Find the last two digits of the expression
$22 \times 31 \times 44 \times 27 \times 37 \times 43$?

Sol:- If we divide the above expression by 100, we will get the last two digits as remainder.

$\Rightarrow rem(\frac{22 \times 31 \times 44 \times 27 \times 37 \times 43}{100})$,

dividing by 4 to make it simple

$= rem(\frac{22 \times 31 \times 11 \times 27 \times 37 \times 43}{25})$

$= rem(\frac{132 \times 22 \times 216}{25})$

$= rem(\frac{7 \times 22 \times 16}{25}) \quad \Rightarrow rem(\frac{4 \times 16}{25})$

$= rem(\frac{14}{25}) = 14$

Since we had divided by 4 initially now to get the correct answer, we need to multiply the remainder by 4.
So remainder will be $14 \times 4 = 56$, which will also be the last two digits of the expression.

Variety Questions

Q.1. The five - digit number 45yz0 is divisible by 40. What is the maximum possible value of (y + z) ?
SSC CGL 26/09/2024 (2nd Shift)
(a) 15 (b) 18 (c) 16 (d) 17

Q.2. In a room, there are some chairs and some people. If on each chair, only one person is seated, then there is no chair for exactly one person. If on each chair, two persons sit, then there is one vacant chair. What is the number of chairs in the room?
SSC CGL 26/09/2024 (1st Shift)
(a) 7 (b) 4 (c) 3 (d) 6

Q.3. Cindy bought 15 apples and 12 oranges and paid a sum of ₹447 for the purchase. Which of the statements given below is inconsistent with the information given in the previous statement, leading to no possible prices of the two fruits?
SSC CGL 25/09/2024 (3rd Shift)
(a) Purchased 25 apples and 20 oranges and paid a sum of ₹745
(b) Purchased 10 apples and 13 oranges and paid a sum of ₹353
(c) Purchased 12 apples and 8 oranges and paid a sum of ₹340
(d) Purchased 35 apples and 28 oranges and paid a sum of ₹1,029

Q.4. Aman has certain number of notes of denomination ₹20 and ₹10 which amount to ₹390. If the numbers of notes of each kind are interchanged, then the new amount is ₹90 less than before. Find the number of notes of ₹20 denomination.
SSC CGL 23/09/2024 (1st Shift)
(a) 16 (b) 12 (c) 15 (d) 14

Q.5. 2 biscuits and 1 chocolate cost ₹69. 2 chocolates and 3 cups of coffee cost ₹127. 3 biscuits, 4 chocolates and 2 cups of coffee cost ₹229. Find the total cost (in ₹) of 5 biscuits, 5 chocolates and 5 cups of coffee.
SSC CGL 13/09/2024 (3rd Shift)
(a) 304 (b) 375 (c) 345 (d) 355

Q.6. 8 apples and 10 oranges weigh 5 kg. 12 apples and 20 oranges weigh 9 kg. What is the weight (in kg, rounded off to the nearest integer) of 15 apples and 24 oranges ?
SSC CHSL 08/07/2024 (3rd Shift)
(a) 16 (b) 11 (c) 13 (d) 10

Q.7. In an election, voters have the option to vote for one of three candidates. They also have the option to select 'None Of The Above' (NOTA) to reject all the candidates. All three candidates get 6 times the NOTA votes. The winner gets twice the votes of the second runner-up. The first runner-up gets 900 more votes than NOTA and defeats the second runner-up by 150 votes. Find the total number of votes cast.
SSC CHSL 05/07/2024 (4th Shift)
(a) 15177 (b) 11577 (c) 11025 (d) 17715

Q.8. How many factors of 14,400 are divisible by 18 but not by 36 ?
SSC CHSL 05/07/2024 (4th Shift)
(a) 3 (b) 5 (c) 4 (d) 2

Q.9. Raju has ₹11,000 and starts saving ₹5,000 each week towards buying a new laptop. At the same time, Ramesh has ₹60,000 and begins spending ₹2,000 per week on supplies for his art class. Will there be a week when they have the same amount of money?
SSC CHSL 05/07/2024 (1st Shift)
(a) Yes, after 5 weeks
(b) No, they will never have the same amount
(c) Yes, after 7 weeks
(d) Yes, after 6 weeks

Q.10. If 3c2933k is divisible by both 5 and 11, where c and k are single digit natural numbers, then c + k = _____.
SSC CHSL 05/07/2024 (1st Shift)
(a) 6 (b) 8 (c) 5 (d) 7

Q.11. If two numbers are each divided by the same divisor, then the remainders are 6 and 7, respectively. If the sum of the two numbers be divided by the same divisor, then the remainder is 5. The divisor is:
SSC CHSL 04/07/2024 (2nd Shift)
(a) 6 (b) 4 (c) 13 (d) 8

Q.12. Find the lowest positive value of (c – b) such that the 7-digit number 1738b9c is divisible by 12.
SSC CHSL 01/07/2024 (4th Shift)
(a) 4 (b) 7 (c) 1 (d) 2

Q.13. Successive division of a number by 2, 3, 5 and 7 gives remainders 1, 4, 0 and 5, respectively. What will be the sum of the remainders if the same number is divided by 7, 5, 3 and 2 successively ?
SSC CHSL 01/07/2024 (4th Shift)
(a) 17 (b) 8 (c) 10 (d) 9

Q.14. Ram gives a six-digit number 468312 to Shyam to check the divisibility. Shyam tells Ram that the number is divisible by 57. Shyam asks Ram, "If we rearrange the digits of this number in descending order, then by which number will it be always divisible ?"
Graduate Level 21/06/2024 (Shift - 3)
(a) 2 (b) 3 (c) 19 (d) 17

Q.15. A 4-digit number '34PQ' divisible by 3,5 and 7. Find the value of P + Q .
Matriculation Level 20/06/2024 (Shift - 4)
(a) 11 (b) 12 (c) 10 (d) 13

Q.16. A six-digit number is divisible by 33. If 21 is added to the number, then the new number which formed is also divisible by:
Higher Secondary 20/06/2024 (Shift - 2)
(a) 5 (b) 4 (c) 2 (d) 3

Q.17. A six-digit number 11p9q4 is divisible by 24. Then the greatest possible value for pq is:
SSC CGL Tier II (26/10/2023)

Search on T.G. @apna_pdf

Search on Telegram @apna_pdf

(a) 56 (b) 68 (c) 42 (d) 32

Q.18. The remainder of the term $9 + 9^2 + \ldots\ldots + 9^{(2n+1)}$ when divided by 6 is:
SSC CHSL 11/08/2023 (4th Shift)
(a) 1 (b) 4 (c) 2 (d) 3

Q.19. Two numbers, when divided by a certain divisor, leave the remainder 57. When sum of the two numbers is divided by the same divisor, the remainder is 49. The divisor is:
SSC CHSL 08/08/2023 (3rd Shift)
(a) 56 (b) 57 (c) 49 (d) 65

Q.20. In a division sum, the divisor is 11 times the quotient and 5 times the remainder. If the remainder is 44, then the dividend is:
SSC CHSL 07/08/2023 (4th Shift)
(a) 8888 (b) 4448 (c) 8444 (d) 4444

Q.21. What is the least value of x + y, if 10 digit number 780x533y24 is divisible by 88 ?
SSC CHSL 03/08/2023 (4th Shift)
(a) 4 (b) 3 (c) 1 (d) 2

Q.22. Suhas mistakenly took as dividend a number which was 10% less than the original dividend. He also mistakenly took as divisor a number which was 20% less than the original divisor. If the correct quotient of the original question of division was 24 and the remainder was 0, then what quotient did Suhas obtain, assuming there was no error in his calculations?
SSC CGL 19/07/2023 (1st shift)
(a) 27 (b) 21.6 (c) 26.4 (d) 30

Q.23. During a division, Pranjal mistakenly took as the dividend a number that was 10% more than the original dividend. He also mistakenly took as the divisor a number that was 25% more than the original divisor. If the correct quotient of the original division problem was 25 and the remainder was 0, what was the quotient that Pranjal obtained, assuming his calculations had no error ?
SSC CGL 17/07/2023 (4th shift)
(a) 21.75 (b) 21.25 (c) 28.75 (d) 22

Q.24. The six-digit number 7x1yyx is a multiple of 33 for non-zero digits x and y. Which of the following could be a possible value of (x + y) ?
Matriculation Level 30/06/2023 (Shift - 4)
(a) 5 (b) 4 (c) 2 (d) 3

Q.25. A girl wants to plant trees in her garden in rows in such a way that the number of trees in each row to be the same. There are 10 rows and the number of trees in each row is 12, what is the number of trees in each row, if there are 5 more rows ?
SSC MTS 17/05/2023 (Evening)
(a) 10 (b) 8 (c) 6 (d) 12

Q.26. What is the total number of factors of the number 720 except 1 and the number itself?
SSC CHSL 10/03/2023 (4th Shift)
(a) 29 (b) 27 (c) 32 (d) 28

Q.27. Which of the following is the smallest among $(14)^{\frac{1}{3}}$, $(12)^{\frac{1}{2}}$, $(16)^{\frac{1}{6}}$ & $(25)^{\frac{1}{12}}$?
SSC CHSL 10/03/2023 (3rd Shift)
(a) $(14)^{\frac{1}{3}}$ (b) $(25)^{\frac{1}{12}}$ (c) $(16)^{\frac{1}{6}}$ (d) $(12)^{\frac{1}{2}}$

Q.28. How many terms of the series - 9, - 6, - 3, ...must be taken so that the sum of all the terms is 45 ?
SSC CHSL 10/03/2023 (1st Shift)
(a) 11 (b) 8 (c) 10 (d) 9

Q.29. Which of the following statements is correct ?
I.The Value of $100^2 - 99^2 + 98^2 - 97^2 + 96^2 - 95^2 + 94^2 - 93^2 + \ldots\ldots + 22^2 - 21^2$ is 4840.
II. The value of $(K^2 + \frac{1}{K^2})(K - \frac{1}{K})(K^4 + \frac{1}{K^4})(K + \frac{1}{K})(K^4 - \frac{1}{K^4})$ is $K^{16} - \frac{1}{K^{16}}$
SSC CGL 13/12/2022 (3rd Shift)
(a) Neither I nor II (b) Both I and II
(c) Only II (d) Only I

Q.30. If the seven-digit number 52A6B7C is divisible by 33, and A, B, C are primes, then the maximum value of 2A + 3B+C is:
SSC CGL 12/12/2022 (3rd Shift)
(a) 32 (b) 23 (c) 27 (d) 34

Q.31. In a test (+ 5) marks are given for every correct answer and (−2) marks are given for every incorrect answer. Jay answered all the questions and scored (−12) marks, though he got 4 correct answers. How many of his answers were INCORRECT ?
SSC CPO 11/11/2022 (Evening)
(a) 8 (b) 32 (c) 16 (d) 20

Q.32. The number 150328 is divisible by 23. If the digits are rearranged in descending order and five times of 13 is subtracted from the new number thus formed, then the resultant number will be divisible by:
SSC CPO 10/11/2022 (Morning)
(a) 3 (b) 5 (c) 11 (d) 2

Q.33. What is the sum of all the common terms between the given series S1 and S2 ?
S1 = 2, 9, 16, ..., 632
S2 = 7, 11, 15, ..., 743
SSC CGL Tier II (08/08/2022)
(a) 6974 (b) 6750 (c) 7140 (d) 6860

Q.34. Let p, q, r and s be positive natural numbers having three exact factors including 1 and the number itself If q > p and both are two-digit numbers, and r > s and both are one-digit numbers, then the value of the expression $\frac{p-q-1}{r-s}$ is:
SSC CGL Tier II (03/02/2022)
(a) - s - 1 (b) s - 1 (c) 1 - s (d) s + 1

Q.35. Three fractions x, y and z are such that x > y > z. When the smallest of them is divided by the greatest, the result is $\frac{9}{16}$ which exceeds y by 0.0625. If x + y + z = $2\frac{3}{12}$, then what is the value of x + z ?
SSC CGL Tier II (29/01/2022)
(a) $\frac{5}{4}$ (b) $\frac{1}{4}$ (c) $\frac{7}{4}$ (d) $\frac{3}{4}$

Q.36. How many numbers between 400 and 700 are divisible by 5, 6 and 7 ?
SSC CPO 24/11/2020 (Evening)
(a) 2 (b) 5 (c) 10 (d) 20

Q.37. Find the number of prime factors in the product $(30)^5 \times (24)^5$.
SSC CGL Tier II (18/11/2020)
(a) 45 (b) 35 (c) 10 (d) 30

Q.38. Let ab, a ≠ b, is a 2-digit prime number such that ba is also a prime number. The sum of all such number is:
SSC CGL Tier II (16/11/2020)
(a) 374 (b) 418 (c) 407 (d) 396

Q.39. Given that $2^{20} + 1$ is completely divisible by a whole number. Which of the following is completely divisible by the same number ?
SSC CHSL 16/10/2020 (Afternoon)
(a) $2^{15} + 1$ (b) 5×2^{30}
(c) $2^{90} + 1$ (d) $2^{60} + 1$

Q.40. Which of the following numbers will completely divide $7^{81} + 7^{82} + 7^{83}$?
SSC CHSL 17/03/2020 (Morning)
(a) 399 (b) 389 (c) 387 (d) 397

Q.41. When a positive integer is divided by d, the remainder is 15. When ten times of the same number is divided by d, the remainder is 6. The least possible value of d is:
SSC CGL 05/03/2020 (Afternoon)
(a) 9 (b) 12 (c) 16 (d) 18

Q.42. When 200 is divided by a positive integer x, the remainder is 8. How many values of x are there?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 03/03/2020 (Afternoon)
(a) 7 (b) 5 (c) 8 (d) 6

Q.43. How many natural numbers less than 1000 are divisible by 5 or 7 but NOT by 35 ?
SSC CPO 11/12/2019 (Morning)
(a) 285 (b) 313 (c) 341 (d) 243

Q.44. If r is the remainder when each of 4749, 5601 and 7092 is divided by the greatest possible number d (> 1), then the value of (d + r) will be:
SSC CPO 11/12/2019 (Morning)
(a) 276 (b) 271 (c) 298 (d) 282

Q.45. Let x be the least 4-digit number which when divided by 2, 3, 4, 5, 6 and 7 leaves a remainder of 1 in each case. If x lies between 2800 and 3000, then what is the sum of digits of x ?
SSC CPO 09/12/2019 (Evening)
(a) 15 (b) 16 (c) 12 (d) 13

Q.46. If the six digit number 479xyz is exactly divisible by 7, 11 and 13 , then {(y + z) ÷ x} is equal to :
SSC CPO 09/12/2019 (Morning)
(a) $\frac{11}{9}$ (b) 4 (c) $\frac{13}{7}$ (d) $\frac{7}{13}$

Q.47. Which among the following is the smallest ?
SSC CPO 09/12/19 (Morning)
(a) √401 - √399 (b) √101 - √99
(c) √301 - √299 (d) √201 - √199

Q.48. Two positive numbers differ by 2001. When the larger number is divided by the smaller number, the quotient is 9 and the remainder is 41. The sum of the digits of the larger number is :
SSC CGL Tier II (13/09/2019)
(a) 15 (b) 11 (c) 10 (d) 14

Q.49. When a two - digit number is multiplied by the sum of its digits, the product is 424. When the number obtained by interchanging its digits is multiplied by the sum of the digits, the result is 280. The sum of the digits of the given number is :
SSC CGL Tier II (12/09/2019)
(a) 6 (b) 9 (c) 8 (d) 7

Q.50. Let x be the least number which when divided by 15,18,20 and 27, the remainder in each case is 10 and x is a multiple of 31. What least number should be added to x to make it a perfect square ?
SSC CGL Tier II (12/09/2019)
(a) 39 (b) 37 (c) 43 (d) 36

Q.51. When 12, 16, 18, 20 and 25 divide the least number x, the remainder in each case is 4 but x is divisible by 7. What is the digit at the thousands' place in x ?
SSC CGL Tier II (11/09/2019)
(a) 5 (b) 8 (c) 4 (d) 3

Q.52. Let x = $(633)^{24} - (277)^{38} + (266)^{54}$ What is the unit digit of x ?
SSC CGL Tier II (11/09/2019)
(a) 7 (b) 6 (c) 4 (d) 8

Q.53. The sum of the digits of a two-digit number is $\frac{1}{7}$ of the number. The unit digit is 4 less than the tens digit. If the number obtained on reversing its digit is divided by 7, the remainder will be :
SSC CGL Tier II (11/09/2019)
(a) 4 (b) 5 (c) 1 (d) 6

Q.54. When 6892, 7105 and 7531 are divided by the greatest number x, then the remainder in each case is y. What is the value of (x - y) ?
SSC MTS 22/08/2019 (Afternoon)
(a) 123 (b) 137 (c) 147 (d) 113

Q.55. Let x be the greatest number which when divides 6475, 4984 and 4132, the remainder in each case is the same. What is the sum of digits of x ?
SSC MTS 22/08/2019 (Morning)
(a) 4 (b) 7 (c) 5 (d) 6

Q.56. A gardener planted 1936 saplings in a garden such that there were as many rows of saplings as the columns. The number of rows planted is :
SSC CPO 16/03/2019 (Afternoon)
(a) 46 (b) 44 (c) 48 (d)42

Q.57. What is the difference between the largest and smallest numbers of the four digits created using numbers 2, 9, 6, 5 ? (Each number can be used only once)
SSC CPO 14/03/2019 (Evening)
(a) 6993 (b) 7056 (c) 6606 (d) 7083

Q.58. The square root of which of the following is a rational number ?
SSC CPO 12/03/2019 (Morning)
(a) 1250.49 (b) 6250.49
(c) 1354.24 (d) 5768.28

Practice Questions

SSC CHSL 2024 Tier - 2

Q.59. A number 37 is divided into two parts such that 5 times one part and 11 times the other is together equal to 227. Find the value of 9 times the smaller number.
SSC CHSL Tier II (18/11/2024)
(a) 60 (b) 61 (c) 62 (d) 63

SSC MTS 2024 Tier - 1

Q.60. The number of heads on the farm, as determined by the farmer, was 60. When he counted, he discovered there were 150 legs. If all that was present were pigeons or horses, and every horse on the property had four legs while every pigeon had two, how many horses were there on the property ?
SSC MTS 07/10/2024 (Afternoon)
(a) 14 (b) 12 (c) 15 (d) 10

Q.61. A length of a violin string varies inversely with respect to the frequency of its vibrations. The frequency of a 14-inch-long violin string is 450 cycles per second. Find the frequency of a 12-inch violin string.
SSC MTS 17/10/2024 (Evening)
(a) 515 cycles per second
(b) 525 cycles per second
(c) 520 cycles per second
(d) 510 cycles per second

Q.62. b is the sum of two quantities, one of which varies inversely as the square of a^2 , and the other of which varies directly as a. Identify the relationship between a and b if b = 49 when a = 3 or 5.
SSC MTS 21/10/2024 (Morning)
(a) a = 3b (b) a = $3b^2 - 7/a$
(c) b = $8a + 225/a^2$ (d) b = 2a

Q.63. If p is directly proportional to q and is p = 7 when q = 6, then what is the value of p when q = 21 ?
SSC MTS 21/10/2024 (Evening)
(a) 24.0 (b) 24.5 (c) 23.5 (d) 25.0

Q.64. If P (P > 0) is the least possible number that must be subtracted from 7, 9, and 12 so that the resulting numbers are in continued proportion, then find the value of $P^2 + 1$.
SSC MTS 29/10/2024 (Evening)
(a) 10 (b) 12 (c) 3 (d) 8

SSC CGL 2024 Tier - 1

Q.65. Which of the following can be the value of 'k' so that the number 217924k is divisible by 6?
SSC CGL 09/09/2024 (1st Shift)
(a) 4 (b) 6 (c) 2 (d) 0

Q.66. Without doing the actual division, find the remainder when 28735429 is divided by 9.
SSC CGL 09/09/2024 (2nd Shift)
(a) 4 (b) 2 (c) 8 (d) 9

Q.67. If 7845K854 is divisible by 11, then what is the value of K?
SSC CGL 09/09/2024 (3rd Shift)
(a) 6 (b) 9 (c) 7 (d) 8

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.68. Which of the following is the largest 5-digit number divisible by 47 ?
SSC CGL 10/09/2024 (1st Shift)
(a) 99999 (b) 98888 (c) 99969 (d) 10000

Q.69. Akshay purchased pens and notebooks from a shop for a total sum of ₹180. From the following data, what is the value of 'X'?

Items	Price per unit (in ₹)	Quantity
Pens	10	X
Notebooks	20	6

SSC CGL 10/09/2024 (2nd Shift)
(a) 4 (b) 6 (c) 5 (d) 7

Q.70. If $(77^{77} + 77)$ is divided by 78, then the remainder will be:
SSC CGL 10/09/2024 (2nd Shift)
(a) 76 (b) 77 (c) 78 (d) 1

Q.71. Which digits should come in the place of * and #, respectively, if the 7-digit number 62684*# is divisible by both 8 and 5 ?
SSC CGL 10/09/2024 (3rd Shift)
(a) 2 and 0 (b) 4 and 0
(c) 5 and 0 (d) 0 and 5

Q.72. Find the smallest number to be added to 999, so that 99 divides the sum exactly.
SSC CGL 11/09/2024 (1st Shift)
(a) 99 (b) 0 (c) 90 (d) 9

Q.73. In a division problem, the divisor is 4 times the quotient and 2 times the remainder. If the remainder is 32, then find the dividend.
SSC CGL 11/09/2024 (1st Shift)
(a) 1056 (b) 1650 (c) 3240 (d) 1065

Q.74. Which of the following numbers is divisible by both 2 and 5 ?
SSC CGL 11/09/2024 (2nd Shift)
(a) 63840 (b) 20792 (c) 37915 (d) 37254

Q.75. Find the quotient, when the mean proportional of $7\frac{1}{5}$ and 245 is divided by an even prime number
SSC CGL 11/09/2024 (2nd Shift)
(a) 49 (b) 42 (c) 21 (d) 36

Q.76. Naman bought a few apples for ₹720 from a shop. He negotiated the price and the shopkeeper reduced it by ₹2 per apple. Due to this Naman could buy four more apples than what he had bought earlier. How many apples did he originally buy?
SSC CGL 11/09/2024 (3rd Shift)
(a) 48 (b) 44 (c) 36 (d) 40

Q.77. Replace * by the smallest digit so that 723*56* is divisible by 6
SSC CGL 11/09/2024 (3rd Shift)
(a) 4 (b) 3 (c) 2 (d) 1

Q.78. In a garden, there are 6 daisy plants the first year. Each year, a gardener adds 3 new daisy plants. He has 26 jasmine plants the first year and loses 2 each year. When will the number of daisy plants equal to the number of jasmine plants after the first year?
SSC CGL 12/09/2024 (2nd Shift)
(a) 5 years (b) 4 years
(c) 2 years (d) 6 years

Q.79. Which of the following numbers is divisible by 2, 5, 10 and 11?
SSC CGL 12/09/2024 (3rd Shift)
(a) 203467 (b) 830942
(c) 589270 (d) 1234560

Q.80. Find the smallest value that must be assigned to number 'a' in order for 91876a2 to be divisible by 8.
SSC CGL 12/09/2024 (3rd Shift)
(a) 3 (b) 0 (c) 1 (d) 2

Q.81. If 321y72 is a multiple of 6, where y is a digit, what is the least value of y?
SSC CGL 13/09/2024 (1st Shift)
(a) 3 (b) 0 (c) 7 (d) 2

Q.82. At a cafe, Rama bought drinks for her 7 friends at ₹240. Some of them wanted coffee, while others wanted black tea. A regular cup of coffee cost ₹40 and a regular cup of black tea cost ₹ 30. How many cups of black tea did she purchase?
SSC CGL 13/09/2024 (1st Shift)
(a) 5 (b) 4 (c) 3 (d) 6

Q.83. Find the remainder: $(17^{13} - 21) \div 18$
SSC CGL 13/09/2024 (3rd Shift)
(a) 15 (b) 17 (c) 14 (d) 21

Q.84. Find the least value of x for which 57x716 is divisible by 9.
SSC CGL 17/09/2024 (2nd Shift)
(a) 1 (b) 9 (c) 0 (d) 8

Q.85. If P is a digit such that 6954P is divisible by 11, then P equals:
SSC CGL 17/09/2024 (3rd Shift)
(a) 2 (b) 8 (c) 6 (d) 7

Q.86. When $f(m) = m^5 + 5m^4 - 3m + 7$ is divided by (m - 2), then the remainder is _____.
SSC CGL 17/09/2024 (3rd Shift)
(a) 7 (b) 5 (c) 0 (d) 113

Q.87. A number r when divided by 8 leaves remainder 3. What will be the remainder when $(r^2 + 6r + 7)$ is divided by 8?
SSC CGL 18/09/2024 (1st Shift)
(a) 2 (b) 3 (c) 1 (d) 4

Q.88. Find the remainder, if 19^{200} is divided by 20.
SSC CGL 18/09/2024 (2nd Shift)
(a) 2 (b) -1 (c) 1 (d) 3

Q.89. Which of the following fractions is the largest ?
$\frac{2}{3}, \frac{6}{53}, \frac{79}{90}, \frac{33}{44}$
SSC CGL 18/09/2024 (2nd Shift)
(a) $\frac{2}{3}$ (b) $\frac{33}{44}$ (c) $\frac{6}{53}$ (d) $\frac{79}{90}$

Q.90. If the 9-digit number 5x79856y6 is divisible by 36, then what is the negative value of $\sqrt{(2x + y)}$ for the largest possible value of y, given x and y are natural numbers?
SSC CGL 18/09/2024 (3rd Shift)
(a) -7 (b) -2 (c) -4 (d) -5

Q.91. Anna and Ben each have a collection of marbles. If Anna gives one marble to Ben, they will both have an equal number of marbles. Conversely, if Ben gives one marble to Anna, she will end up with three times the number of marbles that Ben has. What is the total number of marbles they both have?
SSC CGL 18/09/2024 (3rd Shift)
(a) 10 (b) 8 (c) 11 (d) 9

Q.92. What number should be subtracted from $x^3 - 4x^2 - 8x + 11$ to make the number divisible by $(x + 2)$?
SSC CGL 19/09/2024 (1st Shift)
(a) 9 (b) 5 (c) 3 (d) 7

Q.93. Each of Ravi and Kavita had some marbles. Kavita had 12 more marbles than Ravi had. If each of them had one more marble, then three times the number of marbles Kavita would then have had would have been equal to four times the number of marbles Ravi would then have had. How many marbles did Kavita actually have ?
SSC CGL 19/09/2024 (1st Shift)
(a) 43 (b) 47 (c) 51 (d) 48

Q.94. From the given numbers A, B, C and D, which number is NOT divisible by 11?
A = 712712 B = 177210
C = 64614 D = 756148
SSC CGL 19/09/2024 (2nd Shift)
(a) C (b) D (c) B (d) A

Q.95. Which of the following numbers is NOT divisible by 8 ?
SSC CGL 19/09/2024 (3rd Shift)
(a) 7344 (b) 5544 (c) 7497 (d) 4608

Q.96. For what least value of n, $2^{2n} + 2n$ is completely divided by 6, where n is an integer?
SSC CGL 23/09/2024 (1st Shift)
(a) 3 (b) 1 (c) 0 (d) 2

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.97. The least number which must be subtracted from 7278745 so as to obtain a sum divisible by 11 is:
SSC CGL 23/09/2024 (2nd Shift)
(a) 3 (b) 1 (c) 5 (d) 2

Q.98. Ten chairs and six tables together cost ₹5,140; three chairs and two tables together cost ₹1,635. The cost of 1 chair and 1 table is:
SSC CGL 23/09/2024 (2nd Shift)
(a) ₹900 (b) ₹600 (c) ₹800 (d) ₹700

Q.99. The number 4,29,714 is divisible by:
SSC CGL 23/09/2024 (3rd Shift)
(a) 3 and 5 (b) 6 and 5
(c) 4 and 6 (d) 3 and 6

Q.100. Find the greatest value of 'k' in a 6-digit number 6745k2 such that the number is divisible by 3.
SSC CGL 24/09/2024 (1st Shift)
(a) 8 (b) 6 (c) 9 (d) 7

Q.101. On dividing a number by 55, we get 28 as the remainder. On dividing the same number by 11, what is the remainder?
SSC CGL 24/09/2024 (2nd Shift)
(a) 5 (b) 8 (c) 7 (d) 6

Q.102. The ratio of two numbers is 2 : 5 and their difference is 210. The smaller number is _____.
SSC CGL 24/09/2024 (3rd Shift)
(a) 60 (b) 150 (c) 140 (d) 350

Q.103. If 436P5 is divisible by 3, then the largest value of P is:
SSC CGL 24/09/2024 (3rd Shift)
(a) 12 (b) 6 (c) 8 (d) 9

Q.104. Which composite number can divide the sum of the first 12 natural numbers?
SSC CGL 24/09/2024 (3rd Shift)
(a) 6 (b) 12 (c) 4 (d) 8

Q.105. If m is even, then $(8^m - 1)$ is divisible by:
SSC CGL 25/09/2024 (2nd Shift)
(a) 63 (b) 42 (c) 65 (d) 8

Q.106. Which of the following numbers is divisible by 6?
SSC CGL 25/09/2024 (3rd Shift)
(a) 128530 (b) 12581
(c) 438750 (d) 62233

Q.107. A number whose fifth part increased by 5 is equal to its third part decreased by 7. Find half of the number.
SSC CGL 26/09/2024 (1st Shift)
(a) 45 (b) 150 (c) 80 (d) 60

Q.108. The sum of two consecutive even numbers is 174. Find the smaller number.
SSC CGL 26/09/2024 (2nd Shift)
(a) 84 (b) 90 (c) 86 (d) 88

Q.109. $7^{15} + 7^{16} + 7^{17}$ is divisible by which of the following given numbers?
SSC CGL 26/09/2024 (3rd Shift)
(a) 3 (b) 5 (c) 2 (d) 4

SSC CHSL 2024 Tier - 1

Q.110. Find the number when successively divided by 3, 5 and 7 leaves remainder 2, 1 and 3, respectively, and the last quotient is 3.
SSC CHSL 01/07/2024 (2nd Shift)
(a) 367 (b) 365 (c) 362 (d) 360

Q.111. How many numbers lie between 2000 and 2020 that are divisible by 8 ?
SSC CHSL 02/07/2024 (1st Shift)
(a) 4 (b) 3 (c) 2 (d) 5

Q.112. On dividing a certain number by 304, we get 43 as the remainder. If the same number is divided by 16, what will be the remainder?
SSC CHSL 02/07/2024 (2nd Shift)
(a) 8 (b) 11 (c) 15 (d) 12

Q.113. The sum of the five consecutive even numbers is 2720. The sum of the third and fifth numbers is :
SSC CHSL 02/07/2024 (2nd Shift)
(a) 1392 (b) 1192 (c) 1092 (d) 1292

Q.114. What is the number of digits required for numbering a book with 428 pages ?
SSC CHSL 02/07/2024 (4th Shift)
(a) 1500 (b) 2000 (c) 988 (d) 1176

Q.115. An 8 digit number is divisible by 99. If the digits are shuffled, then the number is always divisible by _____.
SSC CHSL 03/07/2024 (1st Shift)
(a) 9 (b) 11 (c) 6 (d) 5

Q.116. When a number is divided by 512 it leaves a remainder 67. If the same number is divided by 32, then what will be the remainder?
SSC CHSL 03/07/2024 (1st Shift)
(a) 5 (b) 0 (c) 4 (d) 3

Q.117. Find the remainder when 179 × 172 × 173 is divided by 17.
SSC CHSL 03/07/2024 (2nd Shift)
(a) 2 (b) 9 (c) 3 (d) 6

Q.118. A seven-digit number 489y5z6 is divisible by 72. Which of the options gives the highest possible product of y and z ?
SSC CHSL 03/07/2024 (3rd Shift)
(a) 3 (b) 42 (c) 30 (d) 21

Q.119. When the integer n is divided by 18, the quotient is x and the remainder is 6, When the integer n is divided by 25, the quotient is y and the remainder is 15. Which of the following is true?
SSC CHSL 03/07/2024 (4th Shift)
(a) 18x − 25y = 9 (b) 18x + 25y = 9
(c) 25y − 18x = 9 (d) 25y +18x = 9

Q.120. Which of the following numbers is divisible by 22 ?
SSC CHSL 04/07/2024 (1st Shift)
(a) 654320 (b) 893002
(c) 602351 (d) 645372

Q.121. The number nearest to 7658 and exactly divisible by 45 is :
SSC CHSL 04/07/2024 (1st Shift)
(a) 7645 (b) 7660 (c) 7640 (d) 7650

Q.122. The sum of two−digit number and the number obtained by interchanging the digit is 77. If the difference of digits is 1, then the number is:
SSC CHSL 05/07/2024 (2nd Shift)
(a) 67 (b) 34 (c) 12 (d) 45

Q.123. Write the smallest digit in the blank space of a number 7__7624, so that the number formed is divisible by 3.
SSC CHSL 05/07/2024 (2nd Shift)
(a) 2 (b) 1 (c) 3 (d) 0

Q.124. K being any odd number greater than 1, $k^{33} - k$ is always divisible by:
SSC CHSL 05/07/2024 (4th Shift)
(a) 5 (b) 13 (c) 24 (d) 15

Q.125. How many numbers between 10 and 65 are divisible by 2, 3 and 4 ?
SSC CHSL 08/07/2024 (1st Shift)
(a) 5 (b) 7 (c) 9 (d) 3

Q.126. A's marks in Mathematics are directly proportional to practice time. In 6 hours of practice, A gets 70 marks. What should be the practice time (approximately) to get 90 Marks ?
SSC CHSL 08/07/2024 (1st Shift)
(a) 7.7 hours (b) 7 hours
(c) 8.3 hours (d) 8 hours

Q.127. A two - digit number is 12 more than five times the sum of its digits. The number formed by reversing the digits is 9 less than the original number. The number is:
SSC CHSL 08/07/2024 (2nd Shift)
(a) 96 (b) 78 (c) 87 (d) 69

Q.128. When the integer n is divided by 5, the remainder is 3. What is the remainder if 6n is divided by 5 ?
SSC CHSL 08/07/2024 (2nd Shift)
(a) 0 (b) 2 (c) 3 (d) 1

Q.129. Identify a single-digit number

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

other than 1, which may exactly divide the number $17^3 + 18^3 - 16^3 - 15^3$
SSC CHSL 08/07/2024 (2nd Shift)
(a) 3 (b) 5 (c) 7 (d) 2

Q.130. A natural number n divides 732 and leaves 12 as a remainder. How many values of n are possible?
SSC CHSL 09/07/2024 (1st Shift)
(a) 20 (b) 16 (c) 18 (d) 22

Q.131. The age of a tree depends on the number of rings in the trunk. The value of a such tree is proportional to its age. If a tree with 40 rings and 50 years of age has a value of ₹50,000, then a tree with 30 rings is _____ years of age and its value is ₹_____.
SSC CHSL 09/07/2024 (2nd Shift)
(a) 37.5, 57500 (b) 37.5, 37500
(c) 57.5, 37500 (d) 57.5, 57500

Q.132. $(8^6 + 1)$ when divided by 7, would leave a remainder of:
SSC CHSL 10/07/2024 (1st Shift)
(a) 1 (b) 4 (c) 2 (d) 6

Q.133. The sum of the digits of a two-digit number is 9. If the digits are reversed, then the number is increased by 27. Find the number.
SSC CHSL 10/07/2024 (1st Shift)
(a) 63 (b) 36 (c) 54 (d) 45

Q.134. A number is divisible by 11 if and only if the difference of the sum of the digits in the even and odd positions in the number is:
SSC CHSL 10/07/2024 (4th Shift)
(a) 0 or multiple of 11 (b) 11 (c) 0 (d) 1

Q.135. When 2^{256} is divided by 17, the remainder would be:
SSC CHSL 10/07/2024 (4th Shift)
(a) 2 (b) 0 (c) 1 (d) 5

Q.136. The sum of two numbers is 76. Three times the larger number is 46 more than four times the smaller one. Find the two numbers.
SSC CHSL 11/07/2024 (1st Shift)
(a) 44 and 32 (b) 50 and 26
(c) 40 and 36 (d) 35 and 41

Q.137. If the number 6p5157q is divisible by 88, then p × q = _____ where p and q are single digit numbers.
SSC CHSL 11/07/2024 (1st Shift)
(a) 12 (b) 18 (c) 20 (d) 15

Q.138. On dividing a certain number by 459, we get 19 as remainder. What will be the remainder, when the same number is divided by 17 ?
SSC CHSL 11/07/2024 (2nd Shift)
(a) 11 (b) 1 (c) 13 (d) 2

Q.139. The sum of the digits of a two–digit number is 9. The number obtained by interchanging its digits exceeds the given number by 45, then the original number is :
SSC CHSL 11/07/2024 (2nd Shift)
(a) 18 (b) 36 (c) 27 (d) 54

Q.140. Divide 25 into two parts such that 6 times of the larger part added to 4 times of the smaller part is equal to 130. Find the larger part.
SSC CHSL 11/07/2024 (2nd Shift)
(a) 13 (b) 20 (c) 15 (d) 14

Q.141. The number 611611611611 is:
(A) divisible by both 6 and 11
(B) neither divisible by 6 nor by 11
(C) divisible by 6 only
(D) divisible by 11 only
SSC CHSL 11/07/2024 (4th Shift)
(a) (B) (b) (D) (c) (A) (d) (C)

SSC CPO 2024 Tier - 1

Q.142. Arrange the following ratios in ascending order.
3 : 4, 3 : 5, 2 : 11, 7 : 2
SSC CPO 28/06/2024 (3rd Shift)
(a) 3 : 5 < 2 : 11 < 3 : 4 < 7 : 2
(b) 7 : 2 < 3 : 4 < 3 : 5 < 2 : 11
(c) 2 : 11 < 3 : 5 < 3 : 4 < 7 : 2
(d) 3 : 4 < 3 : 5 < 2 : 11 < 7 : 2

Q.143. 18 students of a class took part in a quiz. If the number of girls is 8 more than the number of boys, find the product of the number of boys and girls.
SSC CPO 29/06/2024 (2nd Shift)
(a) 56 (b) 36 (c) 63 (d) 65

SSC Selection Post (Phase - XII)

Q.144. Which of the following numbers is divisible by 11?
Matriculation Level 20/06/2024 (Shift - 1)
(a) 908781 (b) 969331
(c) 701611 (d) 611571

Q.145. The number 10000 is exactly divisible by which of the following numbers ?
Matriculation Level 20/06/2024 (Shift - 1)
(a) 18 (b) 17 (c) 25 (d) 14

Q.146. If the number $3727x4$ is completely divisible by 8, then the smallest integer in place of x will be
Matriculation Level 21/06/2024 (Shift - 1)
(a) 6 (b) 8 (c) 2 (d) 0

Q.147. Which of the following is a condition of divisibility of a number by six?
Matriculation Level 21/06/2024 (Shift - 4)
(a) Sum of digits is divisible by 6
(b) Last digit is 3 or 6
(c) Sum of digits is divisible by 3 and last digit is even
(d) Sum of digits is divisible by 3 and first digit is even

Q.148. The largest 4 - digit number that is exactly divisible by 88 is:
Matriculation Level 21/06/2024 (Shift - 4)
(a) 9848 (b) 9988 (c) 8888 (d) 9768

Q.149. Find the least value digit which is assigned to x so that the number $1972x471$ is divisible by 9.
Matriculation Level 24/06/2024 (Shift - 1)
(a) 3 (b) 5 (c) 4 (d) 2

Q.150. If a number is divisible by both 11 and 13, then it must be :
Matriculation Level 24/06/2024 (Shift - 4)
(a) divisible by (11 × 13)
(b) divisible by 42
(c) divisible by (11 + 13)
(d) divisible by (13 - 11)

Q.151. If a 9-digit number 937X728Y6 is divisible by 72, then one of the possible values of X + Y is :
Matriculation Level 24/06/2024 (Shift - 4)
(a) 12 (b) 8 (c) 9 (d) 5

Q.152. A number when divided by a divisor leaves a remainder of 24. When twice the original number is divided by the same divisor, the remainder is 13. What is the value of the divisor ?
Matriculation Level 25/06/2024 (Shift - 1)
(a) 35 (b) 37 (c) 25 (d) 30

Q.153. If $(5)^{55}$ is divisible by 4, then the remainder is :
Matriculation Level 25/06/2024 (Shift - 1)
(a) 5 (b) 1 (c) 3 (d) 2

Q.154. How many numbers less than 1,000 are multiples of both 7 and 11 ?
Matriculation Level 26/06/2024 (Shift - 1)
(a) 13 (b) 11 (c) 12 (d) 10

Q.155. Which of the following numbers is divisible by 4.
(i) 67920598 (ii) 618703592
(iii) 618703594 (iv) 67920590
Matriculation Level 26/06/2024 (Shift - 1)
(a) (i) (b) (iii) (c) (iv) (d) (ii)

Q.156. In a division sum, the divisor is 13 times the quotient and 6 times the remainder. If the remainder is 39, then the dividend is:
Higher Secondary 20/06/2024 (Shift - 2)
(a) 4,800 (b) 4,576 (c) 4,251 (d) 4,240

Q.157. Which of the following numbers is divisible by 36 ?
Higher Secondary 21/06/2024 (Shift - 2)
(a) 1542 (b) 96272 (c) 55512 (d) 8840

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.158. The number 1254216 is divisible by which of the following numbers?
Higher Secondary 21/06/2024 (Shift - 2)
(a) 8 (b) 11 (c) 5 (d) 16

Q.159. Find the sum of $3 + 3^2 + 3^3 + ... +3^8$.
Higher Secondary 24/06/2024 (Shift - 2)
(a) 9840 (b) 6561 (c) 6560 (d) 3280

Q.160. The number 2918245 is divisible by which of the following numbers?
Higher Secondary 25/06/2024 (Shift - 2)
(a) 3 (b) 9 (c) 11 (d) 12

Q.161. $6^{25} + 6^{26} + 6^{27} + 6^{28}$ is divisible by :
Higher Secondary 25/06/2024 (Shift - 2)
(a) 254 (b) 259 (c) 256 (d) 255

Q.162. If a car covers 90 km using 4 litres of petrol, how much distance (in km) will it cover using 32 litres of petrol?
Higher Secondary 25/06/2024 (Shift - 4)
(a) 720 (b) 710 (c) 680 (d) 650

Q.163. In a division sum, the divisor is 10 times the quotient and 5 times the remainder. If the remainder is 12, then what is the dividend?
Higher Secondary 25/06/2024 (Shift - 4)
(a) 368 (b) 372 (c) 386 (d) 352

Q.164. Which of the following numbers will completely divide $4^{12} + 4^{13} + 4^{14} + 4^{15}$
Higher Secondary 25/06/2024 (Shift - 4)
(a) 17 (b) 11 (c) 3 (d) 7

Q.165. Without actual division, find the remainder when 379843 is divided by 3.
Higher Secondary 26/06/2024 (Shift - 2)
(a) 4 (b) 1 (c) 3 (d) 2

Q.166. If the six-digit number 15x1y2 is divisible by 44, then the minimum value of (x + y) is equal to:
Higher Secondary 26/06/2024 (Shift - 2)
(a) 5 (b) 6 (c) 8 (d) 7

Q.167. If a 9-digit number 389x6378y is divisible by 72, then the value of 6x + 7y is:
Graduate Level 20/06/2024 (Shift - 3)
(a) 64 (b) 32 (c) 16 (d) 28

Q.168. Which of the following numbers is divisible by 9?
Graduate Level 20/06/2024 (Shift - 3)
(a) 553986 (b) 350846
(c) 941201 (d) 132490

Q.169. The five-digit number 725yz is divisible by 15. What is the maximum possible value of the product of y and z ?
Graduate Level 21/06/2024 (Shift - 3)
(a) 45 (b) 30 (c) 35 (d) 40

Q.170. If the 6 digit number 7002 * 4 is completely divisible by 8, then the smallest integer in place of * will be:
Graduate Level 24/06/2024 (Shift - 3)
(a) 0 (b) 2 (c) 4 (d) 6

Q.171. If 72 * 72 is divisible by 9, the missing * digit will be:
Graduate Level 24/06/2024 (Shift - 3)
(a) 5 or 8 (b) 0 or 9 (c) 2 or 4 (d) 3 or 6

Q.172. The number 7918378 is divisible by:
Graduate Level 25/06/2024 (Shift - 3)
(a) 13 (b) 9 (c) 11 (d) 4

Q.173. What least number must be subtracted from 2001 to get a number exactly divisible by 17 ?
Graduate Level 25/06/2024 (Shift - 3)
(a) 12 (b) 13 (c) 11 (d) 14

Q.174. If * is a digit such that 7235 * is divisible by 11, then the value of * is:
Graduate Level 26/06/2024 (Shift - 3)
(a) 9 (b) 6 (c) 5 (d) 8

Q.175. The average of 25 integers is zero. What is the maximum possible number of positive integers?
Graduate Level 26/06/2024 (Shift - 4)
(a) 12 (b) 20 (c) 13 (d) 24

Q.176. Find the largest number which should replace P in the 7- digit number 87893P4 to make the number divisible by 4.
Graduate Level 26/06/2024 (Shift - 4)
(a) 8 (b) 9 (c) 2 (d) 0

Q.177. Find the smallest non-zero value of k so that 7-digit number 48397k5 is divisible by 9
Graduate Level 26/06/2024 (Shift - 4)
(a) 2 (b) 5 (c) 4 (d) 9

SSC CHSL 2023 Tier - 1

Q.178. What is the least number that must be added to the greatest 6-digit number so that the sum will be exactly divisible by 294 ?
SSC CHSL 07/08/2023 (2nd Shift)
(a) 234 (b) 194 (c) 269 (d) 189

Q.179. Which of the following sets is such that all its elements are divisors of the number 2520 ?
SSC CHSL 08/08/2023 (1st Shift)
(a) 12, 49, 18 (b) 8 , 9, 7
(c) 16, 15, 14 (d) 21, 10, 25

Q.180. What will be the greatest number 32a78b, which is divisible by 3 but NOT divisible by 9 ? (Where a and b are single digit numbers).
SSC CHSL 09/08/2023 (2nd Shift)
(a) 324781 (b) 329787
(c) 326787 (d) 329784

Q.181. The sum of the cubes of two given numbers is 10234, while the sum of the two given numbers is 34. What is the positive difference between the cubes of the two given numbers ?
SSC CHSL 11/08/2023 (1st Shift)
(a) 3484 (b) 3488 (c) 3356 (d) 8602

Q.182. The six-digit number N = 4a6b9c is divisible by 99, then the maximum sum of the digits of N is:
SSC CHSL 17/08/2023 (1st Shift)
(a) 18 (b) 36 (c) 45 (d) 27

SSC CGL 2023 Tier - 1

Q.183. What will be the remainder when $(265)^{4081} + 9$ is divided by 266 ?
SSC CGL 14/07/2023 (1st shift)
(a) 8 (b) 6 (c) 1 (d) 9

Q.184. A and B have some toffees. If A gives one toffee to B, then they have an equal number of toffees. If B gives one toffee to A, then the toffees with A are double with B. The total number of toffees with A and B are _____.
SSC CGL 14/07/2023 (3rd shift)
(a) 12 (b) 10 (c) 14 (d) 15

Q.185. Find the smallest number that can be subtracted from 148109326 so that it becomes divisible by 8.
SSC CGL 17/07/2023 (1st shift)
(a) 4 (b) 8 (c) 6 (d) 10

Q.186. The largest 5-digit number exactly divisible by 88 is:
SSC CGL 17/07/2023 (2nd shift)
(a) 99990 (b) 99984 (c) 99978 (d) 99968

Q.187. A six - digit number is divisible by 33. If 54 is added to the number, then the new number formed will also be divisible by :
SSC CGL 17/07/2023 (4th shift)
(a) 3 (b) 2 (c) 5 (d) 7

Q.188. The cost of 32 pens and 12 pencils is ₹790. What is the total cost (in ₹) of 8 pens and 3 pencils together?
SSC CGL 18/07/2023 (2nd shift)
(a) 200.5 (b) 197.5 (c) 180.5 (d) 220.5

Q.189. The sum of the two numbers is 98. The difference between the two numbers is 28, Find one of the two numbers.
SSC CGL 19/07/2023 (3rd shift)
(a) 32 (b) 62 (c) 58 (d) 35

Q.190. What is the sum of the divisors of 484 that are perfect squares?
SSC CGL 20/07/2023 (1st shift)
(a) 125 (b) 35 (c) 610 (d) 13

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.191. The square of 72 is equal to the product of 216 and a number. Find the number.
SSC CGL 20/07/2023 (3rd shift)
(a) 35 (b) 18 (c) 24 (d) 48

Q.192. Find the remainder when $8^8 + 6$ is divided by 7.
SSC CGL 25/07/2023 (1st shift)
(a) 0 (b) 2 (c) 3 (d) 1

Q.193. A four-digits number abba is divisible by 4 and a < b. How many such numbers are there?
SSC CGL 26/07/2023 (1st shift)
(a) 10 (b) 8 (c) 12 (d) 6

Q.194. A 9 - digit number 846523X7Y is divisible by 9, and Y - X = 6. Find the value of $\sqrt{2X + 4Y}$.
SSC CGL 26/07/2023 (2nd shift)
(a) 4 (b) 2 (c) 6 (d) 8

Q.195. When a number is divided by 45, the remainder is 21. What will be the remainder when the number is divided by 15 ?
SSC CGL 26/07/2023 (3rd shift)
(a) 6 (b) 5 (c) 3 (d) 0

Q.196. Which of the following is the smallest 5 - digits number that is exactly divisible by 526 ?
SSC CGL 27/07/2023 (1st shift)
(a) 10520 (b) 11046 (c) 10516 (d) 10426

Q.197. A 6 - digit number has digits as consecutive natural numbers. The number is always divisible by ____.
SSC CGL 27/07/2023 (2nd shift)
(a) 4 (b) 5 (c) 2 (d) 3

Q.198. How many of the following numbers are divisible by 3 but NOT by 9 ?
5826, 5964, 6039, 6336, 6489, 6564, 6867 and 6960
SSC CGL 27/07/2023 (3rd shift)
(a) 5 (b) 3 (c) 4 (d) 6

SSC Selection Post (Phase - XI)

Q.199. Which of the following is a prime number ?
Graduate Level 30/06/2023 (Shift - 1)
(a) 161 (b) 171 (c) 193 (d) 177

Q.200. The sum of two numbers 10373 + 24871 is divisible by :
Matriculation Level 27/06/2023 (Shift - 1)
(a) 7 (b) 8 (c) 6 (d) 13

Q.201. What is the remainder when 4^{999} is divided by 7 ?
Matriculation Level 27/06/2023 (Shift - 2)
(a) 2 (b) 4 (c) 1 (d) 3

Q.202. Which of the following numbers is divisible by 120 ?
Matriculation Level 28/06/2023 (Shift - 4)
(a) 170280 (b) 140240
(c) 156200 (d) 170360

SSC CHSL 2022 Tier - 2

Q.203. How many whole numbers lie between 11^2 and 12^2 ?
SSC CHSL Tier II (26/06/2023)
(a) 23 (b) 24 (c) 21 (d) 22

Q.204. A number is divisible by 3 only when:
SSC CHSL Tier II (26/06/2023)
(a) the difference of the sum of the odd and the even digits is divisible by 3
(b) the sum of its digits is divisible by 3
(c) the last digit is either 0 or an even number
(d) the last two digits are divisible by 3

SSC MTS 2022 Tier - 1

Q.205. What is the smallest three - digit number which when divided by 2, 3 and 4 leaves remainder 1 in each case ?
SSC MTS 19/05/2023 (Evening)
(a) 111 (b) 105 (c) 101 (d) 109

Q.206. Which is the smallest three-digit number which when increased by 5 becomes divisible by both 2 and 3 ?
SSC MTS 13/06/2023 (Morning)
(a) 102 (b) 105 (c) 103 (d) 108

SSC CHSL 2022 Tier - 1

Q.207. What is the value of the expression 1 - 2 + 3 - 4 + 5 - 6 ..... to 100 terms ?
SSC CHSL 09/03/2023 (2nd Shift)
(a) - 50 (b) - 55 (c) - 49 (d) - 60

Q.208. What is the sum of the first 200 terms of the given series?
1 + 5 + 6 + 10 + 11 + 15 + 16 + 20 +.....
SSC CHSL 10/03/2023 (1st Shift)
(a) 49400 (b) 49600 (c) 50100 (d) 48300

Q.209. How many prime numbers are there between 20 and 50?
SSC CHSL 10/03/2023 (2nd Shift)
(a) 8 (b) 5 (c) 6 (d) 7

Q.210. The sum of three consecutive even numbers is 126. What is the product of the smallest and the largest numbers ?
SSC CHSL 10/03/2023 (3rd Shift)
(a) 1840 (b) 1950 (c) 1760 (d) 1620

Q.211. What is the sum of all three digit numbers which are divisible by 15 ?
SSC CHSL 13/03/2023 (2nd Shift)
(a) 32850 (b) 36825 (c) 41200 (d) 28750

Q.212. If the sum of three consecutive composite numbers is 36. then what is the product of the three numbers?
SSC CHSL 14/03/2023 (3rd Shift)
(a) 1460 (b) 1750 (c) 1680 (d) 1820

Q.213. What are the last three digit of the multiplication 654321 × 123456 ?
SSC CHSL 14/03/2023 (4th Shift)
(a) 376 (b) 344 (c) 324 (d) 352

Q.214. What is the sum of all two digit even numbers?
SSC CHSL 15/03/2023 (1st Shift)
(a) 2520 (b) 2470 (c) 2430 (d) 2410

Q.215. XY7B is a 4 digit number divisible by 4. What is the largest value of B ?
SSC CHSL 15/03/2023 (3rd Shift)
(a) 6 (b) 2 (c) 8 (d) 0

Q.216. How many numbers are there from 17 to 457 which are divisible by both 5 and 3 ?
SSC CHSL 16/03/2023 (2nd Shift)
(a) 29 (b) 35 (c) 30 (d) 33

Q.217. The product of two consecutive prime numbers is 7387. What is the difference between the two numbers ?
SSC CHSL 16/03/2023 (2nd Shift)
(a) 3 (b) 6 (c) 2 (d) 4

Q.218. How many numbers are there between 201 and 401 which are divisible by 5 but not by 4 ?
SSC CHSL 16/03/2023 (4th Shift)
(a) 30 (b) 20 (c) 40 (d) 45

Q.219. What is the sum of all two digit odd numbers ?
SSC CHSL 17/03/2023 (1st Shift)
(a) 2375 (b) 2475 (c) 2325 (d) 2425

Q.220. If the sum of a number and its reciprocal is 4, find the sum of their squares,
SSC CHSL 17/03/2023 (2nd Shift)
(a) 12 (b) 16 (c) 14 (d) 18

Q.221. What is the value of $98^2 - 97^2 + 96^2 - 95^2 + 94^2 - 93^2 + \ldots\ldots\ldots\ldots 12^2 - 11^2$
SSC CHSL 17/03/2023 (4th Shift)
(a) 4725 (b) 4796 (c) 4851 (d) 4926

Q.222. If the sum of squares of two real numbers is 12 and the product of the numbers is 4, find the difference between the numbers.
SSC CHSL 20/03/2023 (3rd Shift)
(a) 4 (b) 8 (c) 1 (d) 2

Q.223. Which of the following is largest among $(125)^{\frac{1}{6}}, (11)^{\frac{1}{3}}, (12)^{\frac{1}{6}}, (5)^{\frac{1}{4}}$?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 21/03/2023 (3rd Shift)
(a) $(12)^{\frac{1}{6}}$ (b) $(11)^{\frac{1}{3}}$ (c) $(125)^{\frac{1}{6}}$ (d) $(5)^{\frac{1}{4}}$

Q.224. Which of the following statements is true?
I. $\frac{5}{11} > \frac{5}{6}$ II. $\frac{5}{9} > \frac{8}{9}$ III. $\frac{5}{6} > \frac{4}{5}$
SSC CHSL 21/03/2023 (4th Shift)
(a) Only III (b) Both I and II
(c) Only II (d) Only I

SSC CGL 2022 Tier - 2

Q.225. The number 5769116 is divisible by which of the following numbers?
SSC CGL Tier II (02/03/2023)
(a) 4 (b) 5 (c) 12 (d) 8

SSC CGL 2022 Tier - 1

Q.226. What will be the remainder when $27^{27} + 27$ is divided by 28 ?
SSC CGL 01/12/2022 (3rd Shift)
(a) 28 (b) 27 (c) 25 (d) 26

Q.227. In a class of students, the first student has 2 toffees, second has 4 toffees, third has 6 toffees and so on. If the number of students in the class is 25, then the total number of toffees are divisible by_____.
SSC CGL 02/12/2022 (2nd Shift)
(a) 5 and 7 (b) 5 and 13
(c) 11 and 13 (d) 7 and 11

Q.228. The difference of two numbers is 1564. After dividing the larger number by the smaller, we get 6 as quotient and 19 as remainder. What is the smaller number ?
SSC CGL 02/12/2022 (3rd Shift)
(a) 456 (b) 287 (c) 623 (d) 309

Q.229. The nearest number which is greater to 87501, and is completely divisible by 765 is :
SSC CGL 03/12/2022 (1st Shift)
(a) 88975 (b) 87975
(c) 87966 (d) 87775

Q.230. Which of the following pairs of non-zero values of p and q make 6 - digit number 674pq0 divisible by both 3 and 11?
SSC CGL 05/12/2022 (1st Shift)
(a) p = 2 and q = 2 (b) p = 5 and q = 4
(c) p = 4 and q = 2 (d) p = 5 and q = 2

Q.231. The largest five-digit number which when divided by 7, 9 and 11, leaves the same remainder as 3 in each case, is:
SSC CGL 05/12/2022 (2nd Shift)
(a) 95840 (b) 98685 (c) 96720 (d) 99795

Q.232. Find the greatest number that will divide 49, 147 and 322 to leave the same remainder in each case.
SSC CGL 06/12/2022 (1st Shift)
(a) 9 (b) 5 (c) 7 (d) 8

Q.233. If a number K = 42 × 25 × 54 × 135 is divisible by 3^a, then find the maximum value of a.
SSC CGL 07/12/2022 (1st Shift)
(a) 6 (b) 7 (c) 4 (d) 5

Q.234. 9435 is added to 7593, then 2607 is subtracted from the sum. The result is divisible by:
SSC CGL 07/12/2022 (3rd Shift)
(a) 4 (b) 10 (c) 3 (d) 5

Q.235. 7 is added to a certain number and the sum is multiplied by 5. The product is then divided by 3 and 4 is subtracted from the quotient. If the result comes to 16, then what is the original number?
SSC CGL 08/12/2022 (3rd Shift)
(a) 3 (b) 1 (c) 5 (d) 4

Q.236. If 7 - digit number 678p37q is divisible by 75 and p is not a composite, then the values of p and q are:
SSC CGL 08/12/2022 (4th Shift)
(a) p = 5, q = 5 (b) p = 3, q = 0
(c) p = 3, q = 5 (d) p = 2, q = 5

Q.237. Any six - digit number that is formed by repeating a three-digit number, is always divisible by:
SSC CGL 12/12/2022 (2nd Shift)
(a) 111 (b) 1001 (c) 19 (d) 101

Q.238. Choose the option in which the numbers are in correct ascending order.
SSC CGL 13/12/2022 (2nd Shift)
(a) $\frac{4}{5}, \frac{2}{3}, \frac{1}{11}$ and $\frac{2}{9}$
(b) $\frac{1}{11}, \frac{2}{9}, \frac{2}{3}$ and $\frac{4}{5}$
(c) $\frac{2}{9}, \frac{1}{11}, \frac{4}{5}$ and $\frac{2}{3}$
(d) $\frac{2}{3}, \frac{4}{5}, \frac{1}{11}$ and $\frac{2}{9}$

Q.239. The sum of two numbers is 680. If the bigger number is decreased by 15% and the smaller number is increased by 15%, then the resultant numbers are equal. Find the smaller number.
SSC CGL 13/12/2022 (2nd Shift)
(a) 307 (b) 289
(c) 291 (d) 304

Q.240. A four-digit pin, say abcd, of a lock has different non-zero digits. The digits satisfy b = 2a, c = 2b, d = 2c. The pin is divisible by _____.
SSC CGL 13/12/2022 (2nd Shift)
(a) 2, 3, 5 (b) 2, 3, 7
(c) 2, 3, 13 (d) 2, 3, 11

SSC CPO 2022 Tier - 1

Q.241. A number, when divided by 15 and 18 every time, leaves 3 as a remainder, the least possible number is:
SSC CPO 09/11/2022 (Morning)
(a) 83 (b) 103 (c) 39 (d) 93

Q.242. Find the sum of the numbers between 550 and 700 such that when they are divided by 12, 16 and 24, leave remainder 5 in each case.
SSC CPO 09/11/2022 (Evening)
(a) 1980 (b) 1887 (c) 1860 (d) 1867

Q.243. If the 9 - digit number 72x8431y4 is divisible by 36, what is the value of $(\frac{x}{y} - \frac{y}{x})$ for the smallest possible value of y, given that x and y are natural numbers?
SSC CPO 09/11/2022 (Evening)
(a) $1\frac{5}{7}$ (b) $2\frac{1}{10}$ (c) $1\frac{2}{5}$ (d) $2\frac{9}{10}$

Q.244. What are the values of R and M, respectively, if the given number is perfectly divisible by 16 and 11 ? 34R05030M6
SSC CPO 10/11/2022 (Morning)
(a) 4 and 6 (b) 7 and 5
(c) 5 and 5 (d) 5 and 7

Q.245. If the number 476 ** 0 is divisible by both 3 and 11, then in the hundredth and tenth places, the non-zero digits are, respectively:
SSC CPO 10/11/2022 (Evening)
(a) 2 and 3 (b) 3 and 2
(c) 5 and 8 (d) 8 and 5

Q.246. Ramu had to select a list of numbers between 1 and 1000 (including both), which are divisible by both 2 and 7. How many such numbers are there?
SSC CPO 11/11/2022 (Morning)
(a) 142 (b) 71 (c) 97 (d) 642

Q.247. The sum of the odd divisors of 216 is:
SSC CPO 11/11/2022 (Morning)
(a) 16 (b) 14 (c) 40 (d) 600

Q.248. A six - digit number is divisible by 198. If the digits are rearranged, even then the number will be divisible by:
SSC CPO 11/11/2022 (Afternoon)
(a) 3 (b) 6 (c) 2 (d) 66

Q.249. A six-digit number 763254 is divisible by 18. If we subtract five times of 41 from the number, then the new number which is formed will be divisible by:
SSC CPO 11/11/2022 (Afternoon)
(a) 2 (b) 7 (c) 5 (d) 3

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.250. Two positive numbers differ by 3951. When the larger number is divided by the smaller number, the quotient is 12 and the remainder is 13. The sum of the digits of the larger number is:
SSC CPO 11/11/2022 (Evening)
(a) 12 (b) 16 (c) 18 (d) 14

SSC CGL 2021 Tier - 2

Q.251. If $\sqrt[3]{N}$ lies between 6 and 7, where N is an integer then how many values N can take?
SSC CGL Tier II (08/08/2022)
(a) 126 (b) 127 (c) 128 (d) 125

Q.252. If the digits of a two digit number is reversed, then the number is decreased by 36. Which of the following is correct regarding the number?
I. The difference of the digits is 4.
II. The value of number can be 84.
III. Number is always a composite number.
SSC CGL Tier II (08/08/2022)
(a) I, II and III (b) II and III
(c) I and III (d) I and II

Q.253. x, y and z are distinct prime numbers where x<y<z. If x + y + z = 70 , then what is the value of z ?
SSC CGL Tier II (08/08/2022)
(a) 29 (b) 43 (c) 31 (d) 37

Q.254. How many numbers are there from 400 to 700 in which the digit 6 occur exactly twice ?
SSC CGL Tier II (08/08/2022)
(a) 19 (b) 18 (c) 21 (d) 20

Q.255. What is the sum of the first 20 terms of the following series ?
1 × 2 + 2 × 3 + 3 × 4 + 4 × 5 .....
SSC CGL Tier II (08/08/2022)
(a) 3160 (b) 2940 (c) 3240 (d) 3080

Q.256. What is the value of $\frac{7}{2}+\frac{11}{3}+\frac{7}{6}+\frac{11}{15}+\frac{7}{12}+\frac{11}{35}+.....+\frac{7}{156}+\frac{11}{575}$?
SSC CGL Tier II (08/08/2022)
(a) $\frac{3917}{355}$ (b) $\frac{3816}{325}$ (c) $\frac{3714}{345}$ (d) $\frac{3216}{315}$

SSC Selection Post (Phase - X)

Q.257. Which of the following is not a pair of co-prime numbers?
Graduate Level 01/08/2022 (Shift - 4)
(a) 22, 24 (b) 1, 4 (c) 3,7 (d) 21, 22

Q.258. The sum of three prime numbers is 90. If one of them exceeds another by 30, then one of the numbers is:
Graduate Level 05/08/2022 (Shift - 3)
(a) 41 (b) 67 (c) 47 (d) 59

Q.259. If 608xy0 is divisible by both 3 and 11, the nonzero digit in the hundred's place and ten's places, respectively, are:
Higher Secondary 02/08/2022 (Shift - 2)
(a) 5 and 6 (b) 5 and 8
(c) 8 and 5 (d) 6 and 5

Q.260. If the 5-digit number 743pq, is divisible by 90, then $\frac{q}{p}$ = ?
Higher Secondary 05/08/2022 (Shift - 2)
(a) 0 (b) 5 (c) 10 (d) 1

SSC MTS 2021 Tier - 1

Q.261. Ishita can read a newspaper in 'n' minutes. What part of the newspaper can she read in 7 minutes? (n > 7)
SSC MTS 12/07/2022 (Morning)
(a) $\frac{n}{7}$ (b) $7n^2$ (c) 7n (d) $\frac{7}{n}$

Q.262. How many multiples of 7 are there between 100 and 200 ?
SSC MTS 22/07/2022 (Evening)
(a) 14 (b) 15 (c) 12 (d) 16

SSC CHSL 2021 Tier - 1

Q.263. On dividing 8675123 by a certain number, the quotient is 33611 and the remainder is 3485. The divisor is _____.
SSC CHSL 25/05/2022 (Afternoon)
(a) 538 (b) 258 (c) 248 (d) 356

Q.264. The difference between a number and the square root of the number is 2. The number is:
SSC CHSL 26/05/2022 (Afternoon)
(a) 1 (b) 2 (c) 3 (d) 4

Q.265. Which of the following can be a rationalizing factor of $(\sqrt{2}+\sqrt{3}+\sqrt{5})$?
SSC CHSL 27/05/2022 (Afternoon)
(a) $(\sqrt{2}-\sqrt{3}-\sqrt{5})\sqrt{6}$
(b) $(\sqrt{2}+\sqrt{3}-\sqrt{5})\sqrt{6}$
(c) $(\sqrt{2}-\sqrt{3}+\sqrt{5})\sqrt{6}$
(d) $(\sqrt{2}+\sqrt{3}+\sqrt{5})\sqrt{6}$

Q.266. When f(x) = $15x^3-14x^2-4x+10$ is divided by (3x + 2), then the remainder is:
SSC CHSL 27/05/2022 (Afternoon)
(a) − 1 (b) 1 (c) − 2 (d) 2

Q.267. If a positive integer N is divided by 7, the remainder is 3. Which of the following numbers yields a remainder of 0 when it is divided by 7 ?
SSC CHSL 27/05/2022 (Evening)
(a) N + 5 (b) N + 2 (c) N + 4 (d) N + 3

Q.268. The sum of the first 78 natural numbers from 1 to 78 is divisible by
SSC CHSL 01/06/2022 (Evening)
(a) 79 (b) 61 (c) 29 (d) 30

Q.269. A number x is three times another number y. If the sum of both the numbers is 20, then x and y, respectively, are:
SSC CHSL 10/06/2022 (Evening)
(a) 8 and 12 (b) 15 and 5
(c) 5 and 15 (d) 2 and 18

SSC CGL 2021 Tier - 1

Q.270. How many numbers are there from 500 to 650 (including both) which are neither divisible by 3 nor by 7 ?
SSC CGL 11/04/2022 (Afternoon)
(a) 21 (b) 121 (c) 87 (d) 99

Q.271. If each of the two numbers 5^{16} and 5^{25} are divided by 6, the remainder are R_1 and R_2, respectively. What is the value of $\frac{R_1+R_2}{R_2}$?
SSC CGL 19/04/2022 (Morning)
(a) $\frac{1}{6}$ (b) $\frac{5}{6}$ (c) $\frac{1}{5}$ (d) $\frac{6}{5}$

SSC CGL 2020 Tier - 2

Q.272. If the sum of two positive numbers is 65 and the square root of their product is 26, then the sum of their reciprocals is:
SSC CGL Tier II (29/01/2022)
(a) $\frac{3}{52}$ (b) $\frac{1}{52}$ (c) $\frac{5}{52}$ (d) $\frac{7}{52}$

Q.273. Let x = $(433)^{24}$ - $(377)^{38}$ + $(166)^{54}$. What is the unit digit of x ?
SSC CGL Tier II (29/01/2022)
(a) 9 (b) 6 (c) 8 (d) 7

Q.274. The sum of the digits of the least number which when divided by 36, 72, 80 and 88 leaves the remainders 16, 52, 60 and 68, respectively, is:
SSC CGL Tier II (03/02/2022)
(a) 17 (b) 11 (c) 14 (d) 16

Q.275. Let p, q, r and s be positive natural numbers having three exact factors including 1 and the number itself If q > p and both are two-digit numbers, and r > s and both are one-digit numbers, then the value of the expression $\frac{p-q-1}{r-s}$ is:
SSC CGL Tier II (03/02/2022)
(a) - s - 1 (b) s - 1 (c) 1 - s (d) s + 1

Q.276. The sum of three fractions A, B

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

and C, A > B > C , is $\frac{121}{60}$. When C is divided by B, the resulting fraction is $\frac{9}{10}$, which exceeds A by $\frac{3}{20}$. What is the difference between B and C ?
SSC CGL Tier II (03/02/2022)
(a) $\frac{1}{15}$ (b) $\frac{1}{10}$ (c) $\frac{3}{10}$ (d) $\frac{7}{15}$

SSC MTS 2020 Tier - 1

Q.277. Let x be the largest 4-digit number which is divisible by each of 16, 21, 24 and 28. The sum of the digits of x is:
SSC MTS 05/10/2021 (Evening)
(a) 19 (b) 21 (c) 24 (d) 16

Q.278. Let x be the least number which on being divided by 8, 12, 15, 24, 25 and 40 leaves a remainder of 7 in each case. What will be the remainder when x is divided by 29 ?
SSC MTS 06/10/2021 (Afternoon)
(a) 18 (b) 27 (c) 19 (d) 20

Q.279. Let *x* be the least number between 56,000 and 60,000 which when divided by 40, 45, 50 and 55 leaves a remainder of 23 in each case.What is the sum of the digits of *x* ?
SSC MTS 08/10/2021 (Afternoon)
(a) 23 (b) 21 (c) 26 (d)19

Q.280. The difference between a positive number and its reciprocal increases by a factor of $\frac{175}{144}$ when the number is made to increase by 20%. What is the number?
SSC MTS 12/10/2021 (Afternoon)
(a) 7.5 (b) 6 (c) 2.5 (d) 5

Q.281. Let x be the greatest number by which when 448, 678 and 908 are divided, the remainder in each case is 11. When 147 is divided by x, the remainder is:
SSC MTS 14/10/2021 (Afternoon)
(a) 4 (b) 5 (c) 9 (d) 3

SSC CGL 2020 Tier - 1

Q.282. The average of squares of five consecutive odd natural numbers is 233. What is the average of the largest number and the smallest number?
SSC CGL 20/08/2021 (Morning)
(a) 11 (b) 17 (c) 13 (d) 15

SSC CHSL 2020 Tier - 1

Q.283. When (2^{24} - 1) is divided by 7, the remainder is:
SSC CHSL 04/08/2021 (Evening)
(a) 2 (b) 0 (c) 4 (d) 1

Q.284. When a positive integer n is divided by 12, the remainder is 5. What will be the remainder if $8n^2 + 7$ is divided by 12 ?
SSC CHSL 06/08/2021 (Evening)
(a) 2 (b) 5 (c) 3 (d) 4

SSC CPO 2020 Tier - 1

Q.285. The remainder when 75 × 73 × 78 × 76 is divided by 34 is:
SSC CPO 23/11/2020 (Evening)
(a) 18 (b) 12 (c) 22 (d) 15

Q.286. What is the least number of soldiers that can be drawn up in troops of 10, 12, 15, 18 and 20 soldiers, and also in form of a perfect square ?
SSC CPO 24/11/2020 (Evening)
(a) 180 (b) 625 (c) 900 (d) 400

Answer Key :-

1.(c)	2.(c)	3.(d)	4.(a)
5.(d)	6.(b)	7.(c)	8.(a)
9.(d)	10.(a)	11.(d)	12.(c)
13.(d)	14.(b)	15.(a)	16.(d)
17.(a)	18.(d)	19.(d)	20.(d)
21.(d)	22.(a)	23.(d)	24.(a)
25.(b)	26.(d)	27.(b)	28.(c)
29.(d)	30.(b)	31.(c)	32.(b)
33.(a)	34.(a)	35.(c)	36.(a)
37.(b)	38.(b)	39.(d)	40.(a)
41.(c)	42.(c)	43.(a)	44.(a)
45.(b)	46.(b)	47.(a)	48.(d)
49.(c)	50.(a)	51.(b)	52.(d)
53.(d)	54.(b)	55.(d)	56.(b)
57.(d)	58.(c)	59.(d)	60.(c)
61.(b)	62.(c)	63.(b)	64.(a)
65.(c)	66.(a)	67.(b)	68.(c)
69.(b)	70.(a)	71.(b)	72.(c)
73.(a)	74.(a)	75.(c)	76.(c)
77.(c)	78.(b)	79.(c)	80.(a)
81.(b)	82.(b)	83.(c)	84.(a)
85.(a)	86.(d)	87.(a)	88.(c)
89.(d)	90.(d)	91.(b)	92.(c)
93.(b)	94.(b)	95.(c)	96.(b)
97.(b)	98.(d)	99.(d)	100.(c)
101.(d)	102.(c)	103.(d)	104.(a)
105.(a)	106.(c)	107.(a)	108.(c)
109.(a)	110.(b)	111.(c)	112.(b)
113.(c)	114.(d)	115.(a)	116.(d)
117.(c)	118.(b)	119.(a)	120.(b)
121.(d)	122.(b)	123.(b)	124.(c)
125.(a)	126.(a)	127.(c)	128.(c)
129.(d)	130.(a)	131.(b)	132.(c)
133.(b)	134.(a)	135.(c)	136.(b)
137.(b)	138.(d)	139.(c)	140.(c)
141.(b)	142.(c)	143.(d)	144.(b)
145.(c)	146.(d)	147.(c)	148.(d)
149.(b)	150.(a)	151.(a)	152.(a)
153.(b)	154.(c)	155.(d)	156.(c)
157.(c)	158.(a)	159.(a)	160.(c)
161.(b)	162.(a)	163.(b)	164.(a)
165.(b)	166.(d)	167.(a)	168.(a)
169.(d)	170.(b)	171.(b)	172.(a)
173.(a)	174.(d)	175.(d)	176.(a)
177.(d)	178.(d)	179.(b)	180.(d)
181.(a)	182.(d)	183.(a)	184.(a)
185.(c)	186.(d)	187.(a)	188.(b)
189.(d)	190.(c)	191.(c)	192.(a)
193.(b)	194.(c)	195.(a)	196.(a)
197.(d)	198.(c)	199.(c)	200.(c)
201.(c)	202.(a)	203.(d)	204.(b)
205.(d)	206.(c)	207.(a)	208.(c)
209.(d)	210.(c)	211.(a)	212.(c)
213.(a)	214.(c)	215.(a)	216.(a)
217.(b)	218.(a)	219.(b)	220.(c)
221.(b)	222.(d)	223.(c)	224.(a)
225.(a)	226.(d)	227.(b)	228.(d)
229.(b)	230.(d)	231.(d)	232.(c)
233.(b)	234.(c)	235.(c)	236.(c)
237.(b)	238.(b)	239.(b)	240.(c)
241.(d)	242.(b)	243.(b)	244.(c)
245.(d)	246.(b)	247.(c)	248.(a)
249.(b)	250.(b)	251.(a)	252.(d)
253.(d)	254.(d)	255.(d)	256.(b)
257.(a)	258.(d)	259.(c)	260.(a)
261.(d)	262.(a)	263.(b)	264.(d)
265.(b)	266.(d)	267.(c)	268.(a)
269.(b)	270.(c)	271.(d)	272.(c)
273.(c)	274.(d)	275.(a)	276.(a)
277.(c)	278.(b)	279.(a)	280.(d)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

281.(c)	282.(d)	283.(b)	284.(c)
285.(b)	286.(c)		

Solutions :-

Sol.1.(c) 45yz0
For divisibility of 40 number must be divisible by 8 and 5
Divisibility of 5:- A number is divisible by 5 if its last digit is 0 or 5
Divisibility of 8 :- if the last three digits of the number are either all zeros or are divisible by 8:
Maximum possible value of y and z be 8 and 8 respectively,
So, the value of (y + z) = 8 + 8 = 16

Sol.2.(c) Let number of chairs = x
When one person is seated on each chair then
Total number of men = $x + 1$ … (i)
When two person is seated on each chair then
Total number of men = $2x - 2$ …(ii)
From (i) and (ii)
$x + 1 = 2x - 2 \Rightarrow x = 3$
Hence number of chairs = 3

Sol.3.(d) According to question
15 A + 12 O = 447 … (i)
For inconsistent and no possible solutions $\frac{a1}{a2} = \frac{b1}{b2} \neq \frac{c1}{c2}$
By checking options one by one we find that only option (d) satisfies the condition.
In option (d)
35 A + 28 O = 1029 … (ii)
From (i) and (ii)
$\frac{a1}{a2} = \frac{15}{35} = \frac{3}{7}$
$\frac{b1}{b2} = \frac{12}{28} = \frac{3}{7}$
$\frac{c1}{c2} = \frac{447}{1029} = \frac{149}{343}$
hence, $\frac{a1}{a2} = \frac{b1}{b2} \neq \frac{c1}{c2}$

Sol.4.(a) Let the number of notes ₹20 and ₹10 be x and y respectively,
According to the question,
$20x + 10y$ = ₹ 390 …….(i)
$10x + 20y$ = ₹ 300 …….(ii)
Add eq . (i) and (ii)
$30x + 30y = 690$
$x + y = 23 \Rightarrow y = 23 - x$
Put the value of y in eq . (i)
$20x + 230 - 10x = 390$
$10x = 160 \Rightarrow x = 16$

Sol.5.(d) Let cost of 1 biscuit, 1 chocolate, 1 cup coffee be x, y, z respectively.
According to question,
$2x + y = 69$ … (i)
$2y + 3z = 127$… (ii)
$3x + 4y + 2z = 229$… (iii)
Adding (i) and (iii)
$5x + 5y + 2z = 69 + 229$
$5x + 5y + 2z = 298$… (iv)
now, Multiply eq . (i) by 2 and then subtracting eq . (ii) we get
$4x - 3z = 138 - 127$
$4x - 3z = 11$ … (v)
Multiply eq . (ii) by 2 and then subtracting eq . (iii) we get
$-3x + 4z = 254 - 229$
$-3x + 4z = 25$ … (vi)
By solving eq . (v) and (vi) we get
$z = 19$
From eq . (iv) adding $3z$ we get
$5x + 5y + 5z = 298 + 19 \times 3$
$= 298 + 57 = 355$

Sol.6.(b) Let the weight of apples and oranges is 'a' and 'b' respectively.
According to the question,
8a + 10b = 5…….(i)
12a + 20b = 9…….(ii)
Multiply by 2 in e.q .(i) then subtract e.q . (ii) from (i) we get, 4a = 1
$a = \frac{1}{4}$ (put the value in e.q .(i) we get,
$8 \times \frac{1}{4} + 10b = 5 \Rightarrow 10b = 3 \Rightarrow b = \frac{3}{10}$
Weight of 15 apples and 24 oranges
$= 15 \times \frac{1}{4} + 24 \times \frac{3}{10} = 3.75 + 7.2$
= 10.95 kg (approx 11 kg)

Sol.7.(c) Let winner = A ,
1st runner up = B, 2nd runner up = C and nota = N
According to question
A = 2C, B = N + 900 and C
= N + 900 - 150
Now,
A + B + C = 6N
2C + B + C = 6N
3C + B = 6N
3C + N + 900 = 6N
3(N + 900 - 150) + N + 900 = 6N
3N + 2250 + N + 900 = 6N
3150 = 2N ⇒ N = 1575
Hence, B = N + 900 = 2475
C = N + 900 - 150 = 2325 ⇒ A = 2C = 4650
Total votes = A + B + C + N
= 4650 + 2475 + 2325 + 1575 = 11025

Sol.8.(a) Factor of 14400 = $2^6 \times 3^2 \times 5^2$
$\Rightarrow 2^6 \times 3^2 \times 5^2 = 18 \times (2^5 \times 5^2)$
Divisible by 18 then remaining factor
= 6 × 3 = 18
$\Rightarrow 2^6 \times 3^2 \times 5^2 = 36 \times (2^4 \times 5^2)$
Divisible by 36 then remaining factor
= 5 × 3 = 15
Required factor divisible by 18 but not by 36 = 18 - 15 = 3

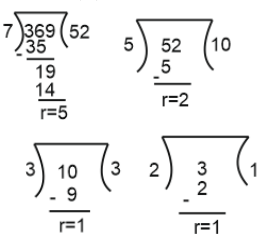
Sol.9.(d) According to question,
Amount of Raju after 6 weeks
= 11000 + 7 × 5000 = ₹ 46000
Now,
Amount of Ramesh after 6 weeks
= ₹60000 - 7 × 2000 = ₹ 46000

Sol.10.(a) Divisibility of 11: The difference of the sum of digits at odd position and sum of digits at even position in a number is 0 or divisible by 11.
Now, (3 + 2 + 3 + k) - (c + 9 + 3) = 0
⇒ (8 + k) = (c + 12) ……(i)
Divisibility of 5 : If the last digit of the number should be 0 or 5 then that number will be divisible by 5.
Value of k
= 5 (given we take only natural no.)
Put value of k in equation (i), we get
⇒ (8 + 5) = (c + 12) ⇒ c = 13 - 12 = 1
So,
c + k = 1 + 5 = 6

Sol.11.(d) Let the numbers be a and b and the divisor be d. The remainders when a and b are divided by d are 6 and 7 respectively. Thus,
$a = dq_1 + 6$, $b = dq_2 + 7$
For their sum
$a + b = d(q_1 + q_2) + 13$ … (i)
When a + b is divided by d, the remainder is 5,
a + b = dq + 5 … (ii)
Equating (i) and (ii) we get,
$d(q_1 + q_2) + 13 = dq + 5$
$d(q_1 + q_2 - q) = -8$
Thus, d must divide 8. Testing values, we find that d = 8 satisfies the condition.
Therefore, the divisor is 8

Sol.12.(c)
1738b9c is divisible by 12 (i.e. 4 × 3)
Now, **divisibility of 3 :-** sum of digits of number be divisible by 3
1738b9c = 1 + 7 + 3 + 8 + b + 9 + c
= 28 + b + c
So, possible values of (b + c)
= 2 , 5 , 8 , 11 , 14 etc
Now, **Divisibility of 4 :-** last two digit of number be divisible by 4 ⇒ number = 9c
Possible values of c = 2 and 6
So, for least value of (c - b)
We should take c = 6 and b = 5
{b + c = 5 + 6 = 11}
Hence, required value of (c - b) = 6 - 5 = 1

Sol.13.(d)



Search on Telegram @apna_pdf

Hence, sum of remainder
= 5 + 2 + 1 + 1 = 9

Sol.14.(b) Divisibility rule of 3 :
For any no to be divisible by 3, the sum of its digits should be divisible by 3.
57 = 19 × 3
Given that , 468312 is divisible by (19 ×3)
On arranging it in descending order , digits remain the same . so it will always be divisible by 3.

Sol.15.(a) If the number is divisible by 5 means the last digit is either 0 or 5.
Let Q = 0
Now we have to find the value of P.
For divisibility by 3, the sum of the digits should be divisible by 3.
⇒ P = 2, 5, 8
But the numbers 3420, 3450 and 3480 are not divisible by 7.
Now, take the value of Q = 5.
For divisibility by 3, we get,
P = 3, 6, 9
But by checking for divisibility by 7, we get P = 6.
Hence, P + Q = 6 + 5 = 11.

Sol.16.(d) Let six digit number = 33 × x
New number = 33 × x + 21
= 3{(11 × x) + 7}
We can say that new number is divisible by 3

Sol.17.(a) 24 = 8 × 3
For 11p9q4 to be divisible by 8, its last 3 digits i.e. 9q4 should be divisible by 8
Then, the possible values of q are 4, 8.
But for the greatest value , q should be 8.
For 11p9**8**4 to be divisible by 3, the sum of its digits i.e. 1 + 1 + p + 9 + **8** + 4 = 23 + p should be divisible by 3.
For greatest value, p should be 7
Hence, pq = 7 × 8 = 56

Sol.18.(d) Given :- $\frac{9+9^2+...+9^{(2n+1)}}{6}$
$\frac{9}{6}$ = Rem 3 , $\frac{9^2}{6}$ = Rem 3 , ... $\frac{9^{2n+1}}{6}$
= Rem 3
So, $\frac{3\times(2n+1)}{6}$ = $\frac{6n+3}{6}$ = Rem 3

Sol.19.(d) Remainder when sum of these numbers are divided by same divisor
= 57 + 57 = 114
According to the question ,
$\frac{114}{divisor}$ = Rem.(49)
Required divisor = (114) − 49 = 65

Sol.20.(d)
Divisor = 5 × Remainder = 5 × 44 = 220
Quotient = $\frac{220}{11}$ = 20
Dividend = 220 × 20 + 44 = 4444

Sol.21.(d)
Co-prime factor of 88 = (8 and 11)
Least value of y , when y24 divisible by 8 :- y = 0
Now , checking divisibility of 11
⇒ (7 + 0 + 5 + 3 + 2) - (8 + x + 3 + 0 + 4) = 0
⇒ 17 − (15 + x) = 0 ⇒ 2− x = 0 ⇒ x = 2
Now , value of (x + y) = 2 + 0 = 2

Sol.22.(a) We know that:-
Dividend = Divisor × Quotient + Remainder
Ratio → initial : final
Dividend → 10 : 9
Divisor → 5 : 4

Initial quotient = 24
Initial number = 24 × 5 = 120
120 which is equal to 10x. ⇒ x = 12
Final dividend (9x) = 108
Final quotient = $\frac{108}{4}$ = 27

Sol.23.(d)
Ratio :- initial : final
Divisor :- 4 : 5
Dividend :- 10 : 11
Initial quotient = 25
Initial dividend (10 units) = 25 × 4 = 100
Then final dividend (11 units) = 110
Final quotient = $\frac{110}{5}$ = 22

Sol.24.(a) Divisibility of 33 : the given number must be divisible by 11 and 3.
Divisibility of 11 : the difference between the sum of odd place digit and the sum of even place digit is either 0 or 11.
Divisibility of 3 : the sum of all digits of the given number must be divisible by 3.
The given number = 7x1yy$x$
($7 + 1 + y$) − ($x + y + x$) = 0 or 11
8 − 2x = 0 ⇒ x = 4
Now, (7 + 4 + 1 + y + y + 4) = 16 + 2y
Putting value of y = 1
16 + 2y = 18 [divisible by 3]
So, required sum = 4 + 1 = 5

Sol.25.(b) According to the question,
10 × 12 = (10 + 5) × x
Number of tree in each row(x)
= $\frac{12\times10}{15}$ = 8

Sol.26.(d) 720 = $2^4 \times 3^2 \times 5^1$
Total no of factors = 5 × 3 × 2 = 30
Removing 1 and 720 = 30 − 2 = 28

Sol.27.(b) $(14)^{\frac{1}{3}}$ = $(14)^{\frac{4}{12}}$, $(12)^{\frac{1}{2}}$
= $(12)^{\frac{6}{12}}$, $(16)^{\frac{1}{6}}$ = $(16)^{\frac{2}{12}}$ & $(25)^{\frac{1}{12}}$
= $(25)^{\frac{1}{12}}$
Therefore, $(25)^{\frac{1}{12}}$ is smallest fraction

Sol.28.(c)
series = - 9, - 6, - 3, ...(series is in the A.P.)
So, a = - 9 , d = 3
Sum of n number
$S_n = \frac{n}{2}[2a + (n-1)d]$
⇒ 45 = $\frac{n}{2}[-18 + (n-1)3]$
⇒ 3n^2 - 21n - 90 = 0 ⇒ n = 10 and -3
(no of terms never be -ve)
Therefore, no. of terms in the given series = 10 term

Sol.29.(d)
I. (100^2 - 99^2) + (98^2 - 97^2) + (96^2 - 95^2) + (94^2- 93^2) ..... + 22^2 - 21^2 = 4840
= (100 + 99)(100 - 99) + (98 - 97)(98 + 97) + (96 - 95)(96 + 95) .....+ (22 - 21)(22 + 21)
= (100 + 99 + 98 + 97 + 96 + 95 .....21)
= $\frac{1}{2}$ × 80 × (21 + 100) = 40 × 121 = 4840
So, LHS = RHS
II. $(k^2 + \frac{1}{K^2})(K - \frac{1}{K})(K^4 + \frac{1}{K^4})(K + \frac{1}{K})(K^4 - \frac{1}{K^4}) = K^{16} - \frac{1}{K^{16}}$
Taking L.H.S
= $(k^2 + \frac{1}{K^2})(k^2 - \frac{1}{K^2})(K^4 + \frac{1}{K^4})(K^4 - \frac{1}{K^4})$
= $(K^4 - \frac{1}{K^4})(K^4 + \frac{1}{K^4})(K^4 - \frac{1}{K^4})$
= $(K^8 - \frac{1}{K^8})(K^4 - \frac{1}{K^4})$
So, LHS ≠ RHS
Clearly, we can see that only statement 1 is correct .

Sol.30.(b) 33 = 11 × 3
For 52A6B7C to be divisible by 11, the difference of the sum of its alternate digits i.e.(5 + A + B + C) - (2 + 6 + 7)
= A + B + C - 10, should be divisible by 11.
For this, we have: A + B + C - 10 = 0/11...
⇒ A + B + C = 10
As we know, the sum of three odd no's are always odd. It suggests that there should be 1 even prime no i.e.2. So, we get A, B, C
as 2, 3, 5
For 52A6B7C to be divisible by 3, the sum of its digits i.e.
5 + 2 + A + 6 + B + 7 + C = 20 + A + B + C , should be divisible by 3.
Now, putting A + B + C = 10 ,
we get : 20 + 10 = 30, divisible by 3.
For maximum value of
2A + 3B + C ; A = 3, B = 5, and C = 2
So, 2A + 3B + C = 2 × 3 + 3 × 5 + 2
= 6 + 15 + 2 = 23

Sol.31.(c) Jay answered 4 correct answers and + 5 marks are given for every correct answer that means he

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

scored 20 marks for his correct answer But Jay scored - 12 marks that means he loses his 20 marks of correct answers also.
Total marks deducted due to incorrect answers = 20 + 12 = 32
For every incorrect answer 2 marks are deducted.
So, no of incorrect answers = $\frac{32}{2}$ = 16

Sol.32.(b) After arranging the digits in descending order and subtracting 65 from the new no, we get :
853210 → 853210 - 65 = 853145, which is divisible by 5 (∵last digit is 5)

Sol.33.(a)
S_1 = 2, 9, 16, **23**, 30, 37, 44, **51**, ..., 632
S_2 = 7, 11, 15, 19, **23,** 27, 31, 35, 39, 43, 47, **51**,
Common terms between given series = 23, 51,.....
Common difference(d) = 51 - 23 = 28
ATQ,
23 + (n - 1)28 ≤ 632
(n - 1)28 ≤ 609 ⇒ n - 1 ≤ 21.75
n ≤ 22.75 ⇒ so, n = 22
Now, S = $\frac{22}{2}[2 \times 23 + (22 - 1)28]$
S = 11[46 + 21 × 28]
S = 11 [46 + 588] = 11 × 634 = 6974

Sol.34.(a)
As prime numbers have 2 factors
Only the squares of prime numbers will have three factors. ⇒ Let r = 9 and s = 4
And q = 49 and p = 25
$\frac{p-q-1}{r-s} = \frac{25-49-1}{9-4} = \frac{-25}{5}$ = - 5
Putting s = 4 in all options we find only option (a) satisfies this value.

Sol.35.(c) 0.0625 = $\frac{1}{16}$,
So , y = $\frac{9}{16} - \frac{1}{16} = \frac{8}{16} = \frac{1}{2}$
Again, x + y + z = $2\frac{3}{12} = \frac{27}{12}$
x + z = $\frac{27}{12} - \frac{1}{2} = \frac{27-6}{12} = \frac{7}{4}$

Sol.36.(a) LCM of 5, 6 and 7 = 210
Numbers divisible by 210 between 400 and 700 = 420, 630
So, there are 2 such numbers.

Sol.37.(b) $(30)^5 \times (24)^5$
= $(2 \times 3 \times 5)^5 \times (2^3 \times 3)^5$
= $2^{20} \times 3^{10} \times 5^5$
Number of prime factors = (20 + 10 + 5)
Number of prime factors = 35

Sol.38.(b) HINT : ab and ba both can be prime only and only when both are odd number
Such numbers are 13, 31, 17, 71, 37, 73, 79, 97
Sum = 13 + 31 + 17 + 71 + 37 + 73 + 79 + 97 = 418

Sol.39.(d) The whole number which divides 2^{20} + 1 also divides the multiple of 2^{20} + 1 ⇒ 2^{60} + 1 = $(2^{20}+1)(2^{40}+1-2^{20})$
Using formula :
$a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$
2^{60} + 1 is the multiple of 2^{20} +1
so,2^{60} + 1 is completely divisible by that whole number.

Sol.40.(a)
$7^{81} + 7^{82} + 7^{83} = 7^{81} \times (1 + 7 + 7^2) = 7^{81} \times (1 + 7 + 49) = 7^{81} \times (57) = 7^{80} \times (7 \times 57) = 7^{80} \times (399)$
Option (a) follows.

Sol.41.(c) Let N be the number which gives Q as quotient and 15 as remainder when divided by d.
Thus, d > 15
N = d × Q + 15
10N = 10(d × Q) + 144 + 6
clearly d is a multiple of 144 which are: 2, 3, 4, 6, 8, 9, 12, 16, 18, 24 and so on.
The least possible value of d is 16.
(d > 15)

Sol.42.(c) When 200 is divided by x, the remainder is 8. So, the number exactly divisible by x is 192.
Factors of 192 = 1, 2, 3, 4, 6, 8, 12, 16, 24, 32, 48, 64, 96, 192
The remainder is always less than the divisor ,
so x > 8
⇒ Desired values are 12, 16, 24, 32, 48, 64, 96, 192.

Sol.43.(a) Total no's less than 1000 which is divisible by 5 = $\frac{1000}{5}$ - 1
= 200 - 1 = 199
Total no's less than 1000 which is divisible by 7 = $\frac{1000}{7}$ = 142
Total no's less than 1000 which is divisible by 35 = $\frac{1000}{35}$ = 28
Required no = 199 + 142 - (2 × 28)
= 285

Sol.44.(a) Difference :-
4749 5601 7092
852 1491
639
As per question, the greatest possible number is taken that divides the three numbers 4749, 5601 and 7092 giving same remainder i.e. r
Now, 5601 - 4749 = 852
7092 - 5601 = 1491
There is no common factor between 852 and 1491
Then again we will take their difference that comes out to be 639
639 can be further break down into 213 that divides 852 , 4 times
And 1491, 7 times 'd' is 213

```
      22
213 | 4749
    | - 426
      489
    - 426
       63
```

And 'r' = 63
As per question,
$(d + r)$ = 213 + 63 = 276

Sol.45.(b)
Now, the LCM of 2, 3, 4, 5, 6 and 7 = 420

```
      6
420 | 2800
    | -2520
      280
```

On Subtracting , 420 - 280 = 140
Now, Adding 140 to 2800
2800 + 140 = 2940
As per question, 1 is the remainder that we get in each case but 2940 is completely divisible by 2, 3, 4, 5, 6 and 7
Therefore,
the number = 2940 + 1 = 2941
Now, the sum of the digits is 16.

Sol.46.(b) Now, we know that the number that is divisible by 7, 11 and 13 is 1001
if 1001 is multiplied with a three digit number say, 'abc' then
the product comes out to be abcabc
⇒ x = 4 , y = 7, z = 9
Putting these values in the equation
{(y + z) ÷ x }
= {(7 + 9) ÷ 4 } = 16 ÷ 4 = 4

Sol.47.(a) As per the options the difference between all the two values of the given four options is '2'
Thus, in such cases : if there is the same difference between the numbers then, The greatest value with the square root of the given options fetches the smallest value. So √401 - √399 will give the smallest value.

Sol.48.(d) Let the numbers be x and y.
According to the question
x - y = 2001 ..... (1)
And 9y + 41 = x ..... (2)
Put the value of x in eq (1)
9y + 41 - y = 2001 ⇒ 8y = 1960
y = 245 ⇒ x = 9(245) + 41 = 2246
Required sum = 2 + 2 + 4 + 6 = 14

Sol.49.(c) Let the number = 10x + y
According to the question
(10x + y)(x + y) = 424 .....(1)
And

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(10y + x)(x + y) = 280 .....(2)
Divide equation (1) by (2)
$\Rightarrow \frac{(10x+y)}{(10y+x)} = \frac{424}{280} \Rightarrow \frac{(10x+y)}{(10y+x)} = \frac{53}{35}$
⇒ 350x + 35y = 530y + 53x
$\Rightarrow 297x = 495y \Rightarrow \frac{x}{y} = \frac{5}{3}$
Put this value in any of the equations
(10x + y)(x + y)=[{10(5) + 3}(5 + 3)] = 424
Or
(10y + x)(x + y) = [{10(3) + 5}(5 + 3)] = 280
Clearly 5 and 3 are the desired values and the sum of the digits = 5+3 = 8

Sol.50.(a) 15 = 3 × 5
18 = 2 × 3 × 3 ;20 = 2 × 2 × 5
27 = 3 × 3 × 3
LCM of 15, 18, 20 and 27
= 2 × 2 × 3 × 3 × 3 × 5 = 540
$\Rightarrow x\ must\ be\ =\ 540k\ +\ 10$
Where 540k + 10 is multiple of 31
The condition gets satisfied when k = 4
Required number = 540 (4) + 10 = 2170
Nearest square to 2170 = 2209
Required number = 2209 - 2170 = 39

Sol.51.(b) 12 = 2 × 2 × 3 ;16 = 2 × 2 × 2 × 2
18 = 2 × 3 × 3; 20 = 2 × 2 × 5
25 = 5 × 5
LCM of 12,16,18,20 and 25 = 2 × 2 × 2 × 2 × 3 × 3 × 5 × 5 = 3600
$\Rightarrow x\ must\ be\ =\ 3600k\ +\ 4$
Where 3600k + 4 is multiple of 7
The condition gets satisfied when k = 5
Required number = 3600(5) + 4 = 18004
$\Rightarrow digit\ at\ the\ thousands'\ place\ in\ x\ =\ 8$

Sol.52.(d) Given,
x = $(633)^{24}$- $(277)^{38}$ + $(266)^{54}$
Unit digit of $(633)^{24}$ = 3^4 = 1
Unit digit of $(277)^{38}$ = 7^2 = 9
Unit digit of $(266)^{54}$ = 6^2= 6
Unit digit of x = 1 - 9 + 6 = - 2
But unit digit can't be negative so, required unit digit = 10 + (- 2) = 8

Sol.53.(d) Let the number = 10x + y
According to the question
(x + y) = $\frac{1}{7}$(10x + y) .....(1)
And , y = x - 4
Put this value in equation (1)
(x + x - 4) = $\frac{1}{7}$(10x + x - 4)
14x - 28 = 11x - 4
$x = 8$ and y = 8 - 4 = 4
the number obtained on reversing the digit = 10y + x = 10(4) + 8 = 48
Required remainder = $\frac{48}{7}$ = 6

Sol.54.(b) If the number 'a' and 'b' are divisible by a number 'n' then, a + b and a - b are also divisible by n.
Here the numbers are 7531, 7105 and 6892
the required number then becomes H.C.F of 7531 - y, 6892 - y and 7105 - y or the HCF of (7531 - y) - (7105 - y) and (7105 - y) - (6892 - y)
(7531 - y) - (7105 - y) = 426
(7105 - y) - (6892 - y) = 213
213 = 3 × 71 ⇒ 426 = 2 × 3 × 71
So, HCF of 426 and 213
x = 3 × 71 = 213
The remainder =
$\frac{7531}{213} = \frac{7105}{213} = \frac{6892}{213}$ = y = 76
$\Rightarrow (x - y) = 213 - 76 = 137$

Sol.55.(d) x will be the HCF of the differences of the three numbers.
6475 - 4984 = 1491
4984 - 4132 = 852
6475 - 4132 = 2343
1491 = 3 × 7 × 71
852 = 2 × 2 × 3 × 71
2343 = 3 × 11 × 71
So,
HCF of 2343, 1491 and 852 = 3 × 71 = 213
So, sum of digit = 2 + 1 + 3 = 6

Sol.56.(b) 44

	44
4	1936
+ 4	-16
84	336
	-336
	0

Sol.57.(d) Difference between the largest and the smallest number
9652 - 2569 = 7083

Sol.58.(c) Since, $\sqrt{1354.24} = 36.8$

Sol.59.(d)
Let one part = x , Second part = 37 - x
According to question ,
⇒ 5x + 11 (37 - x) = 227
⇒ 5x + 407 - 11x = 227
⇒ - 6x = - 180 ⇒ x = 30
∴ one part = 30 , second part = 7
Hence , 9 times of smaller number = 9 × 7 = 63

Sol.60.(c) To solve this type of question, one is taken.
Now,
The total number of legs of all the horses on the farm = 4 × 60 = 240
Given:- number of pigeon legs = 2 and number of horse legs = 4
According to question,
(4 - 2) = 2 unit = 240 - 150
1 unit = $\frac{90}{2}$ = 45
Hence, number of horses in the farm = 60 - 45 = 15

Sol.61.(b) According to question ,
Length $\propto \frac{1}{Frequency} \Rightarrow$ L = $\frac{K}{F}$
⇒ 14 = $\frac{K}{450}$ ⇒ K = 6300
Now , ⇒12 = $\frac{6300}{F}$
⇒ F = $\frac{6300}{12}$ = 525 cycles per second

Sol.62.(c) In this type question solving by the help of options,
On checking all options one by one, only option (c) satisfies.
⇒ b = 8a + $\frac{225}{a^2}$
LHS = b = 49
RHS = 8a + $\frac{225}{a^2}$
= 8 × 5 + $\frac{225}{25}$ = 40 + 9 = 49
Hence, LSH = RHS

Sol.63.(b) According to question ,
⇒ 6 unit = 21
⇒ 7 unit = $\frac{21}{6}$ × 7 = 24.5

Sol.64.(a) If a, b and c are in continue proportion then it can be write as
a : b : : b : c
$\Rightarrow b^2 = ac$
Let least possible number be P and subtracted from each other
$\Rightarrow (9 - P)^2$ = (7 - P) (12 - P) ⇒ P = 3
∴ P^2 + 1 = 9 + 1 = 10

Sol.65.(c) A number is divisible by 6 if it is divisible by both 2 and 3:
Divisibility of 2 : A number is divisible by 2 if it is an even number,
Divisibility of 3 : A number is divisible by 3 if the sum of all digits of that number is divisible by 3.
Now, 217924k
⇒ 2 + 1 + 7 + 9 + 2 + 4 + k = 25 + k
The possible value of k can be 0, 2 , 4 , 6 , 8
But the sum of number must be multiple of 3 so the value of k will be **2**

Sol.66.(a) Divisibility of 9:- sum of digits of number either be 0 or divisible by 9.
Given number = 28735429
2 + 8 + 7 + 3 + 5 + 4 + 2 + 9 = 40
For making given number divisible by 9 we get remainder 4
i.e. 36 + 4 = 40

Sol.67.(b) Divisibility of 11:- difference of the sum of odd and even places digits be 0 or divisible by 11
Given number :- 7845K854
8 + 5 + 8 + 4 - (7 + 4 + K + 5) = 0 or divisible by 11
25 - (16 + K) = 0 or divisible by 11

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

9 - K = 0 or divisible by 11
K = 9

Sol.68.(c)
Largest 5-digit number = 99999
On dividing 99999 by 47, we get 30 as a remainder.
So, the required no which is divisible by 47 = 99999 - 30 = 99969

Sol.69.(b) According to the question,
$\Rightarrow 10x + 20 \times 6 = 180 \Rightarrow 10x = 180 - 120$
$\Rightarrow x = \frac{60}{10} = 6$

Sol.70.(a)
$\frac{(77^{77}+77)}{78} = \frac{[(78-1)^{77}+77]}{78}$
$= \frac{78^{77}+(-1)^{77}}{78} + \frac{77}{78}$
Remainder = $\frac{77-1}{78}$ = 76

Sol.71.(b) Divisibility rule of 8: last three digits should be divisible by 8.
Divisibility rule of 5: last digit is either 0 or 5.
If last digit is 5:
The 62684*5 is not divisible by 8.
If last digit is 0:
62684*0
The value of * can be 0, 4, 8.
By checking options, option (b) satisfied the given condition.

Sol.72.(c) Remainder $(\frac{999}{99})$ = 9
Hence, required smallest number
= 99 - 9 = 90

Sol.73.(a) According to the question,
Remainder = 32
Divisor = 4 × quotient
Divisor = 2 × remainder = 2 × 32 = 64
So, divisor = 64 , quotient = 16
⇒ dividend = divisor × quotient + remainder
⇒ dividend = 64 × 16 + 32 = 1056

Sol.74.(a) 10 = 2 × 5
Divisibility rule of 10 : number is divisible by 10, when its unit place is 0
From the given option, only option (a) is divisible by 10.

Sol.75.(c) Even prime number = 2
Mean proportional of $\frac{36}{5}$ & 245
$= \sqrt{\frac{36}{5} \times 245} = 42$
Then, the quotient when 42 is divisible by 2 = 21

Sol.76.(c)
Let the initial price of apples be ₹x
According to question
$\frac{720}{x-2} - \frac{720}{x} = 4$
$720(\frac{2}{x(x-2)}) = 4$
$x(x - 2) = 360$
$x^2 - 2x - 360 = 0$
$x^2 - 20x + 18x - 360 = 0$
$x(x - 20) + 18(x-20) = 0$
$(x - 20)(x + 18) = 0 \Rightarrow x = 20$
the no of apples originally bought
$= \frac{720}{20} = 36$

Sol.77.(c) 6 = 2 × 3
Using the given options, we have ;
(a) 723**4**56**4**, which is not divisible by 3.
(b)723**3**56**3**, which is not divisible by 2
(c) 723**2**56**2**, which is divisible by 2 and 3 both
(d) 723**1**56**1**, which is not divisible by 2
So, the correct option is (c)

Sol.78.(b) After checking options one by one we get,
After 4 years,
Daisy plants = 6 + 3 + 3 + 3 + 3 = 18
And Jasmine plants = 26 - 2 - 2 - 2 -2 =18
Hence, after 4 years daisy plants and jasmine plants become equal.

Sol.79.(c) LCM of (2,5,10 and 11) = 110
After checking all the options one by one, only option (c) satisfies.
$\Rightarrow \frac{589270}{110}$ = Rem.(0)
So, 589270 is divisible by 2 , 5, 10 and 11

Sol.80.(a) Divisibility rule of 8 : Last three digit should be divisible by 8
Now given , 91876a2
$\therefore \frac{6a2}{8}$, by checking option one by one , option (a) satisfy this condition
$\frac{632}{8}$ = 79
Hence , smallest value of a = 3

Sol.81.(b) A number is divisible by 6 if it is divisible by both 2 and 3:
Divisibility of 2 : A number is divisible by 2 if it is an even number,
Divisibility of 3 : A number is divisible by 3 if the sum of all digits of that number is divisible by 3.
Now, 321y72
⇒ 3 + 2 + 1 + y + 7 + 2 = 15 + y
The least value of y is 0

Sol.82.(b)
The cost of drinks for 7 friends = ₹240
A regular cup of coffee cost = ₹40
A regular cup of black tea cost = ₹30
Assume that all friends drink a coffee ,
So the price of 7 cup of coffee
= 7 × 40 = ₹ 280
Then, Cups of tea she purchase
$= \frac{280-240}{40-30} = \frac{40}{10} = 4$

Sol.83.(c) $(17^{13} - 21) \div 18$
Concept : Rem $\{\frac{(a-1)^n}{a}\}$ →(a -1) or -1 ; when n is odd
$\frac{(18-1)^{13}}{18} - \frac{21}{18}$ ⇒ 17 - 3 = 14(rem)

Sol.84.(a) Divisibility rule of 9 : Sum of the digit of the number should be divisible by 9
Given , number =57x716
Sum of digit : 5 + 7 + x + 7 + 1 +6 = 26 + x
Put the value of x = 1 so sum of digit is divisible by 9 ∴ x = 1

Sol.85.(a) A number is divisible by 11 if the difference between the sum of the digits at odd and even positions is 0 or multiple of 11.
So, 6954P
⇒ (6 + 5 + p) - (9 + 4) = 0 or multiple of 11
⇒ 11 + p = 13 ⇒ p = 2

Sol.86.(d)
Given: f(m) = $m^5 + 5m^4 - 3m + 7$
According to the question,
m - 2 = 0 ⇒ m = 2
Remainder = $2^5 + 5 \times 2^4 - 3 \times 2 + 7$
= 32 + 80 - 6 + 7 = 113

Sol.87.(a) Number (r) ÷ 8 → 3 (rem)
Number $(r^2 + 6r + 7) \div 8$
$\frac{3^2+6(3)+7}{8} = \frac{34}{8}$ → 2 (rem)

Sol.88.(c) **Given**: 19^{200}
$= \frac{19^{200}}{20}$ ⇒ Remainder = $(-1)^{200}$ = 1

Sol.89.(d) $\frac{2}{3}$ = 0.66, $\frac{6}{53}$ = 0.11,
$\frac{79}{90}$ = 0.87, $\frac{33}{44}$ = 0.75
It is clear that, $\frac{79}{90}$ is the largest fraction.

Sol.90.(d) Number = 5x79856y6
For divisibility of 36 a number must be divisible by 9 and 4.
For divisibility of 4 :- last 2 digit must be divisible by 4.
Hence , possible value of y = 1, 3,5,7, 9
We need largest possible value of y = 9
For divisibility of 9 :- sum of number must be divisible by 9.
Hence, sum of number = 5 + x + 7 + 9 + 8 + 5 + 6 + y + 6 = 46 + x + y
On putting largest value of y = 9
= 46 + x + 9 = 55 + x
Now, Number next to 55 that is divisible by 9 is 63
Hence, Required value of x = 63 - 55 = 8
Now,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\sqrt{(2x + y)} = \sqrt{(2 \times 8 + 9)} = \pm 5$

Hence negative value of $\sqrt{(2x + y)}$ = -5

Sol.91.(b) Let Anna and Ben has x and y marbles respectively.

According to question,

$x - 1 = y + 1 \Rightarrow x - y = 2$

$x = 2 + y$ ... (i)

and

$x + 1 = 3(y - 1)$

$2 + y + 1 = 3y - 3$

$2y = 6 \Rightarrow y = 3$

Put y = 3 in equation (i)

$x = 2 + 3 = 5$

Hence,

Total marbles both have = 5 + 3 = 8

Sol.92.(c)

$$\begin{array}{r|l} x+2 & x^3 - 4x^2 - 8x + 11 \quad \underline{x^2 - 6x + 4} \\ & x^3 + 2x^2 \\ & - \quad - \\ \hline & -6x^2 - 8x \\ & -6x^2 - 12x \\ & + \quad + \\ \hline & 4x + 11 \\ & 4x + 8 \\ & - \quad - \\ \hline & 3 \end{array}$$

When $x^3 - 4x^2 - 8x + 11 \div (x + 2)$, we get 3 as remainder, so if 3 is subtracted from $x^3 - 4x^2 - 8x + 11$ than it is divisible by $(x + 2)$

Sol.93.(b)

Let number of marbles Ravi had = x

Number of Marbles Kavita had = $x + 12$

According to question ,

$\Rightarrow 3(x + 13) = 4(x + 1)$

$\Rightarrow 3x + 39 = 4x + 4 \Rightarrow x = 35$

∴ Number of Marbles Kavita had $(x + 12)$

= 35 + 12 = 47

Sol.94.(b) Divisibility rule of 11 : Difference between sum of digit odd places and sum of digits at even places is either 0 or multiple of 11

By checking all options one by one option (b) does not satisfy this condition

756148 = (7 + 6 + 4) - (5 + 1 + 8)

= 17 - 14 = 3 $\neq$ 0 , $Multiple\ of\ 11$

∴ Option (b) is not divisible by 11

Sol.95.(c) Divisibility of 8 : A number is divisible by 8 if the last three digits of the number are either zeros or are divisible by 8

So, 7344, 5544 and 4608 are divisible by 8 except for **7497**.

Sol.96.(b) Givn: 2^{2n} + 2n

Put n = 3,

$\Rightarrow 2^{2 \times 3} + 2 \times 3 = 64 + 6$

= 70 (not divisible by 6)

Put n = 1

$\Rightarrow 2^{2 \times 1} + 2 \times 1 = 4 + 2 = 6$

(divisible by 6)

Put n = 0

$2^{2 \times 0} + 2 \times 0 = 1 + 0 = 1$

(not divisible by 6)

Put n = 2

$2^{2 \times 2} + 2 \times 2 = 16 + 4 = 20$

(not divisible by 6)

It is clear that the correct answer is option (b)

Sol.97.(b) Divisible of 11 : if the difference between the sum of the digits at odd places and the sum of the digits at even places is 0 or multiple of 11

7278745

⇒ (7 + 7 + 7 + 5) - (2 + 8 + 4)

⇒ 26 - 14 = 12

It is clear that if 1 is subtracted from this number (786452), then this number will become divisible by 11.

Sol.98.(d) Let the price of one chairs and one tables be x and y respectively,

⇒ $10x$ + 6y = ₹5140 .....(i)

⇒ $3x$ + 2y = ₹1635 .....(ii)

On multiply by 3 in equation (ii) then subtract equation (i) from (ii)

⇒ x = 5140 - 4905 = ₹235

Put the value of x in equation (ii)

⇒ 3 × 235 + 2y = ₹1635

⇒ 2y = 1635 - 705

⇒ y = $\frac{930}{2}$ = ₹465

Now, The value of 1 chair and 1 table

= 235 + 465 = ₹700

Sol.99.(d) Option (a) 3 and 4 (not correct)

429714 is divisible by 3 but not divisible by 4

Option (b) 6 and 5 (not correct)

429714 is divisible by 6 but not divisible by 5

Option (c) 4 and 6 (not correct)

429714 is divisible by 6 but not divisible by 4

Option (d) 3 and 6 (correct)

429714 is divisible by both numbers 3 and 6

Sol.100.(c) Divisibility rule of 3 : Sum of the digit of the given number should be divisible by 3

Here , 6 + 7 + 4 + 5 + k + 2 = 24 + k

If k = 9 , then 24 + 9 = 33 (which is divisible by 3)

∴ Greatest value of k = 9

Sol.101.(d)

Number ÷ 55 → 28 (remainder)

Number ÷ 11 → $\frac{28}{11}$ = 6 (remainder)

Sol.102.(c)

Two numbers = 2 unit and 5 unit

Difference = 5 - 2 = 3 unit

3 unit = 210

Smaller number (2 unit) = $\frac{210}{3} \times 2$ = 140

Sol.103.(d) For divisibility of 3 the sum of digits must be divisible by 3.

Hence, Sum of digits of number

= 4 + 3 + 6 + P + 5 = 18 + p

Value of P can be 3, 6, 9 but for largest value P = 9

Sol.104.(a)

Sum of first n natural number = $\frac{n(n+1)}{2}$

Sum of first 12 natural number

= $\frac{12(12+1)}{2}$ = 6 × 13

Hence, 6 can divide the sum of first 12 natural numbers.

Sol.105.(a) $8^m - 1$

Put m = 2 (smallest even number)

$8^2 - 1 \Rightarrow 64 - 1 = 63$

Hence, $8^m - 1$ is divisible by 63 when m is even.

Sol.106.(c) For divisibility of 6 a number must be divisible by 2 and 3.

Among the options only option (c) is divisible by 3 and 2 both.

Sol.107.(a)

Let the number is 15x (LCM of 5 and 3)

According to question

$\frac{1}{5}$ of 15x + 5 = $\frac{1}{3}$ of 15x - 7

$3x + 5 = 5x - 7 \Rightarrow 2x = 12 \Rightarrow x = 6$

Hence, number = 15x = 15 × 6 = 90

Half of number = 45

Sol.108.(c)

Let two consecutive even no. = $x, x + 2$

According to question,

$x + x + 2 = 174 \Rightarrow 2x = 172 \Rightarrow x = 86$

Sol.109.(a) $7^{15} + 7^{16} + 7^{17}$

$7^{15}(1 + 7 + 7^2)$

$7^{15}(1 + 7 + 49) \Rightarrow 7^{15}(57)$

Among the options 57 is divisible by 3 only.

Sol.110.(b) In this type of questions, we start the calculation from the last and come towards the initial position.

The number which when divided by 7 leaves remainder 3 and quotient is 3

= 7 × 3 + 3 = 24

When a number is divided by 5, the remainder is 1 = 24 × 5 + 1 = 121

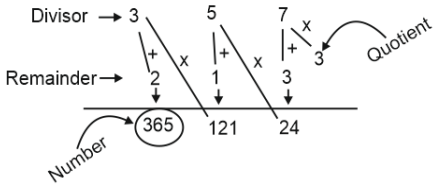
When a number is divided by 3, the remainder is 2 = 121 × 3 + 2 = 365

Hence, required number = 365

Short trick :-

Search on TG: @apna_pdf

Search on Telegram @apna_pdf



Sol.111.(c) Numbers that are divisible by 8 between 2000 and 2020 is 2008 , 2016 (2 numbers)

Sol.112.(b)
Let number = (304 + 43) = 347
Now, required remainder = $\frac{347}{16}$ = 11

Sol.113.(c)
Let five consecutive number be
x - 4 , x - 2, x , x + 2 , x + 4 respectively
Their sum = 5 x
According to the question,
5x = 2720 ⇒ x = 544
Required sum = (x + x + 4)
= 2 × 544 + 4 = 1092

Sol.114.(d) According to the question,
Number of digits required
= (9 × 1) + (90 × 2) + (329 × 3) = 1176

Sol.115.(a) Divisibility rule of 9 :- sum of digits is divisible by 9
When any 8 digit number is divisible by 99 it means that number is also divisible by 9 and 11.
Even if we shuffle the digits the number will be divisible by 9 but not by 11

Sol.116.(d)
Required remainder = $\frac{67}{32}$ = 3

Sol.117.(c) $\frac{179 \times 172 \times 173}{17}$
$\frac{9 \times 2 \times 3}{17} = \frac{18 \times 3}{17} = \frac{1 \times 3}{17}$ = 3
Hence, 3 will be the remainder.

Sol.118.(b) Given number 489y5z6 is divisible by 72 (8 × 9)
Divisibility of 9 :- sum of the digit of number be divisible by 9
⇒ 489y5z6 = 4 + 8 + 9 + y + 5 + z + 6
= y + z + 32
So, possible values of (y + z) = 4 , (4 + 9 = **13**) , (13 + 9 = 22) etc.
Now, **divisibility of 8 :-** last three digit of the number be divisible by 8
Last three digit = 5z6
Possible value of z = 3, 7
For highest possible product of y and z
We take , y = 6 and z = 7
{y + z = 6 + 7 = 13}
Hence, required product of (y × z)
= 7 × 6 = 42

Sol.119.(a) Dividend = divisor × quotient + remainder
When, n is divided by 18, the quotient is x and the remainder is 6
⇒ n = 18x + 6 --------(i)
When, n is divided by 25, the quotient is y and the remainder is 15
⇒ n = 25y + 15 --------(ii)
Equate equation (i) and (ii) we get;
18x + 6 = 25y + 15 ⇒ 18x - 25y = 9

Sol.120.(b) Checking option one by one the correct option is (b)
Divisibility rule of 11 - difference of sum of odd and even places sum is equal to 0 or multiple of 11.
Now, 893002 → Even places' digit
= 9 + 0 + 2 = 11
Odd places' digit = 8 + 3 + 0 = 11
11 - 11 = 0
So the number 893002 is completely divisible by 11.

Sol.121.(d) $\frac{7658}{45}$ = 8 (remainder)
So the nearest number of 7658 which is exactly divisible by 8 will be 7658 - 8 = 7650

Sol.122.(b) To solve these kinds of questions we take help of the options,
Option (a) 67 + 76 = 143 (not satisfied)
Option (b) 34 + 43 = 77 (satisfied)
Option (c)12 + 21 = 33 (not satisfied)
Option (d) 45 + 54 = 99 (not satisfied)
So number will be 34

Sol.123.(b) Divisibility rule of 3 = sum of digits is divisible by 3
7 + x + 7 + 6 + 2 + 4 = 26 + x
Put x = 1
26 + 1 = 27 (which is divisible by 3)
So the smallest number will be 1

Sol.124.(c) Given: k^{33} –k
= k(k^{32} - k)
= k(k^{16} - 1)(k^{16} + 1)
= k(k^8 - 1)(k^8 + 1)(k^{16} + 1)
= k(k^4 - 1)(k^4 + 1)(k^8 + 1)(k^{16} + 1)
= k(k^2 - 1)(k^2 + 1)(k^4 + 1)(k^8 + 1)(k^{16} + 1)
= k(k - 1)(k+1)(k^2 +1)(k^4+1)(k^8 +1)(k^{16} +1)
Put the value of k = 3, 5 ,7.....
= 3 × 2 × 4[(3^2 +1)(3^4 + 1)(3^8 + 1)(3^{16} + 1)]
= 24 × [(3^2 +1)(3^4 + 1)(3^8 + 1)(3^{16} + 1)]
From the above expression it is clear that k^{33} - k will always be divisible by 24.

Sol.125.(a) LCM of 2, 3, 4 = 12
Numbers between 10 to 65 which is divisible by 2, 3, 4 = 12, 24, 36, 48, 60
Hence, the required numbers will be 5.

Sol.126.(a)
Practice time to get 70 marks = 6 hours
Practice time to get 90 marks
= $\frac{6}{70}$ × 90 = 7.7 hours (approx)

Sol.127.(c) Let number = 10x + y
According to the question,
Number is 12 more than five times the sum of its digits
10x + y = 5(x + y) + 12
5x - 4y = 12 -------(i)
Number formed by reversing the digits is 9 less than the original number
10y + x = 10x + y - 9
x - y = 1 -------(ii)
Equation [(i) - 5 × (ii)] we get; y = 7
Put y = 7 in equation (ii) we get;
x - 7 = 1 ⇒ x = 8
Hence, number = 10 × 8 + 7 = 87

Sol.128.(c) Let n = (5 + 3) = 8
Then, 6n = 6 × 8 = 48
Hence, rem. $\frac{6n}{5}$ = rem. $\frac{48}{5}$ = 3

Sol.129.(d) $17^3 + 18^3 - 16^3 - 15^3$
4913 + 5832 – 4096 – 3375 = 3274
Clearly, the number is divisible by 2.

Sol.130.(a) n divides 732 and leaves 12 as a remainder
Then, number n divides (732 - 12)
= 720 completely
Now, factor of 720 = $2^4 \times 3^2 \times 5^1$
Number of factor
= (4 + 1) × (2 + 1) × (1 + 1) = 30
Since, remainder is 12 then, value of n must be greater than 12
Number of factors of 720 which are less or equal to 12
= (1 , 2 , 3 , 4 , 5 , 6 , 8 , 9 , 10 , 12)
= 10 factor
So the possible number of n
= 30 - 10 = 20

Sol.131.(b) age of a tree depends on the number of rings in the trunk
40 rings = 50years ⇒1 rings = 1.25 years
Then, 30 rings = 30 × 1.25 = 37.5 years
The value of tree is proportional to age of tree
50 years = Rs. 50000
⇒ 1 years = Rs. 1000
Then, 37.5 years
= 37.5 × 1000 = Rs. 37500
Hence, tree with 30 rings is 37.5 years of age and its value is Rs. 37500

Sol.132.(c) $\frac{(8^6 + 1)}{7} = \frac{(1^6 + 1)}{7}$ = 2

Sol.133.(b)
Let the original number be (10x + y)
On reversing its digits, no will be (10y + x)
y + x = 9 ---------- (i)
According to the question,
(10y + x) - (10x + y) = 27 ⇒ 9y - 9x = 27
y - x = 3 ---------- (ii)
On solving eqn(i) and (ii) we have ;
y = 6, x = 3

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

So, the number = 10 × 3 + 6 = 36

Sol.134.(a) Number is divisible by 11 if and only if the difference of the sum of the digits in the even and odd positions in the number is 0 or multiple of 11

Sol.135.(c)

Rem $(\frac{2^{256}}{17})$ = Rem $(\frac{(2^4)^{64}}{17})$

= $\frac{(-1)^{64}}{17}$ = $\frac{1}{17}$ = 1

Sol.136.(b) Let the larger no and smaller no be x and y respectively

x + y = 76 ---------- (i)

3x - 4y = 46 ---------- (ii)

Solving eqn. (i) & (ii) we have ;

x = 50, y = 26

Sol.137.(b) 88 = 11 × 8

For 6p5157q to be divisible by 8, its last 3 digits i.e. 57q must be divisible by 8.

For this q must be 6

Now, For 6p5157**6** to be divisible by 11, the difference of the sum of its alternate digits i.e. (6 + 5 + 5 + 6) - (7 + 1 + p)

= 14 - p , must be divisible by 11.

For this, P must be 3.

So, p × q = 3 × 6 = 18

Sol.138.(d) Let divisor be x.

Then, no will be (459x + 19)

Now, remainder$(\frac{459x + 19}{17})$

= rem$(\frac{19}{17})$ = 2

Sol.139.(c) Let the no of unit and tens digits be y and x respectively

Then, number will be (10x + y)

On interchanging its digits, we get

(10y + x)

According to the question,

x + y = 9 ---------- (i)

(10y + x) - (10x + y) = 45

9y - 9x = 45

⇒ y - x = 5 ---------- (ii)

Solving equation (i) & (ii) we have ;

x = 2 , y = 7

So, the original number = 10 × 2 + 7 = 27

Sol.140.(c) Let the larger and smaller parts be x and y respectively

According to question,

x + y = 25 ---------- (i)

6x + 4y = 130 ---------- (ii)

Solving eqn(i) & (ii) we have ;

y = 10, x = 15

So, the larger part = 15

Sol.141.(b) 611611611611

As per question check divisibility by 6 and 11

For divisibility of 6 it must be divisible by 2 and 3

611611611611 is not divisible by 2 hence it is not divisible by 6 also

now, for divisibility of 11, sum of alternate digits

1 + 6 + 1 + 1 + 6 + 1 = 16

6 + 1 + 1 + 6 + 1 + 1 = 16

Difference of sum of alternate digits

= 16 - 16 = 0

Hence it is divisible by 11 only.

Sol.142.(c)

3 : 4, 3 : 5, 2 : 11, 7 : 2

$\frac{3}{4}, \frac{3}{5}, \frac{2}{11}, \frac{7}{2}$

0.75, 0.6, 0.18, 3.5

Hence, correct ascending order is

2:11 < 3 : 5 < 3 : 4 < 7 : 2

Sol.143.(d) Girls - Boys = 8 … (i)

Girls + Boys = 18 … (ii)

On solving eq . (i) and (ii), we get

Girls = 13 and Boys = 5

Product of Girls and Boys = 13 × 5 = 65

Sol.144.(b) Divisibility rule of 11 : The difference of the sum of the alternate digits of any number is either 0 or multiple of 11.

Now, after checking all the options, only option (b) gets satisfied.

969331 → (3 + 9 + 9) - (1 + 3 + 6)

= 21 - 10 = 11, which is divisible by 11.

Sol.145.(c)

From the given option, we have ;

(a)18 → 10000 is not divisible by 18

(b)17 → 10000 is not divisible by 17

(c)25 → 10000 is divisible by 25

(d)14 → 10,000 is not divisible by 14

Clearly, we can see that only option (c) is correct.

Sol.146.(d) For divisibility by 8, the last three digits should be divisible by 8.

Here 7x4 will be divisible by 8.

The value of x will be 0, 4, 8.

Here the smallest value is 0.

Sol.147.(c) Condition for the divisibility of 6 ; Sum of digits is divisible by 3 and last digit is even.

Sol.148.(d) 88 = 11 × 8

From the given option, we have ;

(a) 9848 → 9848 is divisible by 8 but not divisible by 11

(b) 9988→ 9988 is divisible by 11 but not divisible by 8

(c) 8888 → 8888 is divisible by 8 and 11.

(d) 9768 → 9768 is also divisible by 8 and 11.

Clearly, we can see that 9768 is the largest 4-digit number, which is divisible by 88.

Sol.149.(b) For 1972x471 to be divisible by 9, the sum of its digits i.e.1 + 9 + 7 + 2 + x + 4 + 7 + 1 = 31 + x, should be divisible by 9.

Now, putting x = 5, we get 36, which is divisible by 9

So, x = 5

Sol.150.(a) If a number is divisible by both 11 and 13, then it must be divisible by (11 × 13).

Sol.151.(a) 72 = 9 × 8

For 937X728Y6 to be divisible by 8, its last 3 digits i.e.8Y6 should be divisible by 8.

For this y can be 1 or 5.

For 937X728Y6 to be divisible by 9, the sum of its digits i.e. 9 + 3 + 7 + X + 7 + 2 + 8 + Y + 6 = 42 + Y + X should be divisible by 9.

Putting **y = 1**, we get ; 42 + 1 + X = 43 + X ⇒ **X = 2**

Then, X + Y = 2 + 1 = 3

Putting **y = 5**, we get ; 42 + 5 + X = 47 + X ⇒ **X = 7**

Then, X + Y = 7 + 5 = 12

From the above option, we get one of the possible values of X + Y = 12.

Sol.152.(a) Let the original number be x and divisor be d

dq + 24 = x

Multiplying both side by 2,

2dq + 48= 2x

(2dq + 35)+**13** = 2x

So, d is either 35 or factor of 35 but greater than 24 ⇒ d = 35

Sol.153.(b) Rem$(\frac{5^{55}}{4})$ = $\frac{1^{55}}{4}$ = 1

Sol.154.(c) 7 × 11 = 77

Numbers less than 1000 which are multiples of 77 = 77, 154, ……924

since , the given series are in AP. so, we have ;

77 + (n - 1)77 = 924 ⇒ (n - 1)77 = 847

n - 1 = 11 ⇒ n = 12

Sol.155.(d) Divisibility rule of 4 :

For any no. to be divisible by 4, its last 2 digits should be divisible by 4.

Now, after going through all the options, we get only 618703592 is divisible by 4.

Hence, option(d) is the correct one.

Sol.156.(c) Let

Divisor = n , quotient = q, remainder = r

(Dividend)N = n.q + r

Given:

n = 13.q , n = 6.r , r = 39

⇒ n = 39 × 6 = 234 ⇒ q = 18

⇒ N = n × q + r ⇒ N = 234 × 18 + 39

⇒ N = 4212 + 39 = 4251

Sol.157.(c) For divisible by 36 the

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

number must be divisible by both 9 and 4.
To check divisibility by 9 sum of all the numbers divisible by 9.
and for divisibility by 4 the last two digits should be divisible by 4.
By checking option one by one option (c) satisfies.
i.e. Option (c) 55512
5 + 5 + 5 + 1 +2 = 18 (divisible by both 9 and 4)

Sol.158.(a) By checking option one by one option (a) satisfies.
Option (a) 8
For divisibility by 8, last three digits should be divided by 8.
And here 216 is divisible by 8.
Hence the given number is divisible by 8.

Sol.159.(a) $3 + 3^2 + 3^3 + ... +3^8$
$\Rightarrow 3 (1 + 3 + 3^2 + 3^3 + ... +3^7)$
$\Rightarrow 3 (1 +3 + 9 + 27 + 81 + 243 + 729 + 2187) \Rightarrow 3 (3280) = 9840$

Sol.160.(c) (a) For divisibility by 3
2 + 9 + 1 + 8 +2 + 4 + 5 = 31 (not divisible by 3)
(b) Since the number is not divisible by 3, the number is not divisible by 9.
(c) For divisibility by 11
Difference between the sum of the digits placed at odd places and even places is either divisible by 11 or 0.
For 2918245
(2 + 1 + 2 + 5) - (9 + 8 + 4) = 10 - 21 = -11 (divisible by 11)
(d) For divisibility by 12 , the number should be divisible by 4 and 3 , but the given number is not divisible by 4 and 3 ,hence it is not divisible by 12 .

Sol.161.(b) $6^{25} + 6^{26} + 6^{27} + 6^{28}$
$= 6^{25} (1 + 6 + 6^2 + 6^3)$
$= 6^{25} (1 +6 + 36 + 216) = 6^{25} (259)$
Hence the given expression is divisible by 259.

Sol.162.(a) $\frac{90}{4} = \frac{Distance}{32}$
$\Rightarrow$ Distance = 90 × 8 = 720 km

Sol.163.(b) We know
Dividend (N) = divisor × quotient + remainder
Given
Divisor (n) = 10 × quotient (q)
And Divisor (n) = 5 × remainder (R)
R = 12 ⇒ n = 60 and q = 6
Now,
N = 60 × 6 + 12 = 372

Sol.164.(a) $4^{12} + 4^{13} + 4^{14} + 4^{15}$
$\Rightarrow 4^{12} (1 + 4^1 + 4^2 + 4^3)$
$\Rightarrow 4^{12} (1 + 4 + 16 +64) \Rightarrow 4^{12} (85)$
85 is divisible by 17 and hence 17 is the answer.

Sol.165.(b) For divisibility by 3,
The sum of digits of the number should be divisible by 3.
Here 3 + 7 + 9 + 8 + 4 + 3 = 34
And 34 ÷ 3 remainder is 1.
Hence,
When 379843 is divided by 3 the remainder is 1.

Sol.166.(d) For divisibility by 4, the last two digits should be divisible by 4.
Hence the possible value of y can be 1, 3, 5, 7, 9
For divisibility by 11,
The difference between the sum of the digits at odd places and even places should be zero or divisible by 11.
⇒ (1 + x + y) - (5 + 1 + 2) = x + y + 1 - 8
⇒ x + y -7
For minimum value of x and y
Take y = 1
⇒ x = 6 (to make it 6 + 1 - 7 =0)
Hence, x + y = 6 + 1 = 7

Sol.167.(a) 72 = 9 × 8
For 389x6378y to be divisible by 8, its last 3 digit no i.e.78y should be divisible by 8.
For this , y = 4
Now, For 389x6378**4** to be divisible by 9, the sum of its digits i.e. 3 + 8 + 9 + x + 6 + 3 + 7 + 8 + **4** = 48 + x, should be divisible by 9.
For this, we have x = 6
Hence, 6x + 7y = 6 × 6 + 7 × 4
= 36 + 28 = 64

Sol.168.(a) Divisibility rule of 9 :
For any no to be divisible by 9, the sum of its digits should be divisible by 9.
From the given options, we have ;
(a)553986→5 + 5 + 3 + 9 + 8 + 6 = 36, which is divisible by 9.
(b)350846→3 + 5 + 0 + 8 + 4 + 6 = 26, which is not divisible by 9.
(c)941201→9 + 4 + 1 + 2 + 0 + 1 =17, which is not divisible by 9.
(d)132490→1 + 3 + 2 + 4 + 9 + 0 = 19, which is not divisible by 9.
Clearly, we can see that 553986 is the only number which is divisible by 9.

Sol.169.(d) 15 = 5 × 3
For 725yz to be divisible by 5, unit digit i.e.z should be 0 or 5.
For 725yz to be divisible by 3, the sum of digits i.e.7 + 2 + 5 + y + z = 14 + y + z should be divisible by 3.
But for the maximum value of yz, we have to put z = 5 . then we get 19 + y
⇒ y = 8
Then, yz = 8 × 5 = 40

Sol.170.(b) Divisibility rule of 8 ;
For any number to be divisible by 8, its last 3 digits should be divisible by 8.
For 7002x4, 2x4 should be divisible by 8
For this, x must be 2.

Sol.171.(b) Divisibility rule of 9,
For any number to be divisible by 9, the sum of its digits should be divisible by 9.
For 72x72 , 7 + 2 + x + 7 + 2 = 18 + x, should be divisible by 9.
For this , the value of x must be 0 or 9

Sol.172.(a) After checking all the options one by one , only option(a) satisfied.
So, 7918378 is divisible by 13.

Sol.173.(a) Dividing 2001 by 17, we get 12 as remainder.
So, On subtracting **12** from 2001 , we get 1989 which is exactly divisible by 17.

Sol.174.(d) Divisibility rule of 11 :
For any no to be divisible by 11, the difference of the sum of its alternate digits should be divisible by 11.
For 7235x to be divisible by 11, (7 + 3 + x) - (2 + 5) = 3 + x, should be divisible by 11.
For this, x must be 8.

Sol.175.(d) Average of 1 negative number = average of 24 positive numbers
{Because here maximum (+ive) integers are asked whereas the average of 25 numbers is zero.}
So the maximum positive integers will be 24

Sol.176.(a) Divisibility rule of 4,
For any no to be divisible by 4, its last 2 digit should be divisible by 4
Then, For 87893P4,
P4 should be divisible by 4
For this , P can be 2, 4, 6 or 8
But for the maximum value of P, it must be 8.

Sol.177.(d) For 48397k5 to be divisible by 9, the sum of its digits i.e.4 + 8 + 3 + 9 + 7 + k + 5 = 36 + k,
should be divisible by 9
For non zero value of k ⇒ k = 9

Sol.178.(d) $\frac{999999}{294}$ = Rem. (105)
So , required number = 294 – 105 = 189

Sol.179.(b)
Factor of 2520 = 2 × 2 × 2 × 3 × 3 × 5 × 7
Clearly 8 , 9 and 7 are the divisors of number 2520 .

Sol.180.(d) Sum of digits should be divisible by 3 not by 9 .
3 + 2 + a + 7 + 8 + b = 20 + a + b
For greatest number , a should by

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

maximum.
Max. possible value for (a + b) = 13
So , a = 9 and b = 4
Required no. = 329784

Sol.181.(a) Given, $a^3 + b^3 = 10234$
a + b = 34 ----- equ. (1)
We know
$(a + b)^3 = a^3 + b^3 + 3ab\,(a + b)$
$(34)^3 = 10234 + 3ab\,(34)$
39304 - 10234 = 102 × ab ⇒ ab = 285
Then, $(a - b)^2 = (a + b)^2 - 4ab$
$(a - b)^2 = 34^2 - 4 \times 285$
$(a - b)^2 = 16$
(a - b) = 4 ------ equ. (2)
Now , Add equation (1) and (2)
2a = 38
Where , a = 19 and b = 15 ,So that
$a^3 - b^3 = 19^3 - 15^3$ = 6859 - 3375 = 3484

Sol.182.(d) Given :- N = 4a6b9c
N is divisible by 99 therefore it must be divisible by both 9 and 11
(4 + 6 + 9) - (a + b + c) ⇒ 19 - (a + b + c)
if a + b + c = 8 then N is divisible by both 11 and 9
Hence , sum of digits of N = 19 + 8 = 27

Sol.183.(a) $\frac{(265)^{4081} + 9}{266}$ = Rem
$\frac{(266 - 1)^{4081} + 9}{266}$ = Rem
$\frac{(-1)^{4081} + 9}{266}$ = Rem
$\frac{(-1) + 9}{266}$ = Rem. (8)

Sol.184.(a) Let A has x no. of toffees and B has y no. of toffees.
According to the question,
Condition 1 :-
$x - 1 = y + 1$
$x = y + 2$ .....e.q .(1)
Condition 2 :-
$x + 1 = 2 \times (y - 1)$
$x - 2y = -3$
$y + 2 - 2y = -3$ (from eq 1)
$y = 5$ and $x = 7$
Total no. of toffees = 5 + 7 = 12

Sol.185.(c) Divisibility rule of 8 = last 3 digits of the number will be divisible by 8.
Last 3 digit of the number = ...326 - 6
= ..... 320 (divisible of the 8)
So the required number will be = 6

Sol.186.(d)
Largest 5 - digit number = 99999
According to question,
$\frac{99999}{88}$ ⇒ Remainder = 31
Required number = 99999 − 31 = 99968

Sol.187.(a) Let six digit number which is divisible by 33 (11 × 3) is 111111
After adding 54 on it
New number = 111165
Now, by checking the option,
Number (111165) be divisible by 3

Sol.188.(b) Cost of 32 pens and 12 pencils = 790 Rs.
On dividing by 4 , we get
Cost of $\frac{32\ pens}{4}$ and
$\frac{12\ pencils}{4} = \frac{790\ Rs.}{4}$ = 197.5 Rs.
Cost of 8 pens and 3 pencils = 197.5 Rs.

Sol.189.(d)
Let the numbers are a and b , then
According to the question ,
a + b = 98 -------- Eq (1)
And a - b = 28 -------- Eq (2)
on adding both the equations , we get
2a = 98 + 28 ⇒ a = $\frac{126}{2}$ = 63
Second number (b) = 98 − 63 = 35

Sol.190.(c)
Factor of 484 = 1 × 2 × 2 × 11 × 11
Required sum = 1 × ($2^0 + 2^2$) × ($11^0 + 11^2$) = 1 × 5 × 122 = 610

Sol.191.(c) According to the question,
72 × 72 = x × 216
Number (x) = $\frac{72 \times 72}{216}$ = 24

Sol.192.(a) $\frac{8^8 + 6}{7}$ = Rem. $\frac{(+1)^8 + 6}{7}$
= Rem. $\frac{1 + 6}{7}$ Remainder = 0

Sol.193.(b) According to the question,
abba is divisible by 4
Then , last two digit (ba) be divisible by 4 {where a < b}
So, possible values of ba =
(32, 52 , 64 , 72 , 76 , 84 , 92 , 96) = 8

Sol.194.(c)
Given number = 846523X7Y
Divisibility of 9 : sum of all digits should be divisible by 9.
Hence, Y + X = 10 .....(1) and
Y - X = 6 .....(2)
By solving equation (1) and (2) we get,
X = 2 and Y = 8
Now, $\sqrt{2X + 4Y} = \sqrt{4 + 32} = \sqrt{36} = 6$

Sol.195.(a) Let the number be x.
According to question,
$\frac{x}{45} = \frac{x}{15 \times 3}$ → Remainder = 21
$\frac{x}{15}$ → Remainder = 21 − 15 = 6

Sol.196.(a) Smallest 5-digit no = 10,000
When 10,000 is divided by 526 ,
gives the remainder 6.
So, the required no = 10000 + (526 - 6)
= 10520

Sol.197.(d) 6 digit consecutive natural numbers = 123456, 234567, 345678.....
Clearly, we can see that the sum of its digits is always multiple of 3.
So, the no is always divisible by 3.

Sol.198.(c)
Sum of digits of the given number,
5826 = **21**, 5964 = **24**, 6039 = 18,
6336 = 18, 6489 = 27, 6564 = **21,**
6867 = 27 and 6960 = **21**.
Clearly, the numbers whose sum of digits are 18 and 27 are also divisible by 9.
So, 4 numbers are divisible by 3 but not by 9.

Sol.199.(c)
Clearly, 193 is the prime number.

Sol.200.(c) 10373 + 24871 = 35244
Clearly , it is divisible by 6.

Sol.201.(c) Rem. ($\frac{4^{999}}{7}$) = Rem. ($\frac{64^{333}}{7}$)
Rem. ($\frac{(1)^{333}}{7}$) = Remainder (1)

Sol.202.(a) Divisibility of 120 :- no. should be divisible by 3 , 8 and 5
Checking divisibility of 3 , from the given option ,
only , option (a) satisfies the condition.
So , 170280 is divisible by 120.

Sol.203.(d) Number of whole number between 12^2 and 11^2 :-
$\{144 - 121\} - 1 = 22$

Sol.204.(b) **Divisibility of 3 :-** sum of digits should always be divisible by 3.

Sol.205.(d) LCM(2, 3, 4) = 12
(12 × 9) smallest three - digit number which is divisible by 2, 3 and 4 .
(108 + 1) = 109 , smallest three - digit number which when divided by 2, 3 and 4 leaves remainder 1 in each case

Sol.206.(c) in this type of question go through option (c) get satisfied
(103 + 5) = 108 , is divisible by 2 and 3

Sol.207.(a)
1 - 2 + 3 - 4 + 5 - 6 ..... to 100 terms
⇒ (1 - 2) = -1, (3 - 4) = -1 and so on
Total terms = 50
Therefore, 1 - 2 + 3 - 4 + 5 - 6 ..... to 100
= 50 × − 1 = − 50

Sol.208.(c) Series = 1 + 5 + 6 + 10 + 11 + 15 + 16 + 20 + ... = (1 + 6 + 11 + 16 + ...) + (5+10 + 15 +..)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

S_{200} = $\frac{100}{2}$[2 + (99) × 5] + $\frac{100}{2}$[10 + (99) × 5] = 50[497] + 50[505] = 50 × 1002 = 50100

Sol.209.(d) Prime numbers between 20 and 50 = (23, 29, 31, 37, 41, 43, 47)
= 7 prime numbers

Sol.210.(c) Let the three consecutive even number x , x + 2 and x + 4
According to the question,
(x + x + 2 + x + 4) = 126
⇒ 3x = 120 → x = 40
Then, smallest number (x) = 40 and greatest number (x + 4) = 44
Therefore, product of smallest and greatest number = 40 × 44 = 1760

Sol.211.(a)
All three digit number divisible by 15
105 , 120 , 135 , ...,990
Sum = $\frac{n}{2}(a + l)$
Where a = first term and l = last term
No. of terms = ($\frac{990 - 105}{15}$ + 1) = 60
Therefore,
their sum = $\frac{60}{2}(105 + 990)$ = 32850

Sol.212.(c) The average of three consecutive composite numbers
= $\frac{36}{3}$ = 12
so , the composite numbers = 10, 12, 14
So ,
product of the numbers = 10 × 12 × 14 = 1680

Sol.213.(a) 654321 × 123456
On multiplying the given number, the unit digit will be 6 .
From the given option , only option (a) has unit digit 6.
So , 376 will be the last three digits.

Sol.214.(c)
Two digit even numbers= 10, 12, 14 98
Sum = $\frac{n}{2}(a + l)$
Where a = first term and l = last term
No. of terms = ($\frac{98 - 10}{2}$ + 1) = 45
Therefore,
their sum = $\frac{45}{2}(98 + 10)$ = 2430

Sol.215.(a) Divisibility of 4 :- when the last two digits of the given number are divisible by 4 , then the given number is also divisible by 4.
For , XY7B to be divisible by 4 → 7B should be divisible by 4
Possible value of B = 2 , and 6
So largest possible value of B = 6 .

Sol.216.(a) Numbers between 17 and 457 that are divisible by both 5 and 3 → 30 , 45 , 60 450
Formula :- a_n = a + $(n - 1)$ × d
450 = 30 + $(n - 1)$ × 15
n = $\frac{435}{15}$ = 29 terms.

Sol.217.(b) First , we do the square root of 7387 → $\sqrt{7387}$ ≈ 86
Now,
prime numbers will be present near 86.
That is 83 and 89 .
Required difference = 6 .

Sol.218.(a) Number divisible by 5 between 201 and 401 = 40
Number divisible by both 4 and 5 between 201 and 401 = (220 , 240 , 260 , 280 , 300 , 320 , 340 , 360 , 380 , 400) = 10 numbers
So, Required Number = 40 − 10 = 30

Sol.219.(b)
Formula :- Sum of n odd numbers = n^2
There are 50 odd numbers between 1 to 100
So the sum of 50 odd numbers
= 50^2 = 2500
According to the question,
Sum of odd 2 digit numbers,
So, 2500 − (1 + 3 + 5 + 7 + 9) = 2475

Sol.220.(c) Let the number be x
According to the question,
x + $\frac{1}{x}$ = 4 then, sum of their squares
⇒ $x^2 + \frac{1}{x^2}$ = 16 − 2 = 14

Sol.221.(b) 98^2 - 97^2 + 96^2 - 95^2 + 94^2 - 93^2 + ... 12^2 - 11^2
= (98 + 97) (98 - 97) + (96 + 95) (96 - 95) + (94 + 93) (94 - 93) + ...(12 + 11) (12 - 11)
= 98 + 97 + 96 + 95 + 94 + 93.....12 + 11
Total term (n) = 88
Sum of given series = $\frac{n}{2}$(first term + last term) = $\frac{88}{2}$(98 + 11) = 44 × 109 = 4796

Sol.222.(d) Let the numbers be x and y.
⇒ $x^2 + y^2$ = 12 , xy = 4
⇒ $(x - y)^2 = x^2 + y^2 - 2xy$ = 12 − 8 = 4
⇒ $x - y$ = 2

Sol.223.(c) $(125)^{\frac{1}{6}}, (11)^{\frac{1}{3}}, (12)^{\frac{1}{6}}, (5)^{\frac{1}{4}}$
(multiplying by 12 in the power)
$(125)^2, (11)^4, (12)^2, (5)^3$
→ $(125)^2, (121)^2, (144)$, (125)
Now we can see $(125)^{\frac{1}{6}}$ is the largest value.

Sol.224.(a) I. $\frac{5}{11}$ = 0.45 and $\frac{5}{6}$ = 0.83
⇒ $\frac{5}{11} > \frac{5}{6}$ (Wrong statement)
II. $\frac{5}{9}$ = 0.55 and $\frac{8}{9}$ = 0.88
⇒ $\frac{5}{9} > \frac{8}{9}$ (wrong statement)
III. $\frac{5}{6}$ = 0.83 and $\frac{4}{5}$ = 0.8
⇒ $\frac{5}{6} > \frac{4}{5}$ (right statement)

Sol.225.(a) 5769116 is divisible by 4 as its last two digits are divisible by 4.

Sol.226.(d) Concepts :-
Remainder ($\frac{(x-1)^n}{x}$) = $(-1)^n$
Rem.($\frac{(27^{27} + 27)}{28}$) = Rem.($\frac{(-1)^{27} + 27}{28}$)
= $\frac{-1 + 27}{28}$ = 26

Sol.227.(b) Total number of toffee students have = 2 + 4 + 6 + 8 ..... 25 terms
Sum = $\frac{n}{2}$ {2a + (n - 1)d}
Sum = $\frac{25}{2}$ {2 × 2 + (25 - 1) × 2}
= $\frac{25}{2}$× 52 = 650 = 25 × 26 = 5 × 5 ×13 ×2
650 is clearly divisible by 5 and 13 .

Sol.228.(d) Let the larger number be x and smaller number be y .
According to question ,
x - y = 1564 .....eq .(1)
6y + 19 = x ⇒ x - 6y = 19 .....eq .(2)
On solving eq .(1) and eq .(2) , we get
5y = 1545 ⇒ y = 309

Sol.229.(b) Nearest number which is greater to 87501 and is completely divisible by 765 is :- 765 × 115 = 87975
Short Trick:-
In this type of question make factor of 765 = 5 × 3 × 3 × 17
And now , check the option which is divisible by 3 , 5 and 17 .
Clearly , 87975 is clearly divisible by 3 , 5 and 17 .

Sol.230.(d) Given 6 - digit no. is 674pq0 is divisible by 33.
For divisible by 3 :- 6 + 7 + 4 + p + q + 0 must be divisible by 3.
For divisible by 11 :- (6 + 4 + q) - (7 + p) must be divisible by 11.
Now, from the option , we can see that the option **(d)** satisfies the condition.
Number is 674520.

Sol.231.(d) L.C.M. (7, 9, 11) = 693
Now, largest five digit number is 99999

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

When we divide 99999 by 693 , the remainder will be 207.
No. completely divisible by 693 is
99999 - 207 = 99792
Now, the largest number which when divided by 7 , 9 and 11 leaves remainder 3 in each case :- 99792 + 3 = 99795

Sol.232.(c) Factor of 49 = 7 × 7
Factor of 147 = 3 × 7 × 7
Factor of 322 = 2 × 7 × 23
Clearly , 7 is the largest which divides 49 , 147 and 322 , leaving 0 as remainder in all cases.

Sol.233.(b) K = 42 × 25 × 54 × 135
K = 3 × 14 × 5 × 5 × 3^3 × 2 × 3^3 × 5
= 3^7 × 14 × 5 × 5 × 2 × 5
Hence, maximum value of a = 7

Sol.234.(c) 9435 + 7593 - 2607 = 14421
Now, from the option it is only divisible by 3.

Sol.235.(c) Let the original no be x
ATQ, $\left\{\frac{(x+7)\times 5}{3}\right\}$ - 4 = 16
= $\frac{(x+7)\times 5}{3}$ = 20 = $\frac{x+7}{3}$ = 4
= x + 7 = 12 ⇒ x = 12 - 7 = 5

Sol.236.(c) 75 = 25 × 3
For 678p37q to be divisible by 25 , the last two digits i.e.7q should be divisible by 25.
For this , the value q = 5
Now, For 678p37**5** to be divisible by 3, the sum of its digits i.e.6 + 7 + 8 + p + 3 + 7 + **5** = 36 + p, should be divisible by 3.
For p not to be a composite no, the value of p must be 3 i.e. 39, divisible by 3.

Sol.237.(b) Let the six - digit no be abcabc. It can be written as :
100000a + 10000b + 1000c + 100a + 10b + c = 100100a + 10010b + 1001c
= 1001 × (100a + 10b + c)
Clearly, we can see that 6-digit no is always divisible by 1001.

Sol.238.(b)
The given fraction are ; $\frac{4}{5}, \frac{2}{3}, \frac{1}{11}, \frac{2}{9}$
$\frac{4}{5}$ = 0.80, $\frac{2}{3}$ = 0.66,
$\frac{1}{11}$ = 0.09, $\frac{2}{9}$ = 0.22
Arranging it in ascending order , we get ;
$\frac{1}{11} < \frac{2}{9} < \frac{2}{3} < \frac{4}{5}$

Sol.239.(b) Let the bigger and smaller no be x and y respectively
ATQ,
x × $\frac{17}{20}$ = y × $\frac{23}{20}$ ⇒ $\frac{x}{y} = \frac{23}{17}$
and, x + y = 680
(23 + 17) unit = 680
40 unit = 680 ⇒ 1 unit = $\frac{680}{40}$ = 17
So, the smaller no. = 17 unit = 17 × 17
= 289

Sol.240.(c) Let the four digit pin be abcd.
a , b = 2a, c = 4a, d = 8a
Putting a = 1. We get the four digit pin as 1248 which is divisible by 2, 3 and 13

Sol.241.(d) LCM of 15 and 18 = 90
So, the least possible no. = 90K + 3
= 90 × 1 + 3 = 93 (putting k = 1)

Sol.242.(b) LCM of 12, 16, 24 = 48
So, the required no is in the form of 48k + 5.
Putting K = 12, we get ; 48 × 12 + 5 = 581
Putting K = 13, we get ; 48 × 13 + 5 = 629
Putting K = 14, we get ; 48 × 14 + 5 = 677
Now, adding all the no's , we get :
581 + 629 + 677 = 1887

Sol.243.(b) 36 = 4 × 9
For 72x8431y4 to be divisible by 4,
its last 2 digit y4 must be divisible by 4.
For the smallest value of y, we have y = 2
Now, For 72x8431**2**4 to be divisible by 9, the sum of its digits i.e. 7 + 2 + x + 8 + 4 + 3 + 1 + 2 + 4 = 31 + x must be divisible by 9, For this, the value of x must be 5 i.e. 31 + 5 = 36, which is divisible by 9.
So, $\frac{x}{y} - \frac{y}{x} = \frac{5}{2} - \frac{2}{5} = \frac{21}{10} = 2\frac{1}{10}$

Sol.244.(c) 3 4 R 0 5 0 3 0 M 6
Divisibility of 11 = difference of the sum of alternate digits must be 0/11/22....
Divisibility of 16
= must be divisible by 4, 8.
(3 + R + 5 + 3 + M) - (4 + 0 + 0 + 0 + 6) = 0/11
R + M = 10 .....(1)
So, M cannot be 1, the last 3 digits should be divisible by 8 and the last two digits should be divisible by 4.
So, M = 5 and R = 5

Sol.245.(d) For 476xy0 to be divisible by 11, the difference of the sum of its alternate digits i.e.
7 + x - (10 + y) = x - y - 3 should be divisible by 11
For this we have , x - y - 3 = 0/11/22....
x - y = 3 -------- (1)
For 476xy0 to be divisible by 3, the sum of its digits i.e.4 + 7 + 6 + x + y + 0 = 17 + x + y, should be divisible by 3.
For this, x + y = 1/4/7/10..... But we get fractional values .of x and y
so, x + y = 13 --------(2)
Solving equation (1) and (2), we have :
x = 8 and y = 5

Sol.246.(b) Numbers between 1 and 1000, divisible by 2 and 7,
14, 28, 42, 56, 70, ...994
So, number of terms
= $\frac{last\ number - first\ number}{diff.} + 1$
= $\frac{994-14}{14} + 1 = 70 + 1 = 71$

Sol.247.(c) Factors of 216 = $(2)^3 \times (3)^3$
Sum of odd factors = $(3)^0 + (3)^1 + (3)^2 + (3)^3$ = 1 + 3 + 9 + 27 = 40

Sol.248.(a) A smallest 6 digit number which is divisible by 198 is 100188.
Sum of digits = 1 + 0 + 0 + 1 + 8 + 8 = 18
After rearranging the digits of six digit number , sum of digits be constant
So, by the option, option 'a' satisfied
{ A no is divisible by 3 if sum of its digits is a multiple of 3}

Sol.249.(b) 763254 - 205 = 763049
So, the new number formed is divisible by 7.

Sol.250.(b)
Let the two numbers be x and y.
$x - y = 3951$..... (1)
$x = 12y + 13 \Rightarrow x - 12y = 13$..... (2)
By solving eq . (1) and (2) , we get x = 4309 and y = 358
Sum of the digits of the larger number = 4309, 4 + 3 + 9 = 16

Sol.251.(a) It is given that,
6 < $\sqrt[3]{N}$ < 7 ⇒ 6 < $N^{\frac{1}{3}}$ < 7
$6^3 < (N^{\frac{1}{3}})^3 < 7^3$ ⇒ 216 < N < 343
So, the total possible values of N
= (343 - 216) - 1 = 126

Sol.252.(d)
I. Let the two digit no be 10x + y
ATQ, (10x + y) - (10y + x) = 36
9x - 9y = 36 ⇒ x - y = 4
II. The value of no can be 84 as 84 - 48 = 36
III. the number formed in the given case may or may not be composite no. i.e. 84 which is a composite no and 73 which is a prime no.
Clearly, we can see that option (d) is the correct one.

Sol.253.(d) As we know, that sum of two odd numbers gives an even no and two even no. also gives an even no.
Putting x = 2 which is the only even prime no, we have
y + z = 70 - 2 = 68
The possible value of y and z is (7, 61) and (31, 37)
So, the value of z = 61 or 37
Checking the options, we get z = 37. Hence, the correct option is (d).

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.254.(d)
Required numbers from 400 to 700 are : 466, 566, 606, 616, 626, 636, 646, 656, 660, 661, 662, 663, 664, 665, 667, 668, 669, 676, 686, 696.
So, the total such number is 20. Hence, option (d) is the correct answer.

Sol.255.(d) Clearly, we can observe that each term is followed by n(n+1).
So, T_n = n(n + 1) = n^2 + n
$S_{20} = \sum_{n=1}^{20} n^2 + \sum_{n=1}^{20} n$
$S_{20} = \left(\frac{20 \times 21 \times 41}{6}\right) + \frac{20 \times 21}{2}$
S_{20} = 2870 + 210 = 3080

Sol.256.(b) Given series is the combination of two series :
I. $\frac{7}{2} + \frac{7}{6} + \frac{7}{12} + \ldots\ldots \frac{7}{156}$
$= 7\left(\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \ldots \frac{1}{12 \times 13}\right)$
$= 7\left(1 - \frac{1}{2} + \frac{1}{2} - \frac{1}{3} + \frac{1}{3} - \frac{1}{4} \ldots\ldots \frac{1}{12} - \frac{1}{13}\right) \Rightarrow 7\left(1 - \frac{1}{13}\right) = 7 \times \frac{12}{13} = \frac{84}{13}$
II. $\frac{11}{3} + \frac{11}{15} + \ldots\ldots \frac{11}{575}$
$= \frac{11}{2}\left(\frac{2}{1 \times 3} + \frac{2}{3 \times 5} \ldots\ldots \frac{2}{23 \times 25}\right)$
$= \frac{11}{2}\left(1 - \frac{1}{3} + \frac{1}{3} - \frac{1}{5} \ldots\ldots \frac{1}{23} - \frac{1}{25}\right)$
$= \frac{11}{2}\left(1 - \frac{1}{25}\right) = \frac{11}{2} \times \frac{24}{25} = \frac{132}{25}$
So, the required sum = $\frac{84}{13} + \frac{132}{25}$
$= \frac{84 \times 25 + 132 \times 13}{325}$
$= \frac{2100 + 1716}{325} = \frac{3816}{325}$

Sol.257.(a) As we know, co-prime no's are pairs of no's that have only one common factor that is 1.
From the given option, we get 22 and 24 have two common factors. So, it is not a coprime no.

Sol.258.(d) Concept :
odd + odd = even, even + odd = odd
Since, the sum of three prime no's is even, it implies that one of the three no's must be 2 i.e.the only even prime no.
Let the two no's be x and x + 30
According to the question,
2 + x + (x + 30) = 90
2x + 32 = 90 ⇒ 2x = 90 - 32 = 58
⇒ x = $\frac{58}{2}$ = 29
Then, the no's are 2, 29, 29 + 30 = 59

Sol.259.(c) Divisibility of 3 :- A number is divisible by 3 if the sum of the number is divisible by 3.
Divisibility of 11 :- A number is divisible by 11 if the difference of sum of odd places values and even places values is equal to 0 or multiple of 11.
Given no. = 608xy0
Sum of no. = 6 + 0 + 8 + x + y + 0
= 14 + x + y
x + y = 1, 4, 7, 10,13 and so on.---------(i)
Difference between Sum of the odd place value and even place value
= (6 + 8 + y) - (x)
= 14 + y - x ⇒ 14 + y - x = 0
⇒ x - y = 14 or 3 --------(ii)
From (i) and (ii),
x + y = 13 , x - y = 3
2x = 16 ⇒ x = 8 and y = 5
So, 608850 is divisible by both 3 and 11.

Sol.260.(a) 90 = 10 × 9
For 743pq to be divisible by 10, its unit digit must be zero. so, q = 0
For 743p**0** to be divisible by 9, the sum of its digits i.e.7 + 4 + 3 + p + 0 = 14 + p, should be divisible by 9.
For this the value of p is 4.(as 18 is divisible by 9)
Hence, $\frac{q}{p} = \frac{0}{4} = 0$

Sol.261.(d) Time taken to read full news paper = n minutes
Part of newspaper read in 1 minute = $\frac{1}{n}$
Newspaper read in 7 minutes = $\frac{7}{n}$

Sol.262.(a) Total number = $\frac{200 - 100}{7}$
So, divisor(no of multiple of 7) = 14

Sol.263.(b)
Dividend = quotient × divisor + remainder
8675123 = 33611 × D + 3485
8671638 = 33611D
D = $\frac{8671638}{33611}$ = 258

Sol.264.(d) Let the no be x
ATQ,
x - $\sqrt{x}$ = 2 ⇒ x - 2 = $\sqrt{x}$
Squaring both side
$(x - 2)^2$ = x ⇒ x^2 + 4 - 4x = x
⇒ x^2 - 5x + 4 = 0 ⇒ x^2 - 4x - x + 4 = 0
⇒ x(x - 4) - (x - 4) = 0
⇒ (x - 1) (x - 4) = 0 ⇒ x = 1 or x = 4
Putting x = 1 in given equation, we have = 1 - $\sqrt{1}$ ≠ 2 , So, x = 4
Short Trick:- using hit and trial
The difference between a number and the square root of the number = 2
From option (a) , 1 - $\sqrt{1}$ ≠ 2
from option (b) , 2 - $\sqrt{2}$ ≠ 2
from option (c) , 3 - $\sqrt{3}$ ≠ 2
from option (d) , 4 - $\sqrt{4}$ = 2

Sol.265.(b)
$(\sqrt{2} + \sqrt{3} + \sqrt{5})(\sqrt{2} + \sqrt{3} - \sqrt{5})\sqrt{6} = \{(\sqrt{2} + \sqrt{3})^2 - (\sqrt{5})^2\}\sqrt{6}$
$= \{2 + 3 + 2\sqrt{6} - 5\}\sqrt{6} = 2\sqrt{6} \times \sqrt{6} = 12$
Therefore ,
$(\sqrt{2} + \sqrt{3} + \sqrt{5})(\sqrt{2} + \sqrt{3} - \sqrt{5})\sqrt{6} = 12$
which is rational number
So, the rationalizing factor of
$(\sqrt{2} + \sqrt{3} + \sqrt{5}) = (\sqrt{2} + \sqrt{3} - \sqrt{5})\sqrt{6}$

Sol.266.(d) Using remainder theorem,
g(x) = 3x + 2 = 0 ⇒ x = - $\frac{2}{3}$
Putting x = - $\frac{2}{3}$ in f(x)
f(x) = $15x^3 - 14x^2 - 4x + 10$
f(- $\frac{2}{3}$) = 15 × (- $\frac{2}{3}$)^3 - 14 × (- $\frac{2}{3}$)^2 - 4 × (- $\frac{2}{3}$) + 10
= - $\frac{40}{9}$ - $\frac{56}{9}$ + $\frac{8}{3}$ + 10
= - $\frac{72}{9}$ + 10 = - 8 + 10 = 2

Sol.267.(c) Let N be 24 which when divided by 7 gives remainder 3.
Now on putting N = 24 in different options to get the required answer.
We get, N + 4 = 24 + 4 = 28 is completely divisible by 7.

Sol.268.(a) Sum of first 78 natural no.
= $\frac{78\,(78 + 1)}{2}$ = 39 × 79
On checking the options we get the given no i.e. 39 × 79 is divisible by 79

Sol.269.(b) x = 3y And , x + y = 20
so,3y + y = 20 ⇒ y = 5 , x = 3y = 3 × 5 = 15
So, x and y = 15 and 5

Sol.270.(c)

	till 500	till 650	(500 -650)
Divisible by 3 →	166	216	50
Divisible by 7 →	71	92	21
Divisible by 21→	23	30	7

Numbers from 500 to 650 which are divisible by 3 or 7 = 50 + 21 - 7 = 64
Total numbers from 500 to 650
= 650 - 500 + 1 = 151
Numbers that are neither divisible by 3 nor 7 = 151 - 64 = 87

Sol.271.(d)
On dividing 5 by 6 we get R = 5 or -1.
For ease of calculation we use R = -1.
$R_1 = \frac{5^{16}}{6} = \frac{(-1)^{16}}{6}$, R_1 = 1
Again, $R_2 = \frac{5^{25}}{6} = \frac{(-1)^{25}}{6}$
= R_2 = - 1 = 6 - 1 = 5
Now, $\frac{R_1 + R_2}{R_2} = \frac{1 + 5}{5} = \frac{6}{5}$.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.272.(c)
Let the numbers be "a" and "b"
a + b = 65, $\sqrt{ab}$ = 26 ⇒ ab = 676
$\frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{65}{676} = \frac{5}{52}$

Sol.273.(c)
x = $(433)^{24}$ - $(377)^{38}$ + $(166)^{54}$
= 3^4 - 7^2 + 6^2 =1 - 9 + 6 = - 2
Unit digit for - 2 = 10 - 2 = 8

Sol.274.(d) LCM (36, 72, 80, 88) = 7920
Here the difference between each divisor and each remainder given in question = 20
So, for finding the required least number, we need to deduct the difference as obtained above from the LCM of the divisors.
Required least number
= 7920 – 20 = 7900
So, sum of digits = 7 + 9 + 0 + 0 = 16

Sol.275.(a)
As prime numbers have 2 factors
Only the squares of prime numbers will have three factors.
Let r = 9 and s = 4
And q = 49 and p = 25
$\frac{p-q-1}{r-s} = \frac{25-49-1}{9-4} = \frac{-25}{5}$ = - 5
Putting s = 4 in all options we find only option (a) satisfies this value.

Sol.276.(a) $\frac{C}{B} = \frac{9}{10} \Rightarrow C = \frac{9}{10}B$
According to the question,
$\frac{9}{10} = A + \frac{3}{20}$
$A = \frac{9}{10} - \frac{3}{20} = \frac{15}{20} = \frac{3}{4}$
Also, $A + B + C = \frac{121}{60}$
Putting the values of C and A as obtained in above equation, we get
$\frac{3}{4} + B + \frac{9B}{10} = \frac{121}{60}$
$\frac{15+20B+18B}{20} = \frac{121}{60}$
$45 + 60B + 54B = 121$
$114B = 76 \Rightarrow B = \frac{76}{114} = \frac{2}{3}$
So, $C = \frac{9}{10}B = \frac{9}{10} \times \frac{2}{3} = \frac{3}{5}$
So, difference between B and C
$= \frac{2}{3} - \frac{3}{5} = \frac{1}{15}$

Sol.277.(c) LCM (16, 21, 24, 28) = 336

```
      29
336 | 9999
    - 672
      3279
    - 3024
       255
```

So, required largest 4-digit number
x = 9999 – 255 = 9744
Sum of digits of x = 9 + 7 + 4 + 4 = 24

Sol.278.(b)
LCM (8, 12, 15, 24, 25, 40) = 600
Required number = 600 + 7 = 607.
When 607 is divided by 29 we get,
607 = 29 × 20 + 27
So, 27 is required remainder.

Sol.279.(a) LCM (40, 45, 50, 55) = 19800

```
        2
19800 | 56000
      - 39600
        16400
```

19800 – 16400 = 3400
Now to get the least number between 56000 and 60000 we need to add the difference of divisor and remainder that is 3400 to 56000 and then add 23 to the result so obtained.
So, (56000 + 3400) + 23
= 59400 + 23 = 59423
So, x = 59423,
sum of the digits of x = 5 + 9 + 4 + 2 + 3
= 23

Sol.280.(d) Let the number be x,
After increasing by 20% we get $\frac{6x}{5}$
According to the question,
$\frac{\frac{6x}{5} - \frac{5}{6x}}{x - \frac{1}{x}} = \frac{175}{144}$
Checking options one by one we get,
x = 5 satisfies this.

Sol.281.(c)
448 - 11 = 437, 678 - 11 = 667,
908 - 11 = 897
HCF (437, 667, 897) = 23
147 = 23 × 6 + 9
So, required remainder = 9

Sol.282.(d) Let five consecutive odd natural numbers are
(x - 4), (x - 2), x, (x + 2), (x + 4)
$(x-4)^2 + (x-2)^2 + x^2 + (x+2)^2$
$+ (x+4)^2 = 233 \times 5 \Rightarrow 5x^2 + 40 = 1165$
$5x^2 = 1125 \Rightarrow x = 15$,
Largest number = 19
Smallest number = 11
Average = 15

Sol.283.(b) $\frac{(2^{24}-1)}{7} = \frac{((7+1)^8-1)}{7}$
= remainder $(1)^8 - 1 = 0$

Sol.284.(c) When a positive integer n is divided by 12 remainder is 5
n = 17 ⇒ $8n^2 + 7 = 2319$
When 2319 is divided by 12, gives remainder 3

Sol.285.(b) 75 × 73 × 78 × 76 when individually is divided by 34 we get
7 × 5 × 10 × 8 = 2800
2800 when divided by 34 gives the remainder as 12.

Sol.286.(c)
Factor of 10 = 2 × 5 , 12 = 2 × 2 × 3 ,
15 = 3 × 5, 18 = 2 × 3 × 3 and 20 = 2 × 2 × 5
L.C.M. (10,12,15,18,20) = 2 × 2 × 3 × 3 × 5
Least no. to be multiplied to make perfect square = 5
Then,
Required least number = 180 × 5 = 900

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

HCF and LCM

LCM (Least common multiple) of two or more given numbers is the least number that is exactly divisible by each of them.

HCF (Highest common factor) of two or more numbers is the greatest number that divides each of them exactly. HCF is also known as the 'Highest common Divisor' (HCD) and the Greatest Common Measure (GCM).

The concept of multiples and factors

→ If X , Y , and Z are three natural numbers and X × Y = Z , then

(i). X and Y are called the factors of Z.

(ii). Z is said to be divisible by X and Y.

(iii). Z is said to be a multiple of X and Y.

Example: The set of positive Integers which are factors of 18 is (1, 2, 3, 6, 9, 18).

Basic Concepts of H.C.F. and LCM

Method of finding H.C.F.

To find the HCF of the given numbers

1. Break the given numbers into their prime factors.
2. The HCF will be the product of all the prime factors common to all the numbers.

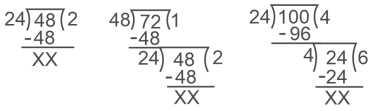
Let us learn the process of finding HCF with the help of some solved examples.

Example:-
Find the HCF of 96, 36 and 18 ?
Solution:-
96 = **2** × **3** × 2 × 2 × 2 × 2
36 = **2** × **3** × 2 × 3
18 = **2** × **3** × 3
Therefore, the HCF of 96, 36 and 18 is the product of the highest number of common factors in the given numbers i.e., 2 × 3 = 6. In other words, 6 is the largest possible integer, which can divide 96, 36 and 18 without leaving any remainder.

Example:- Find the H.C.F. of 42 and 70 ?
Solution:- 42 = 3 × **2 × 7**
70 = 5 × **2 × 7**
Hence, H.C.F. of 42 and 70 = 2 × 7
= 14.

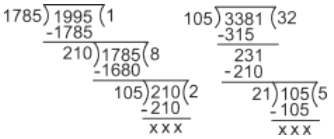
HCF by Division Method

Example:- HCF of 24, 48, 72, and 100.
Solution:- To start the division method select the smallest two numbers./



HCF of 24 and 48 = 24
HCF of 24, 48 and 72 = 24
HCF of 24, 48, 72, and 100 = 4.

Example:- HCF of 1785, 1995, 3381.
Solution:-



HCF of 1785 and 1995 = 105
HCF of 1785, 1995 and 3381 = 21
NOTE :-
(i). HCF of two prime numbers is always 1.
(ii). HCF of co-prime numbers is always 1.

Method of finding L.C.M

The Least Common Multiple of two or more numbers is the smallest number which is exactly divisible by all of them. In other words, it is the product of the highest powers of all the prime factors of the given numbers.

To find the LCM of given numbers:
1. Break the given numbers into their prime factors.
2. The LCM will be the product of the highest power of all the factors that occur in the given numbers.
Let us take some solved examples.

Example:- Find the LCM of 96, 36 and 18.

Solution: 96 = 2 × 2 × 2 × 2 × 2 × 3
= $2^5 \times 3^1$; 36 = 2 × 2 × 3 × 3 = $2^2 \times 3^2$
18 = 2 × 3 × 3 = $2^1 \times 3^2$

Therefore, LCM of 96, 36 and 18 is the product of the highest powers of all the prime factors, i.e. $2^5 \times 3^2$ = 32 × 9 = 288
That is, 288 is the smallest integer which is divisible by 96, 36 and 18 without leaving any remainder.

Example:- Find the LCM of 42 and 70
Solution:- 42 = 3 × 2 × 7
70 = 5 × 2 × 7
Hence, LCM is 2 × 3 × 5 × 7 = 210.

Example:- LCM of 6, 12, 8 ?
Solution:-

2	6, 12, 8
2	3, 6, 4
3	3, 3, 2
2	1, 1, 2
	1, 1, 1

LCM = 2 × 2 × 3 × 2 = 24

HCF of 6, 12, 18

Firstly find out the factors of 6, 12, 18 and then multiply the common factors.

2	6	2	12	2	18
3	3	2	6	3	9
	1	3	3	3	3
			1		1

6 = 2 × 3, 12 = 2 × 2 × 3, 18 = 2 × 3 × 3
HCF = 2 × 3 = 6
Try finding HCF and LCM of 3, 6, 9, 12 yourself. HCF of 3, 6, 9, 12 can also be found by Division method. It is useful when the numbers are bigger.
NOTE :-
(i). HCF of A, B and C is the highest divisor which can exactly divide A, B, and C.
(ii). LCM of A, B and C is the lowest dividend which is exactly divisible by A, B, and C.
There is one very important relationship, given below, between two numbers and their HCF and LCM. Many problems have appeared in various competitive exams based on this relationship.

Important Concepts:-
(1).
LCM × HCF = 1st number × 2nd number
Example:- For numbers 8 and 12,
LCM = 24 and HCF = 4
Now, LCM × HCF = 24 × 4 = 96
also, 8 × 12 = 96

(2). HCF of some numbers is always a factor of LCM of the numbers.

(3).
LCM of Fraction = $\frac{LCM\ of\ numerator}{HCF\ of\ denominator}$

(4).
HCF of Fraction = $\frac{HCF\ of\ numerator}{LCM\ of\ denominator}$

Example: LCM and HCF of $\frac{1}{2}, \frac{2}{3}$ and $\frac{3}{4}$

Solution:- LCM = $\frac{LCM\ of\ numerator}{HCF\ of\ denominator}$
= $\frac{LCM\ of\ 1,2,\ 3}{HCF\ of\ 2,3,4} = \frac{6}{1}$

HCF = $\frac{HCF\ of\ numerator}{LCM\ of\ denominator}$
= $\frac{HCF\ of\ 1,2,3}{LCM\ of\ 2,3,4} = \frac{1}{12}$

(5) Co- Prime numbers :
If the HCF of two numbers is 1 then they are called co-prime numbers.

(6) $\frac{LCM}{HCF} = Product;$
where LCM and HCF are of two numbers N_1 and N_2. If we find two co-prime factors, F_1 and F_2, of the Product as obtained above.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(7)

1st number H×X — 2nd number H×Y

X,Y are co-prime numbers
Where,HCF=H

Example:-

18 — 72
18 × 1 — 18 × 4

Co-prime number

(8).

If 1st number = N_1 and 2nd number = N_2

HCF of N_1 = Hx

HCF of N_2 = Hy

And HCF of N_1 and N_2 = H

So ,

Difference between N_1 and N_2 = Hx - Hy

= H(x - y)

Example :-

N_1 = 24 and N_2 = 36

24 — 36
12 × 2 — 12 × 3

Difference:-12

Note :- HCF is always either the difference of two numbers or factors of difference of two numbers.

6 — 11 — 4
Hx — Hy — Hz

H(x-y) — H(y-z)
H×5 — H×7

(9). When the second divisor is a factor of the first divisor, then the second remainder is obtained by dividing the first remainder by the second divisor.

Example :- When 29 is divided by 8, the remainder obtained is 5, then what will be the remainder when the same number is divided by 4 ?

Solution:- Here, the second divisor that is 4 is a factor of the first divisor that is 8. So, on dividing the first remainder that is 5 by the second divisor that is 4, we get our second remainder which is 1. So, the required answer is 1.

Variety Questions

Q.1. The LCM of x² - 8x + 15 and x² - 5x + 6 is:
SSC CPO 05/10/2023 (2nd Shift)
(a) (x + 5) (x + 2) (x + 3)
(b) (x - 5) (x - 2) (x - 3)
(c) (x + 5) (x - 2) (x - 3)
(d) (x - 2) $(x - 3)^2$ (x - 5)

Q.2. The greatest possible length that can be used to measure exactly the lengths of 3 m 15 cm, 5 m, and 6 m 85 cm is:
SSC CPO 05/10/2023 (2nd Shift)
(a) 11 cm (b) 7 cm (c) 9 cm (d) 5 cm

Q.3. What is the HCF of $(x^6 + 1)$ and $(x^4 - 1)$
SSC CPO 05/10/2023 (1st Shift)
(a) $(1 + x^2)$ (b) (1 + x) (c) 1 (d) $(1 - x^2)$

Q.4. The LCM of two prime numbers x and y (x > y) is 533. The value of 4y - x is:
SSC CPO 03/10/2023 (3rd Shift)
(a) 11 (b) 21 (c) 18 (d) 23

Q.5. What is the HCF of the polynomials $(x^3 - 8)$, $(x^3 - 6x^2 + 12x - 8)$ and $(x^3 - 4x^2 + 4x)$?
SSC MTS 12/09/2023 (3rd Shift)
(a) $(x - 1)$ (b) $(x - 2)$ (c) $(x - 8)$ (d) $(x - 4)$

Q.6. Radha, Pratima and Reena begin to jog around a circular path and they complete their revolutions in 50 seconds, 75 seconds and 100 seconds, respectively. After how much time (in minutes) will they meet together at the starting point for the first time?
SSC MTS 11/09/2023 (3rd Shift)
(a) 6 (b) 5 (c) 4 (d) 3

Q.7. Sanjay wants to exactly measure the lengths 7000 mm, 3850 mm and 12950 mm using a single measuring tape. What will be the greatest possible length (in cm) of the measuring tape?
SSC MTS 11/09/2023 (2nd Shift)
(a) 40 (b) 45 (c) 35 (d) 30

Q.8. Two tankers contain 850 litres and 680 litres of oil. Find the maximum capacity of a container which can measure the oil of both tankers when used, an exact number of times.
SSC MTS 06/09/2023 (2nd Shift)
(a) 425 litres (b) 680 litres
(c) 340 litres (d) 170 litres

Q.9. Find the greatest two digit number which on dividing 219, 365, 511 leaves the remainders 3, 5, 7, respectively.
SSC MTS 01/09/2023 (3rd Shift)
(a) 63 (b) 82 (c) 53 (d) 72

Q.10. Five bells commence tolling together and toll at intervals of 5, 10, 15, 20 and 25 seconds respectively. In 1 hour 20 minutes, how many times do they toll together?
SSC MTS 17/05/2023 (Afternoon)
(a) 20 (b) 15 (c) 14 (d) 17

Q.11. There is a circular path around a sports field. Rahul takes 15 minutes to drive one round of the field, while Anil takes 18 minutes for the same. Suppose they both start from the same point and at the same time, and go in the same direction. After how many minutes will they meet again at the starting point?
SSC MTS 11/05/2023 (Afternoon)
(a) 120 (b) 100 (c) 80 (d) 90

Q.12. Let x = 224 and, y = 322. If the highest common factor of 23x and a × y is divisible by x and y, then what can be the possible value of a?
SSC CPO 11/11/2022 (Evening)
(a) 16 (b) 8 (c) 12 (d) 4

Q.13. The highest common factor of 108, 72 and 5a is a. What can be the least common multiple of 108, 72 and a ?
SSC CPO 10/11/2022 (Afternoon)
(a) 432 (b) 324 (c) 108 (d) 216

Q.14. What is the greatest positive integer that divides 554, 714 and 213 leaving the remainder 43, 57 and 67, respectively?
SSC CPO 10/11/2022 (Afternoon)
(a) 95 (b) 71 (c) 83 (d) 73

Q.15. Find the HCF of $(4^{315} - 1)$ and $(4^{25} - 1)$.
SSC MTS 26/07/2022 (Morning)
(a) 1 (b) $(4^{25} - 1)$ (c) 1024 (d) 1023

Q.16. 120 apples, 240 oranges and 150 pears are packed in cartons in such a way that each carton has the same number of fruits, each carton contains only one type of fruit and fruit is left unpacked. What is the smallest possible number of cartons needed for the purpose ?
SSC MTS 08/07/2022 (Evening)
(a) 50 (b) 40 (c) 17 (d) 30

Q.17. The traffic lights at 3 different road crossings change after every 48 sec, 72 sec and 108 sec, respectively. If they all change simentionusly at 8 : 20 a.m., then at what will they next change again simultaneously?
SSC MTS 07/07/2022 (Morning)
(a) 8 : 27 : 12 a.m. (b) 8 : 33 : 32 a.m.
(c) 8 : 12 : 18 a.m. (d) 8 : 40 : 14 a.m.

Q.18. A and B are two prime numbers such that A > B and their LCM is 209. The value of A^2 - B is ?
SSC CGL 12/04/2022 (Evening)
(a) 350 (b) 372 (c) 361 (d) 339

Q.19. 13, a, b, c are four distinct numbers and the HCF of each pair of numbers (13, a) : (13, b) : (13, c) is 13, where a, b, c are each less than 60 and a < b < c. What is the value of $\frac{a+c}{b}$?
SSC CGL 13/04/2021 (Morning)
(a) 3.5 (b) 2 (c) 5 (d) 4.5

Q.20. The sum of two numbers is 1215 and their HCF is 81. If the numbers lie between 500 and 700, then the sum of reciprocals of the numbers is
SSC CPO 13/12/2019 (Evening)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) $\frac{5}{1512}$ (b) $\frac{5}{378}$ (c) $\frac{5}{702}$ (d) $\frac{5}{1188}$

Q.21. If r is the remainder when each of 6454, 7306 and 8797 is divided by the greatest number d (d > 1), then (d - r) is:
SSC CPO 13/12/2019 (Morning)
(a) 126 (b) 64 (c) 137 (d) 149

Q.22. In finding the HCF of two numbers by division method, the quotients are 1, 8 and 2 respectively, and the last divisor is 105, what is the sum of the numbers ?
SSC CPO 11/12/2019 (Evening)
(a) 3570 (b) 3885 (c) 3780 (d) 3675

Q.23. When the smallest number x is divided by 5, 6, 8, 9 and 12, it gives remainder 1 in each case. But x is divisible by 13. What will be the remainder when x will be divided by 31
SSC MTS 20/08/2019 (Afternoon)
(a) 1 (b) 5 (c) 3 (d) 0

Q.24. The Highest Common Factor and Lowest Common Multiple of two numbers p and q are A and B respectively. IF A + B = p + q, then the value of $A^3 + B^3$ is :
SSC MTS 09/08/2019 (Evening)
(a) p^3 (b) q^3 (c) $p^3 + q^3$ (d) $p^3 - q^3$

Q.25. What is the largest number that divides 460, 491 and 553 and leaves the remainder 26 in each case ?
SSC MTS 06/08/2019 (Afternoon)
(a) 27 (b) 35 (c) 33 (d) 31

Q.26. A is the smallest three-digit number which when divided by 3, 4 and 5 gives remainder 1, 2 and 3 respectively. What is the sum of the digits of A ?
SSC MTS 05/08/2019 (Afternoon)
(a) 11 (b) 10 (c) 6 (d) 8

Q.27. The product of two numbers is 6760 and their HCF is 13. How many such pairs of numbers can be formed?
SSC CPO 16/03/2019 (Evening)
(a) 2 (b) 3 (c) 1 (d) 4

Q.28. An oil merchant has 3 varieties of oil of volumes 432, 594 and 702 respectively. The number of cans of equal size that would be required to fill the oil separately is:
SSC CPO 16/03/2019 (Afternoon)
(a) 13, 15, 17 (b) 8, 11, 13
(c) 8, 13, 15 (d) 6, 9, 11

Q.29. Which of the following statements is true ?
SSC CPO 14/03/2019 (Morning)
(a) LCM of two natural numbers is divisible by their HCF.
(b) HCF + LCM of two numbers = Product of the two numbers.
(c) Two prime numbers are co-prime numbers if their LCM is 1.
(d) HCF of two numbers is the smallest common divisor of both numbers.

Practice Questions

SSC CHSL 2024 Tier - 2

Q.30. A milk vendor has 75 litres of cow milk, 45 litres of toned milk and 30 litres of full cream milk. These should be placed in different trays such that each tray contains the same quantity of milk and two kinds of milk should not be mixed in a tray. What is the least number of trays required to place all the milk?
SSC CHSL Tier II (18/11/2024)
(a) 15 (b) 25 (c) 10 (d) 20

Q.31. Three numbers are in the ratio 5 : 7 : 9, and their LCM is 1260. What is the difference between the largest and the smallest number?
SSC CHSL Tier II (18/11/2024)
(a) 24 (b) 20 (c) 16 (d) 32

SSC MTS 2024 Tier - 1

Q.32. Three red lights on the same road start blinking at the same time and blink repeatedly after every 4, 6 and 8 minutes, respectively. How many times will they blink together in an interval of 3 hours, excluding blinking together at the starting moment ?
SSC MTS 08/10/2024 (Afternoon)
(a) 5 (b) 7 (c) 6 (d) 4

Q.33. As part of the partial work from home process, Amita went to office every 2nd day, Amrita went to office every 3rd day, and Tosita went to office every 6th day, respectively. All three went to office on 31 October 2021. On how many days did all three attend office on the same date during the remaining two months of the year ?
SSC MTS 15/10/2024 (Evening)
(a) 9 (b) 10 (c) 11 (d) 12

Q.34. Find the least number which when divided by 20,25,35 and 40 leaves remainders 14,19,29and 34, respectively.
SSC MTS 16/10/2024 (Evening)
(a) 1284 (b) 1294 (c) 1384 (d) 1394

Q.35. If two positive integers x and y are written as $x = a^2b^3$ and $y = a^3b$; and a and b are prime numbers, then HCF (x, y) is:
SSC MTS 17/10/2024 (Evening)
(a) ab^2 (b) a^2b^2 (c) ab (d) a^2b

Q.36. x,y and z are divisible by 2,3 and 4, respectively. What is the highest common factor (HCF) of 6x, 4y and 3z ?
SSC MTS 18/10/2024 (Morning)
(a) At least 36 (b) At least 12
(c) At least 18 (d) At least 16

Q.37. Find the HCF of :
$3^3 \times 11^2, 2^4 \times 3^2 \times 5^3 \times 11^3$ and $3 \times 5 \times 7 \times 11$
SSC MTS 18/10/2024 (Evening)
(a) 385 (b) 1815 (c) 33 (d) 165

Q.38. Two numbers are in the ratio of 7 : 9 and their LCM is 630. Find the numbers
SSC MTS 21/10/2024 (Morning)
(a) 56, 72 (b) 77, 99 (c) 70, 90 (d) 63, 81

Q.39. If the HCF of 156 and 96 is expressible in the form of 156 × 12 + 96A, then the value of A is:
SSC MTS 23/10/2024 (Afternoon)
(a) -19.735 (b) 19.735
(c) -19.375 (d) 19.375

Q.40. The HCF of 1.75, 5.6 and 7 is:
SSC MTS 28/10/2024 (Morning)
(a) 0.35 (b) 3.5 (c) 0.07 (d) 0.7

Q.41. The LCM of $x^3 - 27$, $x^2 - x - 6$, $x + 2$ is:
SSC MTS 04/11/2024 (Morning)
(a) $(x - 3)(x + 2)(x^2 - 3x + 9)$
(b) $(x + 3)(x + 2)(x^2 - 3x + 9)$
(c) $(x - 3)(x + 2)(x^2 + 3x - 9)$
(d) $(x - 3)(x + 2)(x^2 + 3x + 9)$

Q.42. The product of LCM and HCF of two numbers is 24. If the difference between the two numbers is 2, then find the numbers.
SSC MTS 13/11/2024 (Evening)
(a) 5 and 3 (b) 6 and 4
(c) 2 and 4 (d) 8 and 6

Q.43. The LCM of
$\frac{1}{6}, \frac{4}{15}, \frac{5}{9}, \frac{7}{27}, \frac{8}{3}$ is:
SSC MTS 14/11/2024 (Afternoon)
(a) $92\frac{1}{3}$ (b) $93\frac{2}{3}$ (c) $93\frac{1}{3}$ (d) $92\frac{2}{3}$

SSC CPO 2023 Tier - 1

Q.44. The largest number of four digits that is exactly divisible by 17 and 36 is:
SSC CPO 03/10/2023 (1st Shift)
(a) 8568 (b) 9180 (c) 9792 (d) 7956

Q.45. Two numbers are in the ratio 3 : 4. The product of their HCF and LCM is 2700. The sum of the numbers is:
SSC CPO 03/10/2023 (1st Shift)
(a) 45 (b) 105 (c) 60 (d) 15

Q.46. Find the greatest number which

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

when divides 261, 853 and 1221, leaves a remainder of 5 in each case.
SSC CPO 03/10/2023 (2nd Shift)
(a) 18 (b) 17 (c) 16 (d) 19

Q.47. Find the LCM of $\frac{3}{2}$, $\frac{81}{16}$ and $\frac{9}{8}$.
SSC CPO 03/10/2023 (2nd Shift)
(a) $\frac{111}{2}$ (b) $\frac{91}{2}$ (c) $\frac{81}{2}$ (d) $\frac{101}{2}$

Q.48. Find the greatest possible length (in metres) that can be used to exactly measure the lengths 6 m, 5 m 25 cm and 12 m 50 cm.
SSC CPO 03/10/2023 (2nd Shift)
(a) 0.35 m (b) 0.90 m (c) 0.75 m (d) 0.25 m

Q.49. The least number which should be added to 1351 so that the sum is exactly divisible by 2, 4, 6 and 8 is:
SSC CPO 03/10/2023 (3rd Shift)
(a) 13 (b) 11 (c) 15 (d) 17

Q.50. Let the HCF of m and n be 'a' and let n = ab, LCM of m and n is given by:
SSC CPO 04/10/2023 (1st Shift)
(a) ab (b) am (c) bm (d) mn

Q.51. The LCM and HCF of two numbers are 1105 and 5. If the LCM is 17 times the first number, then find the two numbers.
SSC CPO 04/10/2023 (2nd Shift)
(a) 55 and 85 (b) 65 and 75
(c) 60 and 80 (d) 65 and 85

Q.52. If the HCF of 45 and 55 is expressible in the form of 55 × 5 + 45m, then what is the value of m ?
SSC CPO 04/10/2023 (3rd Shift)
(a) 5 (b) −6 (c) −5 (d) 6

Q.53. Find the least number which when divided by 4, 9, 12 and 15, leaves the remainder 3 in each case.
SSC CPO 04/10/2023 (3rd Shift)
(a) 193 (b) 183 (c) 360 (d) 180

Q.54. Determine the LCM of two numbers if their HCF is 12 and their ratio is 13 : 15.
SSC CPO 04/10/2023 (3rd Shift)
(a) 2450 (b) 1780 (c) 1890 (d) 2340

Q.55. Which of the following numbers leaves the remainder equal to the highest common factor of 6, 8 and 9, when divided by 6, 8 and 9?
SSC CPO 04/10/2023 (3rd Shift)
(a) 506 (b) 575 (c) 291 (d) 433

Q.56. Find the least number which is exactly divisible by 20, 28, 34, 60 and 75.
SSC CPO 05/10/2023 (1st Shift)
(a) 34500 (b) 35900 (c) 35700 (d) 36220

Q.57. Which is the largest number that divides each of 1036, 1813 and 3885 without leaving any remainder ?
SSC CPO 05/10/2023 (1st Shift)
(a) 259 (b) 111 (c) 333 (d) 37

Q.58. What is the LCM of 0.15, 0.18 and 0.45 ?
SSC CPO 05/10/2023 (2nd Shift)
(a) 0.6 (b) 0.9 (c) 0.81 (d) 0.09

Q.59. What will be the least number which when doubled will be exactly divisible by 12, 14, 16 and 18 ?
SSC CPO 05/10/2023 (2nd Shift)
(a) 636 (b) 226 (c) 428 (d) 504

Q.60. The LCM of two numbers is five times their HCF. If the product of the two numbers is 20480, then find their HCF and LCM, respectively.
SSC CPO 05/10/2023 (3rd Shift)
(a) 64 and 320 (b) 56 and 280
(c) 48 and 240 (d) 46 and 230

Q.61. If the sum of two numbers is 60 and their HCF and LCM are 5 and 60, respectively, then the sum of the reciprocals of the numbers will be:
SSC CPO 05/10/2023 (3rd Shift)
(a) $\frac{1}{4}$ (b) $\frac{1}{5}$ (c) $\frac{1}{11}$ (d) $\frac{1}{6}$

Q.62. The least number of five digits which is exactly divisible by 9, 12, 15, 25 and 27 is:
SSC CPO 05/10/2023 (3rd Shift)
(a) 10250 (b) 10800 (c) 10600 (d) 10700

SSC MTS 2023 Tier - 1

Q.63. What is the largest number that divides 627, 15630 and 3128 and leaves remainders of 2, 5 and 3, respectively?
SSC MTS 04/09/2023 (3rd Shift)
(a) 775 (b) 650 (c) 625 (d) 1225

Q.64. The HCF of three numbers is 57. If they are in the ratio of 4 : 5 : 6, then find the numbers.
SSC MTS 05/09/2023 (2nd Shift)
(a) 228, 285, 342 (b) 236, 295, 354
(c) 240, 300, 360 (d) 232, 290, 348

Q.65. Three numbers are in the ratio 3 : 5 : 7 If their LCM is 2625, find their HCF.
SSC MTS 05/09/2023 (3rd Shift)
(a) 100 (b) 125 (c) 50 (d) 25

Q.66. The largest three-digit number which gives the same remainder 2 when divided by 3, 5 and 9 is _____.
SSC MTS 08/09/2023 (1st Shift)
(a) 980 (b) 992 (c) 995 (d) 990

Q.67. The HCF of two numbers is 12. Which of the following can never be their LCM ?
SSC MTS 12/09/2023 (1st Shift)
(a) 24 (b) 74 (c) 48 (d) 60

Q.68. The product of two numbers is 4107. If the HCF of these numbers is 37, then the greater number is:
SSC MTS 12/09/2023 (2nd Shift)
(a) 111 (b) 74 (c) 185 (d) 37

Q.69. The LCM of the two numbers is 1440 and their HCF is 32. If the first number is 288, then find the second number.
SSC MTS 13/09/2023 (2nd Shift)
(a) 150 (b) 145 (c) 180 (d) 160

Q.70. What is the greatest three-digit number which when divided by 4, 8 and 9, leaves no remainder?
SSC MTS 13/09/2023 (3rd Shift)
(a) 924 (b) 963 (c) 932 (d) 936

Q.71. Find the smallest three digit number which when added to 5 is exactly divisible by 12, 14 and 18.
SSC MTS 14/09/2023 (2nd Shift)
(a) 240 (b) 225 (c) 245 (d) 247

Q.72. The ratio of two numbers is 3 : 4. If the sum of these two numbers is 70, then what is their LCM ?
SSC MTS 14/09/2023 (3rd Shift)
(a) 120 (b) 96 (c) 108 (d) 84

SSC CGL 2023 Tier - 1

Q.73. Find the least number divisible by 2, 3, 5, 6, 9 and 18, which is a perfect square.
SSC CGL 24/07/2023 (2nd shift)
(a) 900 (b) 400 (c) 144 (d) 3600

SSC Selection Post (Phase - XI)

Q.74. The smallest six-digit number which is divisible by 12, 16, 24, 28 is:
Matriculation Level 30/06/2023 (Shift - 3)
(a) 100128 (b) 100190
(c) 100180 (d) 100160

SSC CHSL 2022 Tier - 2

Q.75. The HCF of two numbers is one-twentieth of their LCM. If one of the numbers is 96 and the difference of the LCM and the HCF is 456, then what is the other number ?
SSC CHSL Tier II (26/06/2023)
(a) 48 (b) 120 (c) 144 (d) 72

SSC MTS 2022 Tier - 1

Q.76. What is the HCF of two prime numbers X and Y ?
SSC MTS 02/05/2023 (Morning)
(a) 1 (b) 2 (c) Y (d) X

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.77. What is that least number that should be added to 478 so that the number obtained becomes exactly divisible by 5, 6 and 12 ?
SSC MTS 04/05/2023 (Morning)
(a) 62 (b) 12 (c) 2 (d) 52

Q.78. The product of two co-prime numbers is 483. Find the Least Common Multiple of both numbers.
SSC MTS 08/05/2023 (Afternoon)
(a) 483 (b) 21 (c) 1 (d) 23

Q.79. What is that least perfect square which is exactly divisible by each of 14, 84 and 28 ?
SSC MTS 10/05/2023 (Afternoon)
(a) 7056 (b) 3528 (c) 1764 (d) 441

Q.80. The greatest number which when divides 456 and 553 leaves the remainder as 6 and 3 respectively is:
SSC MTS 12/05/2023 (Evening)
(a) 5 (b) 50 (c) 10 (d) 30

Q.81. The least number which when divided by 14, 18 and 36 and leaves 1 as remainder in each case is:
SSC MTS 16/05/2023 (Morning)
(a) 250 (b) 252 (c) 253 (d) 251

Q.82. What will be the ratio of the Least Common Multiple and Highest Common Factor of 12, 24 and 36?
SSC MTS 13/06/2023 (Afternoon)
(a) 3 : 1 (b) 4 : 1 (c) 6 : 1 (d) 2 : 1

Q.83. What is the least number of students in a class such that they can make rows of 10, 15 and 20 and also the total number of students is a perfect square?
SSC MTS 15/06/2023 (Morning)
(a) 6400 (b) 1600 (c) 900 (d) 1800

Q.84. What is the HCF of 513 and 1017 ?
SSC MTS 16/06/2023 (Evening)
(a) 15 (b) 8 (c) 9 (d) 13

Q.85. The Least Common Multiple of three different numbers is 40. Which of the following cannot be their Highest Common Factor ?
SSC MTS 19/06/2023 (Morning)
(a) 20 (b) 25 (c) 5 (d) 10

Q.86. What is the smallest perfect square which is divisible by both 8 and 12 ?
SSC MTS 20/06/2023 (Afternoon)
(a) 100 (b) 144 (c) 121 (d) 196

SSC CGL 2022 Tier - 2

Q.87. The product of the two numbers is 1500 and their HCF is 10. The number of such possible pairs is/are:
SSC CGL Tier II (02/03/2023)
(a) 1 (b) 3 (c) 4 (d) 2

Q.88. If the highest common factor (HCF) of x and y is 15, then the HCF of $36x^2 - 81y^2$ and $81x^2 - 9y^2$ is divisible by
SSC CGL Tier II (06/03/2023)
(a) 135 (b) 120 (c) 180 (d) 90

SSC CGL 2022 Tier - 1

Q.89. Calculate the HCF of $\frac{12}{5}, \frac{14}{15}$ & $\frac{16}{17}$
SSC CGL 03/12/2022 (1st Shift)
(a) $\frac{4}{255}$ (b) $\frac{3}{255}$ (c) $\frac{2}{255}$ (d) $\frac{1}{255}$

Q.90. Choose the correct statement from the following.
SSC CGL 06/12/2022 (2nd Shift)
(a) HCF is the least common multiple of the given numbers.
(b) HCF of two or more numbers is the highest number which perfectly divides all the given numbers.
(c) HCF is also called the least common divisor.
(d) In prime factorisation method of HCF, the multiples of all the given numbers are listed.

SSC CPO 2022 Tier - 1

Q.91. The least common multiple of a and b is 42. The LCM of 5a and 11b is :
SSC CPO 09/11/2022 (Morning)
(a) 2310 (b) 4620 (c) 210 (d) 462

Q.92. The sum of two numbers is 1224 and their HCF is 68. The number of pairs of numbers satisfying the above condition is:
SSC CPO 09/11/2022 (Afternoon)
(a) 3 (b) 4 (c) 6 (d) 2

Q.93. The LCM and ratio of three numbers are 1386 and 3 : 7 : 11, respectively. The sum of the greatest and least numbers is:
SSC CPO 11/11/2022 (Evening)
(a) 60 (b) 64 (c) 84 (d) 108

SSC MTS 2021 Tier - 1

Q.94. If $P = 2^8 \times 3^5, Q = 2^3 \times 3^4$, and $R = 3^5 \times 2^7$, then what is the highest common factor of P, Q and R?
SSC MTS 06/07/2022 (Afternoon)
(a) $2^3 \times 3^4$ (b) $2^8 \times 3^5$
(c) $2^2 \times 3^2$ (d) $2^4 \times 3^5$

Q.95. The ratio of the LCM of two numbers to the sum of the same two numbers is 12 : 7. If their HCF is 4, what is the product of these two numbers?
SSC MTS 14/07/2022 (Morning)
(a) 192 (b) 172 (c) 196 (d) 169

Q.96. If K_1 and K_2 are two distinct prime numbers, then what is the product of the highest common factor and the least common multiple of K_1 and K_2?
SSC MTS 20/07/2022 (Afternoon)
(a) 1 (b) $\frac{K_1}{K_2}$ (c) $K_1 + K_2$ (d) $K_1 \times K_2$

Q.97. Find the smallest natural number 'x' that must be subtracted from 1800 so that (1800 - x), when divided by 7, 11 and 23, will leave 5 as the remainder in each case.
SSC MTS 26/07/2022 (Evening)
(a) 24 (b) 25 (c) 26 (d) 20

SSC CHSL 2021 Tier - 1

Q.98. Four runners started running simultaneously from a point on a circular track. They took 400 seconds, 600 seconds, 720 seconds and 900 seconds to complete one round. After how much time did they meet at the starting point for the first time since the race started?
SSC CHSL 03/06/2022 (Morning)
(a) 4200 sec (b) 2400 sec
(c) 3600 sec (d) 1800 sec

SSC CGL 2021 Tier - 1

Q.99. Which is the smallest multiple of 7, which leaves 5 as a remainder in each case, when divided by 8, 9, 12 and 15?
SSC CGL 12/04/2022 (Morning)
(a) 365 (b) 1085 (c) 2525 (d) 725

SSC CGL 2020 Tier - 2

Q.100. Three numbers are in the ratio $\frac{1}{2} : \frac{2}{3} : \frac{3}{4}$. If the difference between the greatest number and the smallest number is 33, then HCF of the three numbers is:
SSC CGL Tier II (03/02/2022)
(a) 9 (b) 5 (c) 13 (d) 11

SSC MTS 2020 Tier - 1

Q.101. The least number of square tiles required to pave the ceiling of a room 12 m 95 cm long and 3 m 85 cm broad, is:
SSC MTS 11/10/2021 (Afternoon)
(a) 417 (b) 407 (c) 467 (d) 437

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CPO 2020 Tier - 1

Q.102. What is the sum of the digits of the least number which when divided by 15, 18 and 36 leaves the same remainder 9 in each case and is divisible by 11 ?
SSC CPO 25/11/2020 (Morning)
(a) 18 (b) 16 (c) 17 (d) 15

SSC CGL 2019 Tier - 2

Q.103. When 1062, 1134 and 1182 are divided by the greatest number x, the remainder in each case is y. What is the value of (x - y) ?
SSC CGL Tier II (15/11/2020)
(a) 19 (b) 17 (c) 16 (d) 18

Q.104. Let x be the greatest number which when divided by 955, 1027, 1075, the remainder in each case is the same. Which of the following is NOT a factor of x ?
SSC CGL Tier II (16/11/2020)
(a) 6 (b) 16 (c) 4 (d) 8

Answer Key :-

1.(b)	2.(d)	3.(a)	4.(a)
5.(b)	6.(b)	7.(c)	8.(d)
9.(d)	10.(d)	11.(d)	12.(a)
13.(d)	14.(d)	15.(d)	16.(c)
17.(a)	18.(a)	19.(b)	20.(a)
21.(d)	22.(c)	23.(b)	24.(c)
25.(d)	26.(b)	27.(a)	28.(b)
29.(a)	30.(c)	31.(c)	32.(b)
33.(b)	34.(d)	35.(d)	36.(b)
37.(c)	38.(c)	39.(c)	40.(a)
41.(d)	42.(b)	43.(c)	44.(c)
45.(b)	46.(c)	47.(c)	48.(d)
49.(d)	50.(c)	51.(d)	52.(b)
53.(b)	54.(d)	55.(d)	56.(c)
57.(a)	58.(b)	59.(d)	60.(a)
61.(b)	62.(b)	63.(c)	64.(a)
65.(d)	66.(b)	67.(b)	68.(a)
69.(d)	70.(d)	71.(d)	72.(a)
73.(a)	74.(a)	75.(b)	76.(a)
77.(c)	78.(a)	79.(c)	80.(b)
81.(c)	82.(c)	83.(c)	84.(c)
85.(b)	86.(b)	87.(d)	88.(a)
89.(c)	90.(b)	91.(a)	92.(a)
93.(c)	94.(a)	95.(a)	96.(d)
97.(a)	98.(c)	99.(b)	100.(d)
101.(b)	102.(a)	103.(d)	104.(b)

Solutions :-

Sol.1.(b) According to the question,
$x^2 - 8x + 15$
$x^2 - (5 + 3)x + 15$
$x(x - 5) - 3(x - 5)$
$(x - 5), (x - 3)$
And $x^2 - 5x + 6$
$x^2 - (3 + 2)x + 6$
$x(x - 3) - 2(x - 3)$
$(x - 3), (x - 2)$
So the LCM will be $(x - 5)$, $(x - 2)$, $(x - 3)$

Sol.2.(d) According to the question,
1 m = 100 cm
HCF of 315, 500, 685 = 5
315 = 5 × 3 × 21
500 = 5 × 5 × 20
685 = 5 × 137
So the greatest possible length be 5 cm

Sol.3.(a)
$(x^6 + 1) = (x^2 + 1)(x^4 + 1 - x^2)$
$(x^4 - 1) = (x^2 + 1)(x^2 - 1)$
H.C.F = $(1 + x^2)$

Sol.4.(a) L.C.M = 533
As we know that L.C.M of two prime numbers is always the product of the two prime numbers
So, numbers = 13 and 41
Hence, 4y - x = 13 × 4 - 41 = 52 - 41 = 11

Sol.5.(b)
$(x^3 - 8) = (x - 2)(x^2 + 2x + 4)$
$(x^3 - 6x^2 + 12x - 8) = (x - 2)^3$
and $(x^3 - 4x^2 + 4x) = x(x - 2)^2$
HCF of $(x^3 - 8)$, $(x^3 - 6x^2 + 12x - 8)$ and $(x^3 - 4x^2 + 4x) = (x - 2)$

Sol.6.(b) Required time = LCM of 50 , 75 and 100 ⇒ 300 = 5 minutes

Sol.7.(c)
HCF of 7000, 3850 and 12950
7000 = 350 × 20
3850 = 350 × 11
12950 = 350 × 37
So the maximum length will be
= 350 mm or 35 cm

Sol.8.(d) Maximum capacity of container = HCF (850 , 680) = 170 litres

Sol.9.(d)
(219 - 3), (365 - 5), (511 - 7) will be exactly divisible by that two digit number
Required number = HCF of 216, 360, 504
= 72

Sol.10.(d)
L.C.M of 5, 10, 15, 20 and 25 = 300 sec.
Required number = $\frac{80 \times 60}{300} + 1$
= 17 times

Sol.11.(d) According to question,
Required time when they meet
= LCM (15, 18) = 90 min

Sol.12.(a) x = 224 , y = 322 (given)
Factors of 23 × x = 23 × 224 = 23 × 2^5 × 7
Factors of a × y = a × 322 = a × 2 × 7 × 23
For highest common factor a must be 2^4 because all other factors are already available. ⇒ so, possible value of a = 16

Sol.13.(d) HCF of 108, 72, 5a = Difference of any two no's or the factor of it which divides the given no completely
i.e. 108 - 72 = **36** = a
Then ,
LCM of 108, 72 and **36** = 36 × 2 × 3 = 216

Sol.14.(d) 554 - 43 = 511, 714 - 57 = 657, 213 - 67 = 146
The greatest positive integer = HCF of 511, 657 and 146 = Difference of any two no's or the factors of it which divided the given no's completely i.e.
657 - 511 = 146 = 2 × **73**
So, the required no = 73

Sol.15.(d) $(4^{315} - 1)(4^{25} - 1)$
HCF of 315 and 25 = 5
HCF of $(4^{315} - 1)(4^{25} - 1) = 4^5 - 1 = 1023$

Sol.16.(c) HCF of 120 , 240 , 150 = 30
30 fruits can be packed in a carton of each fruits,
Then the minimum number of cartons is,
Carton of apples = $\frac{120}{30}$ = 4
Catron of oranges = $\frac{240}{30}$ = 8
carton of pears = $\frac{150}{30}$ = 5
Then the minimum number of cartons
= 4 + 8 + 5 = 17

Sol.17.(a) The time when the traffic lights changed simultaneously after every interval = LCM of 48, 72, 108 = 432 sec = 7 min 12 sec
So, the required time
= 8 : 20 + 7 min 12 sec = 8 : 27 : 12 a.m

Sol.18.(a) since, the given no's are prime no's. So, the HCF of (A, B) = 1 and LCM of (A, B) = A × B = AB
According to the question,
A × B = 209 = 19 × 11
So, A = 19 and B = 11 (∵ A > B)
Hence, $A^2 - B = 19^2 - 11 = 361 - 11 = 350$

Sol.19.(b) As, HCF of (13, a), (13, b) and (13, c) is 13 where a, b and c must be multiples of 13.
Only possible value for a, b and c such that a < b < c < 60 is 26, 39 and 52.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

So, a = 26, b = 39 and c = 52.

$\frac{a+c}{b} = \frac{26+52}{39} = 2.$

Sol.20.(a) Let numbers be 81x and 81y.
81[x + y] = 1215 ⇒ x + y = 15
Since numbers lie between 500 and 700 then , the values of x and y are 8 and 7.
So, the no's are 81 × 8 and 81 × 7

Now, $\frac{1}{81\times 8} + \frac{1}{81\times 7}$

$= \frac{1}{81}[\frac{1}{8} + \frac{1}{7}] = \frac{1}{81}[\frac{7+8}{56}]$

$= \frac{1}{81}[\frac{15}{56}] = \frac{5}{1512}$

Sol.21.(d) In such questions,
Subtract the numbers in the following manner :
7306 - 6454 = 852, 8797 - 7306 = 1491
Factors of 852 = 4 × 213
Factors of 1491 = 213 × 7
HCF of (852 and 1491) = 213 ,Which will be the divisor for any of the given no i.e. 6454, 7306 and 8797
So, Remainder = 64,
∴ d - r = 213 - 64 = 149

Sol.22.(c)

```
1785)1995(1
     -1785
      210)1785(8
          -1680
           105)210(2
               -210
               xxx
```

In such cases the last remainder is always zero.
The required two numbers are 1995 and 1785
Sum of these two numbers
= 1995 + 1785 = 3780

Sol.23.(b) LCM of (5,6,8,9,12) = 360
So, the number can be written as 360k + 1, divisible by 13.
So, putting k = 10, we have ;
x = 360 × 10 + 1 = 3601
Now, When 3601 is divided by 31, the remainder will be 5.

Sol.24.(c) Formula used :
$A^3 + B^3 = (A + B)\{(A + B)^2 - 3AB\}$
A + B = p + q (given)
We know that ,
HCF × LCM = product of the two no's
⇒ A × B = $p \times q$
Now, $A^3 + B^3 = (p + q)\{(p + q)^2 - 3pq\}$
⇒ $p^3 + q^3$

Sol.25.(d) 460 - 26 = 434, 491 - 26 = 465
553 - 26 = 527
Now, HCF of 434, 465 and 527
434 = 2 × 7 × 31 ⇒ 465 = 3 × 5 × 31
527 = 17 × 31, So, the required HCF = 31

Sol.26.(b) 3 - 1 = 2, 4 - 2 = 2 and 5 - 3 = 2
smallest 3 digit number=100
LCM of 3,4 and 5 = 60

```
60)100(1
   -60
    40
```

Smallest three digit number
= 100 + (60 - 40) - 2 = 118
Sum of the digits = 1 + 1 + 8 = 10

Sol.27.(a) Let the numbers be 13x and 13y. According to question
13x × 13y = 6760 ⇒ 169xy = 6760
⇒ xy = 40
Required number of pairs are (1, 40) and (5, 8)

Sol.28.(b) 432 = $2^4 \times 3^3$,
594 = 2 × 3^3 × 11 , 702 = 2 × 3^3 × 13
HCF = 2 × 3^3 = 54

Cans for first variety of oil = $\frac{432}{54}$ = 8

Cans for 2nd variety of oil = $\frac{594}{54}$ = 11

Cans for 3rd variety of oil = $\frac{702}{54}$ = 13

Sol.29.(a) From the given statements only option (a) is true. As LCM of two numbers is divisible by their HCF.

Sol.30.(c)
For same quantity of milk = HCF of (75, 45, 30) = 15 liter
Trays for cow milk = $\frac{75}{15}$ = 5
Trays for toned milk = $\frac{45}{15}$ = 3
Trays for full cream milk = $\frac{30}{15}$ = 2
Total trays = 5 + 3 + 2 = 10
The least number of trays required to place all the milk is 10.

Sol.31.(c)
Let three numbers are $5x$, $7x$,$9x$
According to question ,
(5 × 7 × 9) x = 1260
⇒ 315 x = 1260 ⇒ x = 4
∴ Three numbers are 20 , 38 , 36
Required difference = 36 - 20 = 16

Sol.32.(b) LCM(4, 6, 8) = 24
It means that in every 24 minute red light blinks
Now, 3 hours = 180 minute
So, in the interval of 3 hours red light blinks = $\frac{180}{24}$ = 7 times
(consider integer value only)

Sol.33.(b)
Amita , Amrita and Tosita went office on 2nd , 3rd and 6th day respectively
LCM (2 , 3 , 6) = 6
So, on every 6th day all three attend the office
Now, total days in last two months
= 30 + 31 = 61 days
Hence, no. of times they attend together the office in last two months = $\frac{61}{6}$ = 10 times (only integer value considered)

Sol.34.(d) LCM (20 , 25 , 35 , 40)
= 2^3 × 5 × 5 × 7 = 1400
Now, in every case remainder is 6 less than the divisor
So, required no. = 1400 - 6 = 1394

Sol.35.(d) Given , x = a^2b^3 and y =a^3b
HCF (x,y) = a^2b

Sol.36.(b) According to question,
Given: x = 2k, y = 3m, z = 4n.
Then, 6x = 12k, 4y = 12m, 3z = 12n.
All are multiples of 12.
HCF (6x, 4y, 3z) = 12.
Hence, the HCF(6x, 4y, 3z) is at least 12.

Sol.37.(c) Given , $3^3 \times 11^2$, $2^4 \times 3^2 \times 5^3 \times 11^3$ and 3 × 5 × 7 × 11
HCF = 3 × 11 = 33

Sol.38.(c)
Let the number be 7x and 9x respectively,
According to question,
⇒ 7 × 9 × x = 630 ⇒ x = 10
So, the number will be 70 and 90.

Sol.39.(c) HCF of (156 and 96) = 12
According to question,
⇒ 156 × 12 + 96A = 12
⇒ 1872 + 96A = 12
⇒ A = $\frac{12-1872}{96} = \frac{-1860}{96} = \frac{-155}{8}$
= - 19.375

Sol.40.(a) Numbers = 1.75 , 5.6 , 7
= $\frac{175}{100}, \frac{560}{100}, \frac{700}{100}$
HCF = $\frac{HCF\ of\ (175, 560, 700)}{LCM\ of\ (100, 100, 100)} = \frac{35}{100}$
= 0.35

Sol.41.(d)
Factor of (x^3 - 27) = (x - 3)(x^2 + 9 + 3x)
Factor of (x^2 - x - 6) = (x + 2)(x - 3)
Factor of (x + 2) = (x + 2)
LCM of (x^3 - 27), (x^2 - x - 6) and (x + 2)
= (x - 3)(x + 2)(x^2 + 9 + 3x)

Sol.42.(b) Product of two numbers
= LCM × HCF = 24
From the options we can see that only option (b) has numbers which can give 24 as product.
Hence, two numbers are 6 and 4.

Sol.43.(c) L.C.M. of 1, 4, 5, 7, 8 = 280
H.C.F. of 6, 15, 9, 27, 3 = 3
L.C.M. of fractions
= $\frac{L.C.M.\ of\ numerator}{H.C.F.\ of\ denominator} = \frac{280}{3} = 93\frac{1}{3}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.44.(c) L.C.M of 17 and 36 = 612
Largest number of 4-digit = 9999
When we divide 9999 by 612, we get 207 as a remainder.
Required number = 9999 - 207 = 9792

Sol.45.(b) Let the numbers are $3x$ and $4x$
According to question,
$\Rightarrow 3x \times 4x = 2700 \Rightarrow x = 15$
So, the sum of the numbers
= 15 × 3 + 15 × 4 = 45 + 60 = 105
Short Trick :- $(3x + 4x) = 7x$
Hence, the sum of the numbers must be a multiple of 7.
Now, from options, 105 is the required answer.

Sol.46.(c) According to the question,
261 - 5 = 256 ⇒ 16 × 16
853 - 5 = 848 ⇒ 16 × 53
1221 - 5 = 1216 ⇒ 16 × 76
So the HCF of 256, 848, 1216 will be16
So the required number will be 16

Sol.47.(c) According to the question,
LCM of $\frac{3}{2}, \frac{81}{16}, \frac{9}{8} = \frac{LCM}{HCF} = \frac{81}{2}$

Sol.48.(d) According to the question,
1 m = 100 cm
HCF of (600,525,1250) = 25 cm or 0.25 m
So the greatest possible length will be 0.25 m

Sol.49.(d) L.C.M of 2, 4, 6 and 8 = 24
When we divide 1351 by 24 we get 7 as remainder.
So, the required number = 24 - 7 = 17

Sol.50.(c) H.C.F of m and n = a
Given, n = ab
L.C.M = $\frac{product\ of\ numbers}{H.C.F}$
$= \frac{m \times ab}{a}$ = mb

Sol.51.(d) According to the question,
1105 = 17 × 1st number
⇒ 1st number = 65
Formula:- 1st no. × 2nd no. = LCM × HCF
65 × 2nd no. = 1105 × 5
2nd no. = 85
So the no. will be 65 and 85

Sol.52.(b) HCF(45, 55) = 5
According to the question,
5 = 55 × 5 + 45m ----------(1)
By go through the options one by one
Value $m = -6$ satisfied the equations
i.e. 5 = 55 × 5 + 45 × (– 6)
⇒ 5 = 275 – 270 = 5

Sol.53.(b) LCM(4, 9, 12, 15) = 180
hence , least number = 180 + 3 = 183

Sol.54.(d)
Let numbers be $13x$ and $15x$ respectively,
Then , HCF($13x$,$15x$) = x
According to the question,
x = 12
So, Numbers = 156 and 180
Hence, LCM(156 , 180) = 2340

Sol.55.(d) Remainder = HCF(6, 8, 9) = 1
And LCM(6, 8, 9) = 72
So, number should be = 72k + 1
After putting k = 6 we get;
Number = 72 × 6 + 1 = 433

Sol.56.(c)
L.C.M of 20, 28, 34, 60 and 75 = 35700
So, the required least number = 35700

Sol.57.(a)
H.C.F of 1036 , 1813 and 3885 = 259
Hence, the required largest number = 259

Sol.58.(b) According to the question,
LCM of $\frac{15}{100}, \frac{18}{100}, \frac{45}{100} = \frac{90}{100}$ = 0.9

Sol.59.(d) According to the question,
LCM of 12, 14, 16 and 18 be 1008
So the 504 is the least number when it doubles will be exactly divisible by the 12, 14, 16, and 18.

Sol.60.(a) Given,
LCM = 5 × HCF
Let numbers be "a" and "b"
a × b = 20480
HCF × LCM = a × b
HCF × 5 × HCF = 20480
$HCF^2 = \frac{20480}{5}$ = 4096 ⇒ HCF = 64
LCM = 5 × HCF = 5 × 64 = 320

Sol.61.(b) Let numbers be a and b
$a \times b$ = HCF × LCM
$a \times b$ = 5 × 60 -----(1)
$a + b$ = 60 -----(2)
Now,
$\frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} = \frac{60}{5 \times 60} = \frac{1}{5}$

Sol.62.(b) According to the question,
LCM of 9, 12, 15, 25 and 27 will be 2700
So the smallest 5 digit number which exactly divisible by these numbers
= 2700 × 4 = 10800

Sol.63.(c) According to the question,
1st number = 627 - 2 = 625
2nd number = 15630 - 5 = 15625
3rd number = 3128 - 3 = 3125
HCF of 625, 15625 and 3125 = 625
So the required number will be 625.

Sol.64.(a) According to the question,
No. will be = 4 × 57, 5 × 57, 6 × 57
= 228, 285, 342

Sol.65.(d) Let three numbers be $3x$, $5x$ and $7x$ respectively,
Then, LCM ($3x$, $5x$, $7x$) = $105x$
$105x$ = 2625 ⇒ x = 25
numbers = (3 × 25) , (5 × 25) , (7 × 25)
So, HCF = 25

Sol.66.(b) LCM (3, 5, 9) = 45
Now, remainder $\frac{999}{45}$ = 9
So, required largest three digit number
= (999 – 9) + 2 = 992

Sol.67.(b) According to the question,
If the HCF of any 2 numbers are x then the LCM of their will be the multiple of x.
So in option (b) 74 is not the multiple of 12 so option (b) is the right answer

Sol.68.(a)
Let the numbers be $37x$ and $37y$
According to the question,
$(37 \times x) \times (37 \times y)$ = 4107
xy = 3 {where x and y be co- prime}
So, possible value of x and y be 1 and 3
Hence, the greater number = 37 × 3 = 111

Sol.69.(d)
LCM × HCF = 1st number × 2nd number
1440 × 32 = 288 × 2nd number
2nd number = 160

Sol.70.(d) LCM of 4 , 8 , 9 = 72
Greatest three digit number = 999
$\frac{999}{72}$ = Rem (63)
Required number = 999 – 63 = 936

Sol.71.(d) The smallest number which is completely divisible by 12, 14 and 18 will be the LCM of these numbers.
So the LCM of 12, 14 and 18 = 252
Required number = 252 - 5 = 247

Sol.72.(a) Let the numbers are $3x$ and $4x$
According to the question,
$3x + 4x = 70 \Rightarrow x = 10$
Numbers 30 and 40
LCM of 30 and 40 = 120

Sol.73.(a) L.C.M of 2, 3, 5, 6, 9 and 18 = 90
90 = 2 × 3 × 3 × 5
As 2 and 5 don't have any pair
So,
the required number = 90 × 2 × 5 = 900

Sol.74.(a)
L.C.M. (12, 16, 24, 28) = 3 × 4 × 4 × 7
= 336
Smallest 6 digit no. = 100000
Rem. $(\frac{100000}{336})$ = 208
So , required smallest 6 digit no.
= 100000 + $(336 - 208)$ = 100128

Sol.75.(b) Let ,
L.C.M. be 20 units then H.C.F. be 1 unit.
According to the question ,
Difference (19 units) = 456 ⇒ 1 unit = 24

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Now , L.C.M. × H.C.F. = 1st no. × 2nd no.
$(20 \times 24) \times (1 \times 24)$ = 96 × 2nd no.
⇒ 2nd no. = $\frac{(20 \times 24) \times (1 \times 24)}{96}$ = 120

Sol.76.(a) The HCF of two prime numbers is always 1.

Sol.77.(c) LCM (5, 6, 12) = 60
Remainder $\frac{478}{60}$ = 58
Hence,
Required least number = 60 − 58 = 2

Sol.78.(a)
Product of two co - prime number = 483
HCF of co - prime numbers always be 1
So, least common multiple of both numbers = 1 × 483 = 483

Sol.79.(c) 14 = 2 × 7 , 84 = 2^2 × 3 × 7
28 = 2^2 × 7
Required perfect square no.
= $2^2 \times 3^2 \times 7^2$ = 1764

Sol.80.(b) According to the question,
Number that completely divisible,
456 − 6 = 450 ⇒ 553 − 3 = 550
According to the option 50 is the largest number that divides 450 and 550 completely.

Sol.81.(c) The number which is divided by 14, 18 and 36 ⇒ LCM(14, 18, 36) = 252
Remainder = 1{given}
So, Required number = 253

Sol.82.(c) Least common multiple of 12, 24 and 36 = 72
Highest common multiple of 12, 24 and 36 = 12
Required ratio = 72 : 12 = 6 : 1

Sol.83.(c) According to question,
LCM (10, 15, 20) = 60
From the given options,
option (c) (60 × 15) = 900 ,
is the correct answer.

Sol.84.(c) 513 = 3 × 3 × 57
1017 = 3 × 3 × 113
So , H.C.F.(513, 1017) = 3 × 3 = 9

Sol.85.(b) Factor of 40 = 2 × 2 × 2 × 5
By the option 25 never be the HCF

Sol.86.(b) Smallest number that is divisible by 8 and 12 will be 24
Required number = 24 × 6 = 144

Sol.87.(d) Let the numbers be $10x$ and 10y
Then , $10x \times 10y$ = 1500 ⇒ xy = 15
Possible value of x and y are
⇒ (1 , 15) and (3 , 5)

Sol.88.(a) Let , the no. are 15a and 15b .
$36x^2 - 81y^2 = 9(2x - 3y)(2x + 3y)$
$= 9(2 \times 15a - 3 \times 15b)(2 \times 15a + 3 \times 15b)$
$= 9 \times 15\{(2a - 3b)(2a + 3b)\}$
And, $81x^2 - 9y^2 = 9(3x - y)(3x + y)$
$= 9(3 \times 15a - 15b)(3 \times 15a + 15b)$
$= 9 \times 15\{(3a - b)(3a + b)\}$
Their H.C.F.= 135

Sol.89.(c) H.C.F. $(\frac{12}{5}, \frac{14}{15}, \frac{16}{17})$
$= \frac{H.C.F.(12, 14, 16)}{L.C.M.(5, 15, 17)} = \frac{2}{255}$

Sol.90.(b) H.C.F of two or more numbers is the highest number which exactly divides all the given numbers.
Example:- H.C.F of 4 and 6 = 2
2 exactly divides 4 and 6.

Sol.91.(a) LCM of a and b = 42
Then, LCM of 5a and 11b = 55ab
= 55 × 42 = 2310

Sol.92.(a) Let the two no's be 68x and 68y where x and y are co-prime no's
ATQ,
68x + 68y = 1224 ⇒ 68(x + y) = 1224
x + y = $\frac{1224}{68}$ = 18
Required no of pairs satisfying the above conditions = 3 i.e. (1, 17) ; (5, 13), (7, 11)

Sol.93.(c)
Let the numbers are $3x$, $7x$ and $11x$
L.C.M = 1386
$\Rightarrow (3 \times 7 \times 11)x = 1386$
$\Rightarrow 231x = 1386 \Rightarrow x = 6$
So, the numbers are = 18 , 42 and 66.
Hence, the sum of the largest and the least number = 66 + 18 = 84

Sol.94.(a)
P = $2^8 \times 3^5$, Q = $2^3 \times 3^4$, R = $3^5 \times 2^7$
HCF of P, Q and R = $2^3 \times 3^4$

Sol.95.(a) Let two numbers are 4a and 4b as their HCF is given as 4
LCM of 4a and 4b is 4ab
Now according to the question
$\frac{LCM}{Sum\ of\ numbers} = \frac{4ab}{4(a + b)} = \frac{12}{7}$
ab = 12 and a + b = 7 ,
by hit and trial ⇒ a = 4 and b = 3
the numbers are 4a and 4b = 16 and 12
Products of two numbers = 16 × 12 = 192

Sol.96.(d) A number that is divisible only by itself and 1 is called prime number
Highest common factor (HCF) of K_1 and K_2 = 1
And least common multiple (LCM) -
= $K_1 \times K_2$
Then the product =$K_1 \times K_2$

Sol.97.(a) LCM of 7, 11 and 23 = 1771
Remainder in each case = 5
So, required number = 1771 + 5 = 1776
Value of x = 1800 - 1776 = 24

Sol.98.(c) First time of meeting of all of them running on a circular track = LCM of (400, 600, 720,900)
400 = $2^4 \times 5^2$, 600 = $2^3 \times 3 \times 5^2$
720 = $2^4 \times 3^2 \times 5$, 900 = $3^2 \times 5^2 \times 2^2$
LCM of (400 , 600 , 720 , 900)
= $2^4 \times 3^2 \times 5^2$ = 3600 sec

Sol.99.(b) LCM (8, 9, 12, 15) = 360
So, the number is 360k + 5, which is divisible by 7 ⇒ Putting k = 3, we have ;
Required no = 360 × 3 + 5
= 1080 + 5 = 1085

Sol.100.(d) According to the question,
$\frac{1}{2} : \frac{2}{3} : \frac{3}{4}$ = 6 : 8 : 9
Let three numbers be 6x, 8x and 9x
So, 9x − 6x = 33 ⇒ 3x = 33 ⇒ x = 11
HCF (6x, 8x, 9x) = x = 11

Sol.101.(b) HCF of (1295, 385) = 35
Area of each square tile = (35 × 35) cm^2
So, least number of square tiles required
= $\frac{1295 \times 385}{35 \times 35}$ = 407

Sol.102.(a) LCM of (15, 18, 36) = 180
Number can be written as 180k + 9,which is divisible by 11.
Now, putting K = 6 we get :
180 × 6 + 9 = 1080 + 9 = 1089
∴ Required Sum = 1 + 0 + 8 + 9 = 18

Sol.103.(d) To find the required greatest number, we need to find the HCF of the difference between all the three given numbers.
1134 - 1062 = 72, 1182 - 1134 = 48
HCF of 72 and 48 = 24
Now, When 1062 is divided by 24 leaves, remainder 6.
So, x - y = 24 - 6 = 18

Sol.104.(b) To find the value of x, we need to find the HCF of the difference between all the three given numbers.
1027 - 955 = 72, 1075 - 1027 = 48
HCF of (72 and 48) = 24
Factors of 24 = 1, 2, 3, 4, 6, 8, 12, 24
Hence, 16 is not the factor of x

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Simplification

KEY POINTS :-

1). $(a + b)^2 = a^2 + b^2 + 2ab$

2). $(a - b)^2 = a^2 + b^2 - 2ab$

3). $a^2 - b^2 = (a + b)(a - b)$

4). Square root of a number is a value that, when multiplied by itself, gives the given number.

Example :-

36 has two square roots 6 and -6;

$6^2 = 36$ and $-6^2 = 36$, hence we write $\sqrt{36} = \pm 6$

5). Square root by Factorization method

Find square root of 1089

First find the factors of 1089.

3	1089
3	363
11	121
	11

$1089 = 3 \times 3 \times 11 \times 11$

$\sqrt{1089} = 3 \times 11 = 33$

6). Square root by Division method

Find square root of 2304.

```
      48
 4  | 23 04
+4  | 16
88  | 704
    | 704
    | xxx
```

Note:- Make group of two digit from right

$\sqrt{2304} = 48$

7). If $\sqrt{?} = x$, then the required number will be (?) = x^2

8). $\sqrt{a^4 \times b^4 \times c^4} = a^2b^2c^2$

9). $\sqrt{a^n \times b^m} = a^{\frac{n}{2}} \times b^{\frac{m}{2}}$

10). $\frac{\sqrt{x}}{\sqrt{y}} = \sqrt{\frac{x}{y}}$

11). $\sqrt{x} \times \sqrt{y} = \sqrt{xy}$

12). If any number ends with 1, its square root will end with 1 or, 9, given that the number is a perfect square.

Example:- $\sqrt{81} = 9, \sqrt{121} = 11$

13). If any number ends with 4, its square root will end with 2 or 8, given that the number is a perfect square.

Example: $\sqrt{324} = 18, \sqrt{144} = 12$

14). If any number ends with 5, its square root will end with 5, given that the number is a perfect square.

Example: $\sqrt{225} = 15, \sqrt{625} = 25$

15). If any number ends with 6, its square root will end with 6, given that the number is a perfect square.

Example: $\sqrt{256} = 16, \sqrt{676} = 26$

16). If any number ends with 9, its square root will end with 3 or 7, given that the number is a perfect square.

Example: $\sqrt{49} = 7, \sqrt{169} = 13$

17). The square of any number always ends with 0, 1, 4, 5, 6 or, 9 but will never end with 2, 3, 7 or, 8.

18). If in a given number, the total number of digits are n and if n is even, the square root of that number will have $\frac{n}{2}$ digits and if n is odd, then the number of digits will be $\frac{n+1}{2}$.

19). $\sqrt{x\sqrt{x\sqrt{x...n}}} = x^{\frac{2^n - 1}{2^n}}$

Example

Find the value of $\sqrt{2\sqrt{2\sqrt{2\sqrt{2\sqrt{2}}}}}$

Here, n = 5, ∴ $\sqrt{2\sqrt{2\sqrt{2\sqrt{2\sqrt{2}}}}}$

$= 2^{\frac{2^5-1}{2^5}} = 2^{\frac{31}{32}}$

20). $\sqrt{x\sqrt{x\sqrt{x...\infty}}} = x$;

Example $\sqrt{7\sqrt{7\sqrt{7...\infty}}} = 7$

21). To find the value of $\sqrt{x + \sqrt{x + \sqrt{x + ...\infty}}}$, find the factors of x, such that the difference between the factors is 1, then the larger factor will be the result.

22). To find the value of $\sqrt{x - \sqrt{x - \sqrt{x - ...\infty}}}$, find the factors of x, such that the difference between the factors is 1, then the smaller factor will be the result.

Example: Find the value of $\sqrt{12 + \sqrt{12 + \sqrt{12 + ...\infty}}}$

The factors of 12 with a difference of 1 are 4, 3. Here, 4 is the larger number.

∴ Value will be 4.

Conventional method

Let $\sqrt{12 + \sqrt{12 + \sqrt{12 + ...\infty}}} = x$

$\Rightarrow \sqrt{12 + x} = x$

$\Rightarrow 12 + x = x^2 \Rightarrow x^2 - x - 12 = 0$

$\Rightarrow x^2 - 4x + 3x - 12 = 0$

$\Rightarrow (x - 4)(x + 3) = 0$

$\Rightarrow x = 4 \text{ and } x = -3$

$\therefore x = 4$

Example :- Find the value of

$\sqrt{30 - \sqrt{30 - \sqrt{30 - ...\infty}}}$.

The factors of 30 with a difference of 1 are 5, 6. Here, 5 is the smaller number. ∴ Value will be 5.

23). If any number is in $\frac{1}{\sqrt{a} \pm \sqrt{b}}$ form, then we multiply by its rationalization factor $\sqrt{a} \mp \sqrt{b}$ in both numerator and denominator.

Example: Find the value of $\frac{1}{\sqrt{9}-\sqrt{8}}$;

$\frac{1}{\sqrt{9}-\sqrt{8}} = \frac{1}{\sqrt{9}-\sqrt{8}} \times \frac{\sqrt{9}+\sqrt{8}}{\sqrt{9}+\sqrt{8}}$

$= \frac{\sqrt{9}+\sqrt{8}}{\sqrt{9}^2-\sqrt{8}^2} = \frac{3+2\sqrt{2}}{1} = 3 + 2\sqrt{2}$

Cube and Cube Root

KEY POINTS

1) If a number is multiplied two times with itself, then the result of this multiplication is called the cube of that number.

Example: $2 \times 2 \times 2 = 2^3$

Cube root of $2^3 = \sqrt[3]{2^3} = 2^{3 \times \frac{1}{3}} = 2^1 = 2$

2) Algebraic method to calculate cube:

$(a + b)^3 = a^3 + 3ab(a + b) + b^3$

$(a - b)^3 = a^3 - 3ab(a - b) - b^3$

Indices and Surds

Key Points:

1) $p^m \times p^n = p^{m+n}$ **2)** $(p^m)^n = p^{mn}$

3) $\frac{p^m}{p^n} = p^{m-n}$ **4)** $\left(\frac{p}{q}\right)^n = \frac{p^n}{q^n}$

5) $p^0 = 1$ **6)** $p^{-n} = \frac{1}{p^n}$

7) $p^{\frac{1}{m}} = \sqrt[m]{p}$ **8)** $\sqrt[m]{p} = p^{\frac{1}{m}}$

9) $\sqrt[m]{pq} = \sqrt[m]{p} \times \sqrt[m]{q}$ **10)** $\sqrt[m]{\frac{p}{q}} = \frac{\sqrt[m]{p}}{\sqrt[m]{q}}$

11) $(\sqrt[m]{p})^m = p$ **12)** $p^{\frac{m}{n}} = \sqrt[n]{p^m}$

13) $\sqrt[m]{\sqrt[n]{p}} = \sqrt[m \times n]{p}$

KEY POINTS

1). Conversion of complex arithmetic expressions into simple ones is called Simplification.

2). VBODMAS Rule: Vinculum > Brackets > Of > division > multiplication > addition > subtraction

* First solve vinculum i.e. bar.

Eg: $(7 - \overline{5 - 4}) = ?$

First solve 5 – 4 i.e. 1 then 7 -1 = 6.

* For brackets open first small brackets

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(....), then {...} and then [...].

* For modulus e.g. |-3| we write magnitude only not sign i.e. 3 in this case.

Important Formulas

1). $(a+b)^2 = a^2 + 2ab + b^2$

2). $(a-b)^2 = a^2 - 2ab + b^2$

3). $(a^2 - b^2) = (a+b)(a-b)$

4). $(a+b)^3 = a^3 + b^3 + 3ab(a+b)$

5). $(a-b)^3 = a^3 - b^3 - 3ab(a-b)$

6). $(a^3 + b^3) = (a+b)(a^2 - ab + b^2)$

7). $(a^3 - b^3) = (a-b)(a^2 + ab + b^2)$

8). $a^3 + b^3 + c^3 - 3abc =$
$(a+b+c)(a^2 + b^2 + c^2 - ab - bc - ca)$
$= \frac{1}{2}(a+b+c)[(a-b)^2 + (b-c)^2 + (c-a)^2]$

Here, if $(a+b+c) = 0$,
then $a^3 + b^3 + c^3 - 3abc = 0$
$\Rightarrow a^3 + b^3 + c^3 = 3abc$

9). $(a+b+c)^2 = (a^2 + b^2 + c^2) + 2(ab + bc + ca)$

Variety Questions

Q.1. Simplify $\frac{(25)^4 + 1250 + 1 - (25)^2}{(25)^2 + 25 + 1}$.

SSC CGL 19/09/2024 (3rd Shift)

(a) 602 (b) 601 (c) 603 (d) 604

Q.2. Simplify

$\frac{25a^2 - 10ab - 48b^2}{5a + 6b} \times (5a + 8b)$

SSC CGL 13/09/2024 (2nd Shift)

(a) $25a^2 - 64b^2$ (b) $(5a - 8b)^2$

(c) $(5a + 8b)^2$ (d) $25a^2 - 36b^2$

Q.3. The simplified form of the expression

$\frac{(x^2 - 9) \times (9x^2 - 1)}{(x - \frac{1}{3}) \times (1 - \frac{x}{3})} \times \frac{9}{(x + \frac{1}{3})(1 + \frac{x}{3})}$

is _____.

SSC CHSL Tier II (10/01/2024)

(a) −729 (b) −81 (c) 729 (d) 81

Q.4. If $A = \frac{58^2 - 25^2}{46^2 - 37^2}$, B = $\frac{26^2 - 15^2}{56^2 - 15^2}$,

then the value of $\frac{1}{B} - \frac{20}{A}$ is :

SSC CGL Tier II (26/10/2023)

(a) 2 (b) 1 (c) −1 (d) 0

Q.5. On comparing the following two numeric expressions, we find that _____.

$[(2\frac{7}{9})^{2\frac{1}{2}}]^{\frac{3}{5}}$ and $[(1\frac{2}{3})^5]^{\frac{3}{5}}$

SSC MTS 14/09/2023 (2nd Shift)

(a) both the expressions are equal

(b) the first expression is smaller than the second

(c) the first expression is larger than the second

(d) the given two expressions cannot be compared

Q.6. On simplifying the following expression, we get _____.

$\frac{24\sqrt{45} - 16\sqrt{20} + \sqrt{245} - 47\sqrt{5}}{3\frac{1}{5} + 1\frac{2}{5} - 2\frac{1}{6} - 2\frac{1}{5} - 5\frac{2}{5} + 3\frac{1}{6}}$

SSC MTS 08/09/2023 (2nd Shift)

(a) 0 (b) 3 (c) 1 (d) 2

Q.7. Simplify :

$\frac{(3.321)^3 + (2.681)^3 + (1.245)^3 - 3 \times 3.321 \times 2.681 \times 1.245}{(3.321)^2 + (2.681)^2 + (1.245)^2 - (3.321 \times 2.681) - (2.681 \times 1.245) - (1.245 \times 3.321)}$

= ?

SSC CHSL 04/08/2023 (1st Shift)

(a) 6.125 (b) 8.645 (c) 7.247 (d) 10.245

Q.8. Simplify the following expression.

$0.01 + 0.68 \times 0.68 + 0.22 \times 0.22 + 0.044 + 0.136 + 0.44 \times 0.68$

SSC CHSL 03/08/2023 (1st Shift)

(a) 0.69 (b) 1 (c) 0.8 (d) 0.9

Q.9. Simplify the given expression .

$\frac{0.09 \times 0.09 + 0.04 \times 0.04 + 0.16 \times 0.16 + 2 \times 0.09 \times 0.04 + 2 \times 0.04 \times 0.16 + 2 \times 0.09 \times 0.16}{0.3 \times 0.3 + 0.2 \times 0.2 + 0.4 \times 0.4}$

SSC CHSL 02/08/2023 (4th Shift)

(a) 0.38 (b) 0.24 (c) 0.32 (d) 0.29

Q.10. What is the value of the given Expression ?

$\frac{4^{a+4} - 5 \times 4^{a+2}}{15 \times 4^a - 2^2 \times 4^a}$

SSC CGL 24/07/2023 (1st shift)

(a) 16 (b) 64 (c) 20 (d) 24

Q.11. What is the value of $(2^2 + 1)(2^4 + 1)(2^8 + 1)(2^{16} + 1)$ ..... $(2^{128} + 1)$?

SSC CHSL 14/03/2023 (2nd Shift)

(a) $\frac{2^{256} - 1}{2}$ (b) $\frac{2^{256} - 1}{3}$

(c) $2^{256} - 1$ (d) $\frac{2^{256} - 1}{4}$

Q.12. Which of the following statement is true ?

I. $\frac{1}{2} + \frac{1}{6} + \frac{1}{12} + ... \frac{1}{110} < \frac{5}{6}$

II. $\frac{1}{3} + \frac{1}{15} + \frac{1}{35} + ... \frac{1}{143} > \frac{7}{13}$

SSC CHSL 13/03/2023 (4th Shift)

(a) Only I (b) Both I and II

(c) Only II (d) Neither I nor II

Q.13. Find the value of the following expression.

$\frac{[\frac{5}{8} - \{\frac{3}{8} - (\frac{5}{8} - \frac{3}{8})\}] of\ 8.8 - 1.2}{4\frac{1}{6} \div 2.5 \times 2 \div \frac{1}{6} of\ 60 + (\frac{3}{4} - \frac{3}{8})}$

SSC CPO 11/11/2022 (Morning)

(a) $5\frac{22}{43}$ (b) $3\frac{23}{67}$ (c) $4\frac{44}{85}$ (d) $4\frac{4}{5}$

Q.14. Solve the following.

$\frac{24 \div \frac{3}{8}\ of (8 + 2 \times \overline{7-3}) + [\frac{2}{11} \div \frac{4}{55} - \{\frac{5}{8} + \frac{6}{16}\}]}{32 \div \overline{15-7} + 75 \div (6 + 15 \div 3 + 4)}$

SSC CPO 09/11/2022 (Morning)

(a) $\frac{23}{27}$ (b) $\frac{9}{2}$ (c) $\frac{11}{18}$ (d) $\frac{15}{19}$

Q.15. Solve

$\frac{(6.9)^3 + (2.7)^3 + (5.8)^3 - 3 \times 6.9 \times 2.7 \times 5.8}{(6.9)^2 + (2.7)^2 + (5.8)^2 - (6.9)(2.7) - (2.7)(5.8) - (5.8)(6.9)}$

SSC CHSL 07/06/2022(Afternoon)

(a) 15.1 (b) 15.3 (c) 15.2 (d) 15.4

Q.16. Simplify the following expression.

$9\frac{1}{5} \div \{(16\frac{1}{5} \div \overline{12\frac{2}{3} - 9\frac{2}{3}}) + 17\frac{1}{2}$ of $3\frac{1}{21}\}$

SSC CHSL 26/05/2022(Evening)

(a) $\frac{139}{881}$ (b) $\frac{137}{881}$ (c) $\frac{140}{881}$ (d) $\frac{138}{881}$

Q.17. The value of

$\frac{1}{4} + \frac{[(20.35)^2 - (8.35)^2] \times 0.0175}{(1.05)^2 + (1.05)(27.65)}$ is:

SSC CGL Tier II (29/01/2022)

(a) $\frac{3}{20}$ (b) $\frac{3}{10}$ (c) $\frac{7}{20}$ (d) $\frac{9}{20}$

Q.18. The simplified value of

$\frac{119 - [48 \div 6 - 7\{5 \times 12 \div 3 - (15 - \overline{3-8})\}]}{24 \div 3 - 9\ of\ 3 + (52 - \overline{8-4}) \div 6}$

is:

SSC MTS 11/10/2021(Morning)

(a) $-\frac{111}{11}$ (b) $-\frac{127}{27}$ (c) $\frac{127}{43}$ (d) $\frac{111}{11}$

Q.19. If $\frac{1}{4 - \sqrt{8}} + \frac{3 + 2\sqrt{2}}{3 - 2\sqrt{2}} - \frac{3 - 2\sqrt{2}}{3 + 2\sqrt{2}}$

$= a + b\sqrt{2}$, then what is the value of (3a + 4b) ?

SSC CGL Tier II (15/11/2020)

(a) $99\frac{1}{2}$ (b) 97 (c) $98\frac{1}{2}$ (d) 98

Q.20. If the following interchanges are made in signs and numbers, which equation would be correct ?

Interchanges: Signs: ÷ and - Numbers: 15 and 5

SSC CHSL 13/10/2020 (Morning)

(a) 4 × 30 - 15 ÷ 5 + 12 = 21

(b) 12 × 30 - 15 ÷ 5 + 4 = 37

(c) 4 × 30 - 15 ÷ 5 + 12 = 27

(d) 4 × 30 - 5 ÷ 15 + 14 = 21

Q.21. If $\frac{4}{1 + \sqrt{2} + \sqrt{3}} = a + b\sqrt{2} + c\sqrt{3} - d\sqrt{6}$, where a, b , c , d are natural numbers, then the value of a + b + c + d is:

SSC CHSL 18/03/2020 (Morning)

(a) 0 (b) 2 (c) 4 (d) 1

Q.22.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

If $[\{(\frac{2}{3})^3\}^{(2x+3)}]^{\frac{-3}{4}} = [\{(\frac{2}{3})^{\frac{2}{3}}\}^{(3x+7)}]^{\frac{-6}{5}}$

then the value of $\sqrt{2 - 42x}$ is:
SSC CHSL 18/03/2020(Morning)
(a) 5 (b) 6 (c) 3 (d) 4

Q.23. If '+' means '-', '-' means '+', '×' means '÷' and '÷' means '×' then the value of $\frac{42 - 12 \times 3 + 8 \div 2 + 15}{8 \times 2 - 4 + 9 \div 3}$ is:
SSC CGL 03/03/2020 (Morning)
(a) $-\frac{5}{3}$ (b) $-\frac{15}{19}$ (c) $\frac{15}{19}$ (d) $\frac{5}{3}$

Q.24. The value of
$\frac{(4.6)^4 + (5.4)^4 + (24.84)^2}{(4.6)^2 + (5.4)^2 + 24.84}$ is :
SSC CGL Tier II (13/09/2019)
(a) 24.42 (b) 24.24 (c) 25.42 (d) 25.48

Q.25. The value of
$\frac{(0.545)(0.081)(0.51)(5.2)}{(0.324)^3 + (0.221)^3 - (0.545)^3}$ is :
SSC CGL Tier II (12/09/2019)
(a) - 1 (b) 1 (c) 3 (d) - 3

Q.26. The value of $22.\overline{4} + 11.5\overline{67} - 33.5\overline{9}$ is
SSC CGL Tier II (11/09/2019)
(a) $0.\overline{32}$ (b) $0.\overline{412}$ (c) $0.3\overline{1}$ (d) $0.4\overline{12}$

Q.27. Find the value
$\{\frac{(0.7)^2 \div 0.14 + (0.6)^2 \div 0.18 + (0.5)^2 \div 0.05}{4(2.5\ of\ 4 - 13 \times 0.25 \times 3)}\}$
SSC MTS 07/08/2019 (Morning)
(a) $\frac{25}{2}$ (b) $\frac{19}{2}$ (c) $\frac{23}{2}$ (d) $\frac{21}{2}$

Q.28. If x = $\frac{1}{12.13} + \frac{1}{13.14} + \frac{1}{14.15}$ .....+ $\frac{1}{23.24}$, y = $\frac{1}{36.37} + \frac{1}{37.38} + \frac{1}{38.39}$ .....+ $\frac{1}{71.72}$ then $\frac{x}{y}$ is equal to :
SSC CHSL 10/07/2019 (Evening)
(a) $\frac{1}{3}$ (b) $\frac{1}{24}$ (c) $\frac{1}{72}$ (d) 3

Q.29. The simplified value of
$\frac{0.01404}{24^2 + 6^2 - 144}$ is:
SSC CHSL 10/07/2019 (Evening)
(a) 3×10^{-5} (b) 6×10^{-5}
(c) 2.4×10^{-4} (d) 3×10^{-4}

Q.30. The simplified value of
$\frac{1.0025 + 6.25 \times 10^{-6}}{0.0025 + 0.95}$ is:
SSC CHSL 09/06/2019 (Evening)
(a) 1.0025 (b) 1.0525
(c) 1.0005 (d) 1.0505

Practice Questions

SSC CHSL 2024 Tier - 2

Q.31. The value of 5 + 24 × 8 ÷ 8 of 8 - 8 ÷ 8 × 4 of 4 is equal to:
SSC CHSL Tier II (18/11/2024)
(a) 8 (b) 9 (c) -8 (d) -9

Q.32. Simplify $(2z - 5y)^2 + (5z + 2y)^2 - 25z^2$.
SSC CHSL Tier II (18/11/2024)
(a) $19y^2 - 4z^2$ (b) $29y^2 + 4z^2$
(c) $29y^2 - 4z^2$ (d) $19y^2 + 4z^2$

SSC MTS 2024 Tier - 1

Q.33. The lowest terms of $\frac{221}{488}$ is:
SSC MTS 30/10/2024 (Afternoon)
(a) $\frac{121}{488}$ (b) $\frac{221}{488}$ (c) $\frac{121}{288}$ (d) $\frac{221}{288}$

SSC CGL 2024 Tier - 1

Q.34. Simplify $\frac{(x^2 - 9)}{x + 3}$
SSC CGL 09/09/2024 (1st Shift)
(a) $x + 3$ (b) $x - 3$ (c) $\sqrt{x^2 - 9}$ (d) $x - 9$

Q.35. Simplify
$\frac{(8.3)^3 + (9.2)^3 + (6.1)^3 - 3 \times 8.3 \times 9.2 \times 6.1}{(8.3)^2 + (9.2)^2 + (6.1)^2 - 8.3 \times 9.2 - 9.2 \times 6.1 - 6.1 \times 8.3}$
SSC CGL 09/09/2024 (2nd Shift)
(a) 30.2 (b) 23.6 (c) 28.7 (d) 25.5

Q.36. Simplify $\frac{0.58 \times 0.58 \times 0.58 - 0.001}{0.58 \times 0.58 + 0.058 + 0.01'}$
SSC CGL 10/09/2024 (2nd Shift)
(a) 0.48 (b) 0.28 (c) 0.37 (d) 0.42

Q.37. If 45 ÷ 3 + 4 × A - 48 ÷ 24 + 4 = 1, then the value of A is:
SSC CGL 10/09/2024 (3rd Shift)
(a) -2 (b) 4 (c) 2 (d) -4

Q.38. Simplify $\frac{(4.2)^3 - (1.2)^3}{(4.2)^2 + 5.04 + (1.2)^2}$
SSC CGL 11/09/2024 (2nd Shift)
(a) 2 (b) 3 (c) 1 (d) 5

Q.39. The value of the expression $(1.55^2 + 0.55^2 + 1.55 \times 0.55)$ is equal to:
SSC CGL 11/09/2024 (2nd Shift)
(a) $1.55^2 - 0.55^2$ (b) $1.55^3 - 0.55^3$
(c) $1.55^3 + 0.55^3$ (d) $1.55^2 + 0.55^2$

Q.40. Solve the following:
$[(2.5 + 1.5)^2 \div 4\ of\ \frac{1}{2} \times 8 - 1]$
SSC CGL 12/09/2024 (2nd Shift)
(a) 0 (b) 81 (c) 27.1 (d) 63

Q.41. Simplify the following expression.
$\frac{(x-y)^3 + (y-z)^3 + (z-x)^3}{(x-y)(y-z)(z-x)}$
SSC CGL 13/09/2024 (1st Shift)
(a) 3 (b) 1 (c) 0 (d) 2

Q.42. Simplify the following expression.
SSC CGL 13/09/2024 (3rd Shift)
$(g - h)^2 - (g + h)^2 + 4gh$
(a) 4gh (b) −4gh (c) 4 (d) 0

Q.43. Simplify
$\frac{1.5 \times 1.5 + 2.5 \times 2.5 + 3.5 \times 3.5 + 2 \times 1.5 \times 2.5 + 2 \times 2.5 \times 3.5 + 2 \times 1.5 \times 3.5}{1.5 + 2.5 + 3.5}$
SSC CGL 13/09/2024 (3rd Shift)
(a) 9.5 (b) 6.5 (c) 8.5 (d) 7.5

Q.44. Simplify the following:
$[(5\frac{1}{2} - 3\frac{1}{3})\ of\ 1\frac{5}{13} + 1 - 2 \times 3\frac{5}{2} \div 2\frac{3}{4}]$
SSC CGL 18/09/2024 (1st Shift)
(a) 0 (b) $\frac{11}{2}$ (c) -2 (d) $3\frac{1}{2}$

Q.45. Simplify the given expression.
$\frac{(4x^2 + 9y^2 - 12xy)}{(3y - 2x)}$
SSC CGL 18/09/2024 (3rd Shift)
(a) 2y - 3x (b) 3y - 2x (c) 2x - 3y (d) 3x - 2y

Q.46. Simplify the following expression
25 ÷ 5 + 3 of 2 - 4 + 6 of 3 ÷ 2 - 8 + 4
SSC CGL 19/09/2024 (2nd Shift)
(a) 16 (b) 4 (c) 8 (d) 12

Q.47. Simplify the following expression.
0.07 × 0.28 ÷ 0.04 + 0.64 − 1.64 ÷ 0.04
SSC CGL 23/09/2024 (3rd Shift)
(a) 38.56 (b) - 39.87 (c) - 46.48 (d) 36.78

Q.48. Find the value of
$11 - \{(3 \div 4)\ of\ 8 - \overline{4 - 8}\}$.
SSC CGL 24/09/2024 (1st Shift)
(a) 2 (b) 3 (c) 1 (d) -1

Q.49. Simplify the following expression.
$133 \div 19 \times 3 - 48 \times 2 \div 24 + 841 \div [\{\overline{45 - 16}\}]$
SSC CGL 24/09/2024 (2nd Shift)
(a) 46 (b) 21 (c) 12 (d) 42

Q.50. $9 \div [1 + \{4 \times (\frac{5}{6} - \overline{\frac{1}{3} + \frac{1}{2}})\}]$ is equal to:
SSC CGL 25/09/2024 (1st Shift)
(a) 1 (b) $\frac{9}{5}$ (c) 0 (d) 9

Q.51. The value of N in the equation 9 × N of 4 ÷ 4 - 15 × 4 = 12 is:
SSC CGL 25/09/2024 (3rd Shift)
(a) 9 (b) 0 (c) 12 (d) 8

Q.52. If $\frac{3(16^3 - 6^3)}{16^2 + 6^2 + Q}$ = 30, then find the value of Q .
SSC CGL 26/09/2024 (1st Shift)
(a) 96 (b) 98 (c) 112 (d) 108

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.53. Simplify the following expression.
(60 + 64 ÷ 4 of 4) × {1000 ÷ ((10 of (3 + 2)) × 2 of 5)} − 28 + (100 × 3 of 3).
SSC CGL 26/09/2024 (2nd Shift)
(a) 600 (b) 1000 (c) 100 (d) 500

Q.54. Simplify 626 × 2912 ÷ 8138
SSC CGL 26/09/2024 (3rd Shift)
(a) 285 (b) 224 (c) 364 (d) 310

Q.55. Simplify $\frac{4x^2 - 49y^2}{2x + 7y}$ + 7y - 2x
SSC CGL 26/09/2024 (3rd Shift)
(a) 4x -14y (b) 7y (c) 4x (d) 0

SSC CHSL 2024 Tier - 1

Q.56. The value of
$(\frac{7 + 8 \times 7 \div 8 + 7 \div 7 \div 7}{3 + 3 \times 3 \div 3 + 5 \div 5 \div 5})$ is :
SSC CHSL 01/07/2024 (2nd Shift)
(a) $1\frac{81}{217}$ (b) $2\frac{61}{217}$
(c) $3\frac{27}{217}$ (d) $1\frac{31}{217}$

Q.57. What is the value of the following expression ?
$\frac{4}{7} \times 4\frac{1}{2} \div 5\frac{1}{3}$ of $2\frac{1}{2}$ - $(7\frac{7}{8} \div 5\frac{1}{9}$ of $9\frac{9}{20}) + \frac{1}{2}$
SSC CHSL 01/07/2024 (2nd Shift)
(a) $\frac{1759}{3250}$ (b) $\frac{1113}{856}$ (c) $\frac{853}{1610}$ (d) $\frac{1093}{111}$

Q.58. Simplify the following expression.
(3 - 3 × 3 + 3 ÷ 3 + 3 × 5) × 2 of 5 + (2 + 2 ÷ 2 + 2 × 2 - 2)
SSC CHSL 02/07/2024 (2nd Shift)
(a) 102 (b) 100 (c) 105 (d) 106

Q.59. Simplify:
$\{(3^3 + 2^3) \times \frac{22}{7}\} \times \{(6^2 + 3^2 - 4^2) \div (14\frac{1}{2})\}$
SSC CHSL 02/07/2024 (3rd Shift)
(a) 220 (b) 145 (c) 110 (d) 198

Q.60. Simplify the following expression.
[40 - 48 ÷ 4 of 3] ÷ {(6 + 4) - 4 of 4 + 4 + (6 - 4) + (4 × 4) ÷ 4} × 3
SSC CHSL 02/07/2024 (3rd Shift)
(a) 30 (b) 26 (c) 25 (d) 27

Q.61. Simplify the given expression.
$8 - 5 \div 2^3 \times 3 + (7 \div 7 \times 7) \div 7 + (3 \times 6 \div \frac{1}{3}) \times \frac{1}{3^3}$
SSC CHSL 03/07/2024 (3rd Shift)
(a) $\frac{73}{9}$ (b) $\frac{73}{27}$ (c) $\frac{73}{21}$ (d) $\frac{73}{8}$

Q.62. The value of $10 + 3\frac{3}{5} \div [2\frac{2}{3} \div \{7\frac{1}{6} - (2\frac{1}{2} + \frac{2}{3})\}]$ is equal to :
SSC CHSL 04/07/2024 (2nd Shift)
(a) $\frac{27}{55}$ (b) $\frac{77}{5}$ (c) $\frac{55}{27}$ (d) $\frac{5}{77}$

Q.63. Simplify:
$3\frac{4}{7} - [16\frac{1}{2} \div \{6^2 - (7 - 2\frac{1}{2})\}]$
SSC CHSL 04/07/2024 (3rd Shift)
(a) $\frac{25}{11}$ (b) $\frac{64}{21}$ (c) $\frac{64}{11}$ (d) $\frac{25}{21}$

Q.64. Simplify $\frac{\frac{1}{2} \div \frac{3}{4} of \frac{5}{6}}{\frac{1}{2} \div \frac{3}{4} \times \frac{5}{6}} + \frac{2 + 2 \times 2}{2 \div 2 \times 2}$
SSC CHSL 05/07/2024 (2nd Shift)
(a) $\frac{111}{25}$ (b) $\frac{121}{25}$ (c) $\frac{75}{36}$ (d) 4

Q.65. Simplify the following expression.
4 × 7 - 3{7 × 4 ÷ (6 × 2)}
SSC CHSL 08/07/2024 (1st Shift)
(a) 12 (b) 19 (c) 21 (d) 4

Q.66. What is the value of the following expression?
$420 \div [\frac{4}{9} \times (1 + \frac{4}{5}) \times 5] + [\frac{5}{7}$ of $\frac{21}{25} \div \frac{3}{4}$ of $\frac{2}{5}]$
SSC CHSL 08/07/2024 (3rd Shift)
(a) 127 (b) 139 (c) 107 (d) 89

Q.67. Solve $\frac{2 \times 2 + 2}{2 \div 2 \times 2} \div \frac{\frac{1}{2} \div \frac{1}{2} of \frac{1}{2}}{\frac{1}{2} + \frac{1}{2} of \frac{1}{2}}$
SSC CHSL 08/07/2024 (4th Shift)
(a) $4\frac{1}{2}$ (b) $2\frac{1}{8}$ (c) $1\frac{1}{8}$ (d) $3\frac{1}{8}$

Q.68. What is the value of the following expression ?
$(24 \div 3$ of $\frac{1}{6}) \times (\frac{4}{5} \div \frac{9}{8} \times \frac{3}{5}) \div (\frac{4}{7} \div \frac{3}{14}$ of $\frac{3}{14})$
SSC CHSL 09/07/2024 (2nd Shift)
(a) $\frac{379}{179}$ (b) $\frac{579}{459}$ (c) $\frac{363}{553}$ (d) $\frac{288}{175}$

Q.69. The value of
$\frac{5 + 7 \times 5 \div 8 of 5 + 3 \div 3 \times 5}{6 \div 6 of 4 + 9 \times 9 \div 3 \times 2 \times 2}$ is :
SSC CHSL 09/07/2024 (3rd Shift)
(a) $\frac{67}{859}$ (b) $\frac{87}{866}$ (c) $\frac{97}{881}$ (d) $\frac{77}{861}$

Q.70. Simplify the following expression.
$11\frac{1}{4} \div 3\frac{3}{5} \times 6\frac{2}{3} + \frac{1}{6}$ = _____.
SSC CHSL 09/07/2024 (4th Shift)
(a) 19 (b) 21 (c) 23 (d) 25

Q.71. The value of $[3^3 \{(40 \times 5) + (7 \times 6)\} \div 11] + (2^3 \times 15 \div 24)$ is:
SSC CHSL 10/07/2024 (3rd Shift)
(a) 559 (b) 595 (c) 599 (d) 959

Q.72. If '÷' means '×', '×' means '÷', '+' means '−', '−' means '+', then 47 ÷ (10 × 5) + (4 − 5) − 6 is:
SSC CHSL 10/07/2024 (4th Shift)
(a) 100 (b) 59 (c) 79 (d) 91

Q.73. What is the value of
$\frac{[\frac{1}{4} \div \frac{1}{4} \times \frac{1}{4}] \times \frac{1}{4}}{[\frac{1}{8} + \frac{1}{8} \times \frac{1}{8}]} + (1 - \frac{4}{9})$?
SSC CHSL 11/07/2024 (1st Shift)
(a) 1 (b) 0 (c) 3 (d) 2

SSC CPO 2024 Tier - 1

Q.74. Simplify the following expression.
$3\frac{1}{5}$ of $2\frac{3}{4} \div \frac{11}{3} + (2\frac{1}{5} \div 1\frac{2}{5}$ of $1\frac{3}{7} - 2\frac{1}{3})$
SSC CPO 27/06/2024 (1st Shift)
(a) $4\frac{1}{6}$ (b) $2\frac{1}{6}$ (c) $3\frac{1}{6}$ (d) $1\frac{1}{6}$

Q.75. Find the value of [18 - 3 × {3 - 3 × (3 ÷ $\frac{1}{3}$ - 3) + 3 ÷ $\frac{1}{3}$ + 3} - 4 × 2].
SSC CPO 27/06/2024 (1st Shift)
(a) 18 (b) 19 (c) 12 (d) 15

Q.76. Find the value of 12 + 24 ÷ 2 - 7 × 30 ÷ 6 + (5 + 4) × 8 + 8 ÷ 8 - 8.
SSC CPO 27/06/2024 (1st Shift)
(a) 45 (b) 85 (c) 54 (d) 58

Q.77. The possible value of x satisfying $\frac{(143 \div 13 \times x - 3 \times 3)}{(6^2 - 7 \times 5 + x^2)}$ = 1 is :
SSC CPO 27/06/2024 (1st Shift)
(a) 1 (b) 3 (c) 2 (d) 4

Q.78. Find the value of
$\frac{12 + 3\frac{2}{3} \div [1\frac{3}{4} \div \{5\frac{1}{4} \times (3\frac{3}{5} \div 4\frac{1}{2})\}]}{1\frac{1}{3} \times 5\frac{1}{5}}$
SSC CPO 27/06/2024 (2nd Shift)
(a) 5 (b) 3 (c) 1 (d) 2

Q.79. Simplify the following expression:
25 × 25 + 9 × 9 + 6 × 6 + 2 × 25 × 9 + 2 × 9 × 6 + 2 × 25 × 6
SSC CPO 27/06/2024 (2nd Shift)
(a) 900 (b) 1200 (c) 1600 (d) 2500

Q.80. The value of $1 - \frac{7}{1 - \frac{1}{1 + \frac{7}{1 - 7}}}$ is :
SSC CPO 27/06/2024 (2nd Shift)
(a) 2 (b) 0 (c) 1 (d) -1

Q.81. Simplify
$9^{18} \div 3^{14}$ of $27^3 \times \sqrt{6561}$
SSC CPO 27/06/2024 (2nd Shift)
(a) 3^{17} (b) 3^{16} (c) 3^{15} (d) 3^{18}

Q.82. The value of 3 + 2 × [7 + (5 + 7) ÷ 2] is equal to :

Search on TG : @apna_pdf

Search on Telegram @apna_pdf

SSC CPO 27/06/2024 (2nd Shift)
(a) 39 (b) 65 (c) 29 (d) 47

Q.83. Simplify $\frac{92736}{(274+830)\ of\ \frac{7}{4}}$ + 513
SSC CPO 27/06/2024 (3rd Shift)
(a) 561 (b) 526 (c) 546 (d) 574

Q.84. Simplify the following expression:
$\frac{(525+175)^2-(525-175)^2}{(525\times175)}$
SSC CPO 27/06/2024 (3rd Shift)
(a) 350 (b) 700 (c) 2 (d) 4

Q.85. The value of 9 × 9 + 9 ÷ 9 − 9 × 9 + 9 + 9 × 9 − 9 − 9 × 9 is:
SSC CPO 27/06/2024 (3rd Shift)
(a) 9 (b) 1 (c) 81 (d) 0

Q.86. The value of $(4^2)^2$ + 4 × 4 ÷ 4 - 4 is:
SSC CPO 27/06/2024 (3rd Shift)
(a) 4^4 (b) 4^3 (c) 4^2 (d) 4^0

Q.87. The value of $1+\frac{1}{1+\frac{1}{5+\frac{1}{2+\frac{1}{3}}}}$ is:
SSC CPO 27/06/2024 (3rd Shift)
(a) $1\frac{13}{45}$ (b) $2\frac{17}{45}$ (c) $2\frac{11}{45}$ (d) $1\frac{38}{45}$

Q.88. If x [- 5 { - 4 (- a)}] + 6 [- 3 { -3 (- a)}] = 6a, then the value of x is:
SSC CPO 28/06/2024 (1st Shift)
(a) −1 (b) 0 (c) −3 (d) 2

Q.89. Simplify 20 ÷ 5 of 4 × 8 + 6 ÷ 24 of 3 × 48 - 6 ÷ 18 × 9.
SSC CPO 28/06/2024 (1st Shift)
(a) 9 (b) 6 (c) 4 (d) 1.125

Q.90. The value of 64 ÷ [44 - (8 of 3 - 16) ÷ 4 × 20] is equal to:
SSC CPO 28/06/2024 (1st Shift)
(a) 12 (b) 18 (c) 16 (d) 15

Q.91. If 855 ÷ 15 − k + 32 × 5 = 1152 ÷ 16 × 111 ÷ 37, then the value of k is:
SSC CPO 28/06/2024 (2nd Shift)
(a) 2 (b) 1 (c) 0 (d) 3

Q.92. Simplify the given expression.
1000 × 100 - 1000 + 4000 ÷ 200
SSC CPO 28/06/2024 (2nd Shift)
(a) 99235 (b) 99980 (c) 99020 (d) 99999

Q.93. Find the value of 15% of 1.5 + 0.15 ÷ 0.1 + 0.01 of 1.1 × 0.5 + 2.5 × 25.
SSC CPO 28/06/2024 (2nd Shift)
(a) 77.2305 (b) 64.2305
(c) 62.2305 (d) 6.42305

Q.94. Simplify the following expression.
(6 + 6 of 5 ÷ 5) ÷ 6 of 5 + (24 ÷ 2 of 3 - 6 of 5 + 4)
SSC CPO 28/06/2024 (2nd Shift)
(a) $-26\frac{2}{5}$ (b) $-17\frac{2}{5}$ (c) $-21\frac{3}{5}$ (d) $-23\frac{1}{5}$

Q.95. Find the simplified value of 5055 − (1002 ÷ 20.04).
SSC CPO 28/06/2024 (2nd Shift)
(a) 4050 (b) 5005 (c) 50.05 (d) 5050

Q.96. If 56 ÷ 4 + p × 3 − 24 ÷ 12 + 4 = 21 ÷ 3 + 3, then the value of p is:
SSC CPO 28/06/2024 (3rd Shift)
(a) 2 (b) −1 (c) 1 (d) −2

Q.97. Simplify
22.0625 - [15 + 0.25 × (4.78 - 1.5 × 3.02)]
SSC CPO 28/06/2024 (3rd Shift)
(a) 7.3 (b) 7. 0 (c) 7.1 (d) 7.2

Q.98. Simplify the following expression.
(4.2 of 2.5 ÷ 3.5) - (3.6 ÷ 2.4 + 2.5 of 3 ÷ 7.5) + (6 - 3 of 2 + 4 of 3 ÷ 6)
SSC CPO 28/06/2024 (3rd Shift)
(a) 2.5 (b) 4.5 (c) 3.5 (d) 1.5

Q.99. Simplify the given expression.
$\frac{13\div\{6-6\div(7-9)\times8+9\}}{5+5\times5\div5 of\ 5}$
SSC CPO 28/06/2024 (3rd Shift)
(a) 13 (b) 39 (c) $\frac{1}{18}$ (d) $\frac{1}{2}$

Q.100. Simplify the given expression.
$\frac{\left(2\frac{1}{7}+6\frac{1}{7}\right)\div\frac{9}{7}}{1\frac{1}{9}\div\left\{\frac{7}{9}+\left(\frac{4}{9}\div\frac{4}{3}\right)\right\}}$
SSC CPO 29/06/2024 (1st Shift)
(a) $\frac{53}{9}$ (b) $\frac{56}{9}$ (c) $\frac{58}{9}$ (d) $\frac{55}{9}$

Q.101. The value of
$\frac{(275\times275\times275+725\times725\times725)}{(275\times275+725\times725-725\times275)}\times\frac{(275\times275\times275-725\times725\times725)}{(275\times275+725\times725+725\times275}$ is
SSC CPO 29/06/2024 (2nd Shift)
(a) −450000 (b) 45000
(c) 450000 (d) −45000

Q.102. If $\frac{5x+3y}{5x-3y}=\frac{7}{3}$, then find $x:y$
SSC CPO 29/06/2024 (2nd Shift)
(a) 5 : 3 (b) 3 : 2 (c) 3 : 5 (d) 2 : 3

Q.103. The value of $\frac{1}{2^2}+\frac{1}{2^3}\div(\frac{1}{2}+\frac{1}{2}$ ÷ 1) + $3\frac{1}{3}\div\frac{5}{2}\times\frac{3}{4}\div6\frac{2}{3}\times\frac{7}{6}$ is:
SSC CPO 29/06/2024 (2nd Shift)
(a) $\frac{11}{20}$ (b) $\frac{11}{30}$ (c) $\frac{21}{20}$ (d) $\frac{7}{40}$

Q.104. Simplify the given expression.
12.3 - [7 + 0.8 of (5.6 - 3.8 × 1.03)]
SSC CPO 29/06/2024 (2nd Shift)
(a) 5.2314 (b) 7.8539
(c) 1.2368 (d) 3.9512

Q.105. If $x+\frac{1}{1+\frac{1}{3+\frac{1}{2}}}$ = 1, then the value of x is equal to :
SSC CPO 29/06/2024 (2nd Shift)
(a) $\frac{7}{9}$ (b) $\frac{1}{7}$ (c) $\frac{3}{7}$ (d) $\frac{2}{9}$

Q.106. Simplify the given expression.
$55\frac{1}{3}\div[3\frac{1}{5}+\{2\frac{1}{2}-(2\frac{1}{3}+\frac{3}{5})\}]$
SSC CPO 29/06/2024 (3rd Shift)
(a) 25 (b) 35 (c) 20 (d) 15

Q.107. Simplify
8.16 × 5.35 + 17.9 - 19.5 of $\frac{1}{15}+\frac{1}{5}$
SSC CPO 29/06/2024 (3rd Shift)
(a) 57.426 (b) 60.456
(c) 65.234 (d) 70.225

Q.108. Simplify the given expression.
$\frac{53-\frac{2}{7}\ of\ 63-9}{72-\frac{2}{5}\ of\ (96-31)}$
SSC CPO 29/06/2024 (3rd Shift)
(a) $\frac{26}{23}$ (b) $\frac{11}{23}$ (c) $\frac{13}{23}$ (d) $\frac{7}{23}$

SSC Selection Post (Phase - XII)

Q.109. Simplify : $25^3-75^3+50^3$
Higher Secondary 20/06/2024 (Shift - 2)
(a) 271250 (b) −281450
(c) 281350 (d) −281250

Q.110. Simplify the expression:
$(0.2)^3+(0.3)^3+(0.5)^3+3\times0.5\times0.7\times0.8$
Higher Secondary 26/06/2024 (Shift - 2)
(a) 0.001 (b) 1.525 (c) 1.000 (d) 0.005

Q.111. Simplify the following expression:
$\frac{0.7^2+(0.4+0.2)(0.7)+(0.4\times0.2)}{(0.7+0.4)}$
Graduate Level 20/06/2024 (Shift - 3)
(a) 0.9 (b) 0.7 (c) 0.3 (d) 0.4

Q.112. Simplify the following expression
$\frac{(8.25)^3-3\times(8.25)^2\times0.25+24.75\times(0.25)^2-(0.25)^3}{4\times4\times4}$
Graduate Level 21/06/2024 (Shift - 3)
(a) 6 (b) 4 (c) 2 (d) 8

Q.113. Simplify the given expression
$\frac{(2.3)^3+(15.9)^3+(3.7)^3-3\times2.3\times15.9\times3.7}{(2.3)^2+(15.9)^2+(3.7)^2-2.3\times15.9-15.9\times3.7-3.7\times2.3}$
Graduate Level 21/06/2024 (Shift - 3)
(a) 14.5 (b) 20.9 (c) 17.6 (d) 21.9

Q.114. Simplify the given expression.
$\frac{12.43\times12.43\times12.43+19.57\times19.57\times19.57}{12.43\times12.43-12.43\times19.57+19.57\times19.57}$
Graduate Level 24/06/2024 (Shift - 3)
(a) 36 (b) 30 (c) 32 (d) 34

Q.115. Simplify the expression:
15 × 15 × 15 + 3 × 15 × 12 × 12 - 3 × 15 × 15 × 12 - 12 × 12 × 12

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Graduate Level 25/06/2024 (Shift - 3)
(a) 36 (b) 9 (c) 18 (d) 27

Q.116. Simplify the following expression:
$\frac{((32)^4 - 1)}{33 \times 31 \times (2^{10} + 1)}$
Graduate Level 26/06/2024 (Shift - 4)
(a) 2 (b) 1 (c) -2 (d) -1

SSC CHSL 2023 Tier - 2

Q.117. If $\sqrt[3]{0.08 \times 0.8 \times p} = 0.008 \times 0.8 \times \sqrt[3]{q}$. then find the value of $\frac{p}{q}$.
SSC CHSL Tier II (02/11/2023)
(a) $8^3 \times 10^{-8}$ (b) $8^3 \times 10^{-9}$
(c) $8^4 \times 10^{-9}$ (d) $8^4 \times 10^{-8}$

Q.118. Simplify :
$\left(\sqrt[3]{\sqrt[3]{343}}\right)^3 \times \left(\sqrt[3]{\sqrt[3]{216}}\right)^3$.
SSC CHSL Tier II (10/01/2024)
(a) 56 (b) 42 (c) $\sqrt[3]{42}$ (d) 42^3

SSC CGL 2023 Tier - 2

Q.119. Find the value of $\frac{\sqrt{1.24} \times \sqrt{2.79}}{\sqrt{2.64} \times \sqrt{5.94}}$.
SSC CGL Tier II (26/10/2023)
(a) $\frac{31}{66}$ (b) $\frac{31}{44}$ (c) $\frac{33}{64}$ (d) $\frac{33}{31}$

SSC CPO 2023 Tier - 1

Q.120. Evaluate
$\frac{0.04}{0.05}$ of $\frac{\left(3\frac{1}{3} - 2\frac{1}{2}\right) \div \frac{1}{2} \text{ of } 1\frac{1}{4}}{\frac{1}{3} + \frac{1}{5} \text{ of } \frac{1}{9}}$
SSC CPO 03/10/2023 (1st Shift)
(a) 5 (b) 0.3 (c) 3 (d) 0.03

Q.121. If (48 ÷ 72 × 3) - [15 ÷ 8 × (40 - 32) - 10] + 2P = 6 ÷ 2, then find the value of P
SSC CPO 03/10/2023 (3rd Shift)
(a) 2 (b) 4 (c) 1 (d) 3

Q.122. The value of
$\frac{1\frac{1}{2} \div 3\frac{1}{4} + \frac{1}{2} \div \frac{13}{14} + \frac{1}{5}}{\frac{1}{5} \times 3\frac{1}{2} - \frac{1}{3} \div 1\frac{3}{4} \times 3\frac{1}{2}}$ is :
SSC CPO 05/10/2023 (1st Shift)
(a) 38 (b) 33 (c) 36 (d) 40

Q.123. Simplify the given expression.
b + 2a - [(3b + a) - (2a + b) + 2a] - a
SSC CPO 05/10/2023 (3rd Shift)
(a) − a (b) - b (c) a (d) b

SSC MTS 2023 Tier - 1

Q.124. Simplify the given expression
71 - (- 3){ - 2 - ($\overline{8 - 3}$)} + 3{5 + (- 2)(−1)}
SSC MTS 04/09/2023 (3rd Shift)
(a) 30 (b) 119 (c) 50 (d) 71

Q.125. Evaluate $3\frac{1}{2}$ - [$2\frac{1}{4}$ ÷ {$1\frac{1}{4}$ - $\frac{3}{4}$ ($1\frac{1}{2}$ - $\frac{1}{2}$ - $2\frac{1}{2}$)}]
SSC MTS 11/09/2023 (1st Shift)
(a) $1\frac{21}{38}$ (b) $2\frac{19}{18}$ (c) $2\frac{21}{38}$ (d) $\frac{47}{38}$

Q.126. What is the value of
$\frac{\left[\frac{1}{5} \div \frac{1}{5} \times \frac{1}{5}\right] \times \frac{1}{5}}{\left[\frac{1}{9} + \frac{1}{9} \times \frac{1}{9}\right] \times \frac{1}{10}}$ + (1 - $\frac{6}{25}$)
SSC MTS 12/09/2023 (2nd Shift)
(a) 2 (b) 1 (c) 3 (d) 4

SSC CHSL 2023 Tier - 1

Q.127. If the mathematical symbols in the expression given below are changed from '+' to '÷' '-' to' ×', ÷' to '-' and ×' to '+'. then what will be the value of the expression ?
87 × 256 + 16 - 77 ÷ 1359
SSC CHSL 07/08/2023 (3rd Shift)
(a) 20 (b) - 40 (c) 40 (d) - 20

Q.128. If $\sqrt{a} = 3b$, then $\frac{a}{b^2}$ is equal to :
SSC CHSL 08/08/2023 (2nd Shift)
(a) $\frac{1}{6}$ (b) 6 (c) $\frac{1}{9}$ (d) 9

Q.129. Simplify the given expression.
$\frac{(0.25)^4 + 2 \times (0.25)^2 + 1 - (0.25)^2}{(0.25)^2 + 0.25 + 1}$
SSC CHSL 08/08/2023 (2nd Shift)
(a) 0.6755 (b) 0.9025
(c) 0.8125 (d) 0.7835

Q.130. Evaluate $\frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$, given that $\sqrt{6} = 2.45$.
SSC CHSL 08/08/2023 (4th Shift)
(a) 7.7 (b) 9.9 (c) 8.8 (d) 6.6

Q.131. Simplify the given expression
$\frac{(4.2)^3 - 0.008}{(4.2)^2 + 0.84 + 0.04}$
SSC CHSL 14/08/2023 (2nd Shift)
(a) 4 (b) - 2 (c) 2 (d) - 4

Q.132. Simplify the given expression and find the value for x = -1.
$\frac{10x^2 + 5x + 2xy + y}{5x + y}$
SSC CHSL 17/08/2023 (3rd Shift)
(a) -1 (b) 0 (c) 1 (d) 2

SSC CGL 2023 Tier - 1

Q.133. Simplify the given expression.
y + 2x - [y - (y - x + y) - (x + y) + y] - 2y.
SSC CGL 17/07/2023 (1st shift)
(a) - y (b) - 2x (c) y (d) 2x

Q.134. Simplify the following
$\frac{3a + b}{2} - \frac{a - 3b}{3}$ + 2b
SSC CGL 19/07/2023 (1st shift)
(a) $\frac{5(a + 3b)}{6}$ (b) $\frac{7a + 3b}{6}$
(c) $\frac{7(a + 3b)}{6}$ (d) $\frac{a + 3b}{6}$

Q.135. Simplify the given expression.
(a - 2b) (b - 3a) + (a + b) (a - 3b) - (b - 3a) (4a - 5b)
SSC CGL 21/07/2023 (1st shift)
(a) $8a^2$ - 10ab
(b) $8a^2$ + 10ab
(c) $10a^2$ - 14ab
(d) $10a^2$ - 4ab

Q.136. Simplify the following expression.
$(4x + 1)^2$ - (4x + 3)(4x - 1)
SSC CGL 24/07/2023 (2nd shift)
(a) (4x + 1) (b) 4 (c) (4x - 3) (d) 4x

Q.137. What value of 'y' will satisfy the following equation ?
$\frac{3y}{1 + \frac{1}{1 + \frac{y}{1 - y}}}$ = 2
SSC CGL 25/07/2023 (1st shift)
(a) $\frac{2}{3}$ (b) $\frac{5}{4}$
(c) $\frac{4}{5}$ (d) $\frac{3}{2}$

Q.138. Simplify the expression $\frac{\sqrt{x} - \sqrt{y}}{\sqrt{x} + \sqrt{y}}$, where x = 2 and y = 3.
SSC CGL 25/07/2023 (4th shift)
(a) $2\sqrt{6}$ - 6 (b) $\sqrt{6}$ - 5
(c) 5 - $2\sqrt{6}$ (d) $2\sqrt{6}$ - 5

SSC Selection Post (Phase - XI)

Q.139. Simplify 52 × 52 − 48 × 48.
Higher Secondary 27/06/2023 (Shift - 3)
(a) 386 (b) 400 (c) 424 (d) 326

SSC CHSL 2022 Tier - 2

Q.140. What is the correct descending order of the following ratios ?
$\frac{17}{30}, \frac{7}{15}, \frac{27}{50}, \frac{11}{20}$
SSC CHSL Tier II (26/06/2023)
(a) $\frac{11}{20} > \frac{17}{30} > \frac{27}{50} > \frac{7}{15}$
(b) $\frac{17}{30} > \frac{11}{20} > \frac{27}{50} > \frac{7}{15}$
(c) $\frac{17}{30} > \frac{27}{50} > \frac{11}{20} > \frac{7}{15}$
(d) $\frac{7}{15} > \frac{11}{20} > \frac{27}{50} > \frac{17}{30}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC MTS 2022 Tier - 1

Q.141. The value of
$(\frac{1}{5}) + [1\frac{1}{4} - \frac{1}{2}] \times (\frac{2}{5})$ lies between :
SSC MTS 04/05/2023 (Morning)
(a) 2.1 and 2.4 (b) 0.2 and 0.6
(c) 1.5 and 1.8 (d) 0.8 and 1.2

Q.142. Find the value of 0.5 + 0.55 + 0.555 + 0.5555 :
SSC MTS 09/05/2023 (Evening)
(a) 1.4405 (b) 1.0555
(c) 1.5555 (d) 2.1605

Q.143. Find the value of
$\sqrt{[(7^2 + 6^3 + 9^2) \div 2 + 52]}$
SSC MTS 16/05/2023 (Morning)
(a) 14 (b) 15 (c) 16 (d) 13

Q.144. What is the value of
$\sqrt{0.52 \times 0.52 + 0.31 \times 0.31 + 0.62 \times 0.52}$?
SSC MTS 13/06/2023 (Morning)
(a) 0.63 (b) 0.73 (c) 0.83 (d) 0.93

Q.145. Find the value of :
$$\frac{\frac{49}{63} \div \frac{21}{9} - \frac{85}{510} + \frac{88}{132} \div \frac{66}{11}}{\frac{1}{7} \div \frac{33}{21} + \frac{26}{143} - \frac{1}{209} \div \frac{1}{19}} ?$$
SSC MTS 19/06/2023 (Afternoon)
(a) $\frac{55}{36}$ (b) $\frac{55}{39}$ (c) $\frac{13}{46}$ (d) $\frac{44}{13}$

SSC CHSL 2022 Tier - 1

Q.146. What is the value of
$$\frac{\frac{5}{2} \div \frac{2}{5} \times \frac{1}{5} - \frac{1}{5} \div \frac{3}{5} \times \frac{5}{2}}{\frac{2}{5} \div \frac{1}{5} - \frac{1}{2} \times \frac{5}{2} \div \frac{25}{4} + \frac{1}{2} \div \frac{2}{5} \times \frac{1}{5}}$$
SSC CHSL 09/03/2023 (1st Shift)
(a) $\frac{31}{127}$ (b) $\frac{32}{127}$ (c) $\frac{28}{125}$ (d) $\frac{25}{123}$

Q.147. If A = $\frac{(36 \div 18 \times 5)}{(36 \div (3 \times 4)}$ and
B = $\frac{(5 \div 15 \times 5 + 6 \times 2 - 5)}{(15 \div 5 \times 25 - 2 \times 3 + 6)}$ then what is the value of (A + B) ?
SSC CHSL 09/03/2023 (4th Shift)
(a) $\frac{776}{225}$ (b) $\frac{424}{225}$ (c) $\frac{772}{225}$ (d) $\frac{401}{225}$

Q.148. What is the difference of the largest and smallest of the given fractions ?
$\frac{5}{11}, \frac{5}{7}, \frac{3}{8}, \frac{6}{13}$
SSC CHSL 13/03/2023 (1st Shift)
(a) $\frac{17}{56}$ (b) $\frac{19}{56}$ (c) $\frac{1}{7}$ (d) $\frac{23}{56}$

Q.149. What is the value of
$$\frac{(.91)^3 + (.09)^3}{[(.91)^2 - .0819 + (.09)^2]}$$
SSC CHSL 15/03/2023 (1st Shift)
(a) 1 (b) 5 (c) 4 (d) 6

SSC CGL 2022 Tier - 2

Q.150. Find the value of the given expression.
$$\sqrt{20 - \sqrt{20 - \sqrt{20 - \sqrt{20 - \ldots\ldots \infty}}}}$$
SSC CGL Tier II (03/03/2023)
(a) 4 (b) 6 (c) 5 (d) 2

Q.151. Simplify the following.
$$\frac{\sqrt{10 + \sqrt{25 + \sqrt{108 + \sqrt{154 + \sqrt{225}}}}}}{\sqrt{16 + 19.25 \times 4^2}}$$
SSC CGL Tier II (06/03/2023)
(a) $\frac{7}{18}$ (b) $\frac{2}{9}$ (c) $\frac{5}{18}$ (d) $\frac{1}{9}$

SSC CGL 2022 Tier - 1

Q.152. Simplify $x^9 \times x^5 \times x^{-4} \times x^0 \times x^{-6}$
SSC CGL 01/12/2022 (2nd Shift)
(a) x^4 (b) x^{-4} (c) x^{-6} (d) x^6

Q.153. What is the value of $100^2 - 99^2 + 98^2 - 97^2 + 96^2 - 95^2 + 94^2 - 93^2 + \ldots\ldots 12^2 - 11^2$?
SSC CGL 05/12/2022 (3rd Shift)
(a) 5050 (b) 4985 (c) 4995 (d) 4950

Q.154. Simplify $\sqrt{36x^2 - 108x + 81}$.
SSC CGL 07/12/2022 (3rd Shift)
(a) 6x - 9 (b) 2x - 9 (c) 5x - 9 (d) 3x - 3

SSC CPO 2022 Tier - 1

Q.155. The value of
$$\frac{\sqrt[3]{-2744} \times \sqrt[3]{-216}}{\sqrt[3]{\frac{64}{729}}}$$ is
SSC CPO 09/11/2022 (Morning)
(a) 164 (b) 152 (c) 189 (d) 156

Q.156. What is the value of 'a' in the below equation ?
$\{(5 \times 5 \times 5 \times 5 \times 5 \times 5)^5 \times (5 \times 5 \times 5 \times 5 \times 5)^8\} \div (5 \times 5) = (625)^a$
SSC CPO 09/11/2022 (Afternoon)
(a) 14 (b) 17 (c) 16 (d) 15

SSC CGL 2021 Tier - 2

Q.157. What is the value of $99\frac{11}{99} + 99\frac{13}{99} + 99\frac{15}{99} + \ldots\ldots + 99\frac{67}{99}$?
SSC CGL Tier II (08/08/2022)
(a) $\frac{94220}{33}$ (b) $\frac{95120}{33}$
(c) $\frac{97120}{33}$ (d) $\frac{96220}{33}$

Q.158. What is the simplified value of
$$\frac{(x+y+z)(xy+yz+zx) - xyz}{(x+y)(y+z)(z+x)} ?$$
SSC CGL Tier II (08/08/2022)
(a) y (b) z (c) 1 (d) x

Q.159. What is the value of
$$\frac{\sqrt{29.16}}{\sqrt{1.1664}} + \frac{\sqrt{0.2916}}{\sqrt{116.64}} + \frac{\sqrt{0.0036}}{\sqrt{0.36}} ?$$
SSC CGL Tier II (08/08/2022)
(a) $\frac{26}{5}$ (b) $\frac{103}{20}$ (c) $\frac{27}{5}$ (d) $\frac{101}{20}$

Q.160. If A = $\frac{\sqrt{0.0004} \times \sqrt[3]{0.000008}}{\sqrt[4]{16000} \times \sqrt[3]{125000} \times \sqrt[4]{810}}$
and B = $\frac{\sqrt[3]{0.729} \times \sqrt[4]{0.0016}}{\sqrt{0.16}}$, then what is A × B ?
SSC CGL Tier II (08/08/2022)
(a) 7×10^{-7} (b) $(\frac{7}{4}) \times 10^{-8}$
(c) $\frac{3}{5} \times 10^{-7}$ (d) $(\frac{7}{3}) \times 10^{-7}$

Q.161. If A = $0.3\overline{12}$, B = $0.4\overline{15}$ & C = $0.30\overline{9}$, then what is the value of A + B + C ?
SSC CGL Tier II (08/08/2022)
(a) $\frac{1141}{1100}$ (b) $\frac{1097}{1100}$ (c) $\frac{1211}{1100}$ (d) $\frac{1043}{1100}$

SSC Selection Post (Phase - X)

Q.162. If √5 = 2.24, then find the value of
$\sqrt{\frac{\sqrt{5}-1}{\sqrt{5}+1}}$
Graduate Level 04/08/2022 (Shift - 4)
(a) 0.62 (b) 0.59 (c) 0.68 (d) 0.55

Q.163. Find the value of : $13^3 + (-8)^3 + (-5^3)$
Higher Secondary 01/08/2022 (Shift - 3)
(a) 1052 (b) 1152 (c) 1562 (d) 1560

SSC MTS 2021 Tier - 1

Q.164. Select the number that will come in place of the question mark(?) in the mathematical statement.
$(0.064)^{123} \div (0.16)^{47} \times (0.4)^{34} \times (0.4)^{29} = (0.4)^?$
SSC MTS 08/07/2022 (Afternoon)
(a) 350 (b) 320 (c) 338 (d) 341

Q.165. If P = 7×4 - 3, Q = 8÷4 + 2, and R = 14 ÷ 21× 9, then what is the value of P × Q + R ?
SSC MTS 25/07/2022 (Morning)
(a) 96 (b) 112 (c) 108 (d) 106

SSC CHSL 2021 Tier - 1

Q.166. Simplify the expression
$(36p^2 + 49q^2)(6p + 7q)(6p - 7q)$
SSC CHSL 24/05/2022 (Morning)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) $1296p^4 + 2401q^4$ (b) $36p^4 - 49q^4$
(c) $1296p^4 - 2401q^4$ (d) $36p^4 + 49q^4$

Q.167. Simplify :
$3p - [3p - \overline{p + q} - \{3p - (p - \overline{q - p})\}]$
SSC CHSL 24/05/2022 (Afternoon)
(a) $3p - q$ (b) $p + 2q$
(c) $3p + 2q$ (d) $2p + 2q$

Q.168. Find the value of
$\left(\frac{9^3 + 9^4 + 9^5 + 9^6 + 9^7}{9^1 + 9^2 + 9^3 + 9^4 + 9^5}\right)^{\frac{1}{2}} = ?$
SSC CHSL 01/06/2022 (Morning)
(a) 9 (b) 3 (c) 729 (d) 81

Q.169. Simplify the following expression
$3\frac{6}{7} - \{5\frac{1}{7} - (2\frac{3}{7} - \overline{3\frac{5}{7} - 4})\}$
SSC CHSL 01/06/2022 (Afternoon)
(a) $\frac{34}{7}$ (b) $\frac{10}{7}$ (c) $\frac{20}{7}$ (d) $\frac{44}{7}$

Q.170. If a, b, c are positive real numbers, what is the value of
$\sqrt{a^{-1}b} \times \sqrt{b^{-1}c} \times \sqrt{c^{-1}a}$?
SSC CHSL 03/06/2022 (Evening)
(a) 2 (b) 3 (c) 1 (d) 4

Q.171. The value of
$$\frac{(a-b)^3 + (b-c)^3 + (c-a)^3}{(a^2-b^2)^3 + (b^2-c^2)^3 + (c^2-a^2)^3}$$
is equal to
SSC CHSL 06/06/2022 (Morning)
(a) ab + bc + ca (b) 0
(c) 1 (d) $\frac{1}{(a+b)(b+c)(c+a)}$

Q.172. Find the value of
$\sqrt{2 + \sqrt{3}} + \sqrt{2 - \sqrt{3}}$.
SSC CHSL 06/06/2022 (Evening)
(a) $\sqrt{6}$ (b) $2\sqrt{3}$ (c) $2\sqrt{2}$ (d) 6

Q.173. Simplify :
$$\frac{(r-s)^3 + (s-t)^3 + (t-r)^3}{6(r-s)(s-t)(t-r)}$$
SSC CHSL 09/06/2022 (Afternoon)
(a) $\frac{1}{6}$ (b) $\frac{1}{2}$ (c) $\frac{1}{3}$ (d) $\frac{1}{4}$

Q.174. Simplify: $(a^{-1} + b^{-1}) \div (a^{-3} + b^{-3})$
SSC CHSL 09/06/2022 (Evening)
(a) $\frac{ab}{a^2 - ab + b^2}$ (b) $\frac{a^3b^3}{a^2 - ab + b^2}$
(c) $\frac{a^2b^2}{a^2 + ab + b^2}$ (d) $\frac{a^2b^2}{a^2 - ab + b^2}$

SSC CGL 2021 Tier - 1

Q.175. Simplify the following expressions:
$$\frac{(a^2 - 4b^2)^3 + 64(b^2 - 4c^2)^3 + (16c^2 - a^2)^3}{(a-2b)^3 + (2b-4c)^3 + (4c-a)^3}$$
SSC CGL 11/04/2022 (Afternoon)
(a) −(a − 2b) (b + 2c) (4c + a)
(b) 2(a + 2b) (b + 2c) (4c + a)
(c) (a + 2b) (b + 2c) (4c + a)
(d) 4(a + 2b) (b + 2c) (4c + a)

Q.176. If $5\sqrt{3} + \sqrt{75} = 17.32$, then the value of $14\sqrt{3} + \sqrt{108}$ is :
SSC CGL 20/04/2022 (Evening)
(a) 32.46 (b) 35.64 (c) 34.64 (d) 33.86

SSC CGL 2020 Tier - 2

Q.177. If 847 × 385 × 675 × 3025 = $3^a \times 5^b \times 7^c \times 11^d$, then the value of ab - cd is:
SSC CGL Tier II (29/01/2022)
(a) 5 (b) 1 (c) 4 (d) 7

Q.178. The value of
$\frac{1}{4-\sqrt{15}} - \frac{1}{\sqrt{15}-\sqrt{14}} + \frac{1}{\sqrt{14}-\sqrt{13}} - \frac{1}{\sqrt{13}-\sqrt{12}} + \frac{1}{\sqrt{12}-\sqrt{11}} - \frac{1}{\sqrt{11}-\sqrt{10}} + \frac{1}{\sqrt{10}-3} - \frac{1}{3-\sqrt{8}}$ is:
SSC CGL Tier II (29/01/2022)
(a) $4 - 2\sqrt{2}$ (b) $2 + 2\sqrt{2}$
(c) $4 + 2\sqrt{2}$ (d) $2 - 2\sqrt{2}$

Q.179. If $\frac{\sqrt{38 - 5\sqrt{3}}}{\sqrt{26 + 7\sqrt{3}}} = \frac{a + b\sqrt{3}}{23}$, b > 0, then the value of (b - a) is :
SSC CGL Tier II (03/02/2022)
(a) 7 (b) 18 (c) 29 (d) 11

SSC MTS 2020 Tier - 1

Q.180. What is the simplified value of
$\{4 - \frac{2}{1 + \frac{2}{1 - \frac{1}{2 + \frac{3}{4}}}}\} \div 1\frac{5}{12}$ of $\frac{72}{145}$ - (4 + 3 ÷ 0.5 - 1)
SSC MTS 20/10/2021 (Afternoon)
(a) - 4 (b) 1 (c) 3 (d) - 2

Q.181. The value of $4\frac{2}{5} \div \{(1\frac{1}{2} - 3\frac{1}{5}) \div 3\frac{2}{5} + (2\frac{1}{5} \div 1\frac{1}{2} + 4\frac{2}{5}) + \frac{1}{2}\} = ?$
SSC MTS 22/10/2021 (Evening)
(a) $\frac{4}{7}$ (b) $\frac{3}{7}$ (c) $\frac{3}{5}$ (d) $\frac{3}{4}$

SSC CGL 2020 Tier - 1

Q.182. The value of $3\frac{5}{6} + [3\frac{2}{3} + \{\frac{15}{4}(5\frac{4}{5} \div 14\frac{1}{2})\}]$ is equal to:
SSC CGL 16/08/2021 (Afternoon)
(a) 9 (b) 6 (c) 7 (d) 8

Q.183. Simplify the following expression:
$(\frac{3}{4} - \frac{1}{4} \div \frac{1}{4} \text{ of } \frac{2}{5}) \div (\frac{3}{4} \div \frac{2}{3} \text{of } \frac{3}{5})$
SSC CGL 24/08/2021 (Evening)
(a) $\frac{14}{75}$ (b) - $\frac{70}{27}$ (c) - $\frac{14}{15}$ (d) $\frac{32}{75}$

SSC CHSL 2020 Tier - 1

Q.184. Simplify the following expression.
$(2x - 3y)^3 - 18xy(2x - 3y)$
SSC CHSL 12/04/2021 (Morning)
(a) $8x^3 - 27y^3 - 36x^2y - 54xy^2$
(b) $8x^3 - 27y^3 - 72x^2y + 108xy^2$
(c) $8x^3 - 27y^3$
(d) $8x^3 + 108xy^2 - 72x^2y$

Q.185. The value of
$364 - [142 - \{75 + (38 - \overline{\frac{5}{4} + \frac{14}{8}})\}]$ is:
SSC CHSL 11/08/2021 (Evening)
(a) 332 (b) 330 (c) 331 (d) 334

Answer Key :-

1.(b)	2.(a)	3.(a)	4.(b)
5.(a)	6.(a)	7.(c)	8.(b)
9.(d)	10.(a)	11.(b)	12.(d)
13.(c)	14.(c)	15.(d)	16.(d)
17.(d)	18.(a)	19.(c)	20.(a)
21.(c)	22.(a)	23.(b)	24.(d)
25.(a)	26.(d)	27.(d)	28.(d)
29.(a)	30.(b)	31.(c)	32.(b)
33.(b)	34.(b)	35.(b)	36.(a)
37.(d)	38.(b)	39.(b)	40.(d)
41.(a)	42.(d)	43.(d)	44.(a)
45.(b)	46.(d)	47.(b)	48.(c)
49.(a)	50.(d)	51.(d)	52.(a)
53.(b)	54.(b)	55.(d)	56.(b)
57.(c)	58.(c)	59.(a)	60.(d)
61.(d)	62.(b)	63.(b)	64.(a)
65.(c)	66.(c)	67.(c)	68.(d)
69.(b)	70.(b)	71.(c)	72.(d)
73.(a)	74.(d)	75.(b)	76.(c)
77.(a)	78.(b)	79.(c)	80.(b)
81.(a)	82.(c)	83.(a)	84.(d)
85.(b)	86.(a)	87.(d)	88.(c)
89.(a)	90.(c)	91.(b)	92.(c)
93.(b)	94.(c)	95.(b)	96.(d)
97.(b)	98.(a)	99.(c)	100.(c)
101.(a)	102.(b)	103.(a)	104.(d)
105.(d)	106.(c)	107.(b)	108.(c)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

109.(d)	110.(c)	111.(a)	112.(d)
113.(d)	114.(c)	115.(d)	116.(b)
117.(c)	118.(b)	119.(a)	120.(c)
121.(d)	122.(c)	123.(b)	124.(d)
125.(c)	126.(d)	127.(b)	128.(d)
129.(c)	130.(b)	131.(a)	132.(a)
133.(d)	134.(c)	135.(c)	136.(b)
137.(c)	138.(d)	139.(b)	140.(b)
141.(b)	142.(d)	143.(b)	144.(c)
145.(a)	146.(d)	147.(a)	148.(b)
149.(a)	150.(a)	151.(b)	152.(a)
153.(c)	154.(a)	155.(c)	156.(b)
157.(b)	158.(c)	159.(b)	160.(c)
161.(a)	162.(a)	163.(d)	164.(c)
165.(d)	166.(c)	167.(d)	168.(a)
169.(b)	170.(c)	171.(d)	172.(a)
173.(b)	174.(d)	175.(b)	176.(c)
177.(a)	178.(a)	179.(c)	180.(a)
181.(d)	182.(a)	183.(c)	184.(b)
185.(a)			

Solutions :-

Sol.1.(b) $\frac{(25)^4+1250+1-(25)^2}{(25)^2+25+1}$

$= \frac{(25)^4-(25)^2+1250+1}{(25)^2+25+1}$

$= \frac{[(25)^2]^2+2\times 25^2\times 1+(1)^2-(25)^2}{(25)^2+25+1}$

$= \frac{[(25)^2+1]^2-(25)^2}{(25)^2+25+1}$

$= \frac{[(25^2+1+25)\,(25^2+1-25)]}{(25)^2+25+1}$

$= (25^2+1-25) = 625-24 = 601$

Sol.2.(a) $\frac{25a^2-10ab-48b^2}{5a+6b}\times(5a+8b)$

$\frac{25a^2-40ab+30ab-48b^2}{5a+6b}\times(5a+8b)$

$\frac{5a(5a-8b)+6b\,(5b-8b)}{5a+6b}\times(5a+8b)$

$\frac{(5a-8b)\,(5a+6b)}{5a+6b}\times(5a+8b)$

$(5a-8b)\times(5a+8b)$

$(5a)^2-(8b)^2 = 25a^2-64b^2$

Sol.3.(a)

$= \frac{(x^2-9)\times(9x^2-1)}{\left(x-\frac{1}{3}\right)\times\left(1-\frac{x}{3}\right)}\times\frac{9}{\left(x+\frac{1}{3}\right)\left(1+\frac{x}{3}\right)}$

$= \frac{(x+3)(x-3)(3x+1)(3x-1)}{\frac{(3x-1)(3-x)}{9}}\times$

$\frac{9}{\frac{(3x+1)(3+x)}{9}} = -729$

Sol.4.(b)

$A = \frac{58^2-25^2}{46^2-37^2} = \frac{(58-25)(58+25)}{(46-37)(46+37)}$

$= \frac{33\times 83}{9\times 83} = \frac{11}{3}$

$B = \frac{26^2-15^2}{56^2-15^2} = \frac{(26-15)(26+15)}{(56-15)(56+15)}$

$= \frac{11\times 41}{41\times 71} = \frac{11}{71}$

Then, $\frac{1}{B}-\frac{20}{A} = \frac{71}{11}-\frac{20\times 3}{11} = \frac{11}{11} = 1$

Sol.5.(a)

$\Rightarrow [(2\frac{7}{9})^{2\frac{1}{2}}]^{\frac{3}{5}} = [(\frac{5}{3})^2)^{\frac{5}{2}}]^{\frac{3}{5}} = (\frac{5}{3})^3$

$\Rightarrow [(1\frac{2}{3})^5]^{\frac{3}{5}} = (\frac{5}{3})^3$

∴ both the expressions are equal

Sol.6.(a)

$\frac{24\sqrt{45}-16\sqrt{20}+\sqrt{245}-47\sqrt{5}}{3\frac{1}{5}+1\frac{2}{5}-2\frac{1}{6}-2\frac{1}{5}-5\frac{2}{5}+3\frac{1}{6}}$

$= \frac{72\sqrt{5}-32\sqrt{5}+7\sqrt{5}-47\sqrt{5}}{\frac{16}{5}+\frac{7}{5}-\frac{13}{6}-\frac{11}{5}-\frac{27}{5}+\frac{19}{6}}$

$= \frac{79\sqrt{5}-79\sqrt{5}}{\frac{16}{5}+\frac{7}{5}-\frac{13}{6}-\frac{11}{5}-\frac{27}{5}+\frac{19}{6}} = 0$

Sol.7.(c)

$\frac{(3.321)^3+(2.681)^3+(1.245)^3-3\times 3.321\times 2.681\times 1.245}{(3.321)^2+(2.681)^2+(1.245)^2-(3.321\times 2.681)-(2.681\times 1.245)-(1.245\times 3.321)}$

$\frac{a^3+b^3+c^3-3abc}{a^2+b^2+c^2-ab-bc-ca} = (a+b+c)$

Here, 3.321 + 2.681 + 1.245 = 7.247

Sol.8.(b) 0.01 + 0.68 × 0.68 + 0.22 × 0.22 + 0.44 + 0.136 + 0.44 × 0.68

$= (0.68+0.22)^2 + 0.01 + 0.044 + 0.136$

0.81 + 0.19 = 1

Sol.9.(d) $(a+b+c)^2 = a^2+b^2+c^2+2ab+2bc+2ca$

$\frac{0.09\times 0.09+0.04\times 0.04+0.16\times 0.16+2\times 0.09\times 0.04+2\times 0.04\times 0.16+2\times 0.09\times 0.16}{0.3\times 0.3+0.2\times 0.2+0.4\times 0.4}$

$\frac{(0.09)^2+(0.04)^2+(0.16)^2+2\times 0.09\times 0.04+2\times 0.04\times 0.16+2\times 0.09\times 0.16}{0.09+0.04+0.16}$

$= \frac{(0.09+0.04+0.16)^2}{0.09+0.04+0.16}$

= 0.09 + 0.04 + 0.16 = 0.29

Sol.10.(a) $\frac{4^{a+4}-5\times 4^{a+2}}{15\times 4^a-2^2\times 4^a}$

$= \frac{4^a(4^4-5\times 4^2)}{4^a(15-2^2)} = \frac{(256-80)}{11} = 16$

Sol.11.(b)

$(2^2+1)(2^4+1)(2^8+1)(2^{16}+1).....(2^{128}+1)$

Multiply and divide by (2^2-1) in the given equation , we get

$\frac{(2^2-1)(2^2+1)(2^4+1)(2^8+1)(2^{16}+1).....(2^{128}+1)}{(2^2-1)}$

$= \frac{(2^4-1)(2^4+1)(2^8+1)(2^{16}+1).....(2^{128}+1)}{3}$

$= \frac{(2^8-1)(2^8+1)(2^{16}+1).....(2^{128}+1)}{3}$

$= \frac{(2^{256}-1)}{3}$

Sol.12.(d) $\frac{1}{2}+\frac{1}{6}+\frac{1}{12}+.....\frac{1}{110} < \frac{5}{6}$

$= (1-\frac{1}{2}) + (\frac{1}{2}-\frac{1}{3}) + (\frac{1}{3}-\frac{1}{4}) + ...$

$(\frac{1}{10}-\frac{1}{11}) < \frac{5}{6} = 1-\frac{1}{11} = \frac{10}{11} > \frac{5}{6}$

Hence, the first statement is wrong.

now, $\frac{1}{3}+\frac{1}{15}+\frac{1}{35}+.....\frac{1}{143} > \frac{7}{13}$

$= \frac{1}{2}[(1-\frac{1}{3}) + (\frac{1}{3}-\frac{1}{5}) + (\frac{1}{5}-\frac{1}{7})$

$+.....(\frac{1}{11}-\frac{1}{13}) > \frac{7}{13} = \frac{1}{2}[(1-\frac{1}{13})$

$= \frac{6}{13} < \frac{7}{13}$

Hence, the second statement is also wrong.

Sol.13.(c)

$\frac{[\frac{5}{8}-\{\frac{3}{8}-(\frac{5}{8}-\frac{3}{8})\}]of\ 8.8-1.2}{4\frac{1}{6}\div 2.5\times 2\div\frac{1}{6}of\ 60+(\frac{3}{4}-\frac{3}{8})}$

$= \frac{[\frac{5}{8}-\{\frac{3}{8}-\frac{1}{4}\}]of\ 8.8-1.2}{\frac{25}{6}\div 2.5\times 2\div 10+\frac{3}{8}}$

$= \frac{[\frac{5}{8}-\frac{1}{8}]of\ 8.8-1.2}{\frac{25}{6}\div\frac{5}{2}\times 2\div 10+\frac{3}{8}}$

$= \frac{\frac{1}{2}of\ 8.8-1.2}{\frac{5}{3}\times\frac{1}{5}+\frac{3}{8}} = \frac{4.4-1.2}{\frac{1}{3}+\frac{3}{8}}$

$= \frac{3.2}{\frac{17}{24}} = 4\frac{44}{85}$

Sol.14.(c)

$\frac{24\div\frac{3}{8}\ of(8+2\times\overline{7-3})+[\frac{2}{11}\div\frac{4}{55}-\{\frac{5}{8}+\frac{6}{16}\}]}{32\div\overline{15-7}+75\div(6+15\div 3+4)}$

$= \frac{24\div\frac{3}{8}\ of\ (8+2\times 4)+\left[\frac{5}{2}-1\right]}{32\div 8+75\div(6+5+4)}$

$= \frac{24\div\frac{3}{8}\ of\ 16+1.5}{4+75\div 15} = \frac{4+1.5}{9}$

$= \frac{5.5}{9} = \frac{11}{18}$

Sol.15.(d)

$\frac{(6.9)^3+(2.7)^3+(5.8)^3-3\times 6.9\times 2.7\times 5.8}{(6.9)^2+(2.7)^2+(5.8)^2-(6.9)(2.7)-(2.7)(5.8)-(5.8)(6.9)}$

$\frac{(6.9+2.7+5.8)\{(6.9)^2+(2.7)^2+(5.8)^2-(6.9\times 2.7)-(2.7\times 5.8)-(5.8\times 6.9)\}}{(6.9)^2+(2.7)^2+(5.8)^2-(6.9)(2.7)-(2.7)(5.8)-(5.8)(6.9)}$

= 6.9 + 2.7 + 5.8 = 15.4

Sol.16.(d)

$9\frac{1}{5}\div\{(16\frac{1}{5}\div\overline{12\frac{2}{3}-9\frac{2}{3}}+17\frac{1}{2}$ of $3\frac{1}{21}\}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{46}{5} \div \{\frac{81}{5} \div (\overline{\frac{38}{3} - \frac{29}{3}}) + \frac{35}{2}\}$ of $\frac{64}{21}$

$= \frac{46}{5} \div \{\frac{81}{5} \div 3 + \frac{160}{3}\}$

$= \frac{46}{5} \div \{\frac{27}{5} + \frac{160}{3}\}$

$= \frac{46}{5} \div \frac{881}{15} \Rightarrow \frac{46}{5} \times \frac{15}{881} \Rightarrow \frac{138}{881}$

Sol.17.(d)

$\frac{1}{4} + \frac{[(20.35)^2 - (8.35)^2] \times 0.0175}{(1.05)^2 + (1.05)(27.65)}$

$= \frac{1}{4} + \frac{[(20.35+8.35)(20.35-8.35)] \times 0.0175}{(1.05)\{(1.05) + (27.65)\}}$

$= \frac{1}{4} + \frac{[28.7 \times 12] \times 0.0175}{(1.05)(28.7)}$

$= \frac{1}{4} + \frac{12 \times 175}{105 \times 100} = \frac{1}{4} + \frac{12 \times 5}{3 \times 100}$

$= \frac{1}{4} + \frac{1}{5} = \frac{9}{20}$

Sol.18.(a)

$\frac{119 - [48 \div 6 - 7\{5 \times 12 \div 3 - (15 - \overline{3 - 8})\}]}{24 \div 3 - 9 \text{ of } 3 + (52 - \overline{8 - 4}) \div 6}$

$= \frac{119 - [8 - 7\{5 \times 4 - (15 + 5)\}]}{8 - 27 + (52 - 4) \div 6}$

$= \frac{119 - [8 - 7\{20 - (20)\}]}{8 - 27 + (48) \div 6}$

$= \frac{119 - [8 - 7\{0\}]}{8 - 27 + 8}$

$= \frac{119 - [8]}{-11} = -\frac{111}{11}$

Sol.19.(c) $\frac{1}{4 - \sqrt{8}}$ (on rationalizing)

$= \frac{1}{4 - \sqrt{8}} \times \frac{4 + \sqrt{8}}{4 + \sqrt{8}} = \frac{4 + \sqrt{8}}{8}$ so,

$= \frac{4 + \sqrt{8}}{8} + \frac{3 + 2\sqrt{2}}{3 - 2\sqrt{2}} - \frac{3 - 2\sqrt{2}}{3 + 2\sqrt{2}}$

$= \frac{4 + \sqrt{8}}{8} + \frac{(3 + 2\sqrt{2})^2 - (3 - 2\sqrt{2})^2}{(3)^2 - (2\sqrt{2})^2}$

$= \frac{4 + \sqrt{8}}{8} + \frac{24\sqrt{2}}{9 - 8} \Rightarrow \frac{1}{2} + \frac{\sqrt{2}}{4} + 24\sqrt{2}$

Since, $\frac{1}{2} + \frac{97}{4}\sqrt{2} = a + b\sqrt{2}$

On comparing a = $\frac{1}{2}$, b = $\frac{97}{4}$

3a + 4b = $3 \times \frac{1}{2} + 4 \times \frac{97}{4} = 98\frac{1}{2}$

Sol.20.(a) After checking option one by one option (a) satisfies.

$4 \times 30 - 15 \div 5 + 12 = 21$

$\Rightarrow 4 \times 30 \div 5 - 15 + 12 = 21$

$\Rightarrow 4 \times 6 - 15 + 12 = 21$

$\Rightarrow 24 - 15 + 12 = 21 \Rightarrow 9 + 12 = 21$

$\Rightarrow 21 = 21$

Sol.21.(c) $\frac{4}{1 + \sqrt{2} + \sqrt{3}}$

$= a + b\sqrt{2} + c\sqrt{3} - d\sqrt{6}$

$= \frac{4}{1 + \sqrt{2} + \sqrt{3}} \times \frac{\sqrt{3} + 1 - \sqrt{2}}{\sqrt{3} + 1 - \sqrt{2}}$

$= (a + b)(a - b) = a^2 - b^2$

$\frac{4\sqrt{3} + 4 - 4\sqrt{2}}{(\sqrt{3} + 1)^2 - (\sqrt{2})^2} = \frac{4\sqrt{3} + 4 - 4\sqrt{2}}{2\sqrt{3} + 2}$

$= \frac{2\sqrt{3} + 2 - 2\sqrt{2}}{\sqrt{3} + 1} \times \frac{\sqrt{3} - 1}{\sqrt{3} - 1}$

$= \frac{(2\sqrt{3} + 2 - 2\sqrt{2})(\sqrt{3} - 1)}{3 - 1}$

$= \frac{(2\sqrt{3} + 2 - 2\sqrt{2})(\sqrt{3} - 1)}{2}$

$= (\sqrt{3} + 1 - \sqrt{2})(\sqrt{3} - 1)$

$= 3 + \sqrt{3} - \sqrt{6} - \sqrt{3} - 1 + \sqrt{2}$

$= 2 + \sqrt{2} - \sqrt{6} = a + b\sqrt{2} + c\sqrt{3} - d\sqrt{6}$

a = 2; b = 1; c = 0; d = 1

a + b + c + d = 2 + 1 + 0 + 1 = 4

Sol.22.(a)

$[\{(\frac{2}{3})^3\}^{(2x+3)}]^{\frac{-3}{4}} = [\{(\frac{2}{3})^{\frac{2}{3}}\}^{(3x+7)}]^{\frac{-6}{5}}$

$\Rightarrow [\{(\frac{2}{3})^3\}^{(2x+3)}]^{\frac{3}{4}} = [\{(\frac{2}{3})^{\frac{2}{3}}\}^{(3x+7)}]^{\frac{6}{5}}$

$\Rightarrow [\{(\frac{2}{3})^3\}^{\frac{3(2x+3)}{4}}] = [\{(\frac{2}{3})^{\frac{2}{3}}\}^{\frac{6(3x+7)}{5}}]$

$\Rightarrow [\{(\frac{2}{3})^3\}^{\frac{6x+9}{4}}] = [\{(\frac{2}{3})^{\frac{2}{3}}\}^{\frac{18x+42}{5}}]$

$\Rightarrow \{(\frac{2}{3})^{\frac{3(6x+9)}{4}}\}$

$= [\{(\frac{2}{3})^{\frac{2(18x+42)}{3 \times 5}}\}] = \{(\frac{2}{3})^{\frac{18x+27}{4}}\}$

$= \frac{36x + 84}{15} = \frac{18x + 27}{4}$

$\Rightarrow 4(36x + 84) = 15(18x + 27)$

$\Rightarrow 144x + 336 = 270x - 405$

$\Rightarrow 126x = 336 - 405 \Rightarrow 126x = -69$

$\Rightarrow x = -\frac{69}{126} = -\frac{69}{126}$

Now put the value of x in given equation

$\sqrt{2 - 42x} = \sqrt{2 - 42(-\frac{23}{42})}$

$= \sqrt{2 + 23} = \sqrt{25} = 5$

Sol.23.(b) $\frac{42 - 12 \times 3 + 8 \div 2 + 15}{8 \times 2 - 4 + 9 \div 3}$

After applying changes as per question we get

$\frac{42 + 12 \div 3 - 8 \times 2 - 15}{8 \div 2 + 4 - 9 \times 3} = -\frac{15}{19}$

Sol.24.(d) $\frac{(4.6)^4 + (5.4)^4 + (24.84)^2}{(4.6)^2 + (5.4)^2 + 24.84}$

$\frac{\{(4.6)^2 + (5.4)^2\}^2 - 2\{(4.6)^2(5.4)^2\} + (24.84)^2}{(4.6)^2 + (5.4)^2 + 24.84}$

$= \frac{\{(4.6)^2 + (5.4)^2\}^2 - (24.84)^2}{(4.6)^2 + (5.4)^2 + 24.84}$

$\frac{[\{(4.6)^2 + (5.4)^2\} - (24.84)][\{(4.6)^2 + (5.4)^2\} + (24.84)]}{(4.6)^2 + (5.4)^2 + 24.84}$

$= (4.6)^2 + (5.4)^2 - 24.84$

$= (4.6 + 5.4)^2 - 2(4.6)(5.4) - 24.84$

$= 100 - 74.52 = 25.48$

Sol.25.(a) $\frac{(0.545)(0.081)(0.51)(5.2)}{(0.324)^3 + (0.221)^3 - (0.545)^3}$

$= \frac{(0.545)(0.081) \times 4 \times 3 \times (0.17)(1.3)}{(0.324)^3 + (0.221)^3 - (0.545)^3}$

$= \frac{3 \times (0.545)(0.324)(0.221)}{(0.324)^3 + (0.221)^3 - (0.545)^3}$

Now, since

(0.324 + 0.221 - 0.545 = 0)

$\Rightarrow (0.324)^3 + (0.221)^3 - (0.545)^3 = -\{3 \times (0.545)(0.324)(0.221)\}$

....(Algebraic property)

So, $\frac{3 \times (0.545)(0.324)(0.221)}{(0.324)^3 + (0.221)^3 - (0.545)^3}$

$= \frac{3 \times (0.545)(0.324)(0.221)}{-\{3 \times (0.545)(0.324)(0.221)\}} = -1$

Sol.26.(d) $22.\overline{4} + 11.5\overline{67} - 33.5\overline{9}$

$= 22.444444....\infty + 11.5676767...\infty - 33.599999...\infty$

$= 0.412121212....\infty = 0.4\overline{12}$

Sol.27.(d)

$\frac{(0.7)^2 \div 0.14 + (0.6)^2 \div 0.18 + (0.5)^2 \div 0.05}{4(2.5 \text{ of } 4 - 13 \times 0.25 \times 3)}$

$= \frac{0.49 \div 0.14 + 0.36 \div 0.18 + 0.25 \div 0.05}{4(10 - 9.75)}$

$= \frac{3.5 + 2 + 5}{4 \times 0.25} = 10.5 = \frac{21}{2}$

Sol.28.(d)

$x = \frac{1}{12.13} + \frac{1}{13.14} + \frac{1}{14.15} .....+ \frac{1}{23.24}$

$= \frac{1}{12} - \frac{1}{13} + \frac{1}{13} - \frac{1}{14} + ...+ \frac{1}{23} - \frac{1}{24}$

$= \frac{1}{12} - \frac{1}{24} = \frac{1}{24}$

$y = \frac{1}{36.37} + \frac{1}{37.38} + \frac{1}{38.39} .....+ \frac{1}{71.72}$

$= \frac{1}{36} - \frac{1}{37} + \frac{1}{37} - \frac{1}{38} + .. + \frac{1}{71} - \frac{1}{72}$

$= \frac{1}{36} - \frac{1}{72} = \frac{1}{72}$

Therefore, $\frac{x}{y} = \frac{\frac{1}{24}}{\frac{1}{72}} = 3$

Alternate Method :-

$x = \frac{1}{12.13} + \frac{1}{13.14} + \frac{1}{14.15} .....+ \frac{1}{23.24}$

$= \frac{1}{13 - 12}(\frac{1}{12} - \frac{1}{24}) = \frac{1}{24}$

$y = \frac{1}{36.37} + \frac{1}{37.38} + \frac{1}{38.39} .....+ \frac{1}{71.72}$

$= \frac{1}{37 - 36}(\frac{1}{36} - \frac{1}{72}) = \frac{1}{72}$

Therefore, $\frac{x}{y} = \frac{\frac{1}{24}}{\frac{1}{72}} = 3$

Sol.29.(a) $\frac{0.01404}{24^2 + 6^2 - 144}$

$= \frac{0.01404}{576 + 36 - 144} = \frac{0.01404}{612 - 144}$

$= \frac{0.01404}{468} = 3 \times 10^{-5}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.30.(b) $\frac{1.0025 + 6.25 \times 10^{-6}}{0.0025 + 0.95}$

$= (\frac{1.00250625}{0.9525}) = 1.0525$

Sol.31.(c)

5 + 24 × 8 ÷ 8 of 8 - 8 ÷ 8 × 4 of 4

= 5 + 24 × 8 ÷ 64 - 1×16 = 5 + 3 - 16 = -8

Sol.32.(b)

$(2z - 5y)^2 + (5z + 2y)^2 - 25z^2$

$= 4z^2 + 25y^2 - 20zy + 25z^2 + 4y^2 + 20zy - 25z^2 = 29y^2 + 4z^2$

Sol.33.(b) According to question,

HCF of (221 and 488) = 1

Since the HCF is 1, the fraction $\frac{221}{488}$ is already in its lowest terms.

So, the lowest term is $\frac{221}{488}$

Sol.34.(b) $\frac{(x^2 - 9)}{x + 3} = \frac{(x^2 - 3^2)}{x + 3}$

$= \frac{(x - 3)(x + 3)}{(x + 3)} = (x - 3)$

Sol.35.(b)

$\frac{(8.3)^3 + (9.2)^3 + (6.1)^3 - 3 \times 8.3 \times 9.2 \times 6.1}{(8.3)^2 + (9.2)^2 + (6.1)^2 - 8.3 \times 9.2 - 9.2 \times 6.1 - 6.1 \times 8.3}$

Identity used:- $(a)^3 + (b)^3 + (c)^3 - 3abc = (a + b + c)[(a)^2 + (b)^2 + (c)^2 - ab - bc - ac]$

$\frac{(8.3)^3 + (9.2)^3 + (6.1)^3 - 3 \times 8.3 \times 9.2 \times 6.1}{\frac{(8.3)^3 + (9.2)^3 + (6.1)^3 - 3 \times 8.3 \times 9.2 \times 6.1}{(8.3 + 9.2 + 6.1)}}$

$= 8.3 + 9.2 + 6.1 = 23.6$

Sol.36.(a) $\frac{0.58 \times 0.58 \times 0.58 - 0.001}{0.58 \times 0.58 + 0.058 + 0.01}$

$= \frac{(0.58)^3 - (0.1)^3}{[(0.58)^2 + 0.1 \times 0.58 + (0.1)^2]}$

Using identity :

$(a)^3 - (b)^3 = (a - b)(a^2 + b^2 + ab)$

$= \frac{(0.58 - 0.1)[(0.58)^2 + (0.1)^2 + 0.1 \times 0.58]}{[(0.58)^2 + 0.1 \times 0.58 + (0.1)^2]}$

= 0.58 - 0.1 = 0.48

Sol.37.(d)

45 ÷ 3 + 4 × A - 48 ÷ 24 + 4 = 1

15 + 4A - 2 + 4 =1 ⇒ 17 + 4A = 1

4A = 1 -17 ⇒ 4A = -16 ⇒ A = - 4

Sol.38.(b) Formula used :

$a^3 - b^3 = (a - b)(a^2 + b^2 + ab)$

$\frac{(4.2)^3 - (1.2)^3}{(4.2)^2 + 5.04 + (1.2)^2}$

$= \frac{(4.2 - 1.2)[(4.2)^2 + 5.04 + (1.2)^2]}{(4.2)^2 + 5.04 + (1.2)^2} = 3$

Sol.39.(b)

Formula : $a^3 - b^3 = (a - b)(a^2 + b^2 + ab)$

Now, we have ;

$(1.55^2 + 0.55^2 + 1.55 \times 0.55)$

On multiplying and dividing the above expression by (1.55-0.55), We get ;

$\frac{(1.55 - 0.55)(1.552 + 0.552 + 1.55 \times 0.55)}{(1.55 - 0.55)}$

$= \frac{1.55^3 - 0.55^3}{1} = 1.55^3 - 0.55^3$

Sol.40.(d)

$[(2.5 + 1.5)^2 \div 4 \text{ of } \frac{1}{2} \times 8 - 1]$

$[(4)^2 \div 2 \times 8 - 1] = 8 \times 8 - 1$

= 64 - 1 = 63

Sol.41.(a) $\frac{(x-y)^3 + (y-z)^3 + (z-x)^3}{(x-y)(y-z)(z-x)}$

We know that, when a + b + c = 0 then

$(a)^3 + (b)^3 + (c)^3 = 3abc$.

Now,

$x - y + y - z + z - x = 0$

So, $\frac{3(x-y)(y-z)(z-x)}{(x-y)(y-z)(z-x)} = 3$

Sol.42.(d) $(g - h)^2 - (g + h)^2 + 4gh$

Identity used : $a^2 - b^2 = (a + b)(a - b)$

= (g - h - g - h) (g - h + g + h) + 4gh

= (- 2h) (2g) + 4gh = - 4gh + 4gh = 0

Sol.43.(d)

$\frac{1.5 \times 1.5 + 2.5 \times 2.5 + 3.5 \times 3.5 + 2 \times 1.5 \times 2.5 + 2 \times 2.5 \times 3.5 + 2 \times 1.5 \times 3.5}{1.5 + 2.5 + 3.5}$

We know that $(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$

$\frac{(1.5 + 2.5 + 3.5)^2}{1.5 + 2.5 + 3.5} = 1.5 + 2.5 + 3.5 = 7.5$

Sol.44.(a)

$[(5\frac{1}{2} - 3\frac{1}{3}) \text{ of } 1\frac{5}{13} + 1 - 2 \times 3\frac{5}{2} \div 2\frac{3}{4}]$

$= [(\frac{13}{6}) \text{ of } \frac{18}{13} + 1 - 2 \times \frac{11}{2} \times \frac{4}{11}]$

= [3 + 1 - 4] = 0

Sol.45.(b) $\frac{(4x^2 + 9y^2 - 12xy)}{(3y - 2x)}$

$\frac{(2x)^2 + (3y)^2 - 2 \times 2x \times 3y)}{(3y - 2x)}$

$\frac{(3y - 2x)^2}{(3y - 2x)} = 3y - 2x$

Sol.46.(d)

25 ÷ 5 + 3 of 2 - 4 + 6 of 3 ÷ 2 - 8 + 4

= 5 + 6 - 4 + 18 ÷ 2 - 8 + 4

= 7 + 9 - 8 + 4 = 12

Sol.47.(b)

= 0.07 × 0.28 ÷ 0.04 + 0.64 - 1.64 ÷ 0.04

= 0.07 × 7 + 0.64 - 41

= 0.49 - 40.36 = - 39.87

Sol.48.(c) 11 - {(3 ÷ 4) of 8 - $\overline{4 - 8}$}

⇒ 11 - { 6 - (-4)} ⇒ 11 - 10 = 11 - 10 = 1

Sol.49.(a) 133 ÷ 19 × 3 - 48 × 2 ÷ 24 + 841 ÷ [{$\overline{45 - 16}$}]

$= 7 \times 3 - 48 \times \frac{2}{24} + 841 \div 29$

= 21 - 4 + 29 = 46

Sol.50.(d) $9 \div [1 + \{4 \times (\frac{5}{6} - \overline{\frac{1}{3} + \frac{1}{2}})\}]$

$9 \div [1 + \{4 \times (\frac{5}{6} - \frac{2 + 3}{6})\}]$

$9 \div [1 + \{4 \times (\frac{5}{6} - \frac{5}{6})\}]$

$9 \div [1 + \{4 \times 0\}] \Rightarrow 9 \div 1 = 9$

Sol.51.(d) 9 × N of 4 ÷ 4 - 15 × 4 = 12

9 × 4N ÷ 4 - 60 = 12

9N - 60 = 12 ⇒ 9N = 72 ⇒ N = 8

Sol.52.(a) $\frac{3(16^3 - 6^3)}{(16^2 + 6^2 + Q)} = 30$

$\frac{3(4096 - 216)}{(256 + 36 + Q)} = 30$

$\frac{3(3880)}{(292 + Q)} = 30 \Rightarrow 388 = 292 + Q$

Q = 388 - 292 = 96

Sol.53.(b) (60 + 64 ÷ 4 of 4) × [1000 ÷ {(10 of (3 + 2)) × 2 of 5}] - 28 + (100 × 3 of 3)

= (60 + 64 ÷ 16) × [1000 ÷ {10 of 5 × 10}] - 28 + (100 × 9)

= (60 + 4) × [1000 ÷ 500] - 28 + 900

= 64 × 2 - 28 + 900

= 128 - 28 + 900 = 1000

Sol.54.(b) 626 × 2912 ÷ 8138

$= 626 \times \frac{2912}{8138} = 626 \times \frac{112}{313}$

= 2 × 112 = 224

Sol.55.(d) $\frac{4x^2 - 49y^2}{2x + 7y} + 7y - 2x$

$= \frac{(2x)^2 - (7y)^2}{2x + 7y} + 7y - 2x$

$\frac{(2x + 7y)(2x - 7y)}{2x + 7y} + 7y - 2x$

$= 2x - 7y + 7y - 2x = 0$

Sol.56.(b) $\frac{7 + 8 \times 7 \div 8 + 7 \div 7 \div 7}{3 + 3 \times 3 \div 3 + 5 \div 5 \div 5}$

$\frac{7 + 7 + 1 \div 7}{3 + 3 \times 1 + 1 \div 5} = \frac{14 + \frac{1}{7}}{6 + \frac{1}{5}} =$

$\frac{\frac{99}{7}}{\frac{31}{5}} = \frac{99}{7} \times \frac{5}{31} = \frac{495}{217} = 2\frac{61}{217}$

Sol.57.(c) $\frac{4}{7} \times 4\frac{1}{2} \div 5\frac{1}{3}$ of $2\frac{1}{2}$ - ($7\frac{7}{8} \div 5\frac{1}{9}$ of $9\frac{9}{20}$) + $\frac{1}{2}$

$= \frac{4}{7} \times \frac{9}{2} \div \frac{16}{3}$ of $\frac{5}{2}$ - ($\frac{63}{8} \div \frac{46}{9}$ of $\frac{189}{20}$) + $\frac{1}{2}$

$= \frac{4}{7} \times \frac{9}{2} \div \frac{80}{6} - (\frac{63}{8} \div \frac{483}{10}) + \frac{1}{2}$

$= \frac{4}{7} \times \frac{9}{2} \times \frac{6}{80} - (\frac{63}{8} \times \frac{10}{483}) + \frac{1}{2}$

$= \frac{27}{140} - (\frac{315}{1932}) + \frac{1}{2} = \frac{27}{140} - (\frac{105}{644}) + \frac{1}{2}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{97}{140} - (\frac{105}{644}) = \frac{97 \times 644 - 105 \times 140}{140 \times 644}$

$= \frac{62468 - 14700}{140 \times 644}$

$= \frac{47768}{140 \times 644} = \frac{4 \times 2 \times 7 \times 853}{140 \times 644} = \frac{853}{1610}$

Sol.58.(c) (3 - 3 × 3 + 3 ÷ 3 + 3 × 5) × 2 of 5 + (2 + 2 ÷ 2 + 2 × 2 - 2)
= (3 - 9 + 1 + 15) × 10 + (2 + 1 + 4 - 2)
= (19 - 9) × 10 + (7 - 2)
= (10) × 10 + (5) = 100 + 5 = 105

Sol.59.(a)

$\{(3^3 + 2^3) \times \frac{22}{7}\} \times \{(6^2 + 3^2 - 4^2) \div (14\frac{1}{2})\}$

$= \{(27 + 8) \times \frac{22}{7}\} \times \{(36 + 9 - 16) \div (\frac{29}{2})\}$

$= \{35 \times \frac{22}{7}\} \times \{29 \div (\frac{29}{2})\}$

$= \{110\} \times \{29 \times \frac{2}{29})\} = \{110 \times 2\} \Rightarrow 220$

Sol.60.(d) [40 - 48 ÷ 4 of 3] ÷ {(6 + 4) - 4 of 4 + 4 + (6 - 4) + (4 × 4) ÷ 4} × 3
= [40 - 48 ÷ 12] ÷ {10 - 16 + 4 + 2 + 4} × 3
= 36 ÷ 4 × 3 = 27

Sol.61.(d) $8 - 5 \div 2^3 \times 3 + (7 \div 7 \times 7) \div 7 + (3 \times 6 \div \frac{1}{3}) \times \frac{1}{3^3}$

= 8 - 5 ÷ 8 × 3 + (1 × 7) ÷ 7 + (3 × 6 × 3) $\times \frac{1}{27}$

$= 8 - 5 \times \frac{1}{8} \times 3 + (7) \times \frac{1}{7} + (54) \times \frac{1}{27}$

$= 8 - \frac{15}{8} + 1 + 2 = 11 - \frac{15}{8} = \frac{73}{8}$

Sol.62.(b)

$10 + 3\frac{3}{5} \div [2\frac{2}{3} \div \{7\frac{1}{6} - (2\frac{1}{2} + \frac{2}{3})\}]$

$= 10 + \frac{18}{5} \div [\frac{8}{3} \div \{\frac{43}{6} - (\frac{5}{2} + \frac{2}{3})\}]$

$= 10 + \frac{18}{5} \div [\frac{8}{3} \div \{\frac{43}{6} - (\frac{15+4}{6})\}]$

$= 10 + \frac{18}{5} \div [\frac{8}{3} \div \{\frac{43-19}{6}\}]$

$= 10 + \frac{18}{5} \div [\frac{8}{3} \times \{\frac{6}{24}\}]$

$= 10 + \frac{18}{5} \div [\frac{2}{3}]$

$= 10 + \frac{18}{5} \times \frac{3}{2} = 10 + \frac{27}{5} = \frac{77}{5}$

Sol.63.(b) $3\frac{4}{7} - [16\frac{1}{2} \div \{6^2 - (7 - 2\frac{1}{2})\}]$

$= \frac{25}{7} - [\frac{33}{2} \div \{36 - (7 - \frac{5}{2})\}]$

$= \frac{25}{7} - [\frac{33}{2} \div \{36 - (\frac{9}{2})\}]$

$= \frac{25}{7} - [\frac{33}{2} \div \frac{63}{2}]$

$= \frac{25}{7} - [\frac{33}{2} \times \frac{2}{63}] = \frac{25}{7} - [\frac{33}{63}]$

$= \frac{25 \times 9}{7 \times 9} - \frac{33}{63}$

$= \frac{225 - 33}{63} = \frac{192}{63} = \frac{64}{21}$

Sol.64.(a) $= \frac{\frac{1}{2} \div \frac{3}{4} of \frac{5}{6}}{\frac{1}{2} \div \frac{3}{4} \times \frac{5}{6}} + \frac{2 + 2 \times 2}{2 \div 2 \times 2}$

$= \frac{\frac{1}{2} \div \frac{15}{24}}{\frac{2}{3} \times \frac{5}{6}} + \frac{2+4}{2} = \frac{\frac{12}{15}}{\frac{5}{9}} + 3$

$= \frac{12 \times 3}{5 \times 5} + 3 = \frac{36}{25} + 3$

$= \frac{36 + 75}{25} = \frac{111}{25}$

Sol.65.(c) 4 × 7 - 3{7 × 4 ÷ (6 × 2)}
= 28 - 3{7 × 4 ÷ 12}

$= 28 - 3\{\frac{7}{3}\} = 28 - 7 = 21$

Sol.66.(c) $420 \div [\frac{4}{9} \times (1 + \frac{4}{5}) \times 5] + [\frac{5}{7} \text{ of } \frac{21}{25} \div \frac{3}{4} \text{ of } \frac{2}{5}]$

$= 420 \div [\frac{4}{9} \times (\frac{9}{5}) \times 5] + [\frac{3}{5} \div \frac{3}{10}]$

$= 420 \div 4 + [\frac{3}{5} \times \frac{10}{3}] = 105 + 2 = 107$

Sol.67.(c) $\frac{2 \times 2 + 2}{2 \div 2 \times 2} \div \frac{\frac{1}{2} \div \frac{1}{2} of \frac{1}{2}}{\frac{1}{2} + \frac{1}{2} of \frac{1}{2}}$

$\frac{4+2}{1 \times 2} \div \frac{\frac{1}{2} \div \frac{1}{4}}{\frac{1}{2} + \frac{1}{4}} = 3 \div \frac{\frac{1}{2} \times 4}{\frac{6}{8}}$

$3 \div \frac{2 \times 8}{6} = 3 \times \frac{6}{16} = \frac{9}{8} = 1\frac{1}{8}$

Sol.68.(d) $(24 \div 3 \text{ of } \frac{1}{6}) \times (\frac{4}{5} \div \frac{9}{8} \times \frac{3}{5}) \div (\frac{4}{7} \div \frac{3}{14} \text{ of } \frac{3}{14})$

$= (24 \div \frac{1}{2}) \times (\frac{4}{5} \times \frac{8}{9} \times \frac{3}{5}) \div (\frac{4}{7} \div \frac{9}{196})$

$= (24 \times 2) \times (\frac{32}{75}) \div (\frac{4}{7} \times \frac{196}{9})$

$= 48 \times (\frac{32}{75}) \div (\frac{112}{9})$

$= 48 \times (\frac{32}{75}) \times (\frac{9}{112})$

$= 48 \times (\frac{2}{25}) \times (\frac{3}{7}) = \frac{288}{175}$

Sol.69.(b)

$= \frac{5 + 7 \times 5 \div 8 of 5 + 3 \div 3 \times 5}{6 \div 6 of 4 + 9 \times 9 \div 3 \times 2 \times 2}$

$= \frac{5 + 7 \times 5 \div 40 + 1 \times 5}{6 \div 24 + 27 \times 2 \times 2}$

$= \frac{\frac{7}{8} + 10}{\frac{1}{4} + 108} = \frac{\frac{7+80}{8}}{\frac{1+432}{4}}$

$= \frac{\frac{87}{8}}{\frac{433}{4}} = \frac{87 \times 4}{8 \times 433} = \frac{87}{866}$

Sol.70.(b) $11\frac{1}{4} \div 3\frac{3}{5} \times 6\frac{2}{3} + \frac{1}{6}$

$= \frac{45}{4} \div \frac{18}{5} \times \frac{20}{3} + \frac{1}{6}$

$= \frac{45}{4} \times \frac{5}{18} \times \frac{20}{3} + \frac{1}{6}$

$= \frac{125}{6} + \frac{1}{6} = \frac{126}{6} = 21$

Sol.71.(c)
$[3^3 \{(40 \times 5) + (7 \times 6)\} \div 11] + (2^3 \times 15 \div 24)$
= [27 {(200 + 42} ÷ 11] + 5
= [27 {242} ÷ 11] + 5
= [27 × 22] + 5 = 594 + 5 = 599

Sol.72.(d) Given expression :-
47 ÷ (10 × 5) + (4 – 5) – 6
Replacing the signs as per the directions given, we get ;
47 × (10 ÷ 5) - (4 + 5) + 6
= 47 × 2 - 9 + 6 = 94 - 3 = 91

Sol.73.(a) $\frac{[\frac{1}{4} \div \frac{1}{4} \times \frac{1}{4}] \times \frac{1}{4}}{[\frac{1}{8} + \frac{1}{8} \times \frac{1}{8}]} + (1 - \frac{4}{9})$

$= \frac{\frac{1}{4} \times \frac{1}{4}}{\frac{1}{8} + \frac{1}{64}} + \frac{5}{9} = \frac{\frac{1}{16}}{\frac{9}{64}} + \frac{5}{9}$

$= \frac{1}{16} \times \frac{64}{9} + \frac{5}{9} = \frac{4}{9} + \frac{5}{9} = \frac{9}{9} = 1$

Sol.74.(d) $3\frac{1}{5} \text{ of } 2\frac{3}{4} \div \frac{11}{3} + (2\frac{1}{5} \div 1\frac{2}{5} \text{ of } 1\frac{3}{7} - 2\frac{1}{3})$

$= \frac{16}{5} \text{ of } \frac{11}{4} \div \frac{11}{3} + (\frac{11}{5} \div \frac{7}{5} \text{ of } \frac{10}{7} - \frac{7}{3}) = \frac{12}{5} + (\frac{11}{10} - \frac{7}{3})$

$= \frac{12}{5} - \frac{37}{30} = \frac{35}{30} = \frac{7}{6} = 1\frac{1}{6}$

Sol.75.(b) $[18 - 3 \times \{3 - 3 \times (3 \div \frac{1}{3} - 3) + 3 \div \frac{1}{3} + 3\} - 4 \times 2]$
= [18 - 3 × {3 - 3 × 6 + 12} - 8]
= [18 - 3 × (-3) - 8] = 18 + 9 - 8 = 19

Sol.76.(c) 12 + 24 ÷ 2 - 7 × 30 ÷ 6 + (5 + 4) × 8 + 8 ÷ 8 - 8
= 12 + 12 - 7 × 5 + (9) × 8 + 1 - 8
= 12 + 12 - 35 + 72 + 1 - 8 = 97 - 43 = 54

Sol.77.(a) $\frac{(143 \div 13 \times x - 3 \times 3)}{(6^2 - 7 \times 5 + x^2)} = 1$

$\Rightarrow \frac{11x - 9}{36 - 35 + x^2} = 1 \Rightarrow 11x - 9 = 1 + x^2$

$\Rightarrow x^2 - 11x + 10 = 0 \Rightarrow x^2 - 10x - x + 10 = 0$
$\Rightarrow x(x - 10) - 1(x - 10) = 0$
$\Rightarrow (x - 10)(x - 1) = 0 \Rightarrow x = 10$ or 1
$\Rightarrow x = 1$ (from option)

Sol.78.(b)

$\frac{12 + 3\frac{2}{3} \div [1\frac{3}{4} \div \{5\frac{1}{4} \times (3\frac{3}{5} \div 4\frac{1}{2})\}]}{1\frac{1}{3} \times 5\frac{1}{5}}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \dfrac{12 + \frac{11}{3} \div \left[\frac{7}{4} \div \left\{\frac{21}{4} \times (\frac{18}{5} \div \frac{9}{2})\right\}\right]}{\frac{4}{3} \times \frac{26}{5}}$

$= \dfrac{12 + \frac{11}{3} \div \left[\frac{7}{4} \div \frac{21}{5}\right]}{\frac{104}{15}}$

$= \dfrac{12 + \frac{11}{3} \div \frac{5}{12}}{\frac{104}{15}} = \dfrac{12 + \frac{44}{5}}{\frac{104}{15}}$

$= \dfrac{\frac{104}{5}}{\frac{104}{15}} = \dfrac{104}{5} \times \dfrac{15}{104} = 3$

Sol.79.(c) Formula used :

$(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

$25 \times 25 + 9 \times 9 + 6 \times 6 + 2 \times 25 \times 9 + 2 \times 9 \times 6 + 2 \times 25 \times 6$

$= 25^2 + 9^2 + 6^2 + 2 \times 25 \times 9 + 2 \times 9 \times 6 + 2 \times 25 \times 6 = (25 + 9 + 6)^2 = 1600$

Sol.80.(b)

$1 - \dfrac{7}{1 - \frac{1}{1 + \frac{7}{1-7}}} = 1 - \dfrac{7}{1 - \frac{1}{1 - \frac{7}{6}}}$

$= 1 - \dfrac{7}{1 - \frac{1}{\frac{-1}{6}}} = 1 - \dfrac{7}{1 + 6} = 1 - 1 = 0$

Sol.81.(a) $9^{18} \div 3^{14}$ of $27^3 \times \sqrt{6561}$

$= (3^2)^{18} \div 3^{14}$ of $(3^3)^3 \times 3^4$

$= 3^{36} \div 3^{23} \times 3^4 \Rightarrow 3^{13} \times 3^4 = 3^{17}$

Sol.82.(c) $3 + 2 \times [7 + (5 + 7) \div 2]$

$= 3 + 2 \times [7 + 12 \div 2]$

$= 3 + 2 \times 13 = 3 + 26 = 29$

Sol.83.(a) $\dfrac{92736}{(274 + 830)\ of\ \frac{7}{4}} + 513$

$= \dfrac{92736}{1104\ of\ \frac{7}{4}} + 513 = \dfrac{92736}{276 \times 7} + 513$

$\Rightarrow 48 + 513 = 561$

Sol.84.(d) $\dfrac{(525 + 175)^2 - (525 - 175)^2}{(525 \times 175)}$

$= \dfrac{(525 + 175 + 525 - 175)\ (525 + 175 - 525 + 175)}{(525 \times 175)}$

$= \dfrac{(1050)\ \times (350)}{(525 \times 175)} = 4$

Short Trick : Using the formula,

$(a + b)^2 - (a - b)^2 = 4ab$

$\dfrac{(525 + 175)^2 - (525 - 175)^2}{(525 \times 175)}$

$= \dfrac{4 \times 525 \times 175}{(525 \times 175)} = 4$

Sol.85.(b) $9 \times 9 + 9 \div 9 - 9 \times 9 + 9 + 9 \times 9 - 9 - 9 \times 9$

$= 81 + 1 - 81 + 9 + 81 - 9 - 81$

$= 1 + 9 - 9 = 1$

Sol.86.(a) $(4^2)^2 + 4 \times 4 \div 4 - 4$

$= 256 + 4 \times 1 - 4 = 256 + 4 - 4 = 256$ or 4^4

Sol.87.(d) $1 + \dfrac{1}{1 + \frac{1}{5 + \frac{1}{2 + \frac{1}{3}}}}$

$= 1 + \dfrac{1}{1 + \frac{1}{5 + \frac{3}{7}}} = 1 + \dfrac{1}{1 + \frac{7}{38}}$

$= 1 + \dfrac{38}{45} = 1 + \dfrac{38}{45} = 1\dfrac{38}{45}$

Sol.88.(c)

x [- 5 { - 4 (- a)}] + 6 [- 3 { -3 (- a)}] = 6a

$\Rightarrow x$ [- 5 {4a}] + 6 [- 3 {3a}] = 6a

$\Rightarrow x$ [- 20a] + 6 [- 9a] = 6a

$\Rightarrow x$ [- 20a] = 6a + 54a

$\Rightarrow x$ [- 20a] = 60a $\Rightarrow x = \dfrac{60a}{-20a} = -3$

Sol.89.(a) $20 \div 5$ of $4 \times 8 + 6 \div 24$ of $3 \times 48 - 6 \div 18 \times 9$

$= 20 \div 20 \times 8 + 6 \div 72 \times 48 - \dfrac{1}{3} \times 9$

$= 1 \times 8 + \dfrac{1}{12} \times 48 - \dfrac{1}{3} \times 9 = 8 + 4 - 3 = 9$

Sol.90.(c) $64 \div [44 - (8$ of $3 - 16) \div 4 \times 20]$

$= 64 \div [44 - (24 - 16) \div 4 \times 20]$

$= 64 \div [44 - 8 \div 4 \times 20]$

$= 64 \div [44 - 2 \times 20] = 64 \div [44 - 40] = 16$

Sol.91.(b) $855 \div 15 - k + 32 \times 5 = 1152 \div 16 \times 111 \div 37$

$\Rightarrow 57 - k + 160 = 72 \times 3$

$\Rightarrow 57 - k + 160 = 216$

$\Rightarrow - k = 216 - 217 \Rightarrow k = 1$

Sol.92.(c)

$1000 \times 100 - 1000 + 4000 \div 200$

$= 100000 - 1000 + 20$

$= 99000 + 20 = 99020$

Sol.93.(b) 15% of $1.5 + 0.15 \div 0.1 + 0.01$ of $1.1 \times 0.5 + 2.5 \times 25$.

$= 0.225 + 1.5 + 0.0055 + 62.5 = 64.2305$

Sol.94.(c) $(6 + 6$ of $5 \div 5) \div 6$ of $5 + (24 \div 2$ of $3 - 6$ of $5 + 4)$

$= (6 + 30 \div 5) \div 30 + (24 \div 6 - 30 + 4)$

$= (6 + 6) \div 30 + (4 - 30 + 4)$

$= 12 \div 30 - 22$

$= \dfrac{2}{5} - 22 = \dfrac{-108}{5} = -\ 21\dfrac{3}{5}$

Sol.95.(b)

$5055 - (1002 \div 20.04) = 5055 - 50 = 5005$

Sol.96.(d)

$56 \div 4 + p \times 3 - 24 \div 12 + 4 = 21 \div 3 + 3$

$= 14 + p \times 3 - 2 + 4 = 7 + 3$

$= 16 + p \times 3 = 10 = p \times 3 = - 6 \Rightarrow p = - 2$

Sol.97.(b)

$22.0625 - [15 + 0.25 \times (4.78 - 1.5 \times 3.02)]$

$= 22.0625 - [15 + 0.25 \times (4.78 - 4.53)]$

$= 22.0625 - [15 + 0.25 \times 0.25]$

$= 22.0625 - [15 + 0.0625]$

$= 22.0625 - 15.0625 = 7.0$

Sol.98.(a) (4.2 of 2.5÷ 3.5) - (3.6÷2.4 + 2.5 of 3 ÷7.5) + (6-3 of 2 + 4 of 3 ÷ 6)

= (10.5 ÷ 3.5) - (1.5 + 7.5 ÷7.5) + (6 - 6 + 12 ÷ 6)

= (3) - (1.5 + 1) + (2) ⇒ 3 - 2.5 + 2 = 2.5

Sol.99.(c) $\dfrac{13 \div \{6 - 6 \div (7 - 9) \times 8 + 9\}}{5 + 5 \times 5 \div 5\ of\ 5}$

$= \dfrac{13 \div \{6 - 6 \div (-2) \times 8 + 9\}}{5 + 5 \times 5 \div 25}$

$= \dfrac{13 \div \{6 + 3 \times 8 + 9\}}{5 + 1}$

$= \dfrac{13 \div \{6 + 24 + 9\}}{6} = \dfrac{13 \div 39}{6} = \dfrac{1}{18}$

Sol.100.(c) $\dfrac{\left(2\frac{1}{7} + 6\frac{1}{7}\right) \div \frac{9}{7}}{1\frac{1}{9} \div \left\{\frac{7}{9} + \left(\frac{4}{9} \div \frac{4}{3}\right)\right\}}$

$= \dfrac{\left(\frac{15}{7} + \frac{43}{7}\right) \div \frac{9}{7}}{\frac{10}{9} \div \left\{\frac{7}{9} + \left(\frac{4}{9} \times \frac{3}{4}\right)\right\}}$

$= \dfrac{\left(\frac{58}{7}\right) \times \frac{7}{9}}{\frac{10}{9} \div \left\{\frac{7}{9} + \frac{1}{3}\right\}} = \dfrac{\frac{58}{9}}{\frac{10}{9} \div \frac{10}{9}}$

$= \dfrac{\frac{58}{9}}{\frac{10}{9} \times \frac{9}{10}} = \dfrac{58}{9}$

Sol.101.(a)

$\dfrac{(275 \times 275 \times 275 + 725 \times 725 \times 725)}{(275 \times 275 + 725 \times 725 - 725 \times 275)}$

$\times \dfrac{(275 \times 275 \times 275 - 725 \times 725 \times 725)}{(275 \times 275 + 725 \times 725 + 725 \times 275}$

$= \dfrac{(275)^3 + (725)^3}{(275)^2 + (725)^2 - 725 \times 275)}$

$\times \dfrac{(275)^3 - (725)^3}{(275)^2 + (725)^2 + 725 \times 275)}$

$= \dfrac{(275 + 725)\ [(275)^2 + (725)^2 - 275 \times 725}{(275)^2 + (725)^2 - 725 \times 275)}$

$\times \dfrac{(275 - 725)\ [(275)^2 + (725)^2 + 275 \times 725}{(275)^2 + (725)^2 + 725 \times 275)}$

$= (275 + 725) \times (275 - 725)$

$= 1000 \times (-450) = - 4,50,000$

Sol.102.(b) $\dfrac{5x + 3y}{5x - 3y} = \dfrac{7}{3}$

$15x + 9y = 35x - 21y$

$30y = 20x \Rightarrow \dfrac{x}{y} = \dfrac{30}{20} = \dfrac{3}{2}$ or 3 : 2

Sol.103.(a) $\dfrac{1}{2^2} + \dfrac{1}{2^3} \div (\dfrac{1}{2} + \dfrac{1}{2} \div 1) + 3$

$\dfrac{1}{3} \div \dfrac{5}{2} \times \dfrac{3}{4} \div 6\dfrac{2}{3} \times \dfrac{7}{6}$

$= \dfrac{1}{4} + \dfrac{1}{8} \div (\dfrac{1}{2} + \dfrac{1}{2}) + \dfrac{10}{3} \times \dfrac{2}{5} \times \dfrac{3}{4} \times \dfrac{3}{20} \times \dfrac{7}{6} = \dfrac{1}{4} + \dfrac{1}{8} + \dfrac{7}{40}$

$= \dfrac{10 + 5 + 7}{40} = \dfrac{22}{40} = \dfrac{11}{20}$

Sol.104.(d)

$12.3 - [7 + 0.8$ of $(5.6 - 3.8 \times 1.03)]$

$= 12.3 - [7 + 0.8$ of $(5.6 - 3.914)]$

$= 12.3 - [7 + 1.3488]$

Search on TG. @apna_pdf

Search on Telegram @apna_pdf

= 12.3 - 8.3488 = 3.9512

Sol.105.(d) $x + \frac{1}{1+\frac{1}{3+\frac{1}{2}}} = 1$

$\Rightarrow x + \frac{1}{1+\frac{2}{7}} = 1 \Rightarrow x + \frac{7}{9} = 1$

$\Rightarrow x = 1 - \frac{7}{9} = \frac{2}{9}$

Sol.106.(c)

$55\frac{1}{3} \div [3\frac{1}{5} + \{2\frac{1}{2} - (2\frac{1}{3} + \frac{3}{5})\}]$

$= \frac{166}{3} \div [\frac{16}{5} + \{\frac{5}{2} - (\frac{7}{3} + \frac{3}{5}\}]$

$= \frac{166}{3} \div [\frac{16}{5} + \{\frac{5}{2} - \frac{44}{15}\}$

$= \frac{166}{3} \div \frac{83}{30} = \frac{166}{3} \times \frac{30}{83} = 20$

Sol.107.(b)

$8.16 \times 5.35 + 17.9 - 19.5 \text{ of } \frac{1}{15} + \frac{1}{5}$

$= 43.656 + 17.9 - 19.5 \times \frac{1}{15} + \frac{1}{5}$

= 61.556 - 1.3 + 0.2 = 60.456

Sol.108.(c) $\frac{53 - \frac{2}{7} of\ 63 - 9}{72 - \frac{2}{5} of\ (96 - 31)}$

$= \frac{53 - 2 \times 9 - 9}{72 - \frac{2}{5} of\ 65} = \frac{53 - 18 - 9}{72 - 2 \times 13}$

$= \frac{26}{46} = \frac{13}{23}$

Sol.109.(d) $25^3 - 75^3 + 50^3$

$= (25 - 75)(25^2 + 75^2 + 25 \times 75) + 50^3$

= (-50) (625 + 5625 + 1875) + 125000

= (-50) × 8125 + 125000

= -406250 + 125000 = -281250

Short trick:-

a = 25 , b = -75 , c = 50

If a + b + c = 0, then $a^3 + b^3 + c^3$ = 3abc

So, $25^3 - 75^3 + 50^3$

= - 3 × 25 × 75 × 50 = -281250

Sol.110.(c) We know

$(a + b + c)^3$

$= a^3 + b^3 + c^3 + 3(a + b)(b + c)(c + a)$

Here, a = 0.2

b = 0.3 ⇒ c = 0.5

Hence,

$(0.2)^3 + (0.3)^3 + (0.5)^3 + 3 \times 0.5 \times 0.7 \times 0.8$

$= (0.2 + 0.3 + 0.5)^3 \Rightarrow (1.0)^3 = 1.000$

Sol.111.(a)

$\frac{0.7^2 + (0.4 + 0.2)(0.7) + (0.4 \times 0.2)}{(0.7 + 0.4)}$

$= \frac{0.49 + 0.42 + 0.08}{1.1} = \frac{0.99}{1.1} = 0.9$

Sol.112.(d) Formula used :

$(a - b)^3 = a^3 - b^3 - 3a^2b + 3ab^2$

$\frac{(8.25)^3 - 3 \times (8.25)^2 \times 0.25 + 3 \times 8.25 \times (0.25)^2 - (0.25)^3}{4 \times 4 \times 4}$

$= \frac{(8.25 - 0.25)^3}{64} = \frac{512}{64} = 8$

Sol.113.(d) Formula used :

$a^3 + b^3 + c^3$ - 3abc

= (a + b + c)($a^2 + b^2 + c^2$ - ab - bc - ca)

$\frac{(2.3)^3 + (15.9)^3 + (3.7)^3 - 3 \times 2.3 \times 15.9 \times 3.7}{(2.3)^2 + (15.9)^2 + (3.7)^2 - 2.3 \times 15.9 - 15.9 \times 3.7 - 3.7 \times 2.3}$

$= \frac{(2.3 + 15.9 + 3.7)(2.3^2 + 15.9^2 + 3.7^2 - 2.3 \times 15.9 - 15.9 \times 3.7 - 3.7 \times 2.3)}{(2.3)^2 + (15.9)^2 + (3.7)^2 - 2.3 \times 15.9 - 15.9 \times 3.7 - 3.7 \times 2.3}$

= (2.3 + 15.9 + 3.7) = 21.9

Sol.114.(c) Identity used:

$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

$\frac{12.43 \times 12.43 \times 12.43 + 19.57 \times 19.57 \times 19.57}{12.43 \times 12.43 - 12.43 \times 19.57 + 19.57 \times 19.57}$

$= \frac{12.43^3 + 19.57^3}{12.43^2 - 12.43 \times 19.57 + 19.57^2}$

$= \frac{(12.43 + 19.57)(12.43^2 - 12.43 \times 19.57 + 19.57^2)}{(12.43^2 - 12.43 \times 19.57 + 19.57^2)}$

= 32

Sol.115.(d) Concept used :

$(a - b)^3 = a^3 - b^3 - 3a^2b + 3ab^2$

= 15 × 15 × 15 + 3 × 15 × 12 × 12 - 3 × 15 × 15 × 12 - 12 × 12 × 12

$= 15^3 + 3 \times 15 \times 12^2 - 3 \times 15^2 \times 12 - 12^3$

$= (15 - 12)^3 = 3^3 = 27$

Sol.116.(b) Formula used :

$(a - b)(a + b) = a^2 - b^2$

$\frac{((32)^4 - 1)}{33 \times 31 \times (2^{10} + 1)}$

$= \frac{((2^5)^4 - 1)}{(2^5 + 1)(2^5 - 1)(2^{10} + 1)}$

$= \frac{2^{20} - 1}{(2^{10} - 1)(2^{10} + 1)} = \frac{2^{20} - 1}{2^{20} - 1} = 1$

Sol.117.(c)

$\sqrt[3]{0.08 \times 0.8 \times p} = 0.008 \times 0.8 \times \sqrt[3]{q}$

$8 \times 8 \times 10^{-3} \times p = (8 \times 8 \times 10^{-4})^3 \times q$

$8^2 \times 10^{-3} \times p = 8^6 \times 10^{-12} \times q$

$\frac{p}{q} = 8^4 \times 10^{-9}$

Sol.118.(b) $\left(\sqrt[3]{\sqrt[3]{343}}\right)^3 \times \left(\sqrt[3]{\sqrt[3]{216}}\right)^3$

$= \sqrt[3]{343} \times \sqrt[3]{216} = 7 \times 6 = 42$

Sol.119.(a)

$\frac{\sqrt{1.24} \times \sqrt{2.79}}{\sqrt{2.64} \times \sqrt{5.94}} = \sqrt{\frac{1.24 \times 2.79}{2.64 \times 5.94}}$

$= \sqrt{\frac{31 \times 31}{66 \times 66}} = \frac{31}{66}$

Sol.120.(c)

$= \frac{0.04}{0.05} \text{ of } \frac{\left(3\frac{1}{3} - 2\frac{1}{2}\right) \div \frac{1}{2} of\ 1\frac{1}{4}}{\frac{1}{3} + \frac{1}{5} of \frac{1}{9}}$

$= \frac{4}{5} \text{ of } \frac{\left(\frac{10}{3} - \frac{5}{2}\right) \div \frac{1}{2} of \frac{5}{4}}{\frac{1}{3} + \frac{1}{5} of \frac{1}{9}}$

$= \frac{4}{5} \text{ of } \frac{\left(\frac{5}{6}\right) \div \frac{5}{8}}{\frac{1}{3} + \frac{1}{45}}$

$= \frac{4}{5} \text{ of } \frac{\left(\frac{4}{3}\right)}{\frac{16}{45}} = \frac{4}{5} \times \frac{15}{4} = 3$

Sol.121.(d) (48 ÷ 72 × 3) - [15 ÷ 8 × (40 - 32) - 10] + 2P = 6 ÷ 2

⇒ (48 ÷ 72 × 3) - [15 ÷ 8 × 8 - 10] + 2P = 6 ÷ 2

$\Rightarrow (48 \div 72 \times 3) - [\frac{15}{8} \times 8 - 10] + 2P = 6 \div 2$

$\Rightarrow (\frac{2}{3} \times 3) - [15 - 10] + 2P = 6 \div 2$

$\Rightarrow 2 - 5 + 2P = 3 \Rightarrow P = 3$

Sol.122.(c)

$\frac{1\frac{1}{2} \div 3\frac{1}{4} + \frac{1}{2} \div \frac{13}{14} + \frac{1}{5}}{\frac{1}{5} \times 3\frac{1}{2} - \frac{1}{3} \div 1\frac{3}{4} \times 3\frac{1}{2}}$

$= \frac{\frac{3}{2} \div \frac{13}{4} + \frac{1}{2} \div \frac{13}{14} + \frac{1}{5}}{\frac{1}{5} \times \frac{7}{2} - \frac{1}{3} \div \frac{7}{4} \times \frac{7}{2}}$

$= \frac{\frac{3}{2} \times \frac{4}{13} + \frac{1}{2} \times \frac{14}{13} + \frac{1}{5}}{\frac{1}{5} \times \frac{7}{2} - \frac{1}{3} \times \frac{4}{7} \times \frac{7}{2}}$

$= \frac{\frac{6}{13} + \frac{7}{13} + \frac{1}{5}}{\frac{7}{10} - \frac{2}{3}} = \frac{\frac{6}{5}}{\frac{1}{30}} = 36$

Sol.123.(b)

b + 2a - [(3b + a) - (2a + b) + 2a] - a

= b + 2a - [3b + a - 2a - b + 2a] - a

= b + 2a - [2b + a] - a

= b + 2a - 2b - a - a = - b

Sol.124.(d) 71 - (- 3){ - 2 - $\overline{(8 - 3)}$} + 3{5 + (- 2)(− 1)}

= 71 - (- 3){ - 2 - 5} + 3{5 + 2}

= 71- (- 3){ - 7 } + 3{7}

= 71 - 21 + 21 = 71

Sol.125.(c) $3\frac{1}{2} - [2\frac{1}{4} \div \{1\frac{1}{4} - \frac{3}{4}(1\frac{1}{2} - \frac{1}{2} - 2\frac{1}{2})\}]$

$= \frac{7}{2} - [\frac{9}{4} \div \{\frac{5}{4} - \frac{3}{4}(\frac{3}{2} - \frac{1}{2} - \frac{5}{2})\}]$

$= \frac{7}{2} - [\frac{9}{4} \div \{\frac{5}{4} - \frac{3}{4}(-\frac{3}{2})\}]$

$= \frac{7}{2} - [\frac{9}{4} \div \{\frac{5}{4} + \frac{9}{8}\}]$

$= \frac{7}{2} - \frac{18}{19} = \frac{97}{38} = 2\frac{21}{38}$

Sol.126.(d)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$$\frac{\left[\frac{1}{5}\div\frac{1}{5}\times\frac{1}{5}\right]\times\frac{1}{5}}{\left[\frac{1}{9}+\frac{1}{9}\times\frac{1}{9}\right]\times\frac{1}{10}}+\left(1-\frac{6}{25}\right)$$

$$=\frac{\left[1\times\frac{1}{5}\right]\times\frac{1}{5}}{\left[\frac{1}{9}+\frac{1}{81}\right]\times\frac{1}{10}}+\left(\frac{19}{25}\right)$$

$$=\frac{\frac{1}{25}}{\left[\frac{10}{81}\right]\times\frac{1}{10}}+\left(\frac{19}{25}\right)$$

$$=\frac{1}{25}\times\frac{81}{1}+\left(\frac{19}{25}\right)=\frac{81+19}{25}=\frac{100}{25}=4$$

Sol.127.(b) 87 × 256 + 16 − 77 ÷ 1359
After changing sign ,
87 + 256 ÷ 16 × 77 − 1359
= 87 + 16 × 77 − 1359
= 87 + 1232 − 1359 = −40

Sol.128.(d) $\sqrt{a}=3b\Rightarrow b^2=\frac{a}{9}$,

Now, $\frac{a}{b^2}=\frac{9}{1}=9$

Sol.129.(c)

$$\frac{(0.25)^4+2\times(0.25)^2+1-(0.25)^2}{(0.25)^2+0.25+1}$$

$$=\frac{\{(0.25)^2+1\}^2-(0.25)^2}{(0.25)^2+0.25+1}$$

$$=\frac{\{(0.25)^2+1+0.25\}\{(0.25)^2+1-0.25\}}{(0.25)^2+0.25+1}$$

$$=\{(0.25)^2+1-0.25\}$$

$=\{0.0625+1-0.25\}=0.8125$

Sol.130.(b)

$$\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}=\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}\times\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}+\sqrt{2}}$$

$$=\frac{5+2\sqrt{6}}{3-2}=5+2\times2.45=9.9$$

Sol.131.(a) Formula used :-

$a^3-b^3=(a-b)(a^2+b^2+ab)$

$$\frac{(4.2)^3-0.008}{(4.2)^2+0.84+0.04}$$

$$=\frac{(4.2)^3-(0.2)^3}{(4.2)^2+0.84+0.04}$$

$$=\frac{(4.2-0.2)[(4.2)^2+4.2\times0.2+(0.2)^2]}{(4.2)^2+0.84+0.04}$$

$$=\frac{4[(4.2)^2+0.84+0.04]}{(4.2)^2+0.84+0.04}=4$$

Sol.132.(a) $\frac{10x^2+5x+2xy+y}{5x+y}$

$$\frac{2x(5x+y)+(5x+y)}{5x+y}=\frac{(5x+y)(2x+1)}{5x+y}$$

2x + 1 = 2 × (−1) + 1 = −1

Sol.133.(d)
y + 2x - [y - (y - x + y) - (x + y) + y] - 2y
= $y+2x-[(x-y)-x]-2y$
= $y+2x-[-y]-2y$
= $y+2x+y-2y=2x$

Sol.134.(c) $\frac{3a+b}{2}-\frac{a-3b}{3}+2b$

$$=\frac{3(3a+b)-2(a-3b)+12b}{6}$$

$$=\frac{9a+3b-2a+6b+12b}{6}$$

$$=\frac{7a+21b}{6}=\frac{7(a+3b)}{6}$$

Sol.135.(c) (a - 2b) (b - 3a) + (a + b) (a - 3b) - (b - 3a) (4a - 5b)
= - $3a^2$ - $2b^2$ + 7ab + a^2 - $3b^2$ - 2ab - (-12a² - $5b^2$ + 19ab)
= (- 3a² + a² + 12a²) + (-2b² - 3b² + 5b²) + (7ab - 2ab - 19ab)
= 10a² - 14ab

Sol.136.(b) $(4x+1)^2-(4x+3)(4x-1)$
$=16x^2+1+8x-(16x^2-4x+12x-3)$
$=16x^2+1+8x-16x^2+4x-12x+3)$
= 4
Short Tricks :- Put x = 0 ,
$(4x+1)^2-(4x+3)(4x-1)$
$=(1)^2-(3)(-1)=4$

Sol.137.(c) $\frac{3y}{1+\frac{1}{1+\frac{y}{1-y}}}=2$

$$\frac{3y}{1+\frac{1}{\frac{1-y+y}{1-y}}}=\frac{3y}{1+\frac{1-y}{1}}=\frac{3y}{2-y}=2$$

$\Rightarrow 4-2y=3y\Rightarrow y=\frac{4}{5}$

Sol.138.(d) $\frac{\sqrt{x}-\sqrt{y}}{\sqrt{x}+\sqrt{y}}=\frac{\sqrt{2}-\sqrt{3}}{\sqrt{2}+\sqrt{3}}$

$$=\frac{\sqrt{2}-\sqrt{3}}{\sqrt{2}+\sqrt{3}}\times\frac{\sqrt{2}-\sqrt{3}}{\sqrt{2}-\sqrt{3}}$$

$$=\frac{5-2\sqrt{6}}{2-3}=2\sqrt{6}-5$$

Sol.139.(b) 52 × 52 − 48 × 48
= (52 + 48) (52 − 48) = 100 × 4 = 400

Sol.140.(b) $\frac{17}{30},\frac{7}{15},\frac{27}{50},\frac{11}{20}$
Multiply by 300 in each fraction , we get
170 , 140 , 162 , 165
Descending order :-
$\frac{17}{30}>\frac{11}{20}>\frac{27}{50}>\frac{7}{15}$

Sol.141.(b) $\left(\frac{1}{5}\right)+\left[1\frac{1}{4}-\frac{1}{2}\right]\times\left(\frac{2}{5}\right)$

$=\frac{1}{5}+\left[\frac{3}{4}\right]\times\left(\frac{2}{5}\right)=\frac{1}{5}+\frac{3}{10}=\frac{5}{10}=0.5$

0.5 lies between 0.2 and 0.6

Sol.142.(d) 0.5 + 0.55 + 0.555 + 0.5555
= 5(0.1 + 0.11 + 0.111 + 0.1111)
= 5(0.4321) = 2.1605

Sol.143.(b)

$$\sqrt{[(7^2+6^3+9^2)\div2+52]}$$

$$=\sqrt{[(49+216+81)\div2+52]}$$

$$=\sqrt{[346\div2+52]}=\sqrt{[225]}=15$$

Sol.144.(c)

$$\sqrt{0.52\times0.52+0.31\times0.31+0.62\times0.52}$$

$$=\sqrt{(0.52)^2+(0.31)^2+2\times0.52\times0.31}$$

$$=\sqrt{(0.52+0.31)^2}=(0.52+0.31)$$

= 0.83

Sol.145.(a)

$$\frac{\frac{49}{63}\div\frac{21}{9}-\frac{85}{510}+\frac{88}{132}\div\frac{66}{11}}{\frac{1}{7}\div\frac{33}{21}+\frac{26}{143}-\frac{1}{209}\div\frac{1}{19}}$$

$$=\frac{\frac{49}{63}\times\frac{9}{21}-\frac{85}{510}+\frac{88}{132}\times\frac{11}{66}}{\frac{1}{7}\times\frac{21}{33}+\frac{26}{143}-\frac{1}{209}\times19}$$

$$=\frac{\frac{1}{3}-\frac{1}{6}+\frac{1}{9}}{\frac{1}{11}+\frac{2}{11}-\frac{1}{11}}$$

$$=\frac{6-3+2}{18}\times\frac{11}{2}=\frac{55}{36}$$

Sol.146.(d)

$$\frac{\frac{5}{2}\div\frac{2}{5}\times\frac{1}{5}-\frac{1}{5}\div\frac{3}{5}\times\frac{5}{2}}{\frac{2}{5}\div\frac{1}{5}-\frac{1}{2}\times\frac{5}{2}\div\frac{25}{4}+\frac{1}{2}\div\frac{2}{5}\times\frac{1}{5}}$$

$$=\frac{\frac{25}{4}\times\frac{1}{5}-\frac{1}{3}\times\frac{5}{2}}{2-\frac{1}{2}\times\frac{2}{5}+\frac{5}{4}\times\frac{1}{5}}$$

$$=\frac{\frac{5}{4}-\frac{5}{6}}{2-\frac{1}{5}+\frac{1}{4}}=\frac{5}{12}\times\frac{20}{41}=\frac{25}{123}$$

Sol.147.(a) A = $\frac{(36\div18\times5)}{(36\div(3\times4)}$ and

B = $\frac{(5\div15\times5+6\times2-5)}{(15\div5\times25-2\times3+6)}$

So, (A + B) = $\frac{(36\div18\times5)}{(36\div(3\times4)}+\frac{(5\div15\times5+6\times2-5)}{(15\div5\times25-2\times3+6)}$

$$=\frac{10}{3}+\frac{\frac{26}{3}}{75}=\frac{75\times10+26}{225}=\frac{776}{225}$$

Sol.148.(b) We can write the Fraction $\frac{5}{11},\frac{5}{7},\frac{3}{8},\frac{6}{13}$ as $\frac{30}{66},\frac{30}{42},\frac{30}{80},\frac{30}{65}$ respectively
So, the smallest and greatest fraction respectively are $\frac{30}{80}\left(\frac{3}{8}\right)$ and $\frac{30}{42}\left(\frac{5}{7}\right)$
Therefore, difference of smallest and largest fractions = $\frac{5}{7}-\frac{3}{8}=\frac{19}{56}$

Sol.149.(a) from the formula,
$a^3+b^3=(a+b)(a^2+b^2-ab)$

$$\frac{(.91+0.09)(.91)^2+(0.09)^2-.0819)}{\left[(0.91)^2-.0819+(0.09)^2\right]}=1$$

Sol.150.(a)

$$\sqrt{a-\sqrt{a-\sqrt{a-\sqrt{a-\ldots\ldots\infty}}}}$$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{\sqrt{4a+1}-1}{2}$

$\sqrt{20-\sqrt{20-\sqrt{20-\sqrt{20-\ldots\ldots\infty}}}}$

$= \frac{\sqrt{4\times 20+1}-1}{2} = \frac{\sqrt{81}-1}{2} = \frac{9-1}{2} = 4$

Short Trick:-

Co - prime factors of 20 = (4 , 5)

In case of (−ve) sign , smaller number is the right answer.

Sol.151.(b)

$\frac{\sqrt{10+\sqrt{25+\sqrt{108+\sqrt{154+\sqrt{225}}}}}}{\sqrt{16+19.25\times 4^2}}$

$= \frac{\sqrt{10+\sqrt{25+\sqrt{108+\sqrt{154+15}}}}}{\sqrt{16+308}}$

$= \frac{\sqrt{10+\sqrt{25+\sqrt{108+13}}}}{\sqrt{324}}$

$= \frac{\sqrt{10+\sqrt{25+11}}}{18} = \frac{\sqrt{10+6}}{18} = \frac{2}{9}$

Sol.152.(a) $x^9\times x^5\times x^{-4}\times x^0\times x^{-6}$

$= x^9\times x^5\times\frac{1}{x^4}\times 1\times\frac{1}{x^6}$ .....($x^0 = 1$)

$= \frac{x^{14}}{x^{10}} = x^4$ ..... (as $\frac{p^m}{p^n} = p^{m-n}$)

Sol.153.(c) Sum of 'n' natural numbers

$= \frac{n}{2}(a+l)$ ....where a = first term,

l = last term

$100^2 - 99^2 + 98^2 - 97^2 + \ldots\ldots + 12^2 - 11^2$

$(100+99)(100-99) + (98+97)$

$(98-97) + \ldots\ldots + (12+11)(12-11)$

$= 100 + 99 + 98 + 97 \ldots\ldots + 12 + 11$

Sum = $\frac{90}{2}(100+11) = 4995$

Sol.154.(a) $\sqrt{36x^2 - 108x + 81}$

$= \sqrt{(6x-9)^2} = 6x - 9$

Sol.155.(c) $\frac{\sqrt[3]{-2744}\times\sqrt[3]{-216}}{\sqrt[3]{\frac{64}{729}}}$

$= \frac{(-14)\times(-6)}{\frac{4}{9}} = \frac{14\times 6\times 9}{4} = 189$

Sol.156.(b) $\left\{(5^6)^5\times(5^5)^8\right\}\div 25 = (625)^a$

$5^{30+40}\div 5^2 = (625)^a$

$5^{70}\div 5^2 = (625)^a \Rightarrow 5^{68} = (625)^a$

$(5^4)^{17} = (625)^a \Rightarrow 625^{17} = (625)^a \Rightarrow$ a = 17

Sol.157.(b)

$99\frac{11}{99} + 99\frac{13}{99} + 99\frac{15}{99} + \ldots + 99\frac{67}{99}$

$= (99+\frac{11}{99}) + (99+\frac{13}{99}) + (99+\frac{15}{99})$

.....$(99+\frac{67}{99})$

$= 99\times 29 + \frac{1}{99}(11+13+15+\ldots 67)$

$= 2871 + \frac{1}{99}(29\times\frac{67+11}{2})$

$= 2871 + \frac{1}{99}(29\times 39)$

$= 2871 + \frac{377}{33} = \frac{94743+377}{33} = \frac{95120}{33}$

Sol.158.(c) Let $x = y = z = 2$

$\frac{(x+y+z)(xy+yz+zx)-xyz}{(x+y)(y+z)(z+x)}$

$= \frac{(2+2+2)(2\times 2+2\times 2+2\times 2)-2\times 2\times 2}{(2+2)(2+2)(2+2)}$

$= \frac{(6)(4+4+4)-8}{(4)(4)(4)} = \frac{(6)(12)-8}{64}$

$= \frac{72-8}{64} = \frac{64}{64} = 1$

Sol.159.(b)

$\frac{\sqrt{29.16}}{\sqrt{1.1664}} + \frac{\sqrt{0.2916}}{\sqrt{116.64}} + \frac{\sqrt{0.0036}}{\sqrt{0.36}}$

$= \frac{5.4}{1.08} + \frac{0.54}{10.8} + \frac{0.06}{0.6}$

$= 5 + \frac{1}{20} + \frac{1}{10} = 5 + \frac{3}{20} = \frac{103}{20}$

Sol.160.(c)

$A = \frac{\sqrt{0.0004}\times\sqrt[3]{0.000008}}{\sqrt[4]{16000}\times\sqrt[3]{125000}\times\sqrt[4]{810}}$

$= \frac{0.02\times 0.02}{2\times 10^{\frac{3}{4}}\times 50\times 3\times 10^{\frac{1}{4}}}$

$= \frac{0.0004}{3\times 10^{2+\frac{3}{4}+\frac{1}{4}}} = \frac{0.0004}{3\times 10^3} = \frac{4}{3}\times 10^{-7}$

$B = \frac{\sqrt[3]{0.729}\times\sqrt[4]{0.0016}}{\sqrt{0.16}} = \frac{0.9\times 0.2}{0.4}$

$= \frac{18}{40} = \frac{9}{20}$

Now,

$A\times B = \frac{4}{3}\times 10^{-7}\times\frac{9}{20} = \frac{3}{5}\times 10^{-7}$

Sol.161.(a)

$A = 0.3\overline{12} = \frac{312-3}{990} = \frac{309}{990} = \frac{103}{330}$

$B = 0.4\overline{15} = \frac{415-4}{990} = \frac{411}{990} = \frac{137}{330}$

$C = 0.30\overline{9} = \frac{309-30}{900} = \frac{279}{900} = \frac{31}{100}$

So, $A + B + C = \frac{103}{330} + \frac{137}{330} + \frac{31}{100}$

$= \frac{240}{330} + \frac{31}{100} = \frac{80}{110} + \frac{31}{100} = \frac{1141}{1100}$

Sol.162.(a)

$\sqrt{\frac{\sqrt{5}-1}{\sqrt{5}+1}} = \sqrt{\frac{(\sqrt{5}-1)(\sqrt{5}-1)}{(\sqrt{5}+1)(\sqrt{5}-1)}}$

$= \sqrt{\frac{(\sqrt{5}-1)^2}{4}} = \frac{(\sqrt{5}-1)}{2} = \frac{2.24-1}{2}$

$= \frac{1.24}{2} = 0.62$

Sol.163.(d)

If a + b + c = 0 then $a^3 + b^3 + c^3 = 3abc$

$\Rightarrow 13^3 + (-8)^3 + (-5^3) = 13 - 8 - 5 = 0$

$\Rightarrow 13^3 + (-8)^3 + (-5^3)$

$= 3\times 13\times(-8)\times(-5) = 1560$

Sol.164.(c)

$(0.064)^{123}\div 0.16^{47}\times 0.4^{34}\times 0.4^{29} = 0.4^x$

$\Rightarrow 0.4^x = 0.4^{3\times 123}\div 0.4^{47\times 2}\times 0.4^{34}\times 0.4^{29}$

$\Rightarrow 0.4^x = 0.4^{369-94}\times 0.4^{34}\times 0.4^{29}$

$\Rightarrow 0.4^x = 0.4^{275}\times 0.4^{34}\times 0.4^{29}$

$\Rightarrow 0.4^x = 0.4^{275+34+29} \Rightarrow 0.4^x = 0.4^{338}$

We know that , If bases are equal then powers will be equal.

Therefore, $x = 338$

Sol.165.(d) P = 7 × 4 - 3 = 25

Q = 8 ÷ 4 + 2 = 4 , R = 14 ÷ 21 × 9 = 6

P × Q + R = 25 × 4 + 6 = 106

Sol.166.(c) $(x-y)(x+y) = x^2 - y^2$

$\Rightarrow (36p^2+49q^2)\{(6p)^2 - (7q)^2\}$

$\Rightarrow (36p^2+49q^2)(36p^2-49q^2)$

$\Rightarrow (36p^2)^2 - (49q^2)^2 = 1296p^4 - 2401q^4$

Sol.167.(d)

$3p - [3p - \overline{p+q} - \{3p - (p - \overline{q-p})\}]$

$= 3p - [3p - \overline{p+q} - \{3p - (p - q + p)\}]$

$= 3p - [3p - \overline{p+q} - (3p - 2p + q)]$

$= 3p - [3p - \overline{p+q} - p - q]$

$= 3p - [3p - p - q - p - q]$

$= 3p - p + 2q = 2p + 2q$

Sol.168.(a) $\left(\frac{9^3+9^4+9^5+9^6+9^7}{9^1+9^2+9^3+9^4+9^5}\right)^{\frac{1}{2}}$

$= \left[\frac{9^3(1+9+9^2+9^3+9^4)}{9(1+9+9^2+9^3+9^4)}\right]^{\frac{1}{2}}$

$= (9^2)^{\frac{1}{2}} = 9$

Sol.169.(b)

$3\frac{6}{7} - \{5\frac{1}{7} - (2\frac{3}{7} - \overline{3\frac{5}{7} - 4})\}$

$= \frac{27}{7} - \{\frac{36}{7} - (\frac{17}{7} - \overline{\frac{26}{7} - 4})\}$

$= \frac{27}{7} - \{\frac{36}{7} - (\frac{17}{7} - \frac{26}{7} + 4)\}$

$= \frac{27}{7} - \{\frac{36}{7} - (-\frac{9}{7} + 4)\}$

$= \frac{27}{7} - \{\frac{36}{7} - (\frac{19}{7})\} = \frac{27}{7} - \{\frac{17}{7}\} = \frac{10}{7}$

Sol.170.(c) $\sqrt{a^{-1}b}\times\sqrt{b^{-1}c}\times\sqrt{c^{-1}a}$

$= \sqrt{\frac{b}{a}}\times\sqrt{\frac{c}{b}}\times\sqrt{\frac{a}{c}}$

$= \sqrt{\frac{b}{a}\times\frac{c}{b}\times\frac{a}{c}} = 1$

Sol.171.(d) Formula used :-

$(x^3+y^3+z^3) = 3xyz$ (when x + y + z = 0)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$$\frac{(a-b)^3+(b-c)^3+(c-a)^3}{(a^2-b^2)^3+(b^2-c^2)^3+(c^2-a^2)^3}$$

$$=\frac{3(a-b)(b-c)(c-a)}{3(a^2-b^2)(b^2-c^2)(c^2-a^2)}$$

$$\frac{3(a-b)(b-c)(c-a)}{3(a+b)(a-b)(b+c)(b-c)(c+a)(c-a)}$$

$$=\frac{1}{(a+b)(b+c)(c+a)}$$

Sol.172.(a) $\sqrt{2+\sqrt{3}}+\sqrt{2-\sqrt{3}}$

$$=\sqrt{\frac{2(2+\sqrt{3})}{2}}+\sqrt{\frac{2(2-\sqrt{3})}{2}}$$

$$=\sqrt{\frac{4+2\sqrt{3}}{2}}+\sqrt{\frac{4-2\sqrt{3}}{2}}$$

$$=\sqrt{\frac{(\sqrt{3}+1)^2}{2}}+\sqrt{\frac{(\sqrt{3}-1)^2}{2}}$$

$$=\frac{\sqrt{3}+1}{\sqrt{2}}+\frac{\sqrt{3}-1}{\sqrt{2}}=\frac{2\sqrt{3}}{\sqrt{2}}=\sqrt{6}$$

Sol.173.(b) Formula used :-

$a^3+b^3+c^3$ = 3abc when a + b + c = 0

$$\frac{(r-s)^3+(s-t)^3+(t-r)^3}{6(r-s)(s-t)(t-r)}$$

$$=\frac{3(r-s)(s-t)(t-r)}{6(r-s)(s-t)(t-r)}=\frac{3}{6}=\frac{1}{2}$$

Sol.174.(d) $(a^{-1}+b^{-1})\div(a^{-3}+b^{-3})$

$$=(\frac{1}{a}+\frac{1}{b})\div(\frac{1}{a^3}+\frac{1}{b^3})$$

$$=(\frac{a+b}{ab})\div(\frac{a^3+b^3}{a^3b^3})$$

$$=(\frac{a+b}{ab})\times(\frac{a^3b^3}{a^3+b^3})=\frac{a^2b^2}{a^2-ab+b^2}$$

Sol.175.(b) Put a = b = 1 and c = 0.

$$\frac{(a^2-4b^2)^3+64(b^2-4c^2)^3+(16c^2-a^2)^3}{(a-2b)^3+(2b-4c)^3+(4c-a)^3}$$

$$\frac{(1^2-4\times1^2)^3+64(1^2-4\times0^2)^3+(16\times0^2-1^2)^3}{(1-2)^3+(2-4\times0)^3+(4\times0-1)^3}$$

$$=\frac{36}{6}=6$$

On checking the option we get only option (b) satisfies this.

Sol.176.(c) Given that

$5\sqrt{3}+\sqrt{75}=17.32$

$5\sqrt{3}+5\sqrt{3}=10\sqrt{3}=17.32$

Now according to question

$14\sqrt{3}+\sqrt{108}=14\sqrt{3}+6\sqrt{3}=20\sqrt{3}$

$2\times17.32=34.64$

Sol.177.(a) $847=7^1\times11^2$, $385=5\times7\times11$

$675=3^3\times5^2$, $3025=5^2\times11^2$

$847\times385\times675\times3025=3^a\times5^b\times7^c\times11^d$

$3^3\times5^5\times7^2\times11^5=3^a\times5^b\times7^c\times11^d$

On comparing, we get

a = 3, b = 5, c = 2, d = 5

ab - cd = 3 × 5 - 2 × 5 = 5

Sol.178.(a)

$$\frac{1}{4-\sqrt{15}}=\frac{(4+\sqrt{15})}{(4-\sqrt{15})(4+\sqrt{15})}=4+\sqrt{15}$$

Similarly, we get conjugate of all values,

$4+\sqrt{15}-\sqrt{15}-\sqrt{14}+\sqrt{14}+\sqrt{13}-\sqrt{13}-\sqrt{12}$

$+\sqrt{12}+\sqrt{11}-\sqrt{11}-\sqrt{10}+\sqrt{10}+3-3-\sqrt{8}$

$\Rightarrow 4-\sqrt{8}=4-2\sqrt{2}$

Sol.179.(c) $\frac{\sqrt{38-5\sqrt{3}}}{\sqrt{26+7\sqrt{3}}}$

on multiplying numerator and denominator by $\sqrt{2}$ we get,

$$\frac{\sqrt{76-10\sqrt{3}}}{\sqrt{52+14\sqrt{3}}}=\frac{\sqrt{(5\sqrt{3}-1)^2}}{\sqrt{(7+\sqrt{3})^2}}=\frac{5\sqrt{3}-1}{7+\sqrt{3}}$$

$$\frac{(5\sqrt{3}-1)(7-\sqrt{3})}{(7+\sqrt{3})(7-\sqrt{3})}=\frac{-11+18\sqrt{3}}{23}$$

On comparing $\frac{-11+18\sqrt{3}}{23}$

with $\frac{a+b\sqrt{3}}{23}$ we get,

⇒ a = -11 and b = 18

(b - a) = 18 - (-11) = 29

Sol.180.(a) $\{4-\frac{2}{1+\frac{2}{1-\frac{1}{2+\frac{3}{4}}}}\}\div1\frac{5}{12}$

of $\frac{72}{145}-(4+3\div0.5-1)$

$=\{4-\frac{2}{1+\frac{2}{1-\frac{4}{11}}}\}\div\frac{17}{12}\times\frac{72}{45}-(4+$

$6-1)=\{4-\frac{2}{1+\frac{22}{7}}\}\div\frac{102}{145}-(9)$

$=\{4-\frac{14}{29}\}\div\frac{102}{145}-(9)$

$=\{\frac{102}{29}\}\div\frac{102}{145}-(9)$

$=\{\frac{102}{29}\}\times\frac{145}{102}-(9)=5-9=-4$

Sol.181.(d) $4\frac{2}{5}\div\{(1\frac{1}{2}-3\frac{1}{5})\div3\frac{2}{5}$

$+(2\frac{1}{5}\div1\frac{1}{2}+4\frac{2}{5})+\frac{1}{2}\}$

$=\frac{22}{5}\div\{(\frac{3}{2}-\frac{16}{5})\div\frac{17}{5}+(\frac{11}{5}\div\frac{3}{2}$

$+\frac{22}{5})+\frac{1}{2}\}$

$=\frac{22}{5}\div\{(-\frac{17}{10})\times\frac{5}{17}+(\frac{11}{5}\times\frac{2}{3}+$

$\frac{22}{5})+\frac{1}{2}\}$

$=\frac{22}{5}\div\{-\frac{1}{2}+(\frac{88}{15})+\frac{1}{2}\}$

$=\frac{22}{5}\div\{\frac{88}{15}\}=\frac{22}{5}\times\frac{15}{88}=\frac{3}{4}$

Sol.182.(a)

$3\frac{5}{6}+[3\frac{2}{3}+\{\frac{15}{4}(5\frac{4}{5}\div14\frac{1}{2})\}]$

$=\frac{23}{6}+[\frac{11}{3}+\{\frac{15}{4}(\frac{29}{5}\div\frac{29}{2})\}]$

$=\frac{23}{6}+[\frac{11}{3}+\{\frac{15}{4}\times\frac{2}{5}\}]$

$=\frac{23}{6}+[\frac{11}{3}+\frac{3}{2}]=\frac{23}{6}+\frac{31}{6}=9$

Sol.183.(c)

$(\frac{3}{4}-\frac{1}{4}\div\frac{1}{4}\text{ of }\frac{2}{5})\div(\frac{3}{4}\div\frac{2}{3}\text{ of }\frac{3}{5})$

$=(\frac{3}{4}-\frac{1}{4}\div\frac{1}{10})\div(\frac{3}{4}\div\frac{2}{5})$

$=-\frac{7}{4}\div(\frac{15}{8})=-\frac{14}{15}$

Sol.184.(b) $(2x-3y)^3-18xy(2x-3y)$

$=8x^3-27y^3-36x^2y+54xy^2-36x^2y+54xy^2$

$=8x^3-27y^3-72x^2y+108xy^2$

Sol.185.(a)

$364-[142-\{75+(38-\overline{\frac{5}{4}+\frac{14}{8}})\}]$

$364-[142-\{75+(38-3)\}]=332$

Search on TG: @apna_pdf

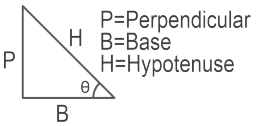
Search on Telegram @apna_pdf

Trigonometry

It is that branch of Mathematics which deals with the measurements of the sides and angles of a triangle and also the problems associated with angles.

Important Formulae

In a right angled triangle, as shown below



- $\sin\theta = \frac{P}{H}$
- $cosec\theta = \frac{H}{P}$
- $\cos\theta = \frac{B}{H}$
- $\sec\theta = \frac{H}{B}$
- $\tan\theta = \frac{P}{B}$
- $\cot\theta = \frac{B}{P}$

Note that

$cosec\theta = \frac{1}{\sin\theta}$, $\therefore cosec\theta \times \sin\theta = 1$

Similarly, $\sec\theta = \frac{1}{\cos\theta}$

$\therefore \sec\theta \times \cos\theta = 1$

And, $\cot\theta = \frac{1}{\tan\theta}$

$\therefore \cot\theta \times \tan\theta = 1$

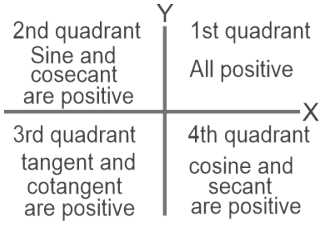
Also, $\tan\theta = \frac{Sin\,\theta}{Cos\,\theta}$

- $\sin\theta = \cos(90° - \theta)$
- $cosec\theta = \sec(90° - \theta)$
- $\tan\theta = \cot(90° - \theta)$

Conversion of trigonometric ratios

- sin (-x) = - sin x
- cosec (-x) = - cosec x
- cos (-x) = cos x
- sec (-x) = sec x
- tan (- x) = - tan x
- cot (- x) = - cot x

Signs of the trigonometric ratios in different quadrants :



- x axis $\pm$ $\theta \rightarrow$ no change
- y axis $\pm$ $\theta \rightarrow$ changes like

$\sin\theta \leftrightarrow \cos\theta$

$\tan\theta \leftrightarrow \cot\theta$

$cosec\theta \leftrightarrow \sec\theta$

Important Identities

- $\sin^2\theta + \cos^2\theta = 1$
- $\sec^2\theta - \tan^2\theta = 1$
- $cosec^2\theta - \cot^2\theta = 1$

We can derive all other identities from these three basic identities.

Values of Trigonometric functions for different values of θ.

	0°	30°	45°	60°	90°
sinθ	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
cosθ	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
tanθ	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	∞
cotθ	∞	$\sqrt{3}$	1	$\frac{1}{\sqrt{3}}$	0
secθ	1	$\frac{2}{\sqrt{3}}$	$\sqrt{2}$	2	∞
cosecθ	∞	2	$\sqrt{2}$	$\frac{2}{\sqrt{3}}$	1

The value of sinθ or cosθ never exceeds 1, whereas the value of secθ or cosecθ is always greater than or equal to 1.

Range of all trigonometric functions

	Minimum	Maximum
Sinx,cosx (odd powers)	-1	+ 1
Sinx,cosx (even powers)	0	+1
Tanx,cotx (odd powers)	-∞	+∞
Tanx,cotx (even powers)	0	+∞
Secx,cosecx (odd powers)	-∞	+∞
Secx,cosecx (even powers)	+1	+∞

Maximum and Minimum value of the trigonometric expressions of the different form :

- a sinx $\pm$ $b\cos x$

Maximum value = $\sqrt{a^2 + b^2}$

Minimum value = - $\sqrt{a^2 + b^2}$

- a$\sin^2 x$ + b$\cos^2 x$

If, a > b Maximum value = a

Minimum value = b

If a < b Maximum value = b

Minimum value = a

- a $cosec^2 x$ + b $\sec^2 x$

Maximum value = ∞

Minimum value = $(\sqrt{a} + \sqrt{b})^2$

- a $\sin^2 x$ + b $cosec^2 x$
- a $\tan^2 x$ + b $\cot^2 x$
- a $\cos^2 x$ + b $\sec^2 x$

Maximum and Minimum value of these three trigonometric expression is ∞ *and* $2\sqrt{ab}$ respectively.

- $\sin^{2n} x + \cos^{2m} x$

Maximum value = 1

Minimum value = (use x = 45°)

Example : Find the minimum and maximum value of $\sin^2 x + \cos^4 x$?

Maximum value of $\sin^2 x + \cos^4 x$ = 1

Minimum value = $\sin^2 45° + \cos^4 45°$ = $\frac{1}{2} + \frac{1}{4} = \frac{3}{4}$

- $(\sin x \cos x)^n$

Maximum value = ∞

Minimum value = $(\frac{1}{2})^n$

Example : Find the minimum value of $\sin^4 x \cos^4 x$?

Minimum value = $(\frac{1}{2})^4 = \frac{1}{16}$

Compound Formulae

- $\sin(A + B) = \sin A.\cos B + \cos A.\sin B$
- $\sin(A - B) = \sin A.\cos B - \cos A.\sin B$
- $\cos(A + B) = \cos A.\cos B - \sin A.\sin B$
- $\cos(A - B) = \cos A.\cos B + \sin A.\sin B$
- $\sin 2A = 2\sin A\cos A = \frac{2\tan A}{1 + \tan^2 A}$
- $\cos 2A = \cos^2 A - \sin^2 A = 1 - 2\sin^2 A$
- $\cos 2A = \frac{1 - \tan^2 A}{1 + \tan^2 A} = 2\cos^2 A - 1$
- $\tan 2A = \frac{2\tan A}{1 - \tan^2 A}$
- $\sin 3A = 3\sin A - 4\sin^3 A$
- $\cos 3A = 4\cos^3 A - 3\cos A$
- $\tan 3A = \frac{3\tan A - \tan^3 A}{1 - 3\tan^2 A}$
- $\sin\theta.\sin 2\theta.\sin 4\theta = \frac{1}{4}\sin 3\theta$
- $\cos\theta.\cos 2\theta.\cos 4\theta = \frac{1}{4}\cos 3\theta$
- $\tan\theta.\tan 2\theta.\tan 4\theta = \tan 3\theta$
- $\tan(A + B) = \frac{\tan A + \tan B}{1 - (\tan A \times \tan B)}$
- $\tan(A - B) = \frac{\tan A - \tan B}{1 + (\tan A \times \tan B)}$
- $\cot(A + B) = \frac{\cot B\cot A - 1}{\cot B + \cot A}$
- $\cot(A - B) = \frac{\cot B\cot A + 1}{\cot B - \cot A}$

Transformations of sums or differences into products

- $\sin C + \sin D = 2\sin\frac{C + D}{2}\cos\frac{C - D}{2}$
- $\sin C - \sin D = 2\cos\frac{C + D}{2}\sin\frac{C - D}{2}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

- $\cos C + \cos D = 2\cos\frac{C+D}{2}\cos\frac{C-D}{2}$
- $\cos C - \cos D = -2\sin\frac{C+D}{2}\sin\frac{C-D}{2}$

Concepts

- a sinX + b cosX = m
  a cosX - b sinX = n

Then, $a^2 + b^2 = m^2 + n^2$

Example : if $3\sin\theta + 5\cos\theta = 5$.Find the value of 3cosθ - 5sinθ ?

$3\cos\theta - 5\sin\theta = \sqrt{5^2 + 3^2 - 5^2} = \pm 3$

- a secX + b tanX = m
  a tanX - b secX = n

Then, $a^2 - b^2 = m^2 - n^2$

If secx and tanx are replaced by cosecx and cotx respectively . Then the outcome will be the same.

Example : if $29\sec\theta - 21\tan\theta = 20$ Find the value of $29\tan\theta - 21\sec\theta$?

Sol:– $= 29\tan\theta - 21\sec\theta$

$= \sqrt{20^2 - 29^2 + 21^2} = 0$

- sec x + tan x = $\frac{1}{\sec x - \tan x}$
- cosec x + cot x = $\frac{1}{\operatorname{cosec} x - \cot x}$

Some Important results

(i). If A + B + C = 180°. then,
- tanA + tanB + tanC = tanA tanB tan C
- cotA cotB + cotB cotC + cotC cotA = 1

(ii). If A + B + C = 90°. then,
- tanA tanB + tanB tanC + tanC tanA = 1
- cotA + cotB + cotC = cotA cotB cotC

(iii). If A + B = 45°. then
- (1 + tanA) (1 + tanB) = 2
- (1 - cotA) (1 - cotB) = 2

Variety Questions

Q.1. Find the value of tan 72° - tan 27° - tan 72° tan 27°.
SSC CGL 25/09/2024 (2nd Shift)
(a) -1 (b) 1 (c) -2 (d) 0

Q.2. Simplify $\frac{1+\sin\theta-\cos\theta}{1+\sin\theta+\cos\theta}$.
SSC CGL 24/09/2024 (3rd Shift)
(a) $\cos\frac{\theta}{2}$ (b) $\sin\frac{\theta}{2}$ (c) $\cot\frac{\theta}{2}$ (d) $\tan\frac{\theta}{2}$

Q.3. The value of the expression $\frac{1-\sin(2t)}{1+\sin(2t)} \times \frac{\cos(t)+\sin(t)}{\cos(t)-\sin(t)}$ is
SSC CGL 19/09/2024 (2nd Shift)
(a) $\frac{1-2\tan(t)}{1+2\tan(t)}$ (b) $\frac{1-\tan(t)}{1+\tan(t)}$
(c) $\frac{1+2\tan(t)}{1-2\tan(t)}$ (d) $\frac{1+\tan(t)}{1-\tan(t)}$

Q.4. SinA SinB = _____.
SSC CGL 18/09/2024 (3rd Shift)
(a) $\frac{1}{2}$\{(sin(A + B) + sin(A - B)\}
(b) $\frac{1}{2}$\{(sin(A + B) - sin(A - B)\}
(c) $\frac{1}{2}$\{(cos(A + B) - cos(A - B)\}
(d) $\frac{1}{2}$\{(cos(A - B) - cos(A + B)\}

Q.5. If $a\sin^3 x + b\cos^3 x = \sin x\cos x$ and $a\sin x = b\cos x$, then find the value of $a^2 + b^2$, provided that x is neither 0° nor 90°.
SSC CGL 11/09/2024 (1st Shift)
(a) 0 (b) 1 (c) $a^2 - b^2$ (d) $a^2 + b^2$

Q.6. If p cosA = 2q sinA and 2p cosecA - q secA = 3, then the value of $p^2 + 4q^2$ is:
SSC CGL 10/09/2024 (2nd Shift)
(a) 2 (b) 4 (c) 1 (d) 3

Q.7. If tanA + sinA = x, tanA - sinA = y, what is the value of $x^2 - y^2$?
SSC CHSL 11/07/2024 (4th Shift)
(a) $4\sqrt{xy}$ (b) $2\sqrt{\frac{x}{y}}$ (c) $\sqrt{xy}$ (d) $4\sqrt{\frac{x}{y}}$

Q.8. What is the value of
$\cos^{-1}(\frac{7}{25}) - \cos^{-1}(\frac{15}{17})$?
SSC CHSL 11/07/2024 (2nd Shift)
(a) $\cos^{-1}(\frac{304}{425})$ (b) $\cot^{-1}(\frac{297}{425})$
(c) $\tan^{-1}(\frac{297}{425})$ (d) $\sin^{-1}(\frac{304}{425})$

Q.9. If $f(p) = \sin^{p+2}x + \cos^{p+2}x$, then the value of $6f(2) - 4f(4) + 10f(0)$ is :
SSC CHSL 10/07/2024 (2nd Shift)
(a) 12 (b) 10 (c) 11 (d) 14

Q.10. If tan A = a tan B and sin A = b sin B, then the value of $\cos^2 A$ is:
SSC CHSL 05/07/2024 (1st Shift)
(a) $\frac{b^2+1}{a^2+1}$ (b) $\frac{b^2-1}{a^2-1}$
(c) $\frac{a^2+1}{b^2+1}$ (d) $\frac{a^2-1}{b^2-1}$

Q.11. If sin(X - Y) = sinXcosY - cosXsinY, then the value of $\frac{\sin(A-B)}{\cos A\cos B} + \frac{\sin(B-C)}{\cos B\cos C}$ is :
SSC CHSL 05/07/2024 (2nd Shift)
(a) $\frac{\cos(A+C)}{\cos A\cos C}$ (b) $\frac{\sin(C-A)}{\cos A\cos C}$
(c) $\frac{\cos(A+C)}{\sin A\sin C}$ (d) $\frac{\sin(A-C)}{\cos A\cos C}$

Q.12. $\frac{3\cos^3\theta - 2\cos\theta}{\sin\theta - 3\sin^3\theta}$ is equal to :
SSC CHSL 03/07/2024 (3rd Shift)
(a) $\tan^2\theta$ (b) $\cot^2\theta$ (c) tan θ (d) cot θ

Q.13. If cot A = 7, then the value of $\frac{5\cos A + 4\sin A}{\cos^3 A + 7\sin^3 A + 6\sin A}$ is :
SSC CHSL 01/07/2024 (3rd Shift)
(a) 2 (b) 0 (c) 3 (d) 1

Q.14. What is the value of $\frac{[(\sin x+\sin y)(\sin y-\sin x)]}{[(\cos x+\cos y)(\cos y-\cos x)]}$
SSC CPO 29/06/2024 (3rd Shift)
(a) 0 (b) 1 (c) -1 (d) 2

Q.15. Simplify $\frac{\cos 13° + \sin 13°}{\cos 13° - \sin 13°}$
SSC CPO 28/06/2024 (1st Shift)
(a) cot 58° (b) tan 32°
(c) tan 58° (d) cos 26°

Q.16. If $(\sin x + \sin y) = a$ and $(\cos x + \cos y) = b$, then find the value of $(\sin x \sin y + \cos x \cos y)$.
SSC CPO 27/06/2024 (2nd Shift)
(a) $\frac{a^2+b^2-1}{2}$ (b) $\frac{a^2-b^2-2}{2}$
(c) $\frac{a^2+b^2-2}{2}$ (d) $\frac{a^2+b^2+2}{2}$

Q.17. If tan(t) + cot(t) = 1, then one of the values of the expression $\frac{1}{\sin(t)+\cos(t)}$ is _____ .
SSC CPO 27/06/2024 (1st Shift)
(a) $\frac{1}{\sqrt{3}}$ (b) $\frac{2}{\sqrt{3}}$ (c) $\frac{\sqrt{3}}{2}$ (d) $\sqrt{3}$

Q.18. If $3\sec^4\theta + 8 = 10\sec^2\theta$, then the value of tanθ can be:
Graduate Level 26/06/2024 (Shift - 4)
(a) 2,√3 (b) 1,√3 (c) 2,$\frac{1}{\sqrt{3}}$ (d) 1,$\frac{1}{\sqrt{3}}$

Q.19. If $\cot^4 A + \cot^2 A = 1$, then find the value of $\cos^4 A - 3\cos^2 A$.
SSC CHSL Tier II 02/11/2023
(a) –1 (b) –2 (c) 2 (d) 1

Q.20 If $\cot^2\theta = 1 - e^2$, then the value of $\operatorname{cosec}\theta + \cot^3\theta\sec\theta$ is:
SSC CPO 05/10/2023 (3rd Shift)
(a) $(2 - e^2)^{\frac{3}{2}}$ (b) $(1 - e^2)$
(c) $(1 - e^2)^{\frac{3}{2}}$ (d) $(2 - e^2)^{\frac{1}{2}}$

Q.21. Find the least value of $16\operatorname{cosec}^2\theta + 25\sin^2\theta$.
SSC CPO 04/10/2023 (3rd Shift)
(a) 35 (b) 38 (c) 42 (d) 40

Q.22. If cosecA + cotA = $a\sqrt{b}$, then find the value of $\frac{(a^2 b - 1)}{(a^2 b + 1)}$.
SSC CHSL 17/08/2023 (2nd Shift)
(a) cosA (b) tanA (c) $\frac{1}{\sin A}$ (d) $\frac{1}{\cot A}$

Q.23. If $\sin\theta + \tan\theta = p$ and $\tan\theta - \sin\theta = q$, then which of the relation satisfies for given values of p and q ?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 11/08/2023 (4th Shift)
(a) $p^2 - q^2 = 4\sqrt{pq}$ (b) $p^2 - q^2 = 8\sqrt{pq}$
(c) $p^2 + q^2 = 4\sqrt{pq}$ (d) $p^2 + q^2 = 4pq$

Q.24. If θ is an acute angle and sinθ cos θ = 2 $\cos^3\theta$ - $\frac{1}{4}$ cosθ, then the value of sinθ is:
SSC CHSL 10/08/2023 (2nd Shift)
(a) $\frac{\sqrt{15}-1}{8}$ (b) $\frac{\sqrt{15}-1}{4}$
(c) $\frac{\sqrt{15}+1}{4}$ (d) $\frac{\sqrt{15}-1}{2}$

Q.25. Simplify the following: 7(cot 11° cot 13° cot 19° cot 29° cot 61°cot 71° cot 77° cot 79°)
SSC CHSL 09/08/2023 (3rd Shift)
(a) 7 (b) - 7 (c) - 1 (d) 1

Q.26. The given expression is equal to :
$\frac{\sin^4 A + \cos^4 A}{1 - 2\sin^2 A \cos^2 A}$
SSC CHSL 09/08/2023 (2nd Shift)
(a) 1 (b) -1 (c) 0 (d) 2

Q.27. If cot A + cos A = p and cot A - cos A = q, then which of the following relation is correct ?
SSC CHSL 03/08/2023 (4th Shift)
(a) $\sqrt{\frac{1}{16pq}}$ = $p^2 + q^2$ (b) $\frac{1}{4pq}$ = $p^2 + q^2$
(c) $\sqrt{16pq}$ = $p^2 - q^2$ (d) 4pq = $p^2 + q^2$

Q.28. The value of the expression 4($\sin^6$ A + $\cos^6$ A) - 6 ($\sin^4$A + $\cos^4$ A) + 8 is :
SSC CHSL 02/08/2023 (4th Shift)
(a) 4 (b) 8 (c) 7 (d) 6

Q.29. Evaluate the following:
$\sqrt{2 + \sqrt{2 + \sqrt{2 + 2\cos 8\theta}}}$
SSC CGL 27/07/2023 (3rd shift)
(a) 2cosθ (b) 2cos2θ (c) sin2θ (d) cos2θ

Q.30. Find the value of $\sqrt{\frac{1 - \sin 3\theta}{1 + \sin 3\theta}}$
SSC CGL 21/07/2023 (2nd shift)
(a) sec 3θ - tan 3θ (b) $(\sec 3\theta - \tan 3\theta)^3$
(c) $(\sec 3\theta - \tan 3\theta)^2$ (d) sec 3θ + tan 3θ

Q.31. The solution of the equation $\cos^2\theta$ + sinθ + 1 = 0 lies between :
Graduate Level 30/06/2023 (shift 1)
(a) $(\frac{3\pi}{4}, \frac{5\pi}{4})$ (b) $(\frac{5\pi}{4}, \frac{7\pi}{4})$
(c) $(\frac{\pi}{4}, \frac{3\pi}{4})$ (d) $(-\frac{\pi}{4}, \frac{\pi}{4})$

Q.32. What is the value of (1+ cotA + tanA) (sinA - cosA) $(\frac{\sin A \cos A}{\sin^3 A - \cos^3 A})$?
SSC CHSL Tier II (26/06/2023)
(a) 1 (b) -1 (c) 0 (d) 2

Q.33. If sin m + sin n = p, cos m + cos n = q, then find the value of sin m × sin n + cos m × cos n.
SSC CHSL 20/03/2023 (2nd Shift)
(a) $p^2 + q^2 - 2$ (b) $\frac{(p^2 + q^2 - 2)}{2}$
(c) p + q - pq (d) p + q + pq

Q.34. If a cot θ + b cosec θ = p and b cot θ + a cosec θ = q then $p^2 - q^2$ is equal to _____.
SSC CGL Tier II (07/03/2023)
(a) $b^2 - a^2$ (b) $a^2 - b^2$ (c) b − a (d) $a^2 + b^2$

Q.35. If A is an acute angle, the simplified form of
$$\frac{\cos(\pi - A).\cot(\frac{\pi}{2} + A)\cos(-A)}{\tan(\pi + A)\tan(\frac{3\pi}{2} + A)\sin(2\pi - A)}$$
SSC CGL 13/12/2022 (4th Shift)
(a) $\cos^2 A$ (b) Sin A (c) $\sin^2 A$ (d) Cos A

Q.36. What is the value of the expression cos 2A cos 2B + $\sin^2$ (A - B) - $\sin^2$(A + B) ?
SSC CGL 12/12/2022 (1st Shift)
(a) sin (2A - 2B) (b) sin (2A + 2B)
(c) cos (2A + 2B) (d) cos (2A - 2B)

Q.37. If $\frac{k - k\cot^2 30°}{1 + \cot^2 30°}$ = $\sin^2 60°$ + $4\tan^2 45°$ - $\operatorname{cosec}^2 60°$, then the value of k (correct to two decimal places) is:
SSC CGL 03/12/2022 (3rd Shift)
(a) 5.55 (b) - 6.83 (c) - 5.58 (d) 6.83

Q.38. If Cos θ + Sin θ = $\sqrt{2}$ Cos θ, find the value of (cos θ - Sinθ).
SSC CPO 10/11/2022 (Afternoon)
(a) $\sqrt{2}$ Sin θ (b) $\sqrt{2}$ Cos θ
(c) $\frac{1}{\sqrt{2}}$ Sin θ (d) $\frac{1}{2}$ Cos θ

Q.39. The value of $\sin 73° + \cos 137°$ is:
SSC CHSL 10/06/2022 (Evening)
(a) sin 13° (b) cos 13°
(c) cos 18° (d) sin 18°

Q.40. The value of sin18° is given as $\frac{\sqrt{5}-1}{4}$. Using this value, find the value of cos18°.
SSC CHSL 30/05/2022 (Afternoon)
(a) $\frac{\sqrt{10+2\sqrt{5}}}{4}$ (b) $\frac{\sqrt{5}+1}{4}$
(c) $\frac{\sqrt{6}+\sqrt{2}}{4}$ (d) $\frac{\sqrt{10-2\sqrt{5}}}{4}$

Q.41. The value of $\frac{\sin 4\theta + \sin 2\theta}{\cos 4\theta + \cos 2\theta}$ is:
SSC CHSL 27/05/2022 (Morning)
(a) $\tan 3\theta$ (b) $\cot 3\theta$ (c) $\tan\theta$ (d) $\cot\theta$

Q.42. The value of $\cot^2 46° - \sec^2 44° + (\sin^2 1° + \sin^2 3° + \sin^2 5° + \ldots + \sin^2 89°)$
SSC CHSL 10/08/2021 (Evening)
(a) 23.5 (b) 20.5 (c) 22.5 (d) 21.5

Q.43. If A lies between 45° and 540°, and sinA = 0.5, what is the value of $\frac{A}{3}$ in degree ?
SSC CHSL 15/04/2021 (Morning)
(a) 170° (b) 175° (c) 165° (d) 160°

Q.44. If cos 27° = x, then the value of tan 63° is:
SSC CHSL 26/10/2020 (Evening)
(a) $\frac{\sqrt{1+x^2}}{x}$ (b) $\frac{x}{\sqrt{1+x^2}}$
(c) $\frac{\sqrt{1-x^2}}{x}$ (d) $\frac{x}{\sqrt{1-x^2}}$

Q.45. If $x\sin^3\theta + y\cos^3\theta = \sin\theta\cos\theta$ and $x\sin\theta = y\cos\theta$, then the value of $x^2 + y^2$ is:
SSC CHSL 20/10/2020 (Morning)
(a) 0 (b) 4 (c) 1 (d) 2

Q.46. If $\cos^2\theta + \cos^4\theta = 1$, then the value of $\sin\theta + \sin^2\theta$ is:
SSC CHSL 16/10/2020 (Morning)
(a) 0 (b) $\frac{1}{2}$ (c) 2 (d) 1

Q.47. If sinθ - cosθ = $\frac{7}{17}$, then find the value of sinθ + cosθ.
SSC CHSL 14/10/2020 (Evening)
(a) $\frac{8}{17}$ (b) $\frac{23}{13}$ (c) $\frac{23}{17}$ (d) $\frac{8}{13}$

Q.48. If secθ and $\sin\theta$ $(0° < \theta < 90°)$ are the roots of the equation $\sqrt{6}x^2 - kx + \sqrt{6} = 0$, then the value of k is:
SSC CHSL 14/10/2020 (Morning)
(a) $\sqrt{3}$ (b) $3\sqrt{2}$ (c) $2\sqrt{3}$ (d) $3\sqrt{3}$

Q.49. If cosA, sinA, cotA are in geometric progression, then the value of $\tan^6 A$ - $\tan^2 A$ is:
SSC CHSL 13/10/2020 (Afternoon)
(a) $\frac{1}{2}$ (b) 3 (c) $\frac{1}{3}$ (d) 1

Q.50. Find the value of Cos 225°
SSC CHSL 17/03/2020 (Afternoon)
(a) - 0.7071 (b) - 0.866
(c) 0.7071 (d) 0.866

Q.51. If 0° < A, B < 45°, cos(A + B) = $\frac{24}{25}$ and sin(A - B) = $\frac{15}{17}$, then tan2A = ?
SSC CGL 06/03/2020 (Evening)
(a) 0 (b) 1 (c) $\frac{416}{87}$ (d) $\frac{213}{4}$

Q.52. If $\cos^2\theta - \sin^2\theta = \tan^2\theta$, then which of the following is true ?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CPO 13/12/2019 (Evening)
(a) cosθcosθ = 1
(b) cosθcosθ = $\sqrt{2}$
(c) $cos^2\theta - sin^2\theta = cot^2\theta$
(d) $cos^2\theta - sin^2\theta = tan^2\theta$

Q.53. everything between 0° and 90° For $\alpha'_i s$, $(i = 1, 2, 3 \ldots\ldots 20)$ it is given that $\sin\alpha_1 + \sin\alpha_2 + \sin\alpha_3 \ldots\ldots\ldots\ldots \sin\alpha_{20} = 20$. Find the value (in degrees) of $(\alpha_1 + \alpha_2 + \alpha_3 \ldots \alpha_{20})$.
SSC CHSL 11/07/2019 (Morning)
(a) 1800° (b) 900° (c) 0° (d) 20°

Q.54. For α and β both being acute angles, it is given that sin(α + β) = 1, cos (α - β) = $\frac{1}{2}$. The values of α and β are :
SSC CHSL 10/07/2019 (Evening)
(a) 75° , 15° (b) 45° , 15°
(c) 75° , 45° (d) 60° , 30°

Q.55. If θ = 9° , then what is the value of cotθ.cot2θ.cot3θ.cot4θ.cot5θ.cot6θ.cot 7θ.cot8θ.cot9θ ?
SSC CHSL 10/07/2019 (Evening)
(a) $\sqrt{3}$ - 1 (b) 1 (c) $\sqrt{3}$ (d) $\frac{1}{\sqrt{3}}$

Q.56. Which among the following is an irrational quantity ?
SSC CHSL 10 /07/ 2019 (Afternoon)
(a) tan30° .tan60° (b) sin30°
(c) tan45° (d) cos30°

Q.57. Which among the following increases continuously in the range $0° < \theta < 90°$?
SSC CHSL 09/07/2019 (Evening)
(a) cotθ (b) cosecθ (c) tanθ (d) cosθ

Q.58. If secθ = $4x$ and tanθ = $\frac{4}{x}$, $(x \neq 0)$ then the value of $8(x^2 - \frac{1}{x^2})$ is :
SSC CHSL 05/07/2019 (Afternoon)
(a) $\frac{1}{16}$ (b) $\frac{1}{4}$ (c) $\frac{1}{2}$ (d) $\frac{1}{8}$

Q.59. If $\sqrt{\frac{1-cos\theta}{1+cos\theta}} \times \sqrt{\frac{cosec\theta - cot\theta}{cosec\theta + cot\theta}}$ = $\frac{1-r}{1+r}$, then the value of r is:
SSC CHSL 03/07/2019 (Afternoon)
(a) Sinθ (b) Cosecθ (c) Secθ (d) Cosθ

Q.60. If $\frac{(sin\theta - cosec\theta)(cos\theta - sec\theta)}{tan^2\theta - sin^2\theta} = r^3$, then r = ?
SSC CHSL 03/07/2019 (Morning)
(a) SinθCosθ (b) tanθ
(c) Cotθ (d) CosecθSecθ

Q.61. If 3 - $2sin^2\theta$ - 3Cosθ = 0, 0° < θ < 90° , then what is the value of (2Cosecθ + tanθ) ?
SSC CHSL 02/07/2019 (Evening)
(a) 7√3 (b) 5√3 (c) $\frac{5\sqrt{3}}{3}$ (d) $\frac{7\sqrt{3}}{3}$

Q.62. A simplified of $(\frac{Sin\theta}{1+cos\theta} + \frac{1+cos\theta}{sin\theta})(\frac{1}{tan\theta + cot\theta})$ is :
SSC CHSL 02/07/2019 (Evening)
(a) Cosθ (b) 2Sinθ (c) Sinθ (d) 2Cosθ

Q.63. The value of $\frac{(cos9° + sin81°)(sec9° + cosec81°)}{sin56°.sec34° + cos25°.cosec65°}$ is:
SSC CHSL 02/07/2019 (Evening)
(a) $\frac{1}{2}$ (b) 4 (c) 2 (d) 1

Q.64. $\frac{(sec\theta + tan\theta)\,(1 - sin\theta)}{cosec\theta(1 + cos\theta)\,(cosec\theta - cot\theta)}$ is equal to:
SSC CHSL 02/07/2019 (Morning)
(a) Sinθ (b) Secθ (c) Cosθ (d) Cosecθ

Q.65. If $3cos^2A + 7sin^2A = 4$, then what is the value of cot A, given that A is an acute angle ?
SSC CGL 13/06/2019 (Evening)
(a) 1 (b) $\sqrt{3}$ (c) $\frac{\sqrt{3}}{2}$ (d) $\frac{1}{\sqrt{3}}$

Q.66. If Cosecθ = $\frac{13}{12}$, then Sinθ + Cosθ - tanθ is equal to :
SSC CGL 11/06/2019 (Afternoon)
(a) $\frac{91}{65}$ (b) $\frac{139}{65}$ (c) $\frac{71}{65}$ (d) - $\frac{71}{65}$

Q.67. If Sec4θ = Cosec (θ + 20°) , then θ is equal to:
SSC CGL 10/06/2019 (Afternoon)
(a) 22° (b) 18° (c) 14° (d) 20°

Q.68. If 3 sinθ = $2cos^2\theta$, 0° < θ < 90°, then the value of $(tan^2\theta + sec^2\theta - cosec^2\theta)$ is :
SSC CGL 10/06/2019 (Morning)
(a) -2 (b) - $\frac{7}{3}$ (c) $\frac{7}{3}$ (d) 2

Q.69. If $\frac{tan\theta + sin\theta}{tan\theta - sin\theta} = \frac{k+1}{k-1}$, then k = ?
SSC CGL 10/06/2019 (Morning)
(a) cosecθ (b) secθ (c) cosθ (d) sinθ

Q.70. If $\frac{1}{cosec\,\theta - 1} + \frac{1}{cosec\,\theta + 1} = 2$ secθ, 0° < θ < 90° , then the value of (cotθ + cosθ) is:
SSC CGL 07/06/2019 (Evening)
(a) $\frac{1+\sqrt{2}}{2}$ (b) $\frac{2+\sqrt{2}}{2}$
(c) $\frac{2+\sqrt{3}}{\sqrt{2}}$ (d) $1 + \sqrt{2}$

Q.71. If sinθ = $\frac{a}{\sqrt{a^2+b^2}}$, 0° < θ < 90°, then the value of secθ + tanθ is :
SSC CGL 07/06/2019 (Afternoon)
(a) $\frac{\sqrt{a^2+b^2}+a}{b}$ (b) $\frac{\sqrt{a^2+b^2}+b}{2a}$
(c) $\frac{\sqrt{a^2+b^2}+a}{2b}$ (d) $\frac{\sqrt{a^2+b^2}+b}{a}$

Q.72. If $cos^2\theta$ - 3cosθ + 2 = $sin^2\theta$, 0° < θ < 90°, then the value of 2cosecθ + 4cotθ is :
SSC CGL 07/06/2019 (Afternoon)
(a) $\frac{8\sqrt{3}}{3}$ (b) $\frac{4\sqrt{3}}{4}$ (c) $2\sqrt{3}$ (d) $4\sqrt{3}$

Q.73. The value of $\frac{1}{secx - tanx} - \frac{1}{cosx}$, 0° < x < 90°, is equal to :
SSC CGL 07/06/2019 (Morning)
(a) 2secx (b) tanx (c) 2cosx (d) cotx

Q.74. If $tan^2\theta$ - 3secθ + 3 = 0 , 0° < x < 90°, then the value of sinθ + cotθ is :
SSC CGL 07/06/2019 (Morning)
(a) $\frac{5\sqrt{3}}{6}$ (b) $2\sqrt{3}$ (c) $\frac{5\sqrt{3}}{3}$ (d) $3\sqrt{3}$

Q.75. If $(1 + tan^2\theta) + (1 + (tan^2\theta)^{-1})$ = k, then $\sqrt{k}$ = ?
SSC CGL 06/06/2019 (Evening)
(a) cosecθ.secθ (b) cosecθ.cosθ
(c) sinθ.cosθ (d) sinθ.secθ

Q.76. The value of $\frac{1}{sin\theta} - \frac{cot^2\theta}{1 + cosec\theta}$ is
SSC CGL 06/06/2019 (Evening)
(a) 0 (b) 1 (c) 2 (d) - 1

Q.77. $(\frac{1}{1+sin^2\theta} + \frac{1}{1+cosec^2\theta})$ = ?
SSC CGL 06/06/2019 (Evening)
(a) $sin^2\theta$ (b) 1 (c) $cosec^2\theta$ (d) 2

Q.78. If $\frac{cos\theta}{1-sin\theta} + \frac{cos\theta}{1+sin\theta}$ = 4, 0° < θ < 90° , then the value of (tanθ + cosecθ) is :
SSC CGL 06/06/2019 (Evening)
(a) $\frac{5\sqrt{2}}{2}$ (b) $\frac{5\sqrt{3}}{3}$ (c) $\frac{4\sqrt{3}}{3}$ (d) $\frac{5\sqrt{2}}{3}$

Q.79. $\frac{Sin\theta - Cos\theta + 1}{Sin\theta + Cos\theta - 1}$ = ?
SSC CGL 06/06/2019 (Morning)
(a) secθ sinθ (b) secθ tanθ
(c) secθ + tanθ (d) secθ - tanθ

Q.80. The value of $\sqrt{sec^2\theta + cosec^2\theta} \times \sqrt{tan^2\theta - sin^2\theta}$ is equal to :
SSC CGL 06/06/2019 (Morning)
(a) $cosec\theta\ sec^2\theta$ (b) $sin\,\theta\ sec^2\theta$
(c) $sin\theta\ cos^2\theta$ (d) $cosec\theta\ cos^2\theta$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.81. If secθ - tanθ = P, then cosecθ = ?
SSC CGL 04/06/ 2019 (Evening)
(a) $\frac{2P}{1-P^2}$ (b) $\frac{1-P^2}{1+P^2}$
(c) $\frac{P^2+1}{1-P^2}$ (d) $\frac{2P}{1+P^2}$

Q.82. If $0^0 < \theta < 90^0$ and $cos^2\theta = 3(cot^2\theta - cos^2\theta)$ then the value of $(\frac{1}{2} sec\theta + sin\theta)^{-1}$ is :
SSC CGL 04/06/2019 (Afternoon)
(a) $\sqrt{3} + 2$ (b) $2(2 - \sqrt{3})$
(c) $2(\sqrt{3} - 1)$ (d) $\sqrt{3} + 1$

Q.83. $(\frac{sin\theta - 2sin^3\theta}{2cos^3\theta - cos\theta})^2 + 1, \theta \neq 45^0$ is equal to.
SSC CGL 04/06/2019 (Afternoon)
(a) $cosec^2\theta$ (b) $sec^2\theta$ (c) $cot^2\theta$ (d) $2tan^2\theta$

Q.84. $(cosecA - sinA)^2 + (secA - cosA)^2 - (cotA - tanA)^2$ is equal to:
SSC CPO 16/03/2019 (Evening)
(a) 2 (b) 0 (c) 1 (d) -1

Q.85. Find the value of $1 + \frac{tan^2 A}{1 + sec A}$
SSC CPO 15/03/2019 (Evening)
(a) cosec A (b) cos A (c) sec A (d) sin A

Practice Questions

SSC CHSL 2024 Tier - 2

Q.86. Find the value of $(sin^6 A + cos^6 A + 3sin^2A.cos^2A)-(sin^4A - cos^4A + 1) cosec^2A$.
SSC CHSL Tier II (18/11/2024)
(a) 3 (b) -3 (c) 0 (d) -1

Q.87. Find the value of $3 (sec^2A - 1) (cosecA - 1) (cosecA + 1) + 4(cosec^2A - cot^2A)$.
SSC CHSL Tier II (18/11/2024)
(a) 12 (b) 3 (c) 10 (d) 7

SSC CGL 2024 Tier - 1

Q.88. The value of $sin^2 30° - sin^2 40° + sin^2 45° - sin^2 55° - sin^2 35° + sin^2 45° - sin^2 50° + sin^2 60°$ is:
SSC CGL 09/09/2024 (1st Shift)
(a) 1 (b) 2 (c) 4 (d) 0

Q.89. The value of $cos^2 29° + cos^2 61°$ is:
SSC CGL 09/09/2024 (1st Shift)
(a) $\frac{\sqrt{3}}{2}$ (b) 2 (c) 1 (d) 0

Q.90. If cosec θ = $\frac{5}{3}$, then evaluate $(sec^2\theta - 1) \times cot^2\theta \times (1 + cot^2\theta)$
SSC CGL 09/09/2024 (1st Shift)
(a) $\frac{25}{16}$ (b) $\frac{9}{16}$ (c) $\frac{25}{9}$ (d) $\frac{4}{5}$

Q.91. Simplify the following. $\frac{sin^3A - cos^3A}{sin A - cos A}$ where A is an acute angle.
SSC CGL 09/09/2024 (2nd Shift)
(a) 1 + sinA cosA (b) 1 - 3 sinA
(c) 3 cosA - 1 (d) sinA + cosA

Q.92. If $\frac{sec\,\alpha + tan\,\alpha}{sec\,\alpha - tan\,\alpha} = \frac{7}{4}$, then find the value of cosec α.
SSC CGL 09/09/2024 (3rd Shift)
(a) $\frac{1}{3}$ (b) $\frac{1}{11}$ (c) $\frac{11}{3}$ (d) $\frac{3}{11}$

Q.93. If A is an acute angle, which of the following is equal to $\frac{sinA}{1+ cos A}$?
SSC CGL 09/09/2024 (3rd Shift)
(a) $\frac{1 - cosA}{sin A}$ (b) $\frac{1 + cosA}{sin A}$
(c) $\frac{1 - sinA}{cos A}$ (d) $\frac{1 + sinA}{cos A}$

Q.94. If $\frac{7sin\theta + 4cos\theta}{9sin\theta - 2cos\theta} = \frac{5}{4}$, then the value of $\frac{tan^2\theta + 5}{tan^2\theta - 5}$ is :
SSC CGL 09/09/2024 (3rd Shift)
(a) $\frac{2121}{769}$ (b) $-\frac{2121}{769}$
(c) $\frac{769}{2121}$ (d) $-\frac{769}{2121}$

Q.95. $\frac{2 + tan^2 2A + cot^2 2A}{sec2A.cosec2A}$ is equal to__.
SSC CGL 10/09/2024 (1st Shift)
(a) sec2A + tan2A (b) sec2A + cosec2A
(c) cot2A - cosec2A (d) sec2A.cosec2A

Q.96. Let 0° < t < 90°. Then which of the following is true ?
SSC CGL 10/09/2024 (1st Shift)
(a) sin(t) ≠ cos (t) when t = 45°
(b) sin(t) > cos (t) when t < 45°
(c) sin(t) < cos (t) when t < 45°
(d) sin(t) < cos (t) when t > 45°

Q.97. If 2 tanθ = 3, then $\frac{3\,sin\theta - 2\,cos\theta}{3\,sin\theta + 2\,cos\theta}$ is equal to:
SSC CGL 10/09/2024 (2nd Shift)
(a) $\frac{6}{13}$ (b) $\frac{6}{7}$ (c) $\frac{5}{7}$ (d) $\frac{5}{13}$

Q.98. If cotθ = $\frac{4}{3}$, then evaluate $\frac{(sec\theta(1 + cot^2\theta)(cosec^2\theta - cot^2\theta))}{cosec^3\theta}$.
SSC CGL 10/09/2024 (2nd Shift)
(a) $\frac{3}{4}$ (b) $\frac{4}{5}$ (c) $\frac{4}{3}$ (d) $\frac{3}{5}$

Q.99. $\frac{3\,sin\,58°}{5\,cos\,32°} + \frac{2\,cos\,62°}{5\,sin\,28°}$ is equal to :
SSC CGL 10/09/2024 (3rd Shift)
(a) 0 (b) 2 (c) 3 (d) 1

Q.100. If $7 cos^2\theta + 5 sin^2\theta - 6 = 0$, ($0^0 < \theta < 90^0$), then what is the value of $1 + \sqrt{\frac{sec\,\theta + tan\,\theta}{sec\,\theta - tan\,\theta}}$?
SSC CGL 10/09/2024 (3rd Shift)
(a) $\sqrt{2} + 2$ (b) $\sqrt{2} + 1$ (c) $\sqrt{2} - 1$ (d) $\sqrt{2} - 2$

Q.101. Find the value of $\frac{sec\,35°}{cosec\,55°} - \frac{cos\,25°}{sin\,65°}$
SSC CGL 11/09/2024 (1st Shift)
(a) 0 (b) 1 (c) $\frac{1}{2}$ (d) 2

Q.102. Evaluate the value of (cosec 56° cos 34°- cos 59°cosec 31°).
SSC CGL 11/09/2024 (2nd Shift)
(a) 1 (b) 2 (c) -1 (d) 0

Q.103. Find the value of: $[\frac{4}{3} tan^2 60° + 3 cos^2 30° - 2 sec^2 30° - \frac{3}{4} cot^2 60°] \div [sin 60° cos 30° - cos 60° sin 30°]$
SSC CGL 11/09/2024 (2nd Shift)
(a) $6\frac{2}{3}$ (b) $3\frac{1}{2}$ (c) $4\frac{1}{3}$ (d) $6\frac{3}{2}$

Q.104. Express sin 74° + tan 74° in terms of trigonometric ratios of angles between 0° and 45°.
SSC CGL 11/09/2024 (3rd Shift)
(a) sec 16° + cot 16°
(b) cosec 16° + sec 16°
(c) cosec 16° + cot 16°
(d) cos 16° + cot 16°

Q.105. If p sin A - cos A = 1, then $p^2 - (1 + p^2) cos A$ equals:
SSC CGL 11/09/2024 (3rd Shift)
(a) 1 (b) -1 (c) 2 (d) 0

Q.106. The value of $(\frac{sin\theta - 2sin^3\theta}{2cos^3\theta - cos\theta})^3 \frac{1}{tan\theta} - sec^2\theta$ is:
SSC CGL 12/09/2024 (1st Shift)
(a) 2 (b) 1 (c) 0 (d) -1

Q.107. If $2cosec^2\theta + 3cot^2\theta = 17$, then the value of 'θ' when 0°≤ θ ≤ 90° is:
SSC CGL 12/09/2024 (1st Shift)
(a) 45° (b) 90° (c) 30° (d) 75°

Q.108. Solve the following:
$\frac{1}{1 + cos\theta} + \frac{1}{1 - cos\theta} = ?$
SSC CGL 12/09/2024 (2nd Shift)
(a) $2cosec^2\theta$ (b) $2sin^2\theta$
(c) $2sec^2\theta$ (d) $2tan^2\theta$

Q.109. If 7 tan θ = 3, then

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\frac{7\sin\theta + 5\cos\theta}{7\sin\theta - 2\cos\theta}$ is:
SSC CGL 12/09/2024 (2nd Shift)
(a) 7 (b) 5 (c) 8 (d) 6

Q.110. If $\cot^4\phi - \cot^2\phi = 1$, then the value of $\cos^4\phi + \cos^2\phi$ is:
SSC CGL 12/09/2024 (2nd Shift)
(a) 2 (b) 1 (c) $\frac{1}{\sqrt{3}}$ (d) $\frac{3}{2}$

Q.111. If $\tan 4\theta . \tan 6\theta = 1$, where 6θ is an acute angle, then find the value of $\cot 5\theta$.
SSC CGL 12/09/2024 (3rd Shift)
(a) $\sqrt{3}$ (b) $-\sqrt{3}$ (c) -1 (d) 1

Q.112. If 7 cosA = 6, then the numerical value of $\frac{cosecA + cotA}{cosecA - cotA}$ is:
SSC CGL 12/09/2024 (3rd Shift)
(a) 1 (b) 0 (c) 13 (d) -13

Q.113. If $p(\sqrt{3} + \cot 30°) = \tan^3 60° - 2\sin 60°$, then the value of p is:
SSC CGL 13/09/2024 (1st Shift)
(a) -1 (b) $2\sqrt{3}$ (c) 1 (d) $\sqrt{3}$

Q.114. If $\frac{1}{1-\sin\theta} + \frac{1}{1+\sin\theta} = 4\sec\theta$, $(0 < \theta < 90°)$, then the value of $(\cot\theta + \operatorname{cosec}\theta)$ is:
SSC CGL 13/09/2024 (1st Shift)
(a) $\sqrt{3}$ (b) $\sqrt{6}$ (c) $\sqrt{2}$ (d) $\sqrt{5}$

Q.115. If sin 31° = α, then the value of cot 59° is:
SSC CGL 13/09/2024 (1st Shift)
(a) $\frac{\sqrt{1-\alpha^2}}{2\alpha}$ (b) $\frac{\alpha}{\sqrt{1-\alpha^2}}$
(c) $\frac{\sqrt{1+\alpha^2}}{\alpha}$ (d) $\frac{\alpha}{\sqrt{1+\alpha^2}}$

Q.116. If $\frac{\tan(x)}{\sec(x)} = \frac{1}{2}$, then the value of $(\sin(x) + \cos(x))^2$ is _____.
SSC CGL 13/09/2024 (2nd Shift)
(a) $\frac{2+\sqrt{3}}{3}$ (b) $\frac{2+\sqrt{3}}{2}$
(c) $\frac{2-\sqrt{3}}{2}$ (d) $\frac{2-\sqrt{3}}{3}$

Q.117. If tanA = $\frac{5}{7}$, then find the value of $\frac{7\sin A - 3\cos A}{7\sin A + 3\cos A} + 4$.
SSC CGL 13/09/2024 (2nd Shift)
(a) $4\frac{1}{4}$ (b) $3\frac{5}{7}$ (c) $3\frac{1}{5}$ (d) $7\frac{1}{3}$

Q.118. If sinB = $\frac{15}{17}$, what is the value of cosB(sec B - tan B)? Given that $0 < B < \frac{\pi}{2}$
SSC CGL 13/09/2024 (2nd Shift)
(a) $\frac{1}{16}$ (b) $\frac{2}{15}$ (c) $\frac{8}{15}$ (d) $\frac{2}{17}$

Q.119. The value of $\left(\frac{cosecA}{cosecA-1} + \frac{cosecA}{cosecA+1}\right)\left(\frac{secA}{secA-1} + \frac{secA}{secA+1}\right)^{-1}$, when A = 60° is:
SSC CGL 13/09/2024 (3rd Shift)
(a) 4 (b) 3 (c) 1 (d) 2

Q.120. In a right angle Δ ABC, ∠B = 90°, if tanA = 1, then 4 sinA cosA = _____.
SSC CGL 17/09/2024 (1st Shift)
(a) 1 (b) 2 (c) $\frac{1}{2}$ (d) 4

Q.121. If $\sec\theta = \frac{29}{20}$ where $0 < \theta < 90°$, then what is the value of $3\operatorname{cosec}\theta + 3\cot\theta$?
SSC CGL 17/09/2024 (1st Shift)
(a) $\frac{7}{3}$ (b) 7 (c) 14 (d) 49

Q.122. If cos24° = $\frac{m}{n}$, then the value of (cosec 24° - cos 66°) is:
SSC CGL 17/09/2024 (1st Shift)
(a) $\frac{m^2}{n\sqrt{m^2-n^2}}$ (b) $\frac{n^2}{m\sqrt{m^2-n^2}}$
(c) $\frac{n^2}{m\sqrt{n^2-m^2}}$ (d) $\frac{m^2}{n\sqrt{n^2-m^2}}$

Q.123. Find the value of
$\left[\frac{4\cos(90-\theta)\sin^3(90+\theta) - 4\sin(90+\theta)\cos^3(90-\theta)}{\cos\left(\frac{180+80}{2}\right)}\right]$
SSC CGL 17/09/2024 (2nd Shift)
(a) -1 (b) 1 (c) 2 (d) 0

Q.124. If sinA + cosA = $\frac{1}{2\sqrt{2}}$, then find the value of $\sin^4 A + \cos^4 A$.
SSC CGL 17/09/2024 (2nd Shift)
(a) $\frac{79}{128}$ (b) $\frac{7}{13}$ (c) $\frac{79}{126}$ (d) $\frac{5}{13}$

Q.125. If a = $x\cos\theta + y\sin\theta$ and b = $x\sin\theta - y\cos\theta$, then $a^2 + b^2$ is equal to:
SSC CGL 17/09/2024 (2nd Shift)
(a) $x + y$ (b) $x^2 - y^2$ (c) $x^2 + y^2$ (d) $x - y$

Q.126. If cosec x = $\frac{5}{4}$, then the value of $\frac{5\sin^2 x + 8\cot^2 x}{27\tan^2 x - 125\cos^2 x}$ is:
SSC CGL 17/09/2024 (3rd Shift)
(a) $\frac{33}{91}$ (b) $\frac{77}{30}$ (c) $\frac{55}{87}$ (d) $\frac{99}{47}$

Q.127. If $\sin\theta + \cos\theta = \sqrt{3}\cos\theta$, then the value of cot θ is:
SSC CGL 17/09/2024 (3rd Shift)
(a) $\sqrt{3} - 1$ (b) $\frac{(\sqrt{3}+1)}{2}$
(c) $\frac{\sqrt{3}-1}{2}$ (d) $\sqrt{3} + 1$

Q.128. If sec(t) = $\frac{x}{y}$, then cot(t) is equal to:
SSC CGL 18/09/2024 (1st Shift)
(a) $\frac{y}{\sqrt{x^2-y^2}}$ (b) $\frac{x}{\sqrt{x^2+y^2}}$
(c) $\frac{x}{\sqrt{x^2-y^2}}$ (d) $\frac{y}{\sqrt{x^2+y^2}}$

Q.129. At what angle θ, the value of sin (θ) and cos (θ) will have the same value ?
SSC CGL 18/09/2024 (1st Shift)
(a) 45° (b) 30° (c) 60° (d) 75°

Q.130. If 3 sin A + 4 cos A = 5, then the value of tan A is:
SSC CGL 18/09/2024 (1st Shift)
(a) $\frac{3}{4}$ (b) $\frac{3}{5}$ (c) $\frac{5}{4}$ (d) $\frac{4}{5}$

Q.131. Find the value of $\frac{\tan 55°}{\cot 35°}$
SSC CGL 18/09/2024 (2nd Shift)
(a) cos 35° (b) 1 (c) sec 55° (d) 0

Q.132. Simplify. $\frac{\sin A}{1+\cos A}$ + cot A, where A is an acute angle.
SSC CGL 18/09/2024 (2nd Shift)
(a) sinA (b) cosA
(c) sinA + cosA (d) cosec A

Q.133. If tanΘ = $\frac{8}{15}$, and Θ is an acute angle, then the value of $\frac{\sqrt{1-\sin\theta}}{\sqrt{1+\sin\theta}}$ is :
SSC CGL 18/09/2024 (2nd Shift)
(a) $\frac{2}{5}$ (b) $\frac{3}{5}$ (c) $\frac{1}{5}$ (d) $\frac{4}{5}$

Q.134. The given expression is equivalent to:
$\sqrt{\frac{\sec\theta+1}{\sec\theta-1}} + \sqrt{\frac{\sec\theta-1}{\sec\theta+1}}$
SSC CGL 18/09/2024 (3rd Shift)
(a) 2sin θ (b) 2 cosec θ
(c) 2 tan θ (d) 2 tan θ sec θ

Q.135. What is the value of $\sqrt{\frac{9\sin^2 26° + 9\sin^2 64° + 36}{32 - 7\cos^2 32° - 7\cos^2 58°}}$?
SSC CGL 18/09/2024 (3rd Shift)
(a) $\frac{3\sqrt{5}}{5}$ (b) $\frac{5\sqrt{3}}{3}$ (c) $\frac{5\sqrt{5}}{3}$ (d) $\frac{3\sqrt{3}}{5}$

Q.136. The value of the expression sin x + cosec x = 2, then the value of $\sin^7 x + \operatorname{cosec}^7 x$ is:
SSC CGL 19/09/2024 (1st Shift)
(a) 0 (b) 1 (c) 2 (d) 4

Q.137. If sinA + cosA = $\sqrt{3}$, then find the value of tanA + cotA+ 2sinAcosA.
SSC CGL 19/09/2024 (1st Shift)
(a) 6 (b) 2 (c) 1 (d) 3

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.138. If $3\sin^2\theta + 5\cos^2\theta = 4$ and θ is an acute angle, then the value of tanθ is:
SSC CGL 19/09/2024 (1st Shift)
(a) $\frac{1}{\sqrt{2}}$ (b) $\frac{1}{\sqrt{3}}$ (c) $\frac{1}{2}$ (d) 1

Q.139. The maximum value of (2 sin θ + 3 cos θ) is:
SSC CGL 19/09/2024 (2nd Shift)
(a) $\sqrt{17}$ (b) $\sqrt{11}$ (c) 9 (d) $\sqrt{13}$

Q.140. Simplify $[1- \sin^2 32° + \frac{1}{1+\tan^2 58°}]$.
SSC CGL 19/09/2024 (2nd Shift)
(a) $\frac{1}{2}$ (b) sin32° (c) 1 (d) $\sqrt{3}$

Q.141. if tan θ = $\frac{5}{8}$, then find the value of $\frac{(1+\cos\theta)(1-\cos\theta)}{(1+\sin\theta)(1-\sin\theta)}$.
SSC CGL 19/09/2024 (3rd Shift)
(a) $\frac{5}{64}$ (b) $\frac{2}{25}$ (c) $\frac{25}{64}$ (d) $\frac{64}{25}$

Q.142. If tan θ + cot θ = 2, and θ is an acute angle, then the value of θ is :
SSC CGL 19/09/2024 (3rd Shift)
(a) 30° (b) 15° (c) 60° (d) 45°

Q.143. If A is an acute angle, then $\sqrt{\frac{1-\cos A}{1+\cos A}} + \sqrt{\frac{1+\cos A}{1-\cos A}}$ is equal to :
SSC CGL 19/09/2024 (3rd Shift)
(a) 2 cosecA (b) 2 cosA
(c) 2 secA (d) 2 sinA

Q.144. The value of θ, when $\sqrt{3}$ cosθ + sinθ = 1 (1 ≤ θ ≤ 90°), is:
SSC CGL 23/09/2024 (1st Shift)
(a) 20° (b) 60° (c) 90° (d) 30°

Q.145. Let x = r cos (t), y = r sin (t) cos (u), z = r sin (t)sin (u). Then the value of $x^2 + y^2 + z^2$ is ___.
SSC CGL 23/09/2024 (1st Shift)
(a) r^2 cos (u) (b) r^2 (c) 2r (d) r^2 sin (t)

Q.146. If 4tanθ - 3 = 0, then the value of $\frac{1-\cos 2\theta}{1+\cos 2\theta}$ is:
SSC CGL 23/09/2024 (1st Shift)
(a) 1 (b) $\frac{7}{15}$ (c) $\frac{4}{3}$ (d) $\frac{9}{16}$

Q.147. If sin A - cos A = $\frac{\sqrt{3}-\sqrt{2}}{2}$, then the value of sin A. cos A is:
SSC CGL 23/09/2024 (2nd Shift)
(a) $\frac{2\sqrt{3}-1}{4}$ (b) $\frac{2\sqrt{2}-1}{8}$
(c) $\frac{2\sqrt{6}-1}{8}$ (d) $\frac{3\sqrt{2}-1}{4}$

Q.148. If cos A + $\cos^2$A = 1 then $\sin^2$A + $\sin^4$A is equal to:
SSC CGL 23/09/2024 (2nd Shift)
(a) $\frac{\cos^2 A}{\cos A}$ (b) 0 (c) $\frac{\cos A}{\cos^2 A}$ (d) 1

Q.149. The value of $\frac{1}{\operatorname{cosec}\theta - \cot\theta}$ - $\frac{1}{\sin\theta}$ is equal to:
SSC CGL 23/09/2024 (2nd Shift)
(a) tanθ (b) cosecθ (c) cotθ (d) secθ

Q.150. The value of $\frac{\sin^2\theta - 2\sin^4\theta}{2\cos^4\theta + \cos^2\theta}$ at θ = 45°
SSC CGL 23/09/2024 (3rd Shift)
(a) 1 (b) 0 (c) 3 (d) 2

Q.151. For what value of t is the value of sin² (t), half of the value of tan (t) ?
SSC CGL 23/09/2024 (3rd Shift)
(a) 60° (b) 45° (c) 30° (d) 22.5°

Q.152. If tanA = $\frac{1}{\sqrt{10}}$, A is an acute angle, then the value of sinA + cosecA is:
SSC CGL 23/09/2024 (3rd Shift)
(a) $\frac{11}{\sqrt{10}}$ (b) $\frac{1}{\sqrt{10}}$ (c) $\frac{12}{\sqrt{11}}$ (d) $\frac{10}{\sqrt{11}}$

Q.153. If Sec θ = $\sqrt{2}$, then cosecθ is equal to:
SSC CGL 24/09/2024 (1st Shift)
(a) 0 (b) $\sqrt{2}$ (c) -1 (d) 1

Q.154. If 2 $\sin^2\theta$ + 3 sinθ - 2 = 0, (0 < θ < 90°), then the value of θ is:
SSC CGL 24/09/2024 (1st Shift)
(a) 15° (b) 30° (c) 60° (d) 45°

Q.155. If sin 3A = cos(A - 26°), then A = _____, where 3A is an acute angle.
SSC CGL 24/09/2024 (1st Shift)
(a) 29° (b) 52° (c) 26° (d) 78°

Q.156. The value of (sin A + cosec A)² + (cos A + sec A)² is:
SSC CGL 24/09/2024 (2nd Shift)
(a) 3 + tan²A + cot²A (b) 7 + tan²A + cot²A
(c) 5 + tan²A + cot²A (d) 1 + tan²A + cot²A

Q.157. If 3 tan A = 4 and A is an acute angle, then the value of 4sinA + 3cosA is:
SSC CGL 24/09/2024 (2nd Shift)
(a) 1 (b) 3 (c) 4 (d) 5

Q.158. If 10 $\sin^2\theta$ + 6 $\cos^2\theta$ = 7, 0 < θ < 90° then find the value of tan θ.
SSC CGL 24/09/2024 (3rd Shift)
(a) $\sqrt{3}$ (b) 1 (c) $\frac{1}{\sqrt{3}}$ (d) $\frac{1}{2}$

Q.159. If A = 15°, then What is the value of $\frac{11\sqrt{2}\cos 3A + 10\sin 2A}{7\sqrt{3}\sin 4A}$?
SSC CGL 24/09/2024 (3rd Shift)
(a) $\frac{11}{7}$ (b) $\frac{21}{32}$ (c) $\frac{32}{21}$ (d) $\frac{7}{11}$

Q.160. Evaluate 2 $\frac{\tan 54°}{\cot 36°}$ - $\frac{\cot 41°}{\tan 49°}$.
SSC CGL 25/09/2024 (1st Shift)
(a) -1 (b) 1 (c) 0 (d) 2

Q.161. Find the value of (cosec θ - sin θ)(sec θ - cos θ)(tan θ + cot θ).
SSC CGL 25/09/2024 (1st Shift)
(a) 0 (b) $\frac{1}{2}$ (c) 1 (d) -1

Q.162. If m + 5 = sec²Acosec²A(1 - cos²A) (1 - sin²A) + 5, then find the value of m:
SSC CGL 25/09/2024 (1st Shift)
(a) 10 (b) 0 (c) 1 (d) 5

Q.163. If $\cot^2\theta$ - 2$\cos^2\theta$ = 0, (0°< θ < 90°), then the value of θ is:
SSC CGL 25/09/2024 (2nd Shift)
(a) 45° (b) 60° (c) 90° (d) 30°

Q.164. If x = p secA cos B, y = q secA sinB and z = r tanA, what is the value of the following expression?
$\frac{x^2}{p^2} + \frac{y^2}{q^2} - \frac{z^2}{r^2}$
SSC CGL 25/09/2024 (2nd Shift)
(a) 1 (b) $p^2 + q^2 - r^2$ (c) $p^2 - q^2 + r^2$ (d) 0

Q.165. Find the value of 3sin15° - $4\sin^3 15°$
SSC CGL 25/09/2024 (3rd Shift)
(a) 2 (b) $\frac{1}{2}$ (c) $\frac{1}{\sqrt{2}}$ (d) $\sqrt{2}$

Q.166. If secθ + tanθ = x, then find sinθ.
SSC CGL 25/09/2024 (3rd Shift)
(a) $\frac{x^2+1}{1-x^2}$ (b) $\frac{x^2-1}{1+2x^2}$
(c) $\frac{x^2-1}{1+x^2}$ (d) $\frac{1-x^2}{1+x^2}$

Q.167. If (48°+ k) is an acute angle and sin(48°+ k) = cos13°, what is the value of k(in °)?
SSC CGL 26/09/2024 (1st Shift)
(a) 17 (b) 23 (c) 29 (d) 37

Q.168. Evaluate the given expression.
$\frac{5}{1+\cot^2\theta} + \frac{3}{1+\tan^2\theta} + 2\cos^2\theta$
SSC CGL 26/09/2024 (1st Shift)
(a) 0 (b) 3 (c) 5 (d) 2

Q.169. If A is an acute angle and tanA + cotA = 2, find the value of $7\tan^8 A - 6\cot^8 A + 8\sec^2 A$.
SSC CGL 26/09/2024 (1st Shift)
(a) 6 (b) 17 (c) 16 (d) 7

Q.170. If p = $\frac{\sin A}{1+\cos A}$, then $\frac{\sin A}{1-\cos A}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

= ?
SSC CGL 26/09/2024 (2nd Shift)
(a) $\frac{1}{p}$ (b) $\frac{1}{1-p}$ (c) $\frac{1}{p+1}$ (d) p - 1

Q.171. If 8cotθ = 7, then the value of $\frac{1+sin\theta}{cos\theta}$ is :
SSC CGL 26/09/2024 (2nd Shift)
(a) $\frac{8+\sqrt{113}}{7}$ (b) $\frac{1+\sqrt{113}}{8}$
(c) $\frac{7+\sqrt{113}}{8}$ (d) $\frac{1+\sqrt{113}}{7}$

Q.172. In △ABC, right angled at B if tanC = $\sqrt{3}$, $then\ find\ \frac{sin^2C+cos^2C}{1+cot^2C}$
SSC CGL 26/09/2024 (2nd Shift)
(a) $\frac{3}{4}$ (b) $\frac{16}{3}$ (c) $\frac{4}{15}$ (d) $\frac{3}{16}$

Q.173. The greatest value of $sin^4\theta + cos^4\theta$ is:
SSC CGL 26/09/2024 (3rd Shift)
(a) 2 (b) 1 (c) 3 (d) 4

Q.174. If x = asecθcosϕ, y = bsecθsinϕ and z = ctanθ, then the value of $(\frac{x^2}{a^2}+\frac{y^2}{b^2}-\frac{z^2}{c^2})$ is equal to:
SSC CGL 26/09/2024 (3rd Shift)
(a) 2 (b) 1 (c) 3 (d) 0

Q.175. If cot θ = $\sqrt{11}$, then the value of $\frac{cosec^2\theta - sec^2\theta}{cosec^2\theta + sec^2\theta}$ is:
SSC CGL 26/09/2024 (3rd Shift)
(a) $\frac{3}{5}$ (b) $\frac{5}{6}$ (c) $\frac{4}{5}$ (d) $\frac{6}{7}$

SSC CHSL 2024 Tier - 1

Q.176. In right-angled triangle ABC, ∠B = 90° and angle A and angle C are acute angles.
If cosecA = $2\sqrt{2}$, then find the value of sinA.cosC + cosA.sinC.
SSC CHSL 01/07/2024 (1st Shift)
(a) $\sqrt{2}$ (b) 1 (c) 0 (d) $2\sqrt{2}$

Q.177. If sinθ = $\frac{2xy}{x^2+y^2}$, then the value of tanθ is:
SSC CHSL 01/07/2024 (2nd Shift)
(a) $\frac{2xy}{x^2-y^2}$ (b) $\frac{x^2-y^2}{2xy}$
(c) $\frac{x^2-y^2}{x^2+y^2}$ (d) $\frac{x^2+y^2}{x^2-y^2}$

Q.178. 12 sin^2 A + 2 cos^2 A = 7, where 0° < A < 180°. Then cot A is:
SSC CHSL 01/07/2024 (4th Shift)
(a) $\pm\frac{1}{\sqrt{2}}$ (b) ± 1 (c) $\pm\frac{1}{\sqrt{3}}$ (d) $\pm\frac{1}{2}$

Q.179. What is the value of cos(x + y) - sin(x - y) + tan(2z) ?
SSC CHSL 02/07/2024 (1st Shift)
(a) cos x. cos y - sin x. sin y - sin x. cos y - cos x. sin y + $\frac{2\ tan\ z}{1-tan^2z}$
(b) sin x. sin y + $\frac{2\ tan\ z}{1-tan^2z}$
(c) cos x.cos y - sin x. sin y - sin x.cos y + cos x. sin y + $\frac{2\ tan\ z}{1-tan^2z}$
(d) cos x.cos y - sin x. sin y - cos x. sin y + $\frac{tan\ z}{1-tan^2z}$

Q.180. Given that sin θ = $\frac{15}{17}$, Evaluate $\frac{15\ cot\ \theta + 17\ sin\ \theta}{8\ tan\ \theta + 16\ sec\ \theta}$, where 0° < θ < 90°.
SSC CHSL 02/07/2024 (2nd Shift)
(a) $\frac{23}{49}$ (b) $\frac{49}{26}$ (c) $\frac{26}{23}$ (d) $\frac{49}{23}$

Q.181. If θ is an acute angle and tanθ + cotθ = 2, then find the value of $tan^3\theta + cot^3\theta + 6tan^3\theta cot^2\theta$.
SSC CHSL 02/07/2024 (3rd Shift)
(a) 8 (b) 10 (c) 12 (d) 6

Q.182. If $\sqrt{13}$ sinθ = 2, then the value of $\frac{3\ tan\ \theta + \sqrt{13}\ sin\theta}{\sqrt{13}\ cos\ \theta - 3\ tan\ \theta}$ is :
SSC CHSL 02/07/2024 (4th Shift)
(a) 2 (b) 3 (c) 0 (d) 4

Q.183. (cot θ + tan θ)(cosec θ − sin θ)(cos θ − sec θ) = _____.
SSC CHSL 03/07/2024 (1st Shift)
(a) −1 (b) 2 (c) 0 (d) 1

Q.184. Find the value of the following expression.
sin(30 + θ) - cos(60 - θ)
SSC CHSL 03/07/2024 (2nd Shift)
(a) $\frac{\sqrt{3}}{2}$ (b) 2sin (30 + θ) (c) 1 (d) 0

Q.185. If α + β = 45° and (tan α + 1)(tanβ + 1) = 2x, then x is:
SSC CHSL 03/07/2024 (4th Shift)
(a) - 1 (b) 0 (c) 1 (d) 2

Q.186. What is the value of tan 570° ?
SSC CHSL 04/07/2024 (1st Shift)
(a) - $\frac{1}{\sqrt{3}}$ (b) - $\sqrt{3}$ (c) $\frac{1}{\sqrt{3}}$ (d) $\sqrt{3}$

Q.187. What is the value of $\frac{1}{sin^4(90°-2\alpha)} + \frac{1}{cos^2(90°-2\alpha)-1}$?
SSC CHSL 04/07/2024 (2nd Shift)
(a) $sin^2 2\alpha + tan^2 2\alpha$ (b) $sec^2 2\alpha + cot^2 2\alpha$
(c) $cos^2 2\alpha\ cot^2 2\alpha$ (d) $sec^2 2\alpha\ tan^2 2\alpha$

Q.188. If θ is an acute angle and cotθ + tanθ = 2, then find the value of $tan^{12}\theta + cot^{12}\theta + 2\ tan^5\theta cot^7\theta$.
SSC CHSL 04/07/2024 (3rd Shift)
(a) 2 (b) 3 (c) 4 (d) 1

Q.189. If θ be acute angle and cos θ = $\frac{24}{25}$, then the value of cot(90 - θ) is equal to:
SSC CHSL 05/07/2024 (3rd Shift)
(a) $\frac{6}{25}$ (b) $\frac{7}{24}$ (c) $\frac{7}{25}$ (d) $\frac{5}{24}$

Q.190. $[\frac{cosec\ 31° - sec\ 59°}{(sin\ 18° \div cos\ 72°)} \times \frac{tan\ 26°}{cot\ 64°}] + [\frac{tan\ 30° + tan\ 15°}{(1 - tan\ 30°\ tan\ 15°)}]$ = _____.
SSC CHSL 05/07/2024 (4th Shift)
(a) - 1 (b) 0 (c) 1 (d) 2

Q.191. If cotA = $\frac{5}{12}$, then find the value of $\frac{\sqrt{secA - cosecA}}{\sqrt{secA + cosecA}} - \sqrt{\frac{17}{7}}$.
SSC CHSL 08/07/2024 (1st Shift)
(a) $\frac{24}{\sqrt{119}}$ (b) $\frac{10}{\sqrt{119}}$ (c) 0 (d) - $\frac{10}{\sqrt{119}}$

Q.192. If tan(t) = $\frac{3}{7}$, t is an acute angle, then what is the value of cosec(t) ?
SSC CHSL 08/07/2024 (2nd Shift)
(a) $\frac{\sqrt{58}}{3}$ (b) $\frac{\sqrt{53}}{7}$ (c) $\frac{\sqrt{58}}{7}$ (d) $\frac{\sqrt{53}}{3}$

Q.193. If sin θ = $\frac{11}{12}$, then what will be the value of (tanθ + secθ) ?
SSC CHSL 08/07/2024 (3rd Shift)
(a) $\frac{12}{\sqrt{23}}$ (b) $\frac{11}{\sqrt{23}}$ (c) $\sqrt{23}$ (d) 23

Q.194. If $cos^4\theta - sin^4\theta = \frac{4}{5}$, then find the value of sin4θ.
SSC CHSL 08/07/2024 (4th Shift)
(a) $\frac{24}{25}$ (b) $\frac{16}{25}$ (c) $\frac{21}{25}$ (d) $\frac{18}{25}$

Q.195. If cotα = $\frac{P}{Q}$, then find the value of $\frac{Pcos\alpha - Qsin\alpha}{Pcos\alpha + Qsin\alpha} - \frac{P^2-Q^2}{P^2+Q^2} + 3$.
SSC CHSL 09/07/2024 (1st Shift)
(a) 0 (b) 3 (c) $\frac{P^2}{P^2+Q^2}$ (d) $\frac{P}{Q}$

Q.196. If sinθ = $\frac{7}{25}$, then cosθ and tanθ are respectively _____. (where θ is in the first quadrant)
SSC CHSL 09/07/2024 (3rd Shift)
(a) $\frac{25}{7}$ and $\frac{7}{24}$ (b) $\frac{24}{25}$ and $\frac{24}{7}$
(c) $\frac{24}{25}$ and $\frac{7}{24}$ (d) $\frac{25}{24}$ and $\frac{24}{7}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.197. What is the maximum value of 7 cosA + 24 sinA + 32 ?
SSC CHSL 09/07/2024 (4th Shift)
(a) 39 (b) 32 (c) 25 (d) 57

Q.198. If tanA = $\sqrt{2}$ - 1 then find the value of sinAcosA + tanA.
SSC CHSL 10/07/2024 (1st Shift)
(a) $\frac{24\sqrt{2}+15}{4}$ (b) $\frac{24\sqrt{2}-15}{4}$
(c) $\frac{5\sqrt{2}+4}{4}$ (d) $\frac{5\sqrt{2}-4}{4}$

Q.199. If 4 $\sin^2\theta$ - 4$\sqrt{3}$ sinθ + 3 = 0, then find the value of θ. (0 < θ < 90°)
SSC CHSL 10/07/2024 (3rd Shift)
(a) 45° (b) 30° (c) 60° (d) 75°

Q.200. The value of $(\frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta})(\frac{1}{\tan\theta+\cot\theta})$ is equal to :
SSC CHSL 11/07/2024 (1st Shift)
(a) tan θ (b) 2 sin θ (c) 2 cos θ (d) 1

Q.201. Simplify $\frac{\sin 60° - \cos 60°}{\sin 60° + \cos 60°}$
SSC CHSL 11/07/2024 (3rd Shift)
(a) 2 + $\sqrt{3}$ (b) $\sqrt{3}$ - 2
(c) $\sqrt{3}$ - 1 (d) 2 - $\sqrt{3}$

SSC CPO 2024 Tier - 1

Q.202. If cotθ = $\frac{28}{45}$, then find the value of (sinθ - cosθ).
SSC CPO 27/06/2024 (1st Shift)
(a) $\frac{45}{78}$ (b) $\frac{7}{53}$ (c) $\frac{28}{53}$ (d) $\frac{17}{53}$

Q.203. If sec 6A = cosec (A - 29°), where 2A is an acute angle, then the measure of ∠A = _____°.
SSC CPO 27/06/2024 (1st Shift)
(a) 18 (b) 17 (c) 21 (d) 19

Q.204. Simplify: (1 + $\tan^2$A) + (1 + $\frac{1}{\tan^2 A}$)
SSC CPO 27/06/2024 (1st Shift)
(a) $\frac{1}{\sin^2 A - \sin^4 A}$ (b) $\frac{1}{\sin^2 A - \cos^4 A}$
(c) $\frac{1}{\cos^2 A - \sin^4 A}$ (d) $\frac{1}{\cot^2 A - \tan^4 A}$

Q.205. If sin α = $\frac{5}{13}$, then the value of cos α . cosec α . cot α is _____ .
SSC CPO 27/06/2024 (2nd Shift)
(a) $\frac{12}{5}$ (b) $\frac{144}{25}$ (c) $\frac{5}{12}$ (d) $\frac{25}{144}$

Q.206. Find the value of (1 + cotA - cosecA)(1 + tanA + secA) - 3($\sin^2$A + $\cos^2$A).
SSC CPO 27/06/2024 (2nd Shift)
(a) -1 (b) 1 (c) 2 (d) -2

Q.207. Find the maximum value of (19 sin θ + 6 cot θ sinθ).
SSC CPO 27/06/2024 (3rd Shift)
(a) $\sqrt{397}$ (b) $\sqrt{197}$ (c) $\sqrt{297}$ (d) $\sqrt{497}$

Q.208. If tan θ = $\frac{3}{10}$ then find the value of $\frac{(1+Sin\theta)(1-Sin\theta)}{(1+Cos\theta)(1-Cos\theta)}$
SSC CPO 27/06/2024 (3rd Shift)
(a) $\frac{100}{7}$ (b) $\frac{100}{3}$ (c) $\frac{100}{9}$ (d) $\frac{50}{3}$

Q.209. Which of the following is true when x = SinA + CosA; y = SecA + CosecA ?
SSC CPO 27/06/2024 (3rd Shift)
(a) y(1 + x^2) = 2x (b) y - 2x = x^2 y
(c) y + 2x = x^2 y (d) y(1 - 2x^2) = x

Q.210. Solve the equation for A (in degrees):
2 $\cos^2$A + 3 cosA - 2 = 0, 0 < A < 90°
SSC CPO 28/06/2024 (1st Shift)
(a) 30° (b) 80° (c) 60° (d) 45"

Q.211. Find the value of $\frac{1-\cot^2\theta}{\tan^2\theta - 1}$
SSC CPO 28/06/2024 (1st Shift)
(a) $\tan^2\theta$ (b) cot θ (c) tan θ (d) $\cot^2\theta$

Q.212. If $\frac{(\sec A + \tan A)}{\sec A - \tan A}$ = $2\frac{51}{79}$ then the value of sin A is equal to:
SSC CPO 28/06/2024 (1st Shift)
(a) $\frac{77}{144}$ (b) $\frac{61}{169}$ (c) $\frac{87}{169}$ (d) $\frac{65}{144}$

Q.213. If 4$\sin^2$ θ = 3(1 + cosθ), 0° < θ < 90°, then what is the value of $\sqrt{15}$ tanθ + $\frac{4}{\sqrt{15}}$ sinθ + 2secθ ?
SSC CPO 28/06/2024 (2nd Shift)
(a) 24 (b) 4$\sqrt{15}$ (c) $\frac{8}{\sqrt{15}}$ (d) 8

Q.214. If tan θ + cot θ = 6, then the value of $\tan^2\theta + \cot^2\theta$ is ____ .
SSC CPO 28/06/2024 (2nd Shift)
(a) 24 (b) 34 (c) 20 (d) 22

Q.215. (1 - $\cos^2$A) $\sec^2$A is equal to:
SSC CPO 28/06/2024 (2nd Shift)
(a) $\cos^2$A $\cot^2$A (b) $\tan^2$A
(c) $\cot^2$A (d) cosec^2A

Q.216. If sin x + cos x = $\sqrt{2}$ sin x, then the value of sin x - cos x is:
SSC CPO 28/06/2024 (2nd Shift)
(a) $\sqrt{2}$ sin x (b) 2 sin x
(c) - $\sqrt{2}$ cos x (d) $\sqrt{2}$ cos x

Q.217. If A, B and C are the interior angles of ΔABC, then what is the value of {tan $\frac{A}{2}$ + cosec $\frac{B+C}{2}$} {tan $\frac{A}{2}$ - cosec $\frac{B+C}{2}$} ?
SSC CPO 28/06/2024 (3rd Shift)
(a) 2 (b) -1 (c) -2 (d) 1

Q.218. Simplify $\frac{\sin^3 A + \cos^3 A}{\sin A + \cos A}$
SSC CPO 28/06/2024 (3rd Shift)
(a) 1 - tan A sec A (b) 1 - cos A cot A
(c) 1 - sin A tan A (d) 1 - sin A cos A

Q.219. If sin (x + y) = 1 and cos (x - y) = $\frac{\sqrt{3}}{2}$, find the value of 'y'.
SSC CPO 28/06/2024 (3rd Shift)
(a) 90° (b) 60° (c) 30° (d) 20°

Q.220. The value of $(\frac{2\cos^3\theta - \cos\theta}{\sin\theta - 2\sin^3\theta})^2$ + 1 , θ ≠ 45° is :
SSC CPO 28/06/2024 (3rd Shift)
(a) $\sin^2\theta$ (b) $\sec^2\theta$ (c) $\text{cosec}^2\theta$ (d) $\cot^2\theta$

Q.221. If $\sin^4\theta + \cos^4\theta = 2\sin^2\theta\cos^2\theta$, 0° < θ < 90°, then find the value of cotθ.
SSC CPO 29/06/2024 (1st Shift)
(a) $\frac{1}{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) $\frac{1}{3}$ (d) 1

Q.222. $\tan^4 A + \tan^2 A$ is equal to :
SSC CPO 29/06/2024 (1st Shift)
(a) $\sec^2 A - \sec^4 A$ (b) -($\sec^2 A + \sec^4 A$)
(c) $\sec^4 A - \sec^2 A$ (d) $\sec^4 A + \sec^2 A$

Q.223. Solve the following :
(tanθ + secθ + 1)(cotθ - cosecθ + 1) = ?
SSC CPO 29/06/2024 (1st Shift)
(a) 2 (b) 1 (c) 0 (d) −1

Q.224. The value of (cosecθ - sinθ)(secθ - cosθ)(tanθ + cotθ) is
SSC CPO 29/06/2024 (1st Shift)
(a) −3 (b) 3 (c) secθcosecθ (d) 1

Q.225. Find the value of the following expression.
(1 + tanθ + secθ) × (1 + cotθ - cosecθ)
SSC CPO 29/06/2024 (2nd Shift)
(a) 1 (b) cosθ sinθ (c) 2 (d) tanθ

Q.226. Simplify $\frac{\tan 71° + \tan 19°}{1 - \tan 71° \tan 19°}$
SSC CPO 29/06/2024 (2nd Shift)
(a) Not defined (b) 1 (c) $\sqrt{3}$ (d) 0

Q.227. If sin(x + y) = cos {3(x + y)}, then, the value of cot {2(x + y)} is _____.
SSC CPO 29/06/2024 (2nd Shift)
(a) -1 (b) 1 (c) -2 (d) 2

Q.228. The value of $\frac{2\cos 15° \sin 15°}{\cos^2 15° - \sin^2 15°}$ is:
SSC CPO 29/06/2024 (2nd Shift)
(a) $\frac{1}{\sqrt{3}}$ (b) ∞ (c) $\frac{\sqrt{5}-1}{\sqrt{5}+1}$ (d) $\sqrt{3}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.229. The value of $\frac{17}{sec^2\theta}$ + 10 $sin^2\theta$ + $\frac{7}{1+cot^2\theta}$ is :
SSC CPO 29/06/2024 (3rd Shift)
(a) 34 (b) 20 (c) 17 (d)19

Q.230. The value of $sin^2 15°$ + $sin^2 25°$ + $sin^2 35°$ + $sin^2 45°$ + $sin^2 55°$ + $sin^2 65°$+ $sin^2 75°$ is:
SSC CPO 29/06/2024 (3rd Shift)
(a) 4 (b) 7 (c) $\frac{7}{2}$ (d) $\frac{7}{3}$

SSC Selection Post (Phase - XII)

Q.231. Evaluate $7(\frac{cosec\ 24°}{sec\ 66°})^3$ + 8 $(\frac{cot\ 37°}{tan\ 53°})^4$ - $(2\frac{sec\ 14°}{cosec\ 76°})^2$ + $(-3\frac{tan\ 82°}{cot\ 8°})^3$
Higher Secondary 20/06/2024 (Shift - 2)
(a) −16 (b) 40 (c) 10 (d) 2

Q.232. If 8 tan A = 5, what is the value of $\frac{8sinA - 7cosA}{8sinA + 11cosA}$?
Higher Secondary 21/06/2024 (Shift - 2)
(a) $\frac{-1}{8}$ (b) $\frac{1}{19}$ (c) $\frac{1}{8}$ (d) $\frac{-1}{6}$

Q.233. Which of the following is NOT a correct formula ?
Higher Secondary 24/06/2024 (Shift - 2)
(a) $Cos^2A\ Cot^2A = Cot^2A - Cos^2A$
(b) $\frac{1+Tan^2A}{Tan^2A} = sin^2A$
(c) SecASinA = TanA
(d) $Cosec^2A - Cot^2A = 1$

Q.234. Evaluate the following.
$\frac{5cos^2 120° + 4sec^2 30° - tan^2 135°}{sin^2 30° + cos^2 30°}$
Higher Secondary 25/06/2024 (Shift - 2)
(a) $\frac{37}{12}$ (b) $\frac{57}{5}$ (c) $\frac{67}{12}$ (d) $\frac{27}{5}$

Q.235. Evaluate
$(\frac{sin\ 23°\ cos\ 67° + cos\ 23°\ sin\ 67°}{cosec^2\ 15° - tan^2\ 75°})^3$
Higher Secondary 25/06/2024 (Shift - 4)
(a) 0 (b) 1 (c) 8 (d) -1

Q.236. If A is an acute angle, what is the value of cosec A, if cot A = $\frac{2p}{p^2-1}$?
Higher Secondary 26/06/2024 (Shift - 2)
(a) $\frac{p^2+1}{p^2-1}$ (b) $\frac{p^2-1}{p^2+1}$
(c) $\frac{p^2}{p^2-1}$ (d) $\frac{2p}{p^2+1}$

Q.237. The value of cosecθ [$\frac{1+cos\theta}{sin\theta}$ + $\frac{sin\theta}{1+cos\theta}$] - 2 $cot^2\theta$ is equal to:
Higher Secondary 26/06/2024 (Shift - 2)
(a) 0 (b) 1 (c) 2 (d) 3

Q.238. If sin A + cos A = $\frac{4}{3}$, then find the value of tan A + cot A.
Graduate Level 20/06/2024 (Shift - 3)
(a) $\frac{7}{18}$ (b) $\frac{3}{4}$ (c) $\frac{18}{7}$ (d) $\frac{4}{3}$

Q.239. The expression $sin^2\theta + cos^2\theta$ - 1 = 0 is satisfied by how many values of θ ?
Graduate Level 21/06/2024 (Shift - 3)
(a) No value
(b) Only one value
(c) Infinitely many values
(d) Two values

Q.240. Find the value of (sin75°+ sin 15°).
Graduate Level 21/06/2024 (Shift - 3)
(a) $\frac{\sqrt{6}}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\sqrt{6}$ (d) $\sqrt{3}$

Q.241. Find the value of $\frac{cos\ 25° - sin\ 65°}{cos\ 25° + sin\ 65°}$
Graduate Level 24/06/2024 (Shift - 3)
(a) -1 (b) 0 (c) 1 (d) $\frac{1}{2}$

Q.242. If sin(5x − 40°) = cos (5y + 40°), then the value of x + y is:
Graduate Level 24/06/2024 (Shift - 3)
(a) 18° (b) 15° (c) 40° (d) 20°

Q.243. The sides of a right-angled triangle, right-angled at B, are 6, 8 and 10 units. C is the vertex opposite to the side with length 8 units. What is the value of $tan^2 A + cos^2 C$?
Graduate Level 25/06/2024 (Shift - 3)
(a) $\frac{369}{400}$ (b) $\frac{125}{400}$ (c) $\frac{321}{400}$ (d) $\frac{325}{400}$

Q.244. If sinθ + cosecθ = $\sqrt{5}$, then the value of $sin^3\theta + cosec^3\theta$ is:
Graduate Level 26/06/2024 (Shift - 3)
(a) $\frac{1}{\sqrt{5}}$ (b) $\sqrt{5}$ (c) $2\sqrt{5}$ (d) 0

Q.245. If cos 2θ = 0, where θ is an acute angle, then find the value of sin (75° - θ).
Graduate Level 26/06/2024 (Shift - 3)
(a) $\sqrt{2}$ + 1 (b) $\frac{1}{2}$ (c) $\sqrt{2}$ - 1 (d) $\frac{1}{\sqrt{2}}$

Q.246. If Psin60° = Qcosec45°, then the value of $\frac{P^2+Q^2}{P^2-Q^2}$ is equal to:
Graduate Level 26/06/2024 (Shift - 4)
(a) $\frac{5}{11}$ (b) $\frac{11}{7}$ (c) $\frac{11}{5}$ (d) $\frac{7}{11}$

SSC CPO 2023 Tier - 1

Q.247. Find the value of $(tan^2\theta + tan^4\theta)$.
SSC CPO 03/10/2023 (1st Shift)
(a) $Sec^2\theta - Sec^4\theta$ (b) $Cot^2\theta - tan^2\theta$
(c) $Sec^4\theta + Sec^2\theta$ (d) $Sec^4\theta - Sec^2\theta$

Q.248. If $cos\theta - sin\theta = \sqrt{2}\ sin\theta$, then $(cos\theta + sin\theta)$ is:
SSC CPO 03/10/2023 (1st Shift)
(a) $-\sqrt{2}\ sin\ \theta$ (b) $\sqrt{2}\ tan\ \theta$
(c) $\sqrt{2}\ cos\ \theta$ (d) $-\sqrt{2}\ cos\ \theta$

Q.249. The value of
$(1 + sin^4A - cos^4A)\ cosec^2A$ is:
SSC CPO 03/10/2023 (2nd Shift)
(a) −1 (b) 1 (c) −2 (d) 2

Q.250. If $cos\ A = \frac{15}{17}$, $0 \le A \le 90°$, then the value of $cot(90° - A)$ is :
SSC CPO 03/10/2023 (2nd Shift)
(a) $\frac{8}{15}$ (b) $\frac{7}{15}$ (c) $\frac{\sqrt{2}}{15}$ (d) $\frac{2\sqrt{2}}{15}$

Q.251. If sin 2A = cos 15°, then the smallest positive value of A is:
SSC CPO 03/10/2023 (3rd Shift)
(a) 7.5° (b) 47.5° (c) 75° (d) 37.5°

Q.252. In △ABC, ∠B = 90° and AB : BC= 1 : 2. The value of cos A + tan C is:
SSC CPO 04/10/2023 (1st Shift)
(a) $\frac{1+\sqrt{5}}{2\sqrt{5}}$ (b) $\frac{2\sqrt{5}}{2+\sqrt{5}}$
(c) $\frac{5+\sqrt{5}}{2\sqrt{5}}$ (d) $\frac{2+\sqrt{5}}{2\sqrt{5}}$

Q.253. If $sec\ A - tan\ A = p$, then find the value of sec A.
SSC CPO 04/10/2023 (2nd Shift)
(a) $\frac{p^2-1}{p^2+1}$ (b) $\frac{p^2+1}{p^2-1}$
(c) $\frac{p^2+1}{2p}$ (d) $\frac{p^2+1}{p}$

Q.254. Find the value of $\sqrt{\frac{1-tanA}{1+tan\ A}}$.
SSC CPO 04/10/2023 (2nd Shift)
(a) $\sqrt{\frac{1+\ sin\ A}{cos\ A}}$ (b) $\sqrt{\frac{1+sin\ 2A}{cos\ 2A}}$
(c) $\sqrt{\frac{1-sin\ A}{cos\ A}}$ (d) $\sqrt{\frac{1-sin\ 2A}{cos\ 2A}}$

Q.255. The value of $\sqrt{\frac{1+sin\ A}{1-sin\ A}}$ is :
SSC CPO 04/10/2023 (3rd Shift)
(a) cosec A + cotA (b) cosec A - cotA
(c) sec A - tanA (d) sec A + tanA

Q.256. If sin A = $\frac{2}{3}$, then find the value of $(7 - tan\ A)(3 + cos\ A)$.
SSC CPO 05/10/2023 (1st Shift)
(a) $\frac{61}{3} + \frac{17}{\sqrt{5}}$ (b) $\frac{61}{3} - \frac{17}{3\sqrt{5}}$
(c) $\frac{61}{3} + \frac{17}{3\sqrt{5}}$ (d) $\frac{61}{3\sqrt{5}} + \frac{17}{3}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.257. If $\sin\beta = \frac{1}{3}$, $(\sec\beta - \tan\beta)^2$ is equal to :
SSC CPO 05/10/2023 (1st Shift)
(a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) $\frac{3}{4}$

Q.258. Find the value of $\frac{\sin^2 39° + \sin^2(90° - 39°)}{\cos^2 35° + \cos^2(90° - 35°)}$ + 3tan25° tan65° .
SSC CPO 05/10/2023 (2nd Shift)
(a) 1 (b) 3 (c) 4 (d) 2

Q.259. If tanθ + cotθ = 2, θ is an acute angle, then find the value of 2 $\tan^{25}\theta$ +3 $\cot^{20}\theta$ + 5 $\tan^{30}\theta \cot^{15}\theta$
SSC CPO 05/10/2023 (2nd Shift)
(a) 12 (b) 10 (c) 8 (d) 6

Q.260. Find the value of sin (50° + A) - cos (40° - A).
SSC CPO 05/10/2023 (2nd Shift)
(a) 1 (b) 0 (c) -1 (d) 2

Q.261. If $\sin\theta + \cos\theta = \sqrt{2}\cos\theta$, then find $\frac{\sin\theta - \cos\theta}{\sin\theta}$:
SSC CPO 05/10/2023 (3rd Shift)
(a) $-\sqrt{2}$ (b) -1 (c) 1 (d) $\sqrt{2}$

SSC CHSL 2023 Tier - 1

Q.262. $\frac{\cos\theta}{\sec\theta - 1} + \frac{\cos\theta}{\sec\theta + 1}$ is equal to :
SSC CHSL 02/08/2023 (1st Shift)
(a) $2\sec^2\theta$ (b) $2\cot^2\theta$
(c) $2\cos^2\theta$ (d) $2\sin^2\theta$

Q.263. If $(\sin\theta - \cos\theta) = 0$, then the value of $\sin(\pi - \theta) + \sin(\frac{\pi}{2} - \theta)$ is:
SSC CHSL 02/08/2023 (2nd Shift)
(a) 1 (b) 0 (c) $\sqrt{3}$ (d) $\sqrt{2}$

Q.264. If $\cos\theta + \sec\theta = \sqrt{3}$, then the value of $\cos^3\theta + \sec^3\theta$ is :
SSC CHSL 02/08/2023 (3rd Shift)
(a) 0 (b) $\frac{1}{\sqrt{3}}$ (c) $\sqrt{3}$ (d) $2\sqrt{3}$

Q.265. If cos A = $\frac{63}{65}$, then find the value of tan A + cot A (up to two places of decimal).
SSC CHSL 02/08/2023 (4th Shift)
(a) 4.19 (b) 2.76 (c) 3.19 (d) 5.23

Q.266. If $\frac{\cos\theta}{(1+\sin\theta)} + \frac{\cos\theta}{(1-\sin\theta)} = 4$ and θ is acute , then the value of θ is :
SSC CHSL 03/08/2023 (1st Shift)
(a) 60° (b) 15° (c) 45° (d) 30°

Q.267. If $\sin\alpha + \cos\alpha = \frac{2}{\sqrt{3}}$ then what is $(\tan\alpha + \cot\alpha)$ equal to ?
SSC CHSL 03/08/2023 (1st Shift)
(a) 1 (b) 2 (c) 6 (d) 0

Q.268. The value of $(\operatorname{cosec}^2 B - 1)(\sec^2 B - 1)$ is :
SSC CHSL 03/08/2023 (2nd Shift)
(a) 4 (b) 3 (c) 2 (d) 1

Q.269. If sinθ + cosθ= $\frac{1}{29}$, find the value of $\frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta}$.
SSC CHSL 03/08/2023 (2nd Shift)
(a) $\frac{1}{41}$ (b) $\frac{43}{29}$ (c) $\frac{41}{29}$ (d) $\frac{1}{43}$

Q.270. The given expression is equal to :
$\frac{(1+\tan^2 A)}{\operatorname{cosec}^2 A.\tan A}$
SSC CHSL 03/08/2023 (3rd Shift)
(a) $\sec^2$A (b) Sec A (c) Tan A (d) $\tan^2$A

Q.271. $\cos^4 A - \sin^4 A$ is equal to :
SSC CHSL 03/08/2023 (3rd Shift)
(a) 2 $\cos^2$ A + 1 (b) 1 - 2 $\sin^2$ A
(c) 2 $\sin^2$ A - 1 (d) -(2 $\sin^2$ A + 1)

Q.272. If cosecθ = $1\frac{7}{22}$, find the value of $\cot^2\theta$.
SSC CHSL 03/08/2023 (4th Shift)
(a) $\frac{49}{484}$ (b) $\frac{357}{484}$ (c) $\frac{225}{484}$ (d) $\frac{7}{22}$

Q.273. What is the value of the expression
sinA (1 + $\frac{\sin A}{\cos A}$) + cosA (1 + $\frac{\cos A}{\sin A}$) ?
SSC CHSL 04/08/2023 (1st Shift)
(a) secA + cosecA (b) sinA + cosA
(c) sinA – cosA (d) secA – cosecA

Q.274. Simplify the expression:
$\frac{3 - \sin^2 A + \cos^2 A}{2 + 2\cos^2 A}$
SSC CHSL 04/08/2023 (1st Shift)
(a) 1 (b) 0 (c) -1 (d) 2

Q.275. If sec θ + tan θ = $\sqrt{3}$, then the positive value of sin θ + cos θ is:
SSC CHSL 04/08/2023 (3rd Shift)
(a) $\frac{(1+\sqrt{3})}{2}$ (b) $\frac{2}{\sqrt{3}}$
(c) $\frac{\sqrt{3}}{2}$ (d) $\frac{2}{(1+\sqrt{3})}$

Q.276. If $2\tan^2 A + 4\cos^4 A = 3$, then the possible value of A is:
SSC CHSL 04/08/2023 (4th Shift)
(a) 45° (b) 60° (c) 0° (d) 30°

Q.277. If a = cotA + cosA and b = cotA-cosA, then find the value of $a^2 - b^2 - 4\sqrt{ab}$.
SSC CHSL 04/08/2023 (4th Shift)
(a) 0 (b) - 1 (c) 1 (d) - 4

Q.278. The given expression is equal to :
$1 - \frac{\tan^2\phi}{\sec^2\phi}$
SSC CHSL 07/08/2023 (1st Shift)
(a) $\sin^2\phi\cos^2\phi$ (b) $\sin^2\phi\cot^2\phi$
(c) $\cot^2\phi\cos^2\phi$ (d) $\tan^2\phi\cos^2\phi$

Q.279. Find the value of $\cot^2 B - \operatorname{cosec}^2 B$ for 0 < B < 90°.
SSC CHSL 07/08/2023 (1st Shift)
(a) 1 (b) 2 (c) -1 (d) -2

Q.280. In Δ OPQ, right-angled at P, OP = 7 cm and OQ - PQ = 1 cm. Determine the values of sin Q + cos Q .
SSC CHSL 07/08/2023 (2nd Shift)
(a) $\frac{13}{25}$ (b) $\frac{21}{25}$ (c) $\frac{31}{25}$ (d) $\frac{33}{25}$

Q.281. The given expression is equal to:
$\frac{2\sec A}{\sec^2 A - 1}$
SSC CHSL 07/08/2023 (3rd Shift)
(a) 2 cosec A cot A (b) 2 cos A cot A
(c) 2 cosec A tan A (d) 2 cos A sin A

Q.282. The given expression is equal to:
$\frac{\cos^2 A}{(1+\sin A)}$
SSC CHSL 07/08/2023 (3rd Shift)
(a) 1 - sin A (b) 1+ cos A
(c) Sin A (d) Cos A

Q.283. The value of sin²30° + sin²40° + sin²45° + sin²55 °+ sin²35° + sin²45° + sin²50° + sin²60° is:
SSC CHSL 07/08/2023 (3rd Shift)
(a) 2 (b) 4 (c) 3 (d) 1

Q.284. Simplify the given expression.
$\frac{\sin^2 32° + \sin^2 58°}{\cos^2 32° + \cos^2 58°} + \sin^2 53° + \cos 53° \sin 37°$
SSC CHSL 07/08/2023 (4th Shift)
(a) 2 (b) -1 (c) -2 (d) 1

Q.285. The value of $\frac{1}{\sin\theta} - \frac{\cot^2\theta}{1+\operatorname{cosec}\theta}$ is
SSC CHSL 07/08/2023 (4th Shift)
(a) 2 (b) 1 (c) -1 (d) 0

Q.286. The value of $\frac{\sin 58°}{\cos 32°} + \frac{\sin 55° \sec 35°}{\tan 5° \tan 45° \tan 85°}$ is equal to:
SSC CHSL 07/08/2023 (4th Shift)
(a) 2 (b) 1 (c) 0 (d) 3

Q.287. If secθ = $2\frac{4}{23}$ find the value of $\tan^2\theta$.
SSC CHSL 08/08/2023 (1st Shift)
(a) $2\frac{16}{529}$ (b) $1\frac{200}{529}$ (c) $3\frac{384}{529}$ (d) $3\frac{177}{529}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.288. Find the value of
$\frac{\cos^2 25^\circ - \sin^2 65^\circ}{\cos^2 25^\circ + \sin^2 65^\circ}$:
SSC CHSL 08/08/2023 (1st Shift)
(a) $\frac{1}{2}$ (b) 1 (c) -1 (d) 0

Q.289. Simplify the given equation.
$\frac{Cot^3 A - 1}{cotA - 1} = ?$
SSC CHSL 08/08/2023 (2nd Shift)
(a) $cosec^2 A - cotA$ (b) $cosec^2 A + cotA$
(c) $cot^2 A + cosecA$ (d) $cot^2 A - cosecA$

Q.290. If $Tan\theta + Sec\theta = a$, then what is $Sec\theta$ equal to:
SSC CHSL 08/08/2023 (2nd Shift)
(a) $\frac{a+1}{2a^2}$ (b) $\frac{(a-1)}{2a^2}$
(c) $\frac{a^2-1}{2a}$ (d) $\frac{a^2+1}{2a}$

Q.291. Find the value of
$\frac{\cos A}{1+\sin A} + \frac{1+\sin A}{\cos A} + 2.$
SSC CHSL 08/08/2023 (3rd Shift)
(a) 1 + 2secA (b) 2 - secA
(c) 2 + secA (d) 2(1 + secA)

Q.292. If $\sec\theta + \tan\theta = \frac{1}{\sqrt{3}}$, then the positive value of cot θ + cos θ is :
SSC CHSL 08/08/2023 (4th Shift)
(a) $\frac{3\sqrt{3}}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{2}{3\sqrt{3}}$ (d) $\frac{2}{\sqrt{3}}$

Q.293. If $\frac{\sin\theta - Cos\theta}{\sin\theta + Cos\theta} = \frac{4}{5}$, then the value of $\frac{cosec^2\theta}{2 - cosec^2\theta}$ is:
SSC CHSL 09/08/2023 (1st Shift)
(a) $\frac{16}{25}$ (b) $\frac{40}{41}$ (c) $\frac{41}{40}$ (d) $\frac{31}{30}$

Q.294. ΔPQR is right angled at Q . If PQ = 12 cm PR = 13 cm, find tan P + cot R.
SSC CHSL 09/08/2023 (1st Shift)
(a) $\frac{9}{10}$ (b) 0 (c) $\frac{10}{12}$ (d) $\frac{12}{10}$

Q.295. If tan A = $\frac{1}{2}$ and tan B = $\frac{1}{3}$, then the value of A + B is:
SSC CHSL 09/08/2023 (1st Shift)
(a) 60° (b) 15° (c) 30° (d) 45°

Q.296. If $\cot A = \frac{5}{12}$, find the value of the following expression.
$\frac{5(1-\cos^2 A)}{6(1-\sin^2 A)}$
SSC CHSL 09/08/2023 (2nd Shift)
(a) $\frac{144}{5}$ (b) $\frac{24}{25}$ (c) $\frac{144}{25}$ (d) $\frac{24}{5}$

Q.297. If tanθ.tan2θ = 1 then the value of cot 5θ is:
SSC CHSL 09/08/2023 (4th Shift)
(a) - 1 (b) 1 (c) - $\sqrt{3}$ (d) $\sqrt{3}$

Q.298. If 4 $\sin^2$A - 3 = 0 and 0 ≤ A ≤ 90°, then 3 sin A - 4 $\sin^3$ A is:
SSC CHSL 10/08/2023 (1st Shift)
(a) $\frac{1}{2}$ (b) $\sqrt{\frac{3}{2}}$ (c) 0 (d) 1

Q.299. ΔRMS is right-angled at M. The length of the base, RM = 4 cm and the length of perpendicular MS = 3 cm. Find the value of sec R.
SSC CHSL 10/08/2023 (3rd Shift)
(a) $\frac{3}{4}$ (b) $\frac{5}{4}$ (c) $\frac{4}{5}$ (d) $\frac{2}{5}$

Q.300. Find the value of the following expression.
2($\tan^2$A $\cos^2$A + $\cos^2$A)
SSC CHSL 10/08/2023 (4th Shift)
(a) 4 (b) 1 (c) 3 (d) 2

Q.301. If A, B, C are the acute angles, such that tan (A + B − C) = $\frac{1}{\sqrt{3}}$, cos (B + C − A) = $\frac{1}{2}$ and sin (C + A - B) = $\frac{1}{\sqrt{2}}$. The value of A + B + C will be equal to:
SSC CHSL 10/08/2023 (4th Shift)
(a) 90° (b) 110° (c) 170 ° (d) 135°

Q.302. Find the value of the following expression.
$\frac{(1+\sec Ø)}{(\sec Ø)}$ (1 - cosØ)
SSC CHSL 10/08/2023 (4th Shift)
(a) $\cos^2$Ø (b) $\sec^2$Ø (c) $\cot^2$Ø (d) $\sin^2$Ø

Q.303. Let ABC be a right-angled triangle where ∠ A = 90° and ∠C = 45°. Find the value of sec C + sin C sec C.
SSC CHSL 11/08/2023 (1st Shift)
(a) 1 (b) 1 - $\sqrt{2}$ (c) 1 + $\sqrt{2}$ (d) $\sqrt{2}$ - 1

Q.304. If (4 sinθ + 5 cosθ) = 3, then the value of (4 cosθ - 5 sinθ) is:
SSC CHSL 11/08/2023 (1st Shift)
(a) $3\sqrt{2}$ (b) $4\sqrt{2}$ (c) $2\sqrt{3}$ (d) $2\sqrt{5}$

Q.305. Let ABC be a triangle right angled at B. If tan A = $\frac{12}{5}$, then find the values of cosec A and sec A, respectively.
SSC CHSL 11/08/2023 (3rd Shift)
(a) $\frac{13}{10}, \frac{5}{13}$ (b) $\frac{13}{12}, \frac{13}{5}$
(c) $\frac{10}{13}, \frac{5}{13}$ (d) $\frac{12}{13}, \frac{5}{13}$

Q.306. If $\cos\theta - \sin\theta = 0$, then $(\sin^8\theta + \cos^8\theta)$ is :
SSC CHSL 11/08/2023 (3rd Shift)
(a) $\frac{1}{8}$ (b) $\frac{1}{4}$ (c) $\frac{1}{6}$ (d) $\frac{1}{2}$

Q.307. Simplify the given expression
$\frac{3(\sin^4 Z - \cos^4 Z + 1)}{\sin^2 Z}$
SSC CHSL 11/08/2023 (4th Shift)
(a) 9 (b) 2 (c) 4 (d) 6

Q.308. Find the value of Sin 47° Cos 33° − Cos 43° Sin 57°.
SSC CHSL 14/08/2023 (2nd Shift)
(a) −1 (b) 1 (c) 0 (d) $\frac{1}{2}$

Q.309. The value of $\frac{1+\sin A}{\cos A} + \frac{\cos A}{1+\sin A}$ is:
SSC CHSL 14/08/2023 (3rd Shift)
(a) 2 sec A (b) 2 cosec A
(c) sec A (d) cosec A

Q.310. Simplify the given equation. (1 + $\tan^2$ A) (1 + $\cot^2$ A) = ?
SSC CHSL 14/08/2023 (3rd Shift)
(a) $\frac{1}{\cos^2 A(1+\sin^2 A)}$
(b) $\frac{1}{\sin^2 A(1-\sin^2 A)}$
(c) $\frac{1}{\sin^2 A + 1 + cosec^2 A)}$
(d) $\frac{1}{\sin^2 A(1+\cos^2 A)}$

Q.311. The given expression is equal to: (cot B - tan B). sin B. cos B
SSC CHSL 14/08/2023 (4th Shift)
(a) 1 - 2$\sec^2$ B (b) 1 - 2$\cos^2$B
(c) 2 $\cos^2$B - 1 (d) 2$\sec^2$B - 1

Q.312. $cot^2\theta - cosec^2\theta$ equals to :
SSC CHSL 17/08/2023 (1st Shift)
(a) 0 (b) tanθ (c) 1 (d) - 1

Q.313. If sinθ cosθ = $\frac{1}{\sqrt{3}}$ then the value of $(\sin^4\theta + \cos^4\theta)$ is:
SSC CHSL 17/08/2023 (3rd Shift)
(a) 1 (b) $\frac{5}{3}$ (c) $\frac{2}{3}$ (d) $\frac{1}{3}$

Q.314. Simplify the given expression.
$\sqrt{\frac{1+\cos P}{1-\cos P}}$
SSC CHSL 17/08/2023 (3rd Shift)
(a) cosec P - cot P (b) sec P - tan P
(c) sec P + tan P (d) cosec P + cot P

Q.315. Find the value of tan(50 + θ) - Cot(40 - θ).
SSC CHSL 17/08/2023 (4th Shift)
(a) $\frac{1}{2}$ (b) - 1 (c) 0 (d) 1

Q.316. What is the value of (1 - $\sin^2$A) $cosec^2$A ?
Given A is an acute angle.
SSC CHSL 17/08/2023 (4th Shift)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) $\cot^2 A$ (b) $\cos^2 A$ (c) $\tan^2 A$ (d) $\sin^2 A$

Q.317. If Tan 15° = 2 - $\sqrt{3}$, then the value of Tan 15° Cot 75° + Tan 75° Cot 15° is:
SSC CHSL 17/08/2023 (4th Shift)
(a) 6 (b) 10 (c) 8 (d) 14

SSC CGL 2023 Tier - 1

Q.318. If $\{(\frac{3\sin\theta - \cos\theta}{\cos\theta + \sin\theta})\}$ = 1, then the value of cotθ is:
SSC CGL 14/07/2023 (1st shift)
(a) 3 (b) 0 (c) 1 (d) 2

Q.319. Evaluate the following: cos(36° + A).cos(36°- A) + cos(54°+ A).cos(54° - A)
SSC CGL 14/07/2023 (2nd shift)
(a) sin 2A (b) cos A (c) sin A (d) cos 2A

Q.320. If sin 23° = $\frac{a}{b}$, then the value of sec23° - sin67°is _____
SSC CGL 14/07/2023 (3rd shift)
(a) $\frac{a^2}{\sqrt{b^2 - a^2}}$ (b) $\frac{b^2 - a^2}{ab}$
(c) $\frac{a^2}{b\sqrt{b^2 + a^2}}$ (d) $\frac{a^2}{b\sqrt{b^2 - a^2}}$

Q.321. If $\frac{\cos\beta}{\sec\alpha}$ = 15 and $\frac{\sin\beta}{\sec\alpha}$ = 16, then the value of $\sin^2\beta$ is _____.
SSC CGL 14/07/2023 (3rd shift)
(a) $\frac{256}{481}$ (b) - $\frac{256}{481}$ (c) $\frac{481}{256}$ (d) - $\frac{481}{256}$

Q.322. Simplify the following.
$\frac{\sin^3\alpha + \cos^3\alpha}{\sin\alpha + \cos\alpha}$
SSC CGL 14/07/2023 (4th shift)
(a) 1 + sin α cos α (b) tan α
(c) 1 - sin α cos α (d) sec α

Q.323. If tan $\frac{\pi}{6}$ + sec $\frac{\pi}{6}$= x, then find x.
SSC CGL 17/07/2023 (2nd shift)
(a) $\sqrt{3}$ (b) $\frac{1}{\sqrt{3}}$ (c) $\frac{-1}{\sqrt{3}}$ (d) $\frac{2}{\sqrt{3}}$

Q.324. If cosx = - $\frac{1}{2}$, x lies in third quadrant, then tanx = ?
SSC CGL 17/07/2023 (3rd shift)
(a) $\sqrt{3}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{2}{\sqrt{3}}$ (d) $\frac{1}{\sqrt{3}}$

Q.325. Using cos(A + B) = cosA cosB - sinA sinB, find the value of cos75°.
SSC CGL 17/07/2023 (3rd shift)
(a) $\frac{\sqrt{5} - 1}{4}$ (b) $\frac{\sqrt{5} + 1}{4}$
(c) $\frac{\sqrt{6} - \sqrt{2}}{4}$ (d) $\frac{\sqrt{6} + \sqrt{2}}{4}$

Q.326. $\frac{\sin^4\theta + \cos^4\theta}{1 - 2\sin^2\theta.\cos^2\theta}$ = _____.
SSC CGL 17/07/2023 (4th shift)
(a) 1 (b) 2 (c) -1 (d) 0

Q.327. Using trigonometric formulas, find the value of $(\frac{\sin(x-y)}{\sin(x+y)})(\frac{\tan x + \tan y)}{\tan x - \tan y)})$
SSC CGL 18/07/2023 (1st shift)
(a) - 2 (b) 2 (c) 0 (d) 1

Q.328. If tan$\frac{A}{2}$ = x, then find x.
SSC CGL 18/07/2023 (1st shift)
(a) $\frac{\sqrt{1 + \cos A}}{\sqrt{1 - \cos A}}$ (b) $\frac{\sqrt{1 - \sin A}}{\sqrt{1 + \cos A}}$
(c) $\frac{\sqrt{1 - \cos A}}{\sqrt{1 + \cos A}}$ (d) $\frac{\sqrt{\cos A - 1}}{\sqrt{1 + \cos A}}$

Q.329. The value of
$(\frac{1}{\sin\theta} + \frac{1}{\tan\theta})(\frac{1}{\sin\theta} - \frac{1}{\tan\theta})$ is :
SSC CGL 18/07/2023 (2nd shift)
(a) 0 (b) 2 (c) 3 (d) 1

Q.330. Simplify the following:
$\sin 2x + 2\sin 4x + \sin 6x$
SSC CGL 18/07/2023 (2nd shift)
(a) 4 $\cos^2$x sin 4x (b) 4 $\cos^2$ x sin x
(c) 2 $\cos^2$ x sin 4x (d) 4 $\sin^2$x sin 4x

Q.331. If sin A = - $\frac{3}{5}$, A lies in III quadrant, the value of sec A is:
SSC CGL 18/07/2023 (2nd shift)
(a) - $\frac{4}{5}$ (b) - $\frac{5}{4}$ (c) - $\frac{3}{4}$ (d) $\frac{3}{4}$

Q.332. Find the value of the following expression. $12(\sin^4\theta + \cos^4\theta) + 18(\sin^6\theta + \cos^6\theta) + 78\sin^2\theta\cos^2\theta$
SSC CGL 18/07/2023 (3rd shift)
(a) 30 (b) 40 (c) 10 (d) 20

Q.333. Using tan (A - B) = $\frac{\tan A - \tan B}{1 + \tan A \tan B'}$
find the value of tan15°.
SSC CGL 18/07/2023 (4th shift)
(a) $\sqrt{3}$ + 1 (b) $\sqrt{3}$ - 1 (c) 2 - $\sqrt{3}$ (d) 2 + $\sqrt{3}$

Q.334. If $\frac{\sin x - \cos x}{\sin x + \cos x}$ = $\frac{2}{5}$, then the value of $\frac{1 + \cot^2 x}{1 - \cot^2 x}$ is:
SSC CGL 19/07/2023 (1st shift)
(a) 2.25 (b) 1.45 (c) 3.75 (d) 5.25

Q.335. Find the value of $(\sin\theta + \cos\theta)^2 + (\sin\theta - \cos\theta)^2$
SSC CGL 19/07/2023 (1st shift)
(a) 4 (b) 0 (c) 2 (d) 1

Q.336. If $(\frac{\cos A}{1 - \sin A})$ + $(\frac{\cos A}{1 + \sin A})$ = 4 then what will be the value of A? (0° < θ < 90°)
SSC CGL 19/07/2023 (1st shift)
(a) 90° (b) 45° (c) 60° (d) 30°

Q.337. Using cot(A - B) = $\frac{\cot A \cot B + 1}{\cot B - \cot A}$, find the value of cot 15°.
SSC CGL 19/07/2023 (2nd shift)
(a) 2 + $\sqrt{3}$ (b) 2 - $\sqrt{3}$
(c) $\sqrt{3}$ - 1 (d) $\sqrt{3}$ + 1

Q.338. If P cos α = 3 and 4 tan α = Q, then what is the relation between P and Q, which is independent of α?
SSC CGL 19/07/2023 (2nd shift)
(a) $\frac{9}{P^2} + \frac{16}{Q^2} = 1$ (b) $\frac{9}{P^2} - \frac{16}{Q^2} = 1$
(c) $\frac{P^2}{9} - \frac{Q^2}{16} = 1$ (d) $\frac{P^2}{9} + \frac{Q^2}{16} = 1$

Q.339. For any acute angle θ, sinθ + $\sin^2\theta$ = 1, then the value of $\cos^2\theta + \cos^4\theta$ = _____.
SSC CGL 19/07/2023 (3rd shift)
(a) 0 (b) 1 (c) 2 (d) -1

Q.340. If $\cos x + \sin x = \sqrt{2}\cos x$, what is the value of $(\cos x - \sin x)^2 + (\cos x + \sin x)^2$?
SSC CGL 19/07/2023 (4th shift)
(a) 2 (b) 1 (c) 0 (d) $\frac{1}{\sqrt{2}}$

Q.341. Solve the given expression.
$\frac{\sec^2(90° - \theta) - \cot^2\theta}{2(\sin^2 35° + \sin^2 55°)}$
SSC CGL 20/07/2023 (1st shift)
(a) 0.5 (b) 2 (c) 1.5 (d) 1

Q.342. cosec 2910°+ sec 4260° + tan 2565° + cot 1755° = ?
SSC CGL 20/07/2023 (1st shift)
(a) 3 (b) 1 (c) 4 (d) 0

Q.343. The maximum value of $(\sin^{12}\theta + \cos^{20}\theta)$ for all the real values of θ is:
SSC CGL 20/07/2023 (3rd shift)
(a) 2 (b) 3 (c) 1 (d) 0

Q.344. What is the value of sin(- 405°) ?
SSC CGL 20/07/2023 (3rd shift)
(a) $\frac{\sqrt{5}}{2}$ (b) $\frac{1}{2}$ (c) $\frac{-1}{2}$ (d) $\frac{-1}{\sqrt{2}}$

Q.345. Simplify the following expression
$\frac{\sin\theta - 2345\sin^3\theta}{2\cos^3\theta - \cos\theta}$
SSC CGL 21/07/2023 (3rd shift)
(a) tanθ (b) sinθ (c) secθ (d) cosθ

Q.346. Simplify $\frac{1 + \sin t}{4 - 4\sin t}$ - $\frac{1 - \sin t}{4 + 4\sin t}$
SSC CGL 21/07/2023 (4th shift)
(a) 4tan t. sin t (b) tant . sec t
(c) tan t - sin t (d) tan t + sin t

Q.347. PQR is a triangle right angled at Q

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

and PQ : QR = 3 : 4. What is the value of sin P + sin Q + sin R ?
SSC CGL 21/07/2023 (4th shift)
(a) $\frac{4}{5}$ (b) $\frac{3}{5}$ (c) $\frac{12}{5}$ (d) $\frac{2}{5}$

Q.348. If 2 Cotθ = 3, then find the value of $\frac{\sqrt{13}\ sin\theta\ -3\ tan\theta}{3\ tan\theta+\sqrt{13}\ cos\theta}$
SSC CGL 24/07/2023 (1st shift)
(a) $\frac{1}{\sqrt{13}}$ (b) $\frac{2}{\sqrt{13}}$ (c) 0 (d) $\frac{2}{3}$

Q.349. Using the identity tan2α = $\frac{2tan\alpha}{1-tan^2\alpha}$ find the value of tan15° correct to three decimal places. [Use √3 = 1.732]
SSC CGL 24/07/2023 (1st shift)
(a) 0.268 (b) 0.27 (c) 0.267 (d) 0.269

Q.350. If Cosecθ + Cotθ = m, find the value of $\frac{m^2-1}{m^2+1}$
SSC CGL 24/07/2023 (2nd shift)
(a) 1 (b) 0 (c) cosθ (d) - sinθ

Q.351. If sinθ + cosecθ = $\sqrt{5}$, then the value of $sin^3\theta + cosec^3\theta$ = _____.
SSC CGL 24/07/2023 (3rd shift)
(a) 0 (b) $3\sqrt{5}$ (c) $\frac{1}{\sqrt{5}}$ (d) $2\sqrt{5}$

Q.352. If a cotθ = b, then what will be the value of $\frac{bcos\theta-asin\theta}{bcos\theta+asin\theta}$?
SSC CGL 24/07/2023 (4th shift)
(a) $\frac{b^2+a^2}{b^2-a^2}$ (b) b^2+a^2
(c) $\frac{b^2-a^2}{b^2+a^2}$ (d) 0

Q.353. Simplify the given expression.
$\frac{1+sin^4\theta+cos^4\theta}{cos^2\theta+sin^4\theta}$
SSC CGL 24/07/2023 (4th shift)
(a) 3 (b) 1 (c) 2 (d) 4

Q.354. Using cosec (α + β) = $\frac{sec\alpha\times sec\beta\times cosec\alpha\times cosec\beta}{sec\alpha\times cosec\beta+cosec\alpha\times sec\beta}$, find the value of cosec75°.
SSC CGL 25/07/2023 (1st shift)
(a) $\frac{\sqrt{6}+\sqrt{2}}{4}$ (b) $\frac{\sqrt{6}-\sqrt{2}}{4}$
(c) $\sqrt{6}-\sqrt{2}$ (d) $\sqrt{6}+\sqrt{2}$

Q.355. The value of $\sqrt{\frac{1+cos\theta}{1-cos\theta}}$ is :
SSC CGL 25/07/2023 (3rd shift)
(a) secθ + tanθ (b) cosecθ - cotθ
(c) cosecθ + cotθ (d) secθ - tanθ

Q.356. Find $(\frac{1}{sin\theta})$ - sinθ.
SSC CGL 25/07/2023 (4th shift)
(a) Cosθ cotθ (b) cosθ secθ
(c) cosθ cosecθ (d) cosθ tanθ

Q.357. If $\frac{21\ cos\ A+3\ sin\ A}{3\ cos\ A+4\ sin\ A}$ = 2, then find the value of cot A
SSC CGL 26/07/2023 (2nd shift)
(a) $\frac{9}{11}$ (b) $\frac{11}{9}$ (c) $\frac{1}{3}$ (d) $\frac{11}{10}$

Q.358. tan 4384° + cot 6814° = ?
SSC CGL 26/07/2023 (3rd shift)
(a) -1 (b) 2 (c) 0 (d) 1

Q.359. If A = 22.5° what is the value of ($10\sqrt{2}$ sin 2A - 7 $\sqrt{2}$ cos 2A + 9tan2A) ?
SSC CGL 26/07/2023 (4th shift)
(a) 12 (b) 15 (c) 10 (d) 6

Q.360. sin 600° cos 750° + sin 150° cos 240° = ?
SSC CGL 26/07/2023 (4th shift)
(a) $\frac{2}{3}$ (b) 1 (c) $\frac{1}{2}$ (d) -1

Q.361. What is the values of tan$\frac{\theta}{2}$?
SSC CGL 26/07/2023 (4th shift)
(a) $\frac{Cos\theta}{1-Sin\theta}$ (b) $\frac{Sin\theta}{1-Cos\theta}$
(c) $\frac{Cos\theta}{1-Cos\theta}$ (d) $\frac{Sin\theta}{1+Cos\theta}$

Q.362. If 3x = secA and $\frac{3}{x}$ = tanA, then $9(x^2-\frac{1}{x^2})$ is ____.
SSC CGL 27/07/2023 (2nd shift)
(a) 3 (b) 9 (c) 1 (d) $\frac{1}{9}$

Q.363. If $tan^4\theta + tan^2\theta$ = 1, what is the value of 11 ($cos^4\theta + cos^2\theta$) ?
SSC CGL 27/07/2023 (3rd shift)
(a) -11 (b) 8 (c) 0 (d) 11

SSC Selection Post (Phase - XI)

Q.364. The value of $\frac{32}{sec^2\theta}-\frac{20}{1+tan^2\theta}+12sin^2\theta$ is :
Graduate Level 27/06/2023 (Shift - 4)
(a) 20 (b) 32 (c) 24 (d) 12

Q.365. If sinθ + cosθ = $\frac{\sqrt{11}}{3}$, then what is tanθ + cotθ equal to ?
Graduate Level 27/06/2023 (Shift - 4)
(a) 5 (b) 9 (c) 7 (d) 11

Q.366. If 1 + $sin^2\theta$ = a $cos^2\theta$, then find $sec^4\theta$ - $tan^4\theta$.
Graduate Level 30/06/2023 (Shift - 1)
(a) a^{-2} (b) a^{-1} (c) a (d) a^2

Q.367. In a triangle PQR, if QR = 3 cm, PR = 5 cm and sin P = $\frac{3}{5}$, then ∠Q equals:
Higher Secondary 28/06/2023 (Shift - 2)
(a) $\frac{\pi}{3}$ (b) $\frac{\pi}{2}$ (c) $\frac{\pi}{4}$ (d) $\frac{\pi}{6}$

Q.368. The value of
$cosec\ 41° - sec\ 49°\ is$:
Higher Secondary 30/06/2023 (Shift - 2)
(a) 1 (b) 0 (c) $\frac{1}{4}$ (d) $\frac{1}{2}$

SSC CHSL 2022 Tier - 2

Q.369. If Sin x + Sin^2x = 1, then what is the value of $Cos^8x + 2\ Cos^6x + Cos^4x$?
SSC CHSL Tier II (26/06/2023)
(a) 2 (b) 0 (c) 4 (d) 1

SSC CHSL 2022 Tier - 1

Q.370. What is the value of
$(\frac{1+sec^2A}{1+cos^2A})(\frac{1+sin^2A}{1+cosec^2A})$?
SSC CHSL 09/03/2023 (1st Shift)
(a) cos^2 A (b) $cosec^2$ A
(c) sec^2 A (d) tan^2 A

Q.371. What is $\frac{\sqrt{(1-sinA)}}{\sqrt{(1+sinA)}}$?
SSC CHSL 09/03/2023 (2nd Shift)
(a) sec^2A (b) secA + tanA
(c) tan^2A (d) secA - tanA

Q.372. What is the value of
(1 + tanθ - secθ)(1 + cotθ + cosecθ) ?
SSC CHSL 09/03/2023 (3rd Shift)
(a) -1 (b) 0 (c) 1 (d) 2

Q.373. What is the value of
$\frac{cos(50°+A)-sin(40°-A)}{cos40°\ sec40°}$?
SSC CHSL 10/03/2023 (1st Shift)
(a) 1 (b) 2 (c) 0.5 (d) 0

Q.374. If tan A + sec A = K, then what is the value of sin A ?
SSC CHSL 10/03/2023 (1st Shift)
(a) $\frac{2K}{K^2+1}$ (b) $\frac{K^2-1}{2K}$
(c) $\frac{K^2+1}{k^2-1}$ (d) $\frac{K^2-1}{K^2+1}$

Q.375. What is $\frac{cosec\ 90°}{(1-cos^2\ 60°)}$?
SSC CHSL 10/03/2023 (2nd Shift)
(a) 0 (b) $\frac{4}{3}$ (c) $\frac{1}{4}$ (d) $\frac{3}{4}$

Q.376. What is the value of $\sqrt{\frac{cosec\ A+1}{cosec\ A-1}}+\sqrt{\frac{cosec\ A-1}{cosec\ A+1}}$?
SSC CHSL 13/03/2023 (1st Shift)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) 2 cos A (b) sec A
(c) cos A (d) 2 sec A

Q.377. If m = sec θ - tan θ and n = cosec θ + cot θ, then what is the value of m + n (m - 1) ?
SSC CHSL 13/03/2023 (2nd Shift)
(a) 0 (b) 2 (c) 1 (d) - 1

Q.378. ΔABC is a right angled triangle. ∠ A = 90 degree, AB = 4 cm, BC = 5 cm. What is the value of cos B + cot C ?
SSC CHSL 13/03/2023 (3rd Shift)
(a) $\frac{17}{20}$ (b) $\frac{29}{20}$ (c) $\frac{23}{20}$ (d) $\frac{31}{20}$

Q.379. If ΔPQR is right angled at Q, then what is the value of cos (P + R) ?
SSC CHSL 13/03/2023 (4th Shift)
(a) 0.5 (b) 1 (c) 0.2 (d) 0

Q.380. If $\sqrt{3}\,tan^2\theta$ - 4 tanθ + $\sqrt{3}$ = 0, then what is the value of $tan^2\theta + cot^2\theta$?
SSC CHSL 13/03/2023 (4th Shift)
(a) $\frac{4}{3}$ (b) $\frac{10}{3}$ (c) 3 (d) $\frac{6}{5}$

Q.381. If 6Cotθ = 5, then find the value of $\frac{(6cos\theta + sin\theta)}{(6cos\theta - 4sin\theta)}$?
SSC CHSL 14/03/2023 (2nd Shift)
(a) 5 (b) 1 (c) 6 (d) 0

Q.382. If - sinθ + cosecθ = 6, then what is the value of sinθ + cosecθ ?
SSC CHSL 14/03/2023 (2nd Shift)
(a) 6 (b) $\sqrt{40}$ (c) $\sqrt{34}$ (d) $\sqrt{38}$

Q.383. If $\sqrt{2}sec^2\theta - 4\ sec\theta + 2\sqrt{2} = 0$, then what is the value $sin^2\theta + tan^2\theta$?
SSC CHSL 14/03/2023 (3rd Shift)
(a) $\frac{1}{2}$ (b) $\frac{2}{3}$ (c) $\frac{5}{2}$ (d) $\frac{3}{2}$

Q.384. What is the value of $\frac{sin\,\theta + cos\theta}{sin\,\theta - cos\,\theta} + \frac{sin\,\theta - cos\theta}{sin\,\theta + cos\,\theta}$?
SSC CHSL 14/03/2023 (4th Shift)
(a) $\frac{1}{(sin^2\theta - cos^2\,\theta)}$
(b) $2(sin^2\theta - cos^2\,\theta)$
(c) $\frac{2}{(sin^2\theta - cos^2\,\theta)}$
(d) $sin^2\theta - cos^2\,\theta$

Q.385. Simplify the following expression:- $\frac{1 - sin\,A}{cos\,A} + \frac{cos\,A}{1 - sin\,A}$?
SSC CHSL 15/03/2023 (1st Shift)
(a) 2 sinA (b) 2 cosA (c) 2 secA (d) 2 tanA

Q.386. If sec x + tan x = 5 and cosec y – cot y = $\frac{1}{3}$ then find the value of (sec x + cosec y) - (tan x - cot y).
SSC CHSL 15/03/2023 (1st Shift)
(a) 2.2 (b) 3.2 (c) 4.2 (d) 3.1

Q.387. If A = a cosecθ + b cotθ and B = a cotθ + b cosecθ, then what is the value of A² - B² ?
SSC CHSL 15/03/2023 (4th Shift)
(a) ab (b) (a + b) (c) $(a^2 - b^2)$ (d) (a - b)

Q.388. If cosec θ + cot θ = s, then what is the value of cos θ ?
SSC CHSL 16/03/2023 (2nd Shift)
(a) $\frac{s^2 - 1}{s^2 + 1}$ (b) $\frac{s^2 + 1}{s^2 - 1}$
(c) $\frac{s^2 - 1}{2s}$ (d) $\frac{2s}{s^2 + 1}$

Q.389. Find the value of tan x, if sec x + tan x = √3 and x lies between 0° and 90°.
SSC CHSL 16/03/2023 (3rd Shift)
(a) √3 (b) 1 (c) $\frac{1}{\sqrt{3}}$ (d) 0

Q.390. Tan of complementary of an angle is same as which of the angles ?
SSC CHSL 17/03/2023 (1st Shift)
(a) sin of that angle
(b) cot of that angle
(c) cos of that angle
(d) cosec of that angle

Q.391. If sec θ + tan θ = 2, then what is the value of cot θ ?
SSC CHSL 17/03/2023 (2nd Shift)
(a) $\frac{5}{3}$ (b) $\frac{3}{5}$ (c) $\frac{4}{3}$ (d) $\frac{3}{4}$

Q.392. What is the value of (tan 10°tan 80° + tan 20°tan 70° + tan 30° tan 60° + tan 40°tan 50°) ?
SSC CHSL 17/03/2023 (4th Shift)
(a) 4 (b) 3 (c) 5 (d) 2

Q.393. What is the value of $\frac{cot\theta + cosec\theta - 1}{cot\theta - cosec\theta + 1}$?
SSC CHSL 20/03/2023 (2nd Shift)
(a) 2 secθ (b) 2 cosecθ
(c) 2 cotθ (d) $cot\theta + cosec\theta$

Q.394. If 6secθ = 10, then find the value of $\frac{(5\,cosec\,\theta - 3\,cot\,\theta)}{(4\,cos\,\theta + 3\,sin\,\theta).}$?
SSC CHSL 20/03/2023 (3rd Shift)
(a) $\frac{2}{3}$ (b) $\frac{3}{2}$ (c) $\frac{5}{6}$ (d) $\frac{6}{5}$

Q.395. What is the value of cosec A(1 - cosA)(cosecA + cot A) ?
SSC CHSL 21/03/2023 (2nd Shift)
(a) 2 (b) 1 (c) 0 (d) 3

Q.396. If $\frac{(2cos^3A - cosA)}{(sinA - 2sin^3A)}$ = 1 , then what is the value of A ?
SSC CHSL 21/03/2023 (2nd Shift)
(a) 90° (b) 30° (c) 45° (d) 60°

SSC CGL 2022 Tier - 2

Q.397. (sinθ + cosecθ)² + (cosθ + secθ)² = ?
SSC CGL Tier II (07/03/2023)
(a) 5 + $tan^2\theta + cot^2\theta$
(b) 7 + $tan^2\theta - cot^2\theta$
(c) 7 + $tan^2\theta + cot^2\theta$
(d) 5 + $tan^2\theta - cot^2\theta$

SSC CGL 2022 Tier - 1

Q.398. The value of tan²θ + cot²θ - sec²θ cosec²θ is:
SSC CGL 01/12/2022 (1st Shift)
(a) 2 (b) -2 (c) 0 (d) $\frac{1}{2}$

Q.399. What is sinα - sinβ ?
SSC CGL 01/12/2022 (2nd Shift)
(a) 2cos $\frac{\alpha + \beta}{2}$ sin $\frac{\alpha - \beta}{2}$
(b) 2sin $\frac{\alpha + \beta}{2}$ sin $\frac{\alpha - \beta}{2}$
(c) 2cos $\frac{\alpha - \beta}{2}$ sin $\frac{\alpha + \beta}{2}$
(d) 2cos $\frac{\alpha + \beta}{2}$ cos $\frac{\alpha - \beta}{2}$

Q.400. What is the value of tan 240° ?
SSC CGL 01/12/2022 (3rd Shift)
(a) $\sqrt{2}$ (b) (- $\sqrt{3}$) (c) $\sqrt{3}$ (d) 3

Q.401. If $tan^2\theta = 1 - a^2$, then the value of secθ + $tan^3\,\theta$ cosecθ is:
SSC CGL 01/12/2022 (4th Shift)
(a) $(2 - a)^{\frac{3}{2}}$ (b) $(a^2 - 1)^{\frac{3}{2}}$
(c) $(2 - a^2)^{\frac{3}{2}}$ (d) $a^{\frac{3}{2}}$

Q.402. If sin (A + B) = cos (A + B), what is the value of tan A ?
SSC CGL 02/12/2022 (1st Shift)
(a) $\frac{1 - tanB}{1 + tanB}$ (b) $\frac{1 + tanB}{1 - tanB}$
(c) $\frac{1 + sec\,B}{1 - sec\,B}$ (d) $\frac{1 - cosec\,B}{1 + cosecB}$

Q.403. In Δ ABC, right-angled at B, AB = 7 cm and AC - BC = 1 cm. Find the value of sin C.
SSC CGL 02/12/2022 (2nd Shift)
(a) $\frac{3}{7}$ (b) $\frac{12}{13}$ (c) $\frac{3}{25}$ (d) $\frac{7}{25}$

Q.404. If $\frac{(1 - cos\theta)}{sin\theta} = \frac{1}{5}$, then what will be the value of $\frac{(1 + cos\theta)}{sin\theta}$?
SSC CGL 02/12/2022 (4th Shift)
(a) 5 (b) $\frac{2}{5}$ (c) $\frac{4}{5}$ (d) $\frac{1}{5}$

Q.405. Simplify: $\frac{CosA}{1 + tanA} - \frac{sinA}{1 + cotA}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 03/12/2022 (1st Shift)
(a) tanA (b) cosA - sinA
(c) cosA.sinA (d) cosA + sinA

Q.406. $\frac{1}{1+Cos(90°-\theta)}$ + $\frac{1}{1-Cos(90°-\theta)}$ = _____
SSC CGL 03/12/2022 (1st Shift)
(a) $2sec^2\theta$ (b) 1 (c) 0 (d) $2tan^2\theta$

Q.407. $sin^4\theta + cos^4\theta$ in terms of sinθ can be written as:
SSC CGL 03/12/2022 (2nd Shift)
(a) $2sin^4\theta + 2sin^2\theta - 1$
(b) $2sin^4\theta - 2sin^2\theta$
(c) $2sin^4\theta - 2sin^2\theta - 1$
(d) $2sin^4\theta - 2sin^2\theta + 1$

Q.408. Simplify the following :
$\frac{cos\,x - \sqrt{3}sin\,x}{2}$
SSC CGL 03/12/2022 (3rd Shift)
(a) cos($\frac{\pi}{3}$ - x) (b) sin ($\frac{\pi}{3}$ + x)
(c) cos($\frac{\pi}{3}$ + x) (d) sin($\frac{\pi}{3}$ - x)

Q.409. The value of $\sqrt{\frac{1+cosA}{1-cosA}}$ is:
SSC CGL 03/12/2022 (4th Shift)
(a) sec A - tan A (b) cosec A + cot A
(c) sec A + tan A (d) cosec A - cot A

Q.410. If sinθ + cosθ = $\frac{\sqrt{3}-1}{2\sqrt{2}}$, then what is the value of tanθ + cotθ ?
SSC CGL 05/12/2022 (1st Shift)
(a) 8(√3 - 2) (b) 12(√3 - 2)
(c) 12(√3 + 2) (d) 8(√3 + 2)

Q.411. If sec 2θ = cosec (θ – 36°), where 2θ is an acute angle, find the value of θ.
SSC CGL 05/12/2022 (1st Shift)
(a) 32° (b) 46° (c) 20° (d) 42°

Q.412. What will be the value of cos x cosec x – sin x sec x ?
SSC CGL 05/12/2022 (2nd Shift)
(a) cot $\frac{2x}{2}$ (b) tan 2x
(c) cot 2x (d) 2cot 2x

Q.413. $cot^2A - cos^2A$ is equal to :
SSC CGL 05/12/2022 (3rd Shift)
(a) $cos^2A.sin^2A$ (b) $cos^2A.cot^2A$
(c) 1 (d) 0

Q.414. If bsinθ = a, then secθ + tanθ = ?
SSC CGL 06/12/2022 (1st Shift)
(a) $\sqrt{\frac{b+a}{b-a}}$ (b) $\sqrt{\frac{1}{b+a}}$
(c) $\sqrt{\frac{1}{b-a}}$ (d) $\sqrt{\frac{b-a}{b+a}}$

Q.415. What will be the value of sin10° - $\frac{4}{3}$ $sin^3$10° ?
SSC CGL 06/12/2022 (1st Shift)
(a) $\frac{1}{3\sqrt{3}}$ (b) $\frac{1}{6}$ (c) $\frac{1}{2\sqrt{3}}$ (d) $\frac{\sqrt{3}}{6}$

Q.416. What is the value of Cos(– $\frac{17\pi}{3}$)
SSC CGL 06/12/2022 (2nd Shift)
(a) 1 (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{1}{2}$ (d) 0

Q.417. Solve the following to find its value in terms of trigonometric ratios. (sin A + cos A)(1 – sin A cosA)
SSC CGL 06/12/2022 (3rd Shift)
(a) $sin^3 A + cos^3A$
(b) $sin^2 A - cos^2A$
(c) [cosA - sin A] [$sin^2 A + cos^2A$]
(d) $sin^3 A - cos^3A$

Q.418. If secθ - 2cosθ = $\frac{7}{2}$, where θ is a positive acute angle, then the value of secθ is:
SSC CGL 06/12/2022 (4th Shift)
(a) 6 (b) 8 (c) 5 (d) 4

Q.419. Find the value of tan 3θ if sec3θ = cosec(4θ - 15°).
SSC CGL 06/12/2022 (4th Shift)
(a) $\frac{1}{\sqrt{3}}$ (b) $\sqrt{3}$ (c) -1 (d) 1

Q.420. If tan A – tan B – tan C = tan A tan B tan C, what is the value of A in terms of B and C ?
SSC CGL 07/12/2022 (1st Shift)
(a) A = B + C (b) A = 2B - 2C
(c) A = B - C (d) A = $\frac{B-C}{2}$

Q.421. If $tan^2\alpha = 3 + Q^2$, then sec α + $tan^3\alpha$ cosec α = ?
SSC CGL 07/12/2022 (1st Shift)
(a) $(3 + Q^2)^{\frac{3}{2}}$ (b) $(7 + Q^2)^{\frac{3}{2}}$
(c) $(5 - Q^2)^{\frac{3}{2}}$ (d) $(4 + Q^2)^{\frac{3}{2}}$

Q.422. If 1 + sinθ = mcosθ , then what is the value of sinθ ?
SSC CGL 07/12/2022 (2nd Shift)
(a) $\frac{2m^2-1}{m^2+1}$ (b) $\frac{m^2-1}{m^2+1}$
(c) $\frac{m^2+1}{2m^2-1}$ (d) $\frac{m^2+1}{m^2-1}$

Q.423. Find the value of the following expression.
5 ($sin^4\theta + cos^4\theta$) + 3 ($sin^6\theta + cos^6\theta$) + 19$sin^2\theta cos^2\theta$
SSC CGL 07/12/2022 (3rd Shift)
(a) 8 (b) 5 (c) 6 (d) 7

Q.424. If sin Y = x, then what will be the value of cos 2Y (where 0 ≤ Y ≤ 90°) ?
SSC CGL 08/12/2022 (1st Shift)
(a) (√2 - 1)x (b) √2x (c) 1 – 2x (d) $1 - 2x^2$

Q.425. If A + B = C, then tan A tan B tan C = ?
SSC CGL 08/12/2022 (1st Shift)
(a) tan C + tan A - tan B
(b) tan C + tan A + tan B
(c) tan A - tan B - tan C
(d) tan C - tan A - tan B

Q.426. If x = 8(sin θ + cos θ) and y = 9 (sin θ - cos θ), then the value of of $\frac{x^2}{8^2}$ + $\frac{y^2}{9^2}$ is:
SSC CGL 08/12/2022 (1st Shift)
(a) 4 (b) 6 (c) 8 (d) 2

Q.427. θ = 135°; y = 15°. What is the value of 2cos(θ) sin(y) ?
SSC CGL 08/12/2022 (3rd Shift)
(a) $\frac{\sqrt{3}-1}{2}$ (b) $\frac{1-\sqrt{3}}{2}$
(c) 2 - √3 (d) √3 - 2

Q.428. If sec x - cos x = 4, then what will be the value of $\frac{(1+cos^2x)}{cos\,x}$?
SSC CGL 08/12/2022 (3rd Shift)
(a) $\frac{9}{4}$ (b) $\frac{1}{4}$ (c) 2√5 (d) √5

Q.429. If tan A tan B + $\frac{cos\,x}{cosAcosB}$ = 1, then x = ?
SSC CGL 08/12/2022 (4th Shift)
(a) B (b) A (c) A + B (d) A – B

Q.430. cos^3 60° - cos^3 240° - cos^3 360° =
SSC CGL 09/12/2022 (1st Shift)
(a) $\frac{-3}{4}$ (b) $\frac{-7}{5}$ (c) $\frac{-3}{5}$ (d) $\frac{-9}{7}$

Q.431. If 5 sin^2A + 3 cos^2A = 4 , 0 < A < 90°, then what is the value of tan A ?
SSC CGL 09/12/2022 (1st Shift)
(a) 0 (b) 3 (c) 1 (d) 2

Q.432. If $\frac{sin\,\theta + cos\,\theta}{sin\,\theta - cos\,\theta}$ = $\frac{3}{2}$, then the value of $sin^4\theta - cos^4\theta$ is
SSC CGL 09/12/2022 (2nd Shift)
(a) $\frac{5}{12}$ (b) $\frac{12}{13}$ (c) $\frac{11}{12}$ (d) $\frac{5}{13}$

Q.433. If $sin^2\theta cos^2\theta$ = $\frac{2}{9}$, then what will be the value of $cosec^2\theta + sec^2\theta$?
SSC CGL 09/12/2022 (3rd Shift)
(a) $\frac{7}{2}$ (b) $\frac{5}{2}$ (c) $\frac{9}{2}$ (d) 9√2

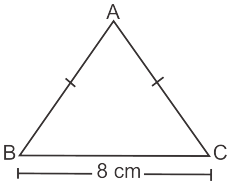
Q.434. If 2 $\frac{cos^2x - sec^2x}{tan^2x}$ = a + b cos2x ,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

then a, b = ?
SSC CGL 09/12/2022 (3rd Shift)
(a) $\frac{-3}{2}, \frac{-1}{2}$ (b) $\frac{3}{2}, \frac{1}{2}$ (c) −3, -1 (d) 3, 1

Q.435. In the given figure, ABC is an isosceles triangle with BC = 8 cm and AB = AC = 5 cm. The value of tan C - cot B is _____.



SSC CGL 09/12/2022 (4th Shift)
(a) $-\frac{5}{12}$ (b) $-\frac{7}{12}$ (c) $\frac{7}{12}$ (d) $\frac{5}{12}$

Q.436. If b cosθ = a, then cosecθ + cotθ = _____
SSC CGL 09/12/2022 (4th Shift)
(a) $\sqrt{\frac{1}{b+a}}$ (b) $\sqrt{\frac{b-a}{b+a}}$
(c) $\sqrt{\frac{b+a}{b-a}}$ (d) $\sqrt{\frac{1}{b-a}}$

Q.437. If cosecθ + cotθ = p, then the value of $\frac{p^2-1}{p^2+1}$ is:
SSC CGL 12/12/2022 (1st Shift)
(a) cosθ (b) sinθ (c) cotθ (d) cosecθ

Q.438. If $\sin^2\theta - 3\sin\theta + 2 = 0$, then find the value of θ (0° ≤ θ ≤ 90°).
SSC CGL 12/12/2022 (2nd Shift)
(a) 45° (b) 0° (c) 60° (d) 90°

Q.439. If tan3θ.tan7θ = 1, where 7θ is an acute angle, then find the value of cot15θ.
SSC CGL 12/12/2022 (3rd Shift)
(a) 1 (b) -1 (c) $-\sqrt{3}$ (d) $\sqrt{3}$

Q.440. If $2\sin\theta + 2\sin^2\theta = 2$, then the value of $2\cos^4\theta + 2\cos^2\theta$ is:
SSC CGL 12/12/2022 (3rd Shift)
(a) 4 (b) 2 (c) 1 (d) 0

Q.441. If $\cos\theta + \cos^2\theta = 1$, find the value of $\sqrt{\sin^4\theta + \cos^2\theta}$
SSC CGL 12/12/2022 (4th Shift)
(a) $\sqrt{2}\cos\theta$ (b) 2 Cosθ
(c) $\sqrt{2}$ Sinθ (d) 2sinθ

Q.442. If $\sec^2A + \tan^2A = 3$, then what is the value of cot A ?
SSC CGL 13/12/2022 (1st Shift)
(a) $\frac{1}{\sqrt{3}}$ (b) 0 (c) 1 (d) $\sqrt{3}$

Q.443. What is the value of cosec 15° sec 15° ?
SSC CGL 13/12/2022 (2nd Shift)
(a) 0.5 (b) 4 (c) 2 (d) 1

Q.444. $\frac{\cos A}{1-\tan A} + \frac{\sin A}{1-\cot A}$ = ?
SSC CGL 13/12/2022 (2nd Shift)
(a) tan A - cot A (b) tan A + cot A
(c) sin A - cos A (d) sin A + cos A

Q.445. If tan40° = a, then find
$= \frac{\tan 320° - \tan 310°}{1 + \tan 320°.\tan 310°}$
SSC CGL 13/12/2022 (3rd Shift)
(a) $\frac{1-a^2}{a}$ (b) $\frac{1+a^2}{2a}$
(c) $\frac{1-a^2}{2a}$ (d) $\frac{1+a^2}{a}$

Q.446. If tan(α + β) = a, tan(α - β) = b then the value of tan 2α is:
SSC CGL 13/12/2022 (4th Shift)
(a) $\frac{a+b}{1-ab}$ (b) $\frac{a+b}{1+ab}$
(c) $\frac{a-b}{1+ab}$ (d) $\frac{a-b}{1-ab}$

SSC CPO 2022 Tier - 1

Q.447. If $x = \frac{2\sin\theta}{(1+\cos\theta+\sin\theta)}$ then the value of $\frac{1-\cos\theta+\sin\theta}{(1+\sin\theta)}$ is:
SSC CPO 09/11/2022 (Morning)
(a) $\frac{x}{(1+x)}$ (b) x (c) $\frac{1}{x}$ (d) $\frac{(1+x)}{x}$

Q.448. If $\{(\frac{\sec\theta-1}{\sec\theta+1})\}^n$ = cosecθ - cotθ, then n = ?
SSC CPO 09/11/2022 (Morning)
(a) 1 (b) 0.5 (c) −1 (d) − 0.5

Q.449. The value of $(2\cos^2\theta - 1)[\frac{1+\tan\theta}{1-\tan\theta} + \frac{1-\tan\theta}{1+\tan\theta}]$ is ;
SSC CPO 09/11/2022 (Morning)
(a) 2 (b) 0 (c) $\frac{\sqrt{3}}{2}$ (d) 1

Q.450. Simplify.
$\frac{\sin 8\theta\cos\theta - \sin 6\theta\cos 3\theta}{\cos 2\theta\cos\theta - \sin 3\theta\sin 4\theta}$
SSC CPO 09/11/2022 (Afternoon)
(a) cotθ (b) cot2θ (c) tanθ (d) tan2θ

Q.451. The value of (1 + cot A − cosec A)(1 + tan A + sec A) − 1 is :
SSC CPO 09/11/2022 (Afternoon)
(a) 1 (b) 2 (c) 3 (d) 0

Q.452. Given that A and B are second quadrant angles, sinA = $\frac{1}{3}$ and sinB = $\frac{1}{5}$, then find the value of cos(A - B).
SSC CPO 09/11/2022 (Evening)
(a) $\frac{4\sqrt{3}+1}{15}$ (b) $\frac{8\sqrt{3}-1}{15}$
(c) $\frac{8\sqrt{3}+1}{15}$ (d) $\frac{4\sqrt{3}-1}{15}$

Q.453. What is the value of $\frac{\sin(A+B)}{\sin A\cos B}$?
SSC CPO 09/11/2022 (Evening)
(a) 1 + cot A tan B (b) 1 + tan A cot B
(c) 1 - sin A cos B (d) 1 - cot A tan B

Q.454. The value of the expression $\cos^2 45° + \cos^2 135° + \cos^2 225° + \cos^2 315°$ is:
SSC CPO 10/11/2022 (Morning)
(a) 2 (b) $\frac{1}{2}$ (c) $\frac{3}{2}$ (d) 1

Q.455. The value of $\frac{2\cos^3\theta - \cos\theta}{\sin\theta - 2\sin^3\theta}$ is:
SSC CPO 10/11/2022 (Morning)
(a) secθ (b) sinθ (c) cotθ (d) tanθ

Q.456. If cos48° = $\frac{m}{n}$, then sec 48° - cot 42° is equal to:
SSC CPO 10/11/2022 (Morning)
(a) $\frac{m-\sqrt{n^2-m^2}}{m}$ (b) $\frac{m-\sqrt{n^2-m^2}}{n}$
(c) $\frac{n-\sqrt{n^2-m^2}}{n}$ (d) $\frac{n-\sqrt{n^2-m^2}}{m}$

Q.457. Solve the following equation.
$\sec^2\theta\sqrt{(1-\sin^2\theta)}$ = _____.
SSC CPO 10/11/2022 (Morning)
(a) tanθ (b) cosecθ (c) secθ (d) 1

Q.458. If the value of cosecA + cotA = m, then the value of cosecA − cotA is:
SSC CPO 10/11/2022 (Afternoon)
(a) $\frac{1}{m}$ (b) m (c) $\sqrt{m}$ (d) m^2

Q.459. The value of (cosec A + cot A)(1 - cos A) is:
SSC CPO 10/11/2022 (Evening)
(a) cos A (b) tan A (c) cot A (d) sin A

Q.460. If cos A = $\sin^2A$, and a $\sin^{12}A$ + b $\sin^{10}A$ + c $\sin^8A$ + $\sin^6 A$ = 1, then a + b + c = ?
SSC CPO 11/11/2022 (Morning)
(a) 7 (b) 8 (c) 9 (d) 6

Q.461. If 4 Cosθ + 3 Sinθ = x and 4 Sinθ - 3 Cos θ = y, find the value of $x^2 + y^2$.
SSC CPO 11/11/2022 (Morning)
(a) 16 (b) 9 (c) 25 (d) 1

Q.462. Simplify. $\frac{\cos^4\theta - \sin^4\theta}{\sin^2\theta}$
SSC CPO 11/11/2022 (Afternoon)
(a) 1 - $\tan^2\theta$ (b) $\tan^2\theta$ - 1
(c) $\cot^2\theta$ - 1 (d) 1 - $\cot^2\theta$

Q.463. The value of $\frac{\sin A}{\cot A + \operatorname{cosec} A}$ - $\frac{\sin A}{\cot A - \operatorname{cosec} A}$ + 1 is ?
SSC CPO 11/11/2022 (Afternoon)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) $\frac{1}{2}$ (b) 3 (c) 0 (d) 2

Q.464. If $1 + \sin^2\theta - 3\sin\theta\cos\theta = 0$, then the value of $\cot\theta$ is:
SSC CPO 11/11/2022 (Evening)
(a) 0 (b) 1 (c) $\frac{1}{2}$ (d) $\frac{1}{3}$

Q.465. If $\cos^4\alpha - \sin^4\alpha = \frac{5}{6}$, then the value of $2\cos^2\alpha - 1$ = _____.
SSC CPO 11/11/2022 (Evening)
(a) $\frac{11}{6}$ (b) $\frac{5}{6}$ (c) $\frac{6}{11}$ (d) $\frac{6}{5}$

SSC CGL 2021 Tier - 2

Q.466. Which of the following is equal to $[\frac{\cos\theta}{\sin\theta} + \frac{\sin\theta}{\cos\theta}]$?
SSC CGL Tier II (08/08/2022)
(a) $\operatorname{cosec}\theta.\sec\theta$ (b) $\sec\theta.\tan\theta$
(c) $\operatorname{cosec}\theta.\tan\theta$ (d) $\cot\theta.\sec\theta$

Q.467. What is the value of $\frac{\cos 50°}{\sin 40°} + \frac{3\operatorname{cosec}80°}{\sec 10°}$ - 2cos50°.cosec 40° ?
SSC CGL Tier II (08/08/2022)
(a) 3 (b) 2 (c) 5 (d) 4

Q.468. If $\sqrt{3}\tan\theta = 3\sin\theta$, then what is the value of $\sin^2\theta - \cos^2\theta$?
SSC CGL Tier II (08/08/2022)
(a) $\frac{1}{5}$ (b) $\frac{1}{4}$ (c) $\frac{1}{2}$ (d) $\frac{1}{3}$

Q.469. Which of the following is equal to $\frac{1}{\tan\theta}$ + tanθ ?
SSC CGL Tier II (08/08/2022)
(a) secθ.cosecθ (b) 1
(c) $\frac{\operatorname{cosec}\theta}{\sec\theta}$ (d) $\tan^2\theta$

SSC Selection Post (Phase - X)

Q.470. $[(\sin\theta\tan\theta + \cos\theta)^2 - 1]$ is equal to:
Graduate Level 02/08/2022 (Shift - 3)
(a) $\tan^2\theta$ (b) cosec θ (c) $\sec^2\theta$ (d) sec θ

Q.471. The value of
$\sin^2\frac{2\pi}{3} + \cos^2\frac{5\pi}{6} - \tan^2\frac{3\pi}{4}$ is :
Graduate Level 03/08/2022 (Shift - 3)
(a) 2 (b) $\frac{1}{2}$ (c) $\frac{1}{4}$ (d) 4

Q.472. $\frac{2\sin\theta}{\sqrt{4 - 4\sin^2\theta}}$ = ?
Graduate Level 04/08/2022 (Shift - 4)
(a) tanθ (b) 2tanθ (c) cotθ (d) 2cotθ

Q.473. Simplify.
$$\frac{1}{\cos x}\sqrt{\frac{\cos(\pi + x)\cos(-x)}{\sin(\pi - x)\cos(\frac{\pi}{2} + x)}}$$
Graduate Level 04/08/2022 (Shift - 4)
(a) sec x (b) tan x (c) cosec x (d) cot x

Q.474. If $\cos\theta = \sin(2\theta) \neq 0$, what is the value of $\cos^4\theta + \sin^4\theta + \cos^3\theta + \sin^3\theta + \sin^2\theta + \cos^2\theta + \sin\theta + \cos\theta$?
Graduate Level 05/08/2022 (Shift - 3)
(a) $\frac{8 + 7\sqrt{3}}{18}$ (b) $\frac{18 + 7\sqrt{3}}{8}$
(c) $\frac{18 + 8\sqrt{3}}{7}$ (d) $\frac{7 + 18\sqrt{3}}{8}$

SSC CHSL 2021 Tier - 1

Q.475. If $\frac{x - x\operatorname{cosec}^2 30°}{1 + \operatorname{cosec}^2 30°} = \cos^2 60° + 4\cot^2 45° - \sec^2 60°$, then the value of x is _____.
SSC CHSL 25/05/2022 (Morning)
(a) $\frac{5}{12}$ (b) $-\frac{5}{12}$ (c) $\frac{1}{5}$ (d) $-\frac{1}{12}$

Q.476. If sec θ - cos θ = 14 and 14sec θ = x, then the value of x is _____.
SSC CHSL 25/05/2022 (Afternoon)
(a) $\tan^2\theta$ (b) $\sec^2\theta$ (c) 2sec θ (d) 2tan θ

Q.477. The value of (1 + tan10°) (1 + tan 35°) is:
SSC CHSL 25/05/2022 (Evening)
(a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) 1 (d) 2

Q.478. The value of $\frac{\sin 4\theta + \sin 2\theta}{\cos 4\theta + \cos 2\theta}$ is:
SSC CHSL 27/05/2022 (Morning)
(a) $\tan 3\theta$ (b) $\cot 3\theta$ (c) $\tan\theta$ (d) $\cot\theta$

Q.479. If $\sin x - 3\cos x = \sqrt{3}\cos x$, then the value of cot x is _____.
SSC CHSL 31/05/2022 (Morning)
(a) $3 - \sqrt{3}$ (b) $3 + \sqrt{3}$ (c) $\sqrt{3}$ (d) $\frac{3 - \sqrt{3}}{6}$

Q.480. What is the value of $(4\sin^3 x - 3\sin x + \sin 3x)$?
SSC CHSL 31/05/2022 (Afternoon)
(a) 1 (b) 0 (c) 4 (d) 3

Q.481. What is the simplified value of $\cos^2(90° - \theta) - [\frac{\{\cos(90° - \theta)\cos\theta\}}{\cot\theta}]$
SSC CHSL 31/05/2022 (Evening)
(a) 4 (b) 2 (c) 0 (d) 1

Q.482. The value of sin2θ (tanθ + cotθ) is :
SSC CHSL 01/06/2022 (Morning)
(a) $\frac{2}{3}$ (b) 1 (c) $\frac{1}{2}$ (d) 2

Q.483. Using 2cosA cosB = cos(A + B) + cos(A − B), find the value of cos75° cos 15°.
SSC CHSL 01/06/2022 (Afternoon)
(a) $\frac{1}{2}$ (b) $\frac{1}{4}$ (c) $\frac{\sqrt{3}}{2}$ (d) $\frac{\sqrt{3}}{4}$

Q.484. If $1 + \tan\theta = \sqrt{3}$, then $\sqrt{3}\cot\theta - 1$ = _____
SSC CHSL 03/06/2022 (Afternoon)
(a) $\frac{\sqrt{3} + 1}{2}$ (b) $\frac{\sqrt{3} - 1}{2}$
(c) $\frac{2\sqrt{3} - 1}{2}$ (d) $\frac{2\sqrt{3} + 1}{2}$

Q.485. If $\operatorname{cosec}^2\theta + \cot^2\theta = \frac{5}{3}$, then what is the value of $\cot 2\theta$
SSC CHSL 07/06/2022 (Morning)
(a) $\frac{1}{\sqrt{3}}$ (b) $-\frac{1}{\sqrt{3}}$ (c) $\frac{2}{\sqrt{3}}$ (d) $-\frac{2}{\sqrt{3}}$

Q.486. $(\operatorname{cosec}\theta - \cot\theta)^2$ = ?, 0° < θ < 90°
SSC CHSL 09/06/2022 (Evening)
(a) $\frac{1 - \sin\theta}{1 + \cos\theta}$ (b) $\frac{1 - \cos\theta}{1 + \cos\theta}$
(c) $\frac{1 + \cos\theta}{1 - \cos\theta}$ (d) $\frac{1 + \cos\theta}{1 - \sin\theta}$

Q.487. Using the formula $\tan\frac{x}{2} = \frac{1 - \cos x}{\sin x}$, find the value of tan22.5°.
SSC CHSL 10/06/2022 (Morning)
(a) $\sqrt{2} - 1$ (b) $\sqrt{2} + 1$
(c) $\frac{\sqrt{3} + \sqrt{2}}{2}$ (d) $\frac{\sqrt{3} - \sqrt{2}}{2}$

SSC CGL 2021 Tier - 1

Q.488. If $4\sin^2\theta = 3(1 + \cos\theta)$, 0° < θ < 90°, then what is the value of (2tanθ + 4sinθ − secθ) ?
SSC CGL 11/04/2022 (Morning)
(a) $3\sqrt{15} - 4$ (b) $15\sqrt{3} - 4$
(c) $15\sqrt{3} + 3$ (d) $4\sqrt{15} - 3$

Q.489. If $3\sec^2\theta + \tan\theta - 7 = 0$, 0° < θ < 90° , then what is the value of $(\frac{2\sin\theta + 3\cos\theta}{\operatorname{cosec}\theta + \sec\theta})$?
SSC CGL 12/04/2022 (Morning)
(a) 10 (b) $\frac{5}{2}$ (c) $\frac{5}{4}$ (d) 4 √2

Q.490. The value of $1 + \sqrt{\frac{\cot\theta + \cos\theta}{\cot\theta - \cos\theta}}$, if 0° < θ < 90° , is equal to :
SSC CGL 12/04/202 (Afternoon)
(a) 1 - secθ + tanθ (b) 1 - secθ - tanθ
(c) 1 + secθ - tanθ (d) 1 + secθ + tanθ

Q.491. The value of $(\frac{1 - \cot\theta}{1 - \tan\theta})^2 - 1$ when 0° < θ < 90°, is equal to :
SSC CGL 12/04/2022 (Afternoon)
(a) $\cos^2\theta - 1$ (b) $\sec^2\theta + 1$
(c) $\cot^2\theta - 1$ (d) $\sin^2\theta - 1$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.492. The expression $(cos^6\theta + sin^6\theta - 1)(tan^2\theta + cot^2\theta + 2) + 3$ is equal to:
SSC CGL 13/04/2022 (Afternoon)
(a) 0 (b) 1 (c) 2 (d) - 1

Q.493. If $sin^2\theta - cos^2\theta - 3sin\theta + 2 = 0$, $0° < \theta < 90°$, then what is the value of $1 + sec\theta + tan\theta$?
SSC CGL 13/04/2022 (Evening)
(a) $-1 + \sqrt{3}$ (b) $-1 - \sqrt{3}$
(c) $1 + \sqrt{3}$ (d) $1 - \sqrt{3}$

Q.494. $(sec\theta - tan\theta)^2 (1 + sin\theta)^2 \div cos^2\theta =$
SSC CGL 13/04/2022 (Evening)
(a) $cos^2\theta$ (b) 1 (c) $cot^2\theta$ (d) -1

Q.495. If $2\,sin^2\theta + 3\cos\theta = 3$, $0^o < \theta < 90^o$, then the value of $(sec^2\theta + cot^2\theta)$ is
SSC CGL 18/04/2022 (Evening)
(a) $3\frac{2}{3}$ (b) $3\frac{1}{3}$ (c) $4\frac{1}{3}$ (d) $4\frac{1}{2}$

Q.496. Simplify the following expression:
$\frac{Cos\,A}{1 - tan\,A} + \frac{Sin\,A}{1 - Cot\,A} - Sin\,A$
SSC CGL 19/04/2022 (Evening)
(a) 1 + Cos A (b) (1 + sin A) cos A
(c) 1 + sin A (d) Cos A

Q.497. Simplify the following expression:
$cosec^4A(1 - cos^4A) - 2cot^2A - 1$
SSC CGL 20/04/2022 (Morning)
(a) sin^2A (b) $cosec^2A$ (c) 1 (d) 0

Q.498. If 6tanA (tanA + 1) = 5 - tanA ,
Given that $0 < A < \frac{\pi}{2}$ What is the value of (sinA + cosA) ?
SSC CGL 20/04/2022 (Morning)
(a) $3\sqrt{5}$ (b) $\frac{5}{\sqrt{3}}$ (c) $5\sqrt{3}$ (d) $\frac{3}{\sqrt{5}}$

Q.499. The value of $(\frac{1 - cot\theta}{1 - tan\theta})^2 + 1$, if $0° < \theta < 90°$, is equal to :
SSC CGL 20/04/2022 (Evening)
(a) $cosec^2\theta$ (b) $sin^2\theta$ (c) $cos^2\theta$ (d) $sec^2\theta$

Q.500. If $\frac{sin^2\theta - 3sin\theta + 2}{cos^2\theta} = 1$, where $0° < \theta < 90°$, then what is the value of (cos2θ - sin3θ + cosec2θ) ?
SSC CGL 21/04/2022 (Afternoon)
(a) $\frac{-3 - 4\sqrt{3}}{6}$ (b) $\frac{-3 + 4\sqrt{3}}{6}$
(c) $\frac{3 + 4\sqrt{3}}{6}$ (d) $\frac{3 - 4\sqrt{3}}{6}$

SSC CGL 2020 Tier - 2

Q.501. $\frac{1 + cos\theta - sin^2\theta}{sin\theta(1 + cos\theta)} \times \frac{\sqrt{sec^2\theta + cosec^2\theta}}{tan\theta + cot\theta}$, $0° < \theta < 90°$, is equal to:
SSC CGL Tier II (29/01/2022)
(a) tanθ (b) secθ (c) cosecθ (d) cotθ

Q.502. If $1 + 2tan^2\theta + 2sin\theta sec^2\theta = \frac{a}{b}$, $0° < \theta < 90°$, then $\frac{a + b}{a - b} = ?$
SSC CGL Tier II (29/01/2022)
(a) secθ (b) sinθ (c) cosθ (d) cosecθ

Q.503.
$\frac{(1 + sec\theta cosec\theta)^2 (sec\theta - tan\theta)^2 (1 + sin\theta)}{(sin\theta + sec\theta)^2 + (cos\theta + cosec\theta)^2}$
, $0° < \theta < 90°$, is equal to :
SSC CGL Tier II (29/01/2022)
(a) cosθ (b) 1 - cosθ (c) sinθ (d) 1 - sinθ

Q.504. $(\frac{tan^3\theta}{sec^2\theta} + \frac{cot^3\theta}{cosec^2\theta} + 2sin\theta cos\theta) \div (1 + cosec^2\theta + tan^2\theta)$, $0° < \theta < 90°$, is equal to:
SSC CGL Tier II (29/01/2022)
(a) cosecθsecθ (b) cosecθ
(c) sinθcosθ (d) secθ

Q.505. The expression
$\frac{tan^6\theta - sec^6\theta + 3sec^2\theta\, tan^2\theta}{tan^2\theta + cot^2\theta + 2}$, $0° < \theta < 90°$
, is equal to:
SSC CGL Tier II (03/02/2022)
(a) $sec^2\theta\, cosec^2\theta$ (b) $-sec^2\theta\, cosec^2\theta$
(c) $cos^2\theta\, sin^2\theta$ (d) $-cos^2\theta\, sin^2\theta$

Q.506. The expression
$\frac{cos^4\theta - sin^4\theta + 2sin^2\theta + 3}{(cosec\theta + cot\theta + 1)(cosec\theta - cot\theta + 1) - 2}$
, $0° < \theta < 90°$, is equal to
SSC CGL Tier II (03/02/2022)
(a) $\frac{1}{2}$sinθ (b) 2sinθ (c) secθ (d) 2cosecθ

Q.507. The expression
$\frac{(1 - sin\theta + cos\theta)^2 (1 - cos\theta) sec^3\theta\, cosec^2\theta}{(sec\theta - tan\theta)(tan\theta + cot\theta)}$
, $(0° < \theta < 90°)$, is equal to
SSC CGL Tier II (03/02/2022)
(a) sin θ (b) 2cos θ (c) cot θ (d) 2 tan θ

Q.508. If $\frac{sin^2\theta}{cos^2\theta - 3cos\theta + 2} = 1$, θ lies in the first quadrant, then the value of $\frac{tan^2\frac{\theta}{2} + sin^2\frac{\theta}{2}}{tan\theta + sin\theta}$ is:
SSC CGL Tier II (03/02/2022)
(a) $\frac{2\sqrt{3}}{27}$ (b) $\frac{5\sqrt{3}}{27}$ (c) $\frac{2\sqrt{3}}{9}$ (d) $\frac{7\sqrt{3}}{54}$

Q.509. The expression
$\frac{(1 - 2sin^2\theta\, cos^2\theta)(cot\theta + 1)\, cos\theta}{(sin^4\theta + cos^4\theta)(1 + tan\theta)\, cosec\theta} - 1$,
$0° < \theta < 90°$, is equal to:
SSC CGL Tier II (03/02/2022)
(a) $cos^2\theta$ (b) $-sin^2\theta$ (c) $sec^2\theta$ (d) $-sec^2\theta$

SSC MTS 2020 Tier - 1

Q.510. What is the average of the sixty terms given below ?
cos^2 x, cos^2 2x, cos^2 3x, ... , cos^2 30x, sin^2 x, sin^2 2x, sin^2 3x, ..., sin^2 30x
SSC MTS 12/10/2021 (Afternoon)
(a) cos^2 x (b) 0.5 (c) 1 (d) cos^2 x sin^2 x

SSC CGL 2020 Tier - 1

Q.511. $\frac{cosec\theta}{cosec\theta - 1} + \frac{cosec\theta}{cosec\theta + 1} - tan^2\theta$, $0° < \theta < 90°$
SSC CGL 13/08/2021 (Morning)
(a) 2 $sec^2\theta$ (b) $sec^2\theta + 1$
(c) $sec^2\theta$ (d) $1 - tan^2\theta$

Q.512. If $2cos^2\theta = 3sin\theta$, $0° < \theta < 90°$, then the value of $(sec^2\theta - tan^2\theta + cos^2\theta)$ is :
SSC CGL 13/08/2021 (Afternoon)
(a) $\frac{7}{4}$ (b) $\frac{5}{4}$ (c) $\frac{9}{4}$ (d) $\frac{3}{4}$

Q.513. The value of $\frac{tan(45° - \alpha)}{cot(45° + \alpha)} - \frac{(cos\,19° + sin\,71°)(sec\,19° + cosec\,71°)}{tan\,12°.tan\,24°.\,tan66°.tan\,78°}$
SSC CGL 13/08/2021 (Evening)
(a) -3 (b) 0 (c) -2 (d) 2

Q.514. $1 + 2\,tan^2\theta + 2\,sin\theta\,sec^2\theta$, $0° < \theta < 90°$, is equal to :
SSC CGL 16/08/2021 (Morning)
(a) $\frac{1 - sin\theta}{1 + sin\theta}$ (b) $\frac{1 + cos\theta}{1 - cos\theta}$
(c) $\frac{1 - cos\theta}{1 + cos\theta}$ (d) $\frac{1 + sin\theta}{1 - sin\theta}$

Q.515. If $sin\,(\frac{2A + B}{2}) = cos\,(\frac{2A - B}{2}) = \frac{\sqrt{3}}{2}$, $0° < \frac{2A + B}{2}$ and $\frac{2A - B}{2} < 90°$ then find the value of sin[3(A - B)].
SSC CGL 16/08/2021 (Evening)
(a) 1 (b) $\frac{1}{\sqrt{2}}$ (c) $\frac{1}{2}$ (d) $\frac{\sqrt{3}}{2}$

Q.516. $(\sqrt{sec^2\theta + cosec^2\theta})(\frac{sin\theta\,(1 + cos\theta)}{1 + cos\theta - sin^2\theta})$, $0° < \theta < 90°$ is equal to:
SSC CGL 17/08/2021 (Morning)
(a) cotθ (b) $cosec^2\theta$ (c) $sec^2\theta$ (d) tanθ

Q.517. For $0° < \theta < 90°$,
$\frac{1}{cos\theta} + \frac{1}{tan\theta - sec\theta}$ is equal to:
SSC CGL 17/08/2021 (Afternoon)
(a) - secθ (b) tanθ (c) secθ (d) - tanθ

Q.518. If $4sin^2(2x - 10)° = 3$, $0 \le (2x - 10) \le 90$, then find the value of
$\frac{Sin^4(x - 5)° + cos^4(x - 5)°}{1 - 2sin^2(3x - 15)°\, cos^2(3x - 15)°}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 17/08/2021 (Evening)

(a) 1 (b) $\frac{5}{8}$ (c) $\frac{-5}{8}$ (d) -1

Q.519. The value of $\frac{\sqrt{2}tan(60° - \theta)\ tan(30° + \theta)}{sin^2\ (45° + \theta) + sin^2\ (45° - \theta)}$ is:

SSC CGL 17/08/2021 (Evening)

(a) $\frac{1}{\sqrt{2}}$ (b) 1 (c) 2 (d) √2

Q.520. In ΔPQR, ∠Q = 90°. If tan R = $\frac{1}{3}$, then what is the value of $\frac{secP(cosR + sinP)}{cosecR(sinR - cosecP)}$?

SSC CGL 18/08/2021 (Afternoon)

(a) - $\frac{2}{7}$ (b) $\frac{18}{7}$ (c) $\frac{2}{7}$ (d) - $\frac{18}{7}$

Q.521. Find the value of

$(sec\theta\ +\ tan\theta)^2 + \frac{1 + cosec\theta}{1 - cosec\theta}$

$where\ 0° < \theta < 90°$

SSC CGL 18/08/2021 (Evening)

(a) 0 (b) -2 (c) 1 (d) 2

Q.522. If $sin^6\theta\ +\ cos^6\theta\ = \frac{1}{3}$, 0° <θ < 90°,then what is the value of $sin\theta.cos\theta$

SSC CGL 18/08/2021 (Evening)

(a) $\frac{\sqrt{6}}{6}$ (b) $\frac{\sqrt{2}}{3}$ (c) $\frac{\sqrt{2}}{\sqrt{3}}$ (d) $\frac{2}{9}$

Q.523. If 2cos²θ - 5cosθ + 2 = 0, 0° < θ < 90°, then the value of (secθ + tanθ) is:

SSC CGL 20/08/2021 (Afternoon)

(a) $1\ -\sqrt{3}$ (b) $2\ -\sqrt{3}$

(c) $1\ +\sqrt{3}$ (d) $2\ +\sqrt{3}$

Q.524. The value of $sec^4\theta(1 - sin^4\theta) - 2tan^2\theta$ is:

SSC CGL 20/08/2021 (Evening)

(a) 1 (b) 0 (c) -1 (d) $\frac{-1}{2}$

Q.525. If sin²θ - cos²θ - 3sinθ + 2 = 0, 0° < θ < 90°, then what is the value of $\frac{1}{\sqrt{sec\ \theta - tan\theta}}$ is:

SSC CGL 23/08/2021 (Morning)

(a) $\sqrt[4]{3}$ (b) $\sqrt[2]{2}$ (c) $\sqrt[2]{3}$ (d) $\sqrt[4]{2}$

Q.526. If 0° < θ < 90°, $\sqrt{\frac{sec^2\theta + cosec^2\theta}{tan^2\theta - sin^2\theta}}$ is equal to:

SSC CGL 23/08/2021 (Afternoon)

(a) sec³θ (b) sin²θ (c) cosec³θ (d) sec²θ

Q.527. If $\frac{1}{1 - sin\theta}$ + $\frac{1}{1 + sin\theta}$ = 4 secθ, 0° < θ < 90°, then the value of cotθ + cosecθ is:

SSC CGL 23/08/2021 (Evening)

(a) $\frac{5\sqrt{3}}{3}$ (b) $3\sqrt{3}$ (c) $\sqrt{3}$ (d) $\frac{4\sqrt{3}}{3}$

Q.528. If sin²θ = 2 sinθ - 1, 0° ≤ θ ≤ 90°, then find the value of $\frac{1 + cosec\theta}{1 - cos\ \theta}$.

SSC CGL 24/08/2021 (Afternoon)

(a) - 1 (b) 1 (c) 2 (d) - 2

Q.529. If sec31° = x, then sin²59° + $\frac{1}{sec^2 31°} - \frac{1}{sin^2 59° cosec^2 59°}$ is equal to:

SSC CGL 24/08/2021 (Evening)

(a) $\frac{x^2 - 2}{x}$ (b) $\frac{2 - x^2}{x^2}$

(c) $\frac{x^2 - 2}{x^2}$ (d) $\frac{2 - x^2}{x}$

SSC CHSL 2020 Tier - 1

Q.530. If $2\ cos\theta\ +\ sec\theta\ -\ 2\sqrt{2}\ =\ 0$, $where\ \theta$ is an acute angle. FInd the value of θ.

SSC CHSL 12/04/2021 (Evening)

(a) 60° (b) 30° (c) 15° (d) 45°

Q.531. If $cot\theta = \sqrt{2} + 1$, then $cosec\theta sec\theta$ = ?

SSC CHSL 13/04/2021 (Morning)

(a) $\frac{\sqrt{2}}{2}$ (b) $4\sqrt{2}$ (c) $\frac{\sqrt{2}}{4}$ (d) $2\sqrt{2}$

Q.532. If $0° < \theta < 90°$, then $\frac{(1 - sin\theta)\ (sec\theta + tan\theta)\ tan\theta}{(sec\theta + tan\theta + 1)\ (cot\theta - cosec\theta + 1)}$ = ?

SSC CHSL 13/04/2021 (Afternoon)

(a) $sin\theta$ (b) $\frac{sin\theta}{2}$ (c) $cos\theta$ (d) $\frac{cos\theta}{2}$

Q.533. If $\frac{3\sqrt{3}\ sec\theta + 4\ tan\theta}{3tan\theta + \sqrt{3}\ sec\theta}$ = 2, 0°<θ < 90° then the value of cosθ will be :

SSC CHSL 13/04/2021 (Evening)

(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) $\frac{1}{4}$ (d) $\frac{1}{2}$

Q.534. If Y = tan 35° , then the value of (2 tan 55° + cot 55°) is:

SSC CHSL 15/04/2021 (Evening)

(a) $\frac{2 + Y^2}{Y}$ (b) $\frac{2 - Y}{Y^2}$ (c) $\frac{2}{Y^2}$ (d) $\frac{2 - Y^2}{Y}$

Q.535. If $tan\theta\ +\ cot\theta\ =\ 4$, then the ratio of $3(tan^2\theta\ +\ cot^2\theta)$ to $(2\ cosec^2\theta\ sec^2\theta\ -\ 4)$ will be:

SSC CHSL 15/04/2021 (Evening)

(a) 4 : 3 (b) 3 : 4 (c) 5 : 4 (d) 3 : 2

Q.536. If $3(sec^2\theta\ +\ tan^2\theta)\ =\ 5$, $0° < \theta < 90°$, then the value of $cosec\theta$ is:

SSC CHSL 16/04/2021 (Afternoon)

(a) $\frac{1}{\sqrt{3}}$ (b) $\frac{2\sqrt{3}}{3}$ (c) 2 (d) $\frac{1}{2}$

Q.537. If $(cos^2\theta\ -\ 1)\ (2sec^2\theta)\ +\ sec^2\theta\ +\ 2tan^2\theta\ =\ 2$, $0° < \theta < 90°$, then the value of $\frac{(sec\theta\ + sin\theta)}{(cosec\theta - cos\theta)}$ will be:

SSC CHSL 16/04/2021 (Afternoon)

(a) -1 (b) -3 (c) 3 (d) 2

Q.538. $\frac{(1 + cos\theta)(cosec\theta - cot\theta)sec\theta}{sin\theta(1 - sin\theta)(sec\theta + tan\theta)}$ =

SSC CHSL 19/04/2021 (Morning)

(a) Sec²θ (b) Sin²θ (c) Cos²θ (d) Cosec²θ

Q.539. If sinθ(2sinθ + 3) = 2, 0° <θ < 90°, then what is the value of (sec²θ + cot²θ - cos²θ)?

SSC CHSL 19/04/2021 (Morning)

(a) $\frac{13}{3}$ (b) $\frac{31}{12}$ (c) $\frac{7}{2}$ (d) $\frac{43}{12}$

Q.540. If $sin\theta$ = $\frac{2\sqrt{ab}}{a + b}$ a > b > 0, then the value of $\frac{cos\theta + 1}{cos\theta - 1}$ will be:

SSC CHSL 19/04/2021 (Afternoon)

(a) - $\frac{b}{a}$ (b) - $\frac{a}{b}$ (c) $\frac{a}{b}$ (d) $\frac{b}{a}$

Q.541. The value of $\frac{3cos^2 27° - 5 + 3cos^2 63°}{tan^2 32° + 4 - cosec^2 58°}\ +\ sin35° cos55°\ +\ cos35° sin55°$ is:

SSC CHSL 19/04/2021 (Afternoon)

(a) - $\frac{1}{4}$ (b) - $\frac{1}{3}$ (c) $\frac{1}{3}$ (d) $1\frac{2}{3}$

Q.542. 2cos²θ = 3(1 - sinθ), 0° < θ < 90° , then what is the value of (tan2θ + cosec3θ - sec2θ) ?

SSC CHSL 04/08/2021 (Evening)

(a) $\sqrt{3}$ + 1 (b) $\sqrt{3}$ - 1

(c) $\frac{1 + \sqrt{3}}{\sqrt{3}}$ (d) $\frac{1 - \sqrt{3}}{\sqrt{3}}$

Q.543. Find the value of θ, if sec²θ + $(1\ -\sqrt{3})tan\theta\ -\ (1\ +\sqrt{3})\ =\ 0$,where θ is an acute angle.

SSC CHSL 05/08/2021 (Evening)

(a) 60° (b) 30° (c) 45° (d) 15°

Q.544. If $cosec^2\theta(cos\theta\ -\ 1)(1\ +\ cos\theta)\ =\ k$, then what is the value of k ?

SSC CHSL 06/08/2021 (Morning)

(a) 1 (b) - 1 (c) $\frac{1}{2}$ (d) 0

Q.545. If $\frac{cot\theta + cos\theta}{cot\theta - cos\theta}$ = $\frac{k + 1}{1 - k}$, k ≠ 1, then k is equal to:

SSC CHSL 09/08/2021 (Morning)

(a) sinθ (b) cosecθ (c) cosθ (d) secθ

Q.546. If cos²θ - sin²θ - 3cosθ + 2 = 0, 0° < θ < 90°, then what will be the value of secθ - cosθ?

SSC CHSL 09/08/2021 (Morning)

(a) $\frac{4}{3}$ (b) $\frac{1}{2}$ (c) $\frac{3}{2}$ (d) $\frac{2}{3}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.547. If $\frac{cosec^2\theta}{cosec^2\theta - cot^2\theta} = \frac{13}{4}$, $0° < \theta < 90°$, then the value of $\frac{52cos^2\theta - 9tan^2\theta}{18sec^2\theta + 8cot^2\theta}$ will be:
SSC CHSL 09/08/2021 (Afternoon)
(a) $\frac{4}{11}$ (b) $\frac{8}{11}$ (c) $\frac{8}{13}$ (d) $\frac{5}{11}$

Q.548. Evaluate the following expression
$\frac{3(cot^2 46° - sec^2 44°)}{2(sin^2 28° + sin^2 62°)} + \frac{2cos^2 60° \, tan^2 33° tan^2 57°)}{sec^2(90° - \theta) - cot^2\theta°}$
SSC CHSL 10/08/2021 (Morning)
(a) - 1 (b) 1 (c) - 2 (d) 2

Q.549. For $\theta: 0° < \theta < 90°$, $3sec\theta + 4cos\theta = 4\sqrt{3}$, find the value of $(1 - sin\theta + cos\theta)$
SSC CHSL 10/08/2021 (Morning)
(a) $\frac{1+2\sqrt{3}}{2}$ (b) $\frac{1+\sqrt{3}}{2}$
(c) $\frac{1-\sqrt{3}}{2}$ (d) $\frac{1-2\sqrt{3}}{2}$

Q.550. If $\frac{5cot\theta + \sqrt{3}cosec\theta}{2\sqrt{3}cosec\theta + 3cot\theta} = 1$, $0 < \theta < 90°$, then the value of $\frac{\frac{7}{2}cot^2\theta - \frac{3}{4}cosec^2\theta}{550^2\theta + \frac{3}{2}tan^2\theta}$ will be:
SSC CHSL 10/08/2021 (Afternoon)
(a) 7 (b) 2 (c) 3 (d) 5

Q.551. If $(1 + cot^2\theta) + (1 + (cot^2\theta)^{-1})$ is equal to k, then $\sqrt{k} = ?$
SSC CHSL 10/08/2021 (Evening)
(a) sinθsecθ (b) cosecθcosθ
(c) cosecθsecθ (d) sinθcosθ

Q.552. The value of $\frac{sec\theta \, cosec\theta}{2 + tan^2\theta + cot^2\theta}$ is equal to:
SSC CHSL 11/08/2021 (Morning)
(a) $sec\theta \, cosec\theta$ (b) $sec\theta \, sin\theta$
(c) $sin\theta \, cos\theta$ (d) $cos\theta \, cosec\theta$

Q.553. If cotA + cosecA = 2 and A is an acute angle, then the value of $\frac{9tanA + 16cosecA}{5sinA + 3tan\,A}$ is:
SSC CHSL 11/08/2021 (Afternoon)
(a) 3 (b) 6 (c) 4 (d) 8

Q.554. If $cot^2\theta + cot^4\theta = 2$, then the value of $2sin^4\theta + sin^2\theta$ is:
SSC CHSL 11/08/2021 (Evening)
(a) 3 (b) 5 (c) 1 (d) 2

Q.555. If $sin\alpha + cosec\alpha = tan\frac{\pi}{3}$, then the value of $(sin^3\alpha + cosec^3\alpha)$ is equal to:
SSC CHSL 11/08/2021 (Evening)
(a) $\frac{1}{2}$ (b) 1 (c) 0 (d) $\frac{3}{2}$

SSC CPO 2020 Tier - 1

Q.556. value of $\frac{sin^2 52° + 2 + sin^2 38°}{4cos^2 43° - 5 + 4cos^2 47°}$ is
SSC CPO 24/11/2020 (Evening)
(a) 3 (b) $\frac{1}{3}$ (c) - 3 (d) - $\frac{1}{3}$

Q.557. If $4(cosec^2 57 - tan^2 33) - cos90 + y \times tan^2 66 \times tan^2 24 = \frac{y}{2}$ then the value of y is:
SSC CPO 25/11/2020 (Morning)
(a) 4 (b) 8 (c) - 4 (d) - 8

Answer Key :-

1.(b)	2.(d)	3.(b)	4.(d)
5.(b)	6.(b)	7.(a)	8.(d)
9.(a)	10.(b)	11.(d)	12.(d)
13.(c)	14.(c)	15.(c)	16.(c)
17.(a)	18.(d)	19.(a)	20.(a)
21.(d)	22.(a)	23.(a)	24.(b)
25.(a)	26.(a)	27.(c)	28.(d)
29.(a)	30.(a)	31.(b)	32.(a)
33.(b)	34.(a)	35.(d)	36.(c)
37.(b)	38.(a)	39.(a)	40.(a)
41.(a)	42.(d)	43.(a)	44.(d)
45.(c)	46.(d)	47.(c)	48.(d)
49.(d)	50.(a)	51.(c)	52.(d)
53.(a)	54.(a)	55.(b)	56.(d)
57.(c)	58.(c)	59.(d)	60.(c)
61.(d)	62.(d)	63.(c)	64.(c)
65.(b)	66.(d)	67.(c)	68.(b)
69.(b)	70.(b)	71.(a)	72.(a)
73.(b)	74.(a)	75.(a)	76.(b)
77.(b)	78.(b)	79.(c)	80.(b)
81.(c)	82.(b)	83.(b)	84.(c)
85.(c)	86.(d)	87.(d)	88.(d)
89.(c)	90.(c)	91.(a)	92.(c)
93.(a)	94.(b)	95.(d)	96.(c)
97.(d)	98.(a)	99.(d)	100.(a)
101.(a)	102.(d)	103.(a)	104.(d)
105.(a)	106.(d)	107.(c)	108.(a)
109.(c)	110.(b)	111.(d)	112.(c)
113.(c)	114.(a)	115.(b)	116.(b)
117.(a)	118.(d)	119.(b)	120.(b)
121.(b)	122.(d)	123.(a)	124.(a)
125.(c)	126.(b)	127.(b)	128.(a)
129.(a)	130.(a)	131.(b)	132.(d)
133.(b)	134.(b)	135.(a)	136.(c)
137.(d)	138.(d)	139.(d)	140.(c)
141.(c)	142.(d)	143.(a)	144.(c)
145.(b)	146.(d)	147.(c)	148.(d)
149.(c)	150.(b)	151.(b)	152.(c)
153.(b)	154.(b)	155.(a)	156.(b)
157.(d)	158.(c)	159.(c)	160.(b)
161.(c)	162.(c)	163.(a)	164.(a)
165.(c)	166.(c)	167.(c)	168.(c)
169.(b)	170.(a)	171.(a)	172.(a)
173.(b)	174.(b)	175.(b)	176.(b)
177.(a)	178.(b)	179.(c)	180.(a)
181.(a)	182.(d)	183.(a)	184.(d)
185.(c)	186.(c)	187.(d)	188.(c)
189.(b)	190.(c)	191.(d)	192.(a)
193.(c)	194.(a)	195.(b)	196.(c)
197.(d)	198.(d)	199.(c)	200.(c)
201.(d)	202.(d)	203.(b)	204.(a)
205.(b)	206.(a)	207.(a)	208.(c)
209.(c)	210.(c)	211.(d)	212.(d)
213.(a)	214.(b)	215.(b)	216.(d)
217.(b)	218.(d)	219.(c)	220.(c)
221.(d)	222.(c)	223.(a)	224.(d)
225.(c)	226.(a)	227.(b)	228.(a)
229.(c)	230.(c)	231.(a)	232.(a)
233.(b)	234.(c)	235.(b)	236.(a)
237.(c)	238.(c)	239.(c)	240.(a)
241.(b)	242.(a)	243.(a)	244.(c)
245.(b)	246.(c)	247.(d)	248.(c)
249.(d)	250.(a)	251.(d)	252.(d)
253.(c)	254.(d)	255.(d)	256.(c)
257.(b)	258.(c)	259.(b)	260.(b)
261.(a)	262.(b)	263.(d)	264.(a)
265.(a)	266.(a)	267.(c)	268.(d)
269.(a)	270.(c)	271.(b)	272.(b)
273.(a)	274.(a)	275.(a)	276.(a)
277.(a)	278.(b)	279.(c)	280.(c)
281.(a)	282.(a)	283.(b)	284.(a)
285.(b)	286.(a)	287.(c)	288.(d)
289.(b)	290.(d)	291.(d)	292.(a)
293.(c)	294.(c)	295.(d)	296.(d)
297.(c)	298.(c)	299.(b)	300.(d)
301.(d)	302.(d)	303.(c)	304.(b)
305.(b)	306.(a)	307.(d)	308.(c)
309.(a)	310.(b)	311.(c)	312.(d)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

313.(d)	314.(d)	315.(c)	316.(a)
317.(d)	318.(c)	319.(d)	320.(d)
321.(a)	322.(c)	323.(a)	324.(a)
325.(c)	326.(a)	327.(d)	328.(c)
329.(d)	330.(a)	331.(b)	332.(a)
333.(c)	334.(b)	335.(c)	336.(c)
337.(a)	338.(c)	339.(b)	340.(a)
341.(a)	342.(c)	343.(c)	344.(d)
345.(a)	346.(b)	347.(c)	348.(c)
349.(a)	350.(c)	351.(d)	352.(c)
353.(c)	354.(c)	355.(c)	356.(a)
357.(c)	358.(c)	359.(a)	360.(d)
361.(d)	362.(c)	363.(d)	364.(d)
365.(b)	366.(c)	367.(b)	368.(b)
369.(d)	370.(d)	371.(d)	372.(d)
373.(d)	374.(d)	375.(b)	376.(d)
377.(d)	378.(d)	379.(d)	380.(b)
381.(c)	382.(b)	383.(d)	384.(c)
385.(c)	386.(b)	387.(c)	388.(a)
389.(c)	390.(b)	391.(c)	392.(a)
393.(d)	394.(c)	395.(b)	396.(c)
397.(c)	398.(b)	399.(a)	400.(c)
401.(c)	402.(a)	403.(d)	404.(a)
405.(b)	406.(a)	407.(d)	408.(c)
409.(b)	410.(a)	411.(d)	412.(d)
413.(b)	414.(a)	415.(b)	416.(c)
417.(a)	418.(d)	419.(d)	420.(a)
421.(d)	422.(b)	423.(a)	424.(d)
425.(d)	426.(d)	427.(b)	428.(c)
429.(c)	430.(a)	431.(c)	432.(b)
433.(c)	434.(c)	435.(b)	436.(c)
437.(a)	438.(d)	439.(b)	440.(b)
441.(a)	442.(c)	443.(b)	444.(d)
445.(c)	446.(a)	447.(b)	448.(b)
449.(a)	450.(d)	451.(a)	452.(c)
453.(a)	454.(a)	455.(c)	456.(d)
457.(c)	458.(a)	459.(d)	460.(a)
461.(c)	462.(c)	463.(b)	464.(b)
465.(b)	466.(a)	467.(b)	468.(d)
469.(a)	470.(a)	471.(b)	472.(a)
473.(c)	474.(b)	475.(b)	476.(a)
477.(d)	478.(a)	479.(d)	480.(b)
481.(c)	482.(d)	483.(b)	484.(a)
485.(b)	486.(b)	487.(a)	488.(a)
489.(c)	490.(d)	491.(c)	492.(a)
493.(c)	494.(b)	495.(c)	496.(d)

497.(d)	498.(d)	499.(a)	500.(b)
501.(d)	502.(d)	503.(d)	504.(c)
505.(d)	506.(b)	507.(d)	508.(d)
509.(b)	510.(b)	511.(b)	512.(a)
513.(a)	514.(d)	515.(b)	516.(c)
517.(d)	518.(b)	519.(d)	520.(d)
521.(a)	522.(b)	523.(d)	524.(a)
525.(a)	526.(c)	527.(c)	528.(c)
529.(b)	530.(d)	531.(d)	532.(b)
533.(d)	534.(a)	535.(d)	536.(c)
537.(c)	538.(a)	539.(d)	540.(b)
541.(c)	542.(b)	543.(a)	544.(b)
545.(a)	546.(c)	547.(b)	548.(a)
549.(b)	550.(d)	551.(c)	552.(c)
553.(c)	554.(c)	555.(c)	556.(c)
557.(d)			

Solutions :-

Sol.1.(b)

$tan72^\circ - tan27^\circ - tan72^\circ\, tan27^\circ$

$= tan72^\circ - tan72^\circ\, tan27^\circ - tan27^\circ$

$= tan72^\circ\,(1 - tan27^\circ) - tan27^\circ$

$= tan(45^\circ + 27^\circ)(1 - tan27^\circ) - tan27^\circ$

$= [\frac{tan45^\circ + tan27^\circ}{1 - tan45^\circ tan27^\circ}](1 - tan27^\circ) - tan27^\circ$

$= \frac{(1 + tan27^\circ)}{(1 - tan27^\circ)}(1 - tan27^\circ) - tan27^\circ$

$= 1 + tan27^\circ - tan27^\circ = 1$

Sol.2.(d) $\frac{1 + sin\theta - cos\theta}{1 + sin\theta + cos\theta}$

$= \frac{1 + sin\theta - (1 - 2sin^2\frac{\theta}{2})}{1 + sin\theta + 2cos^2\frac{\theta}{2} - 1}$

($cos\theta = 1 - 2sin^2\frac{\theta}{2} = 2cos^2\frac{\theta}{2} - 1$)

$= \frac{1 + sin\theta - 1 + 2sin^2\frac{\theta}{2}}{sin\theta + 2cos^2\frac{\theta}{2}}$

$= \frac{sin\theta + 2sin^2\frac{\theta}{2}}{sin\theta + 2cos^2\frac{\theta}{2}}$

$= \frac{2sin\frac{\theta}{2}cos\frac{\theta}{2} + 2sin^2\frac{\theta}{2}}{2sin\frac{\theta}{2}cos\frac{\theta}{2} + 2cos^2\frac{\theta}{2}}$

($sin\theta = 2sin\frac{\theta}{2}cos\frac{\theta}{2}$)

$= \frac{2sin\frac{\theta}{2}(cos\frac{\theta}{2} + sin\frac{\theta}{2})}{2cos\frac{\theta}{2}(sin\frac{\theta}{2} + cos\frac{\theta}{2})} = tan\frac{\theta}{2}$

Sol.3.(b) Identity used:

$sin2A = 2sin\,A\,cosA$ and $sin^2A + cos^2A = 1$

Now,

$= \frac{cos^2t + sin^2t - 2sin\,t\,cos\,t}{cos^2t + sin^2t + 2sin\,t\,cos\,t} \times \frac{cos(t) + sin(t)}{cos(t) - sin(t)}$

$= \frac{(cos\,t - sin\,t)^2}{(cos\,t + sin\,t)^2} \times \frac{cos(t) + sin(t)}{cos(t) - sin(t)}$

$= \frac{(cos\,t - sin\,t)}{(cos\,t + sin\,t)}$

On dividing numerator and denominator by $cos\,t$ we get,

$= \frac{(1 - tan\,t)}{(1 + tan\,t)}$

Sol.4.(d) By using identity:

$SinASinB = -\frac{1}{2}\{(cos(A + B) - cos(A - B)\}$

hence,

$SinASinB = \frac{1}{2}\{(cos(A - B) - cos(A + B)\}$

Sol.5.(b) Given: $asin^3x + bcos^3x = sinx\,cosx$ and $asinx = bcosx$

$asin^3x + bcos^3x = sinx\,cosx$

$asinx\,sin^2x + bcos^3x = sinx\,cosx$

$bcosx\,sin^2x + bcos^3x = sinx\,cosx$

$bcosx\,(sin^2x + cos^2x) = sinx\,cosx$

$bcosx = sinx\,cosx$

$b = sinx$

$asinx = bcosx$

on putting value of b

$asinx = sinx\,cosx$

$a = cosx$

Putting value of a and b

$a^2 + b^2 = sin^2x + cos^2x = 1$

Sol.6.(b) Given: $p\,cosA = 2q\,sinA$

$\Rightarrow p = 2q \times \frac{sinA}{cosA}$ .....(i)

$2p\,cosecA - q\,secA = 3$

$\Rightarrow \frac{2p}{sinA} - \frac{q}{cosA} = 3$

$\Rightarrow 2p \times cosA - q \times sinA = 3 \times sinA.cosA$

$\Rightarrow 2 \times 2q \times \frac{sinA}{cosA} \times cosA - q \times sinA = 3 \times sinA.cosA$ [from eq . (i)]

$\Rightarrow 4q \times sinA - q \times sinA = 3 \times sinA.cosA$

$\Rightarrow 3q \times sinA = 3 \times sinA.cosA \Rightarrow q = cosA$

Put the value of q in eq . (i)

$\Rightarrow p = 2 \times cosA \times \frac{sinA}{cosA} \Rightarrow p = 2sinA$

Now, $p^2 + 4q^2$

$= (2SinA)^2 + 4(cosA)^2$

$= 4(sin^2A + cos^2A) = 4$

Sol.7.(a) $tanA + sin\,A = x$

On squaring both side

$tan^2A + sin^2A + 2tan\,A\,sin\,A = x^2$ ... (i)

Now , $tan\,A - sin\,A = y$

On squaring both side

$tan^2A + sin^2A - 2tan\,A\,sin\,A = y^2$ ... (ii)

On subtracting (i) and (ii)

$x^2 - y^2 = (tan^2A + sin^2A + 2tan\,A\,sin\,A) - (tan^2A + sin^2A - 2tan\,A\,sin\,A)$

$x^2 - y^2 = tan^2A + sin^2A + 2tan\,A\,sin\,A - tan^2A - sin^2A + 2tan\,A\,sin\,A$

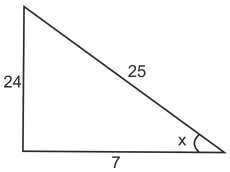
Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$x^2 - y^2 = 4 \tan A \sin A$

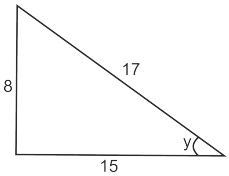
Sol.8.(d) Let $\cos^{-1}(\frac{7}{25}) = x$

$\Rightarrow \cos x = \frac{7}{25}$



Then $\sin x = \frac{24}{25}$

and $\cos^{-1}(\frac{15}{17}) = y \Rightarrow \cos y = \frac{15}{17}$



Then, $\sin y = \frac{8}{17}$

As we know, $\sin(x - y)$

$= \sin x \times \cos y - \cos x \sin y$

$= \frac{24}{25} \times \frac{15}{17} - \frac{7}{25} \times \frac{8}{17}$

$= \frac{360 - 56}{425} = \frac{304}{425}$

$(x - y) = \sin^{-1}(\frac{304}{425})$

Then, $\cos^{-1}(\frac{7}{25}) - \cos^{-1}(\frac{15}{17})$

$= \sin^{-1}(\frac{304}{425})$

Sol.9.(a) Take $x = 45°$

$6f(2) = 6 \times (\sin^{p+2} x + \cos^{p+2} x)$

$= 6 \times (\sin^4 x + \cos^4 x)$

$= 6 \times ((\frac{1}{\sqrt{2}})^4 + (\frac{1}{\sqrt{2}})^4)$

$= 6 \times (\frac{1}{4} + \frac{1}{4}) = 6 \times \frac{1}{2} = \mathbf{3}$

$4f(4) = 4 \times (\sin^6 x + \cos^6 x)$

$= 4 \times ((\sin^2 x)^3 + (\cos^2 x)^3)$

$= 4 \times ((\frac{1}{\sqrt{2}})^2)^3 + ((\frac{1}{\sqrt{2}})^2)^3$

$= 4 \times (\frac{1}{8} + \frac{1}{8}) = 4 \times \frac{1}{4} = \mathbf{1}$

$10f(0) = 10 \times (\sin^2 x + \cos^2 x)$

$= 10 \times (1) = \mathbf{10}$

Hence, $6f(2) - 4f(4) + 10f(0)$

$= 3 - 1 + 10 = 12$

Sol.10.(b) Given :

$\tan A = a \tan B$ and $\sin A = b \sin B$

We put the value of A = 60° and B = 30°

$\tan 60° = a \tan 30°$

$\Rightarrow \sqrt{3} = a \times \frac{1}{\sqrt{3}} \Rightarrow a = 3$

$\sin 60° = b \sin 30°$

$\Rightarrow \frac{\sqrt{3}}{2} = b \times \frac{1}{2} \Rightarrow b = \sqrt{3}$

So, $\cos^2 A = (\cos 60°)^2 = (\frac{1}{2})^2 = \frac{1}{4}$

Now, put the value a and b in all options one by one only option (b) satisfied.

$\Rightarrow \frac{b^2 - 1}{a^2 - 1} = \frac{3 - 1}{9 - 1} = \frac{2}{8} = \frac{1}{4}$

Sol.11.(d) $\frac{\sin(A - B)}{\cos A \cos B} + \frac{\sin(B - C)}{\cos B \cos C}$

$\frac{\sin A \cos B - \cos A \sin B}{\cos A \cos B} + \frac{\sin B \cos C - \cos B \sin C}{\cos B \cos C}$

$\frac{\cos C(\sin A \cos B - \cos A \sin B) + \cos A(\sin B \cos C - \cos B \sin C)}{\cos A \cos B \cos C}$

$\frac{\sin A \cos B \cos C - \cos A \sin B \cos C + \cos A \sin B \cos C - \cos A \cos B \sin C}{\cos A \cos B \cos C}$

$= \frac{\sin A \cos B \cos C - \cos A \cos B \sin C}{\cos A \cos B \cos C}$

$= \frac{\cos B(\sin A \cos C - \cos A \sin C)}{\cos A \cos B \cos C}$

$= \frac{(\sin A \cos C - \cos A \sin C)}{\cos A \cos C} = \frac{\sin(A - C)}{\cos A \cos C}$

Sol.12.(d) $\frac{3\cos^3\theta - 2\cos\theta}{\sin\theta - 3\sin^3\theta}$

$\frac{\cos\theta\,(3\cos^2\theta - 2)}{\sin\theta(1 - 3\sin^2\theta)}$

$\frac{\cos\theta\,(3\cos^2\theta - 2)}{\sin\theta(1 - 3\{1 - \cos^2\theta\})}$

$\frac{\cos\theta\,(3\cos^2\theta - 2)}{\sin\theta(3\cos^2\theta - 2)} = \frac{\cos\theta}{\sin\theta} = \cot\theta$

Sol.13.(c) $\cot A = \frac{7}{1} = \frac{base}{perpendicular}$

Hypotenuse $= \sqrt{(7)^2 + (1)^2}$

Hypotenuse $= \sqrt{50} = 5\sqrt{2}$

Now,

$\frac{5\left(\frac{7}{5\sqrt{2}}\right) + 4\left(\frac{1}{5\sqrt{2}}\right)}{\left(\frac{7}{5\sqrt{2}}\right)^3 + 7\left(\frac{1}{5\sqrt{2}}\right)^3 + 6\left(\frac{1}{5\sqrt{2}}\right)}$

$= \frac{\left(\frac{7}{\sqrt{2}}\right) + \left(\frac{4}{5\sqrt{2}}\right)}{\frac{343}{250\sqrt{2}} + \frac{7}{250\sqrt{2}} + \frac{6}{5\sqrt{2}}}$

$= \frac{\left(\frac{35 + 4}{5\sqrt{2}}\right)}{\frac{343 + 7 + 300}{250\sqrt{2}}} = \frac{39 \times 250\sqrt{2}}{5\sqrt{2} \times 650} = 3$

Alternate method:

$\frac{5\cos A + 4\sin A}{\cos^3 A + 7\sin^3 A + 6\sin A}$

Divide numerator and denominator by $\sin A$

$= \frac{5 \times \frac{\cos A}{\sin A} + 4 \times \frac{\sin A}{\sin A}}{\frac{\cos^3 A}{\sin A} + 7\frac{\sin^3 A}{\sin A} + 6\frac{\sin A}{\sin A}}$

$= \frac{5 \times \cot A + 4 \times 1}{\cos^2 A \times \cot A + 7\sin^2 A + 6}$

$= \frac{5 \times 7 + 4 \times 1}{\cos^2 A \times 7 + 7\sin^2 A + 6}$

$= \frac{35 + 4}{7(\cos^2 A + \sin^2 A) + 6} = \frac{39}{7 + 6} = \frac{39}{13} = 3$

Sol.14.(c) $\frac{[(\sin x + \sin y)(\sin y - \sin x)]}{[(\cos x + \cos y)(\cos y - \cos x)]}$

$= \frac{-[(\sin x + \sin y)(\sin x - \sin y)]}{-[(\cos x + \cos y)(\cos x - \cos y)]}$

$= \frac{[(\sin^2 x - \sin^2 y)]}{[(\cos^2 x - \cos^2 y)]}$

$= \frac{[(1 - \cos^2 x) - (1 - \cos^2 y)]}{[(\cos^2 x - \cos^2 y)]}$

$= \frac{[1 - \cos^2 x - 1 + \cos^2 y]}{[(\cos^2 x - \cos^2 y]}$

$= \frac{[-\cos^2 x + \cos^2 y]}{[(\cos^2 x - \cos^2 y]} = \frac{-(\cos^2 x - \cos^2 y)}{[(\cos^2 x - \cos^2 y]} = -1$

Sol.15.(c) $\frac{\cos 13° + \sin 13°}{\cos 13° - \sin 13°}$

On dividing by $\cos 13°$

$\frac{\frac{\cos 13°}{\cos 13°} + \frac{\sin 13°}{\cos 13°}}{\frac{\cos 13°}{\cos 13°} - \frac{\sin 13°}{\cos 13°}} \Rightarrow \frac{1 + \tan 13°}{1 - \tan 13°}$

$\frac{\tan 45° + \tan 13°}{1 - \tan 45°.\tan 13°} = \tan(45° + 13°)$

$= \tan 58°$

Sol.16.(c) $(\sin x + \sin y) = a$ ------- (i)

Squaring both side,

$\sin^2 x + \sin^2 y + 2\sin x \sin y = a^2$ --------- (ii)

$(\cos x + \cos y) = b$ --------- (iii)

Squaring both side,

$\cos^2 x + \cos^2 y + 2\cos x \cos y = b^2$ --------- (iv)

Adding eqn (ii) & (iv) we get ;

$(\sin^2 x + \cos^2 x) + (\sin^2 y + \cos^2 y) + 2\sin x \sin y + 2\cos x \cos y = a^2 + b^2$

$1 + 1 + 2(\sin x \sin y + \cos x \cos y) = a^2 + b^2$

$2(1 + \sin x \sin y + \cos x \cos y) = a^2 + b^2$

$(1 + \sin x \sin y + \cos x \cos y) = \frac{a^2 + b^2}{2}$

$\sin x \sin y + \cos x \cos y = \frac{a^2 + b^2}{2} - 1$

$= \frac{a^2 + b^2 - 2}{2}$

Sol.17. (a) $\tan(t) + \cot(t) = 1$

$\frac{\sin(t)}{\cos(t)} + \frac{\cos(t)}{\sin(t)} = 1$

$\frac{\sin^2(t) + \cos^2(t)}{\sin(t)\cos(t)} = 1$

$1 = \sin(t)\cos(t)$ .....(i)

$[\sin(t) + \cos(t)]^2 = \sin^2(t) + \cos^2(t) + 2\sin(t)\cos(t)$

$= \sqrt{\sin^2(t) + \cos^2(t) + 2\sin(t)\cos(t)}$

$= \sqrt{1 + 2\sin(t)\cos(t)}$

$= \sqrt{1 + 2 \times 1} = \sqrt{3}$

Then, $\frac{1}{\sin(t) + \cos(t)} = \frac{1}{\sqrt{3}}$

Sol.18.(d) $3\sec^4\theta + 8 = 10\sec^2\theta$

$3\sec^4\theta - 10\sec^2\theta + 8 = 0$

$3\sec^4\theta - 6\sec^2\theta - 4\sec^2\theta + 8 = 0$

$3\sec^2\theta(\sec^2\theta - 2) - 4(\sec^2\theta - 2) = 0$

$(\sec^2\theta - 2)(3\sec^2\theta - 4) = 0$

$\sec^2\theta = 2$ and $\frac{4}{3}$

$\Rightarrow \sec\theta = \sqrt{2}$ and $\frac{2}{\sqrt{3}}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\Rightarrow \theta = 45°$ and $30°$

For $\theta = 45°$, $\tan 45° = 1$

For $\theta = 30°$, $\tan 30° = \frac{1}{\sqrt{3}}$

Sol.19.(a) $Cot^4A + Cot^2A = 1$

$Cot^2A(Cot^2A + 1) = 1$

$CotA = SinA$ or $Sin^2A = CosA$

Now,

$Cos^4A - 3Cos^2A =$

$\left\{(1 - Sin^2A)^2 - 3Sin^4A\right\}$

$1 + Sin^4A - 2SinA - 3Sin^4A$

$1 - 2(Sin^4A + Sin^2A) =$

$1 - 2(Cot^4A + Cot^2A) \Rightarrow 1 - 2 = -1$

Sol.20.(a) According to the question,

$\text{cosec}\theta + cot^3\theta \sec\theta$

$\frac{1}{sin\theta} + \frac{cos^3\theta}{sin^3\theta} \times \frac{1}{cos\theta}$

$\frac{sin^2\theta}{sin^3\theta} + \frac{cos^2\theta}{sin^3\theta} = \frac{1}{sin^3\theta} = cosec^3\theta$

now,

$cot^2\theta = 1 - e^2$ $(cosec^2\theta = 1 + cot^2\theta)$

$cosec^2\theta = 2 - e^2$

$\text{cosec}\theta = \left(2 - e^2\right)^{\frac{1}{2}}$

(on cubing both sides)

$cosec^3\theta = (2 - e^2)^{\frac{3}{2}}$

Sol.21.(d) Minimum value of $asin^2\boldsymbol{\theta} + b$ $cosec^2\boldsymbol{\theta} = 2\sqrt{ab}$ {when , $a > b$}

Hence, minimum value of $16cosec^2\boldsymbol{\theta} + 25sin^2\boldsymbol{\theta} = 2\sqrt{16 \times 25} = 40$

Sol.22.(a) $\text{cosec}A + \cot A = a\sqrt{b}$

$(\frac{1}{sinA} + \frac{cosA}{sinA})^2 = (\frac{1 + cosA}{sinA})^2 = a^2 b$

$\frac{a^2 b - 1}{a^2 b + 1} = \frac{(\frac{1 + cosA}{sinA})^2 - 1}{(\frac{1 + cosA}{sinA})^2 + 1}$

$= \frac{1 + cos^2A + 2cosA - sin^2A}{1 + cos^2A + 2cosA + sin^2A}$

$= \frac{2cos^2A + 2cosA}{2 + 2cosA} = \frac{2cosA\,(cosA + 1)}{2\,(cosA + 1)}$

$= cosA$

Sol.23.(a) Put $\theta = 45°$

Now, $sin\theta + tan\theta = p$ ..... (1)

$\Rightarrow \frac{1}{\sqrt{2}} + 1 = p \Rightarrow \frac{1 + \sqrt{2}}{\sqrt{2}} = p$

And , $tan\theta - sin\theta = q$ ..... (2)

$\Rightarrow 1 - \frac{1}{\sqrt{2}} = q \Rightarrow \frac{\sqrt{2} - 1}{\sqrt{2}} = q$

Now, checking through options, (a) satisfies the value of p and q .

$p^2 - q^2 = 4\sqrt{pq} \Rightarrow (\frac{1 + \sqrt{2}}{\sqrt{2}})^2 - (\frac{\sqrt{2} - 1}{\sqrt{2}})^2$

$= 4\sqrt{\frac{1 + \sqrt{2}}{\sqrt{2}} \times \frac{\sqrt{2} - 1}{\sqrt{2}}}$

$= \frac{(1 + \sqrt{2})^2 - (\sqrt{2} - 1)^2}{2} = 4 \times \sqrt{\frac{1}{2}}$

$\Rightarrow 2\sqrt{2} = 2\sqrt{2}$

Sol.24.(b)

$sin\theta \,.\, cos\theta = 2cos^3\theta - \frac{1}{4}cos\theta$

$4sin\theta \,.\, cos\theta = 8cos^3\theta - cos\theta$

$4sin\theta = 8cos^2\theta - 1$

$4sin\theta = 8 - 8sin^2\theta - 1$

$8sin^2\theta + 4sin\theta - 7 = 0$

$sin\theta = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$= \frac{-4 \pm \sqrt{4^2 - 4 \times 8 \times (-7)}}{2 \times 8}$

$= \frac{-4 \pm \sqrt{240}}{2 \times 8} = \frac{-1 \pm \sqrt{15}}{4}$

Here θ is an acute angle , so

$\Rightarrow sin\theta = \frac{\sqrt{15} - 1}{4}$

Sol.25.(a)

If A + B = 90° , then cot A × cot B = 1

= 7(cot 11° cot 13° cot 19° cot 29° cot 61° cot 71° cot 77° cot 79°)

= 7(cot 11° × cot 79°)(cot 13° × cot 77°) (cot 19° × cot 71°) (cot 29° × cot 61°)

= 7(1 × 1 × 1 × 1) = 7

Sol.26.(a) $sin^2A + cos^2A = 1$

$sin^4A + cos^4A + 2sin^2A.cos^2A = 1$

$sin^4A + cos^4A = 1 - 2sin^2A.cos^2A$

$\frac{sin^4A + cos^4A}{1 - 2sin^2Acos^2A} = 1$

Sol.27.(c) $pq = cot^2A - cos^2A$

$= cot^2A \times cos^2A$ ...(identity)

$\sqrt{pq} = cotA.cosA$

$p^2 = cot^2A + cos^2A + 2 \times cotA.cosA$

$q^2 = cot^2A + cos^2A - 2 \times cotA.cosA$

$p^2 - q^2 = 4 \times cotA.cosA$

Now ,

$p^2 - q^2 = 4 \times cotA.cosA = \sqrt{16pq}$

Sol.28.(d)

$4(sin^6A + cos^6A) - 6(sin^4A + cos^4A) + 8$

[∵ $a^3 + b^3 = (a + b)^3 - 3ab(a + b)$ and $a^2 + b^2 = (a + b)^2 - 2ab$]

$= 4\left(1 - 3sin^2A.cos^2A\right) - 6\,(1 - 2sin^2A\,.cos^2A) + 8$

$= 4 - 12sin^2A.cos^2A - 6 + 12sin^2A\,.cos^2A + 8 = 6$

Sol.29.(a) Concept used :

$(1 + \cos 2\theta) = 2cos^2\theta$

$\sqrt{2 + \sqrt{2 + \sqrt{2 + 2cos8\theta}}}$

$= \sqrt{2 + \sqrt{2 + \sqrt{2(1 + cos8\theta)}}}$

$= \sqrt{2 + \sqrt{2 + \sqrt{2 \times 2cos^2 4\theta}}}$

$= \sqrt{2 + \sqrt{2 + 2cos4\theta}}$

$= \sqrt{2 + \sqrt{2(1 + cos4\theta)}}$

$= \sqrt{2 + \sqrt{2 \times 2cos^2 2\theta}} = \sqrt{2 + 2cos2\theta}$

$= \sqrt{2(1 + cos2\theta)} = \sqrt{2 \times 2cos^2\theta} = 2\cos\theta$

Short trick -

$2\cos\left[\frac{8\theta}{2^3}\right] = 2\cos 2\theta$

Sol.30.(a) $\sqrt{\frac{1 - sin\,3\theta}{1 + sin\,3\theta}}$

After rationalizing,

$= \sqrt{\frac{(1 - sin\,3\theta) \times (1 - sin\,3\theta)}{(1 + sin\,3\theta) \times (1 - sin\,3\theta)}}$

$= \sqrt{\frac{(1 - sin\,3\theta) \times (1 - sin\,3\theta)}{(1 - sin^2 3\theta)}}$

$= \sqrt{\left(\frac{(1 - sin\,3\theta}{cos3\theta}\right)^2}$

$= \left(\frac{(1 - sin\,3\theta}{cos3\theta}\right) = sec3\theta - tan3\theta$

Sol.31.(b) $cos^2\theta + sin\theta + 1 = 0$

$1 - sin^2\theta + sin\theta + 1 = 0$

$sin^2\theta - sin\theta - 2 = 0$

$sin^2\theta - 2sin\theta + sin\theta - 2 = 0$

$sin\theta(sin\theta - 2) + 1(sin\theta - 2) = 0$

$(sin\theta - 2)(sin\theta + 1) = 0$

$sin\theta = -1$ or $+2$

Since $sin\theta$ has a range of -1 to +1.

So, $sin\theta = -1$ or $sin\theta = sin\,\frac{3\pi}{2}$

Comparing both sides $\Rightarrow \theta = \frac{3\pi}{2}$

Therefore solution of $cos^2\theta + sin\theta + 1 = 0$ lies between $(\frac{5\pi}{4}, \frac{7\pi}{4})$.

Sol.32.(a) $(1 + cotA + tanA)$

$(sinA - cosA)\frac{sinAcosA}{\left(sin^3A - cos^3A\right)}$

$= (1 + cotA + tanA)(sinA - cosA)\frac{sinAcosA}{(sinA - cosA)(sin^2A + cos^2A + sinA.cosA)}$

$= (1 + cotA + tanA)\frac{sinAcosA}{(1 + sinA.cosA)}$

Now , put A = 45°

$(3) \times \frac{\frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}}}{\left(1 + \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}}\right)} = 3 \times \frac{1}{2} \times \frac{2}{3} = 1$

Sol.33.(b) sin m + sin n = p

$\Rightarrow (sin\,m + sin\,n)^2 = p^2$

$\Rightarrow sin^2m + sin^2n + 2\,sin\,m\,sin\,n = p^2$ ----------(eq . 1)

And cos m + cos n = q

$\Rightarrow (cos\,m + cos\,n)^2 = q^2$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\Rightarrow \cos^2 m + \cos^2 n + 2\cos m \cos n = q^2$ ----------(eq . 2)

After adding (eq . 1 and 2)

Then,

$(\sin^2 m + \cos^2 m) + (\sin^2 n + \cos^2 n) + 2(\sin m \sin n + \cos m \cos n) = p^2 + q^2$

$\Rightarrow 2 + 2(\sin m \sin n + \cos m \cos n) = p^2 + q^2$

$\Rightarrow (\sin m \sin n + \cos m \cos n) = \frac{(p^2 + q^2 - 2)}{2}$

Sol.34.(a)

b cosec θ + a cot θ = p

b cot θ + a cosec θ = q

$b^2 - a^2 = p^2 - q^2$

Sol.35.(d)

$$\frac{\cos(\pi - A).\cot(\frac{\pi}{2} + A)\cos(-A)}{\tan(\pi + A)\tan(\frac{3\pi}{2} + A)\sin(2\pi - A)}$$

$= \frac{-\cos A.(-\tan A)\cos A}{\tan A.(-\cot A).(-\sin A)} = \frac{\cos^2 A}{\sin A \cot A}$

= cosA

Sol.36.(c) cos 2A cos 2B + $\sin^2$ (A -B) - $\sin^2$(A + B) = cos2A.cos2B + $\{\sin(A - B) + \sin(A + B)\} \times \{\sin(A - B) - \sin(A + B)\}$

= cos2A.cos2B + $\{2\sin A \cos B \times (-2\cos A . \sin B)\}$ = cos2A.cos2B - sin2A.sin2B

= cos(2A + 2B)

Sol.37.(b) $\frac{k - k\cot^2 30°}{1 + \cot^2 30°}$

$= \sin^2 60° + 4\tan^2 45° - \operatorname{cosec}^2 60°$

$\frac{k(1-3)}{(1+3)} = \frac{3}{4} + 4 \times 1 - \frac{4}{3}$

k = -2 $\{\frac{3}{4} + 4 - \frac{4}{3}\}$ = -2 × $(\frac{41}{12})$ = -6.83

Sol.38.(a) cosθ + sinθ = $\sqrt{2}$cosθ

sinθ = $\sqrt{2}$cosθ − cosθ

sinθ = cosθ($\sqrt{2}$ − 1)

sinθ × $\frac{1}{\sqrt{2} - 1}$ = cosθ

($\sqrt{2}$ + 1)sinθ = cosθ

Subtracting sinθ from it

sinθ($\sqrt{2}$ + 1 − 1) = cosθ − sinθ

$\sqrt{2}$sinθ = cosθ − sinθ

Sol.39.(a) Sin 73° + Cos137°

Cos137° = Cos(90° + 47°) = - Sin47°

Sin73° - Sin47° = $2\cos(\frac{A+B}{2})\sin(\frac{A-B}{2})$

$= 2\cos(\frac{73+47}{2}).\sin(\frac{73-47}{2})$

$= 2\cos(\frac{120°}{2})\sin(\frac{26°}{2})$

= 2cos60°.sin13°= 2 ×$\frac{1}{2}$×sin 13°= sin 13°

Sol.40.(a) As we know that,

$\sin^2\theta + \cos^2\theta = 1$

$\cos^2 18° = 1 - (\frac{\sqrt{5} - 1}{4})^2$

$= \frac{16 - (5 + 1 - 2\sqrt{5})}{16} = \frac{10 + 2\sqrt{5}}{16}$

$\cos 18° = \frac{\sqrt{10 + 2\sqrt{5}}}{4}$

Sol.41.(a) $\frac{\sin 4\theta + \sin 2\theta}{\cos 4\theta + \cos 2\theta}$

$= \frac{2\sin(\frac{4\theta + 2\theta}{2})\cos(\frac{4\theta - 2\theta}{2})}{2\cos(\frac{4\theta + 2\theta}{2})\cos(\frac{4\theta - 2\theta}{2})}$

$= \frac{\sin 3\theta \cos\theta}{\cos 3\theta \cos\theta} = \frac{\sin 3\theta}{\cos 3\theta}$ = tan 3θ

Sol.42.(d)

$\sin^2 1° + \sin^2 3° + \sin^2 5° + ... + \sin^2 89°$

No. of terms = $\frac{\text{Last term} - \text{1st term}}{\text{common difference}}$ + 1

$= \frac{89 - 1}{2} + 1 = 45$

$\sin^2 1° + \sin^2 3° + \sin^2 5° + ... + \sin^2 89°$

$= \frac{45}{2} = 22.5$

$\cot^2 46° - \sec^2 44° + (\sin^2 1° + \sin^2 3° + \sin^2 5° + ... + \sin^2 89°)$

$= \tan^2 44° - \sec^2 44° + (22.5) = -1 + 22.5$

= 21.5

Sol.43.(a) sin A = 0.5 is true for all the values of (2π n + 30°) and (2n + 1)π - 30°

For the n = 0

2πn + 30° = 30° and (2n + 1)π - 30° = 150°

And for n = 1

2nπ + 30° = 390° and (2n + 1)π - 30° = 510°

sinA = 0.5 is true for 150°, 390° and 510°

So, $\frac{A}{3}$ = 50°, 130° and 170°

Only 170° is given in the answer so it is the correct answer.

Sol.44.(d) cos 27° = x

sin 63° = cos 27° = x

cos 63° = $\sqrt{1 - x^2}$

$\Rightarrow \tan 63° = \frac{x}{\sqrt{1 - x^2}}$

Sol.45.(c) $x\sin\theta = y\cos\theta$

$= x\sin^3\theta + y\cos^3\theta = \sin\theta\cos\theta$

$= x\sin^3\theta + \frac{x\sin\theta}{\cos\theta} \times \cos^3\theta = \sin\theta\cos\theta$

$= x\sin^3\theta + x\sin\theta \times \cos^2\theta = \sin\theta\cos\theta$

$= x\sin\theta(\sin^2\theta + \cos^2\theta) = \sin\theta\cos\theta$

$= x\sin\theta = \sin\theta\cos\theta \Rightarrow x = \cos\theta$

$= x\sin\theta = y\cos\theta$

$= \cos\theta.\sin\theta = y\cos\theta \Rightarrow y = \sin\theta$

$\Rightarrow x^2 + y^2 = \sin^2\theta + \cos^2\theta = 1$

Short trick:- In such type of questions, value of $x^2 + y^2$ is the square of constant term before $\sin\theta\cos\theta$

Sol.46.(d) $\cos^2\theta + \cos^4\theta = 1$

$\cos^4\theta = 1 - \cos^2\theta \Rightarrow \cos^4\theta = \sin^2\theta$ Or $\cos^2\theta = \sin\theta$

$\sin\theta + \sin^2\theta = \cos^2\theta + \sin^2\theta = 1$

Sol.47.(c) sinθ - cosθ = $\frac{7}{17}$

$\frac{p}{h} - \frac{b}{h} = \frac{7}{17}$ (here, H = 17 or its multiple) & We know,

15, 8 and 17 make right angle triangles.

Put, p = 15 and b = 8

sinθ + cosθ. = $\frac{p}{h} + \frac{b}{h} = \frac{15 + 8}{17} = \frac{23}{17}$

Short trick :- sinθ - cosθ = $\frac{7}{17}$

sinθ + cosθ = $\sqrt{a^2 + b^2 - m^2}$

$= \sqrt{1^2 + 1^2 - (\frac{7}{17})^2} = \sqrt{\frac{529}{289}} = \frac{23}{17}$

Sol.48.(d) sum of roots

= Secθ + Sinθ = $\frac{-b}{a} = \frac{k}{\sqrt{6}}$

product of roots = Secθ × Sinθ

= tanθ = $\frac{c}{a} = \frac{\sqrt{6}}{\sqrt{6}}$ = 1 ⇒ tanθ = 1

it means, θ = 45°

Secθ + Sinθ = $\frac{k}{\sqrt{6}} \Rightarrow \sqrt{2} + \frac{1}{\sqrt{2}} = \frac{k}{\sqrt{6}}$

$\frac{3}{\sqrt{2}} = \frac{k}{\sqrt{6}} \Rightarrow$ k = $3\sqrt{3}$

Sol.49.(d) If CosA, SinA and CotA are in geometric progression,then

$\sin^2 A$ = CosA × CotA

$\sin^2 A$ = CosA × $\frac{\cos A}{\sin A} \Rightarrow \sin^3 A = \cos^2 A$

After dividing by $\cos^3 A$

$\frac{\sin^3 A}{\cos^3 A} = \frac{1}{\cos A} \Rightarrow \tan^3 A$ = SecA

$\tan^6 A - \tan^2 A = \sec^2 A - \tan^2 A = 1$

Sol.50.(a) cos 225° = cos (180 + 45)°

= - cos 45° = - $\frac{1}{\sqrt{2}}$ = - $\frac{1}{1.414}$ = - 0.7071

Sol.51.(c) tan2A = tan[(A + B) + (A - B)]

$= \frac{\tan(A+B) + \tan(A-B)}{1 - \tan(A+B)\tan(A-B)}$

cos(A + B) = $\frac{24}{25} \Rightarrow$ tan(A + B) = $\frac{7}{24}$

sin(A - B) = $\frac{15}{17} \Rightarrow$ tan(A - B) = $\frac{15}{8}$

tan[(A + B) + (A - B)]

$= \frac{\frac{7}{24} + \frac{15}{8}}{1 - \frac{7}{24} \times \frac{15}{8}} = \frac{416}{87}$

Sol.52.(d) $\cos^2\theta - \sin^2\theta = \tan^2\theta$

$\Rightarrow \frac{\cos^2\theta - \sin^2\theta}{1} = \frac{\sin^2\theta}{\cos^2\theta}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\Rightarrow \frac{cos^2\theta - sin^2\theta}{cos^2\theta + sin^2\theta} = \frac{sin^2\theta}{cos^2\theta}$

By using componendo and Dividendo rule,

$\Rightarrow \frac{cos^2\theta}{-sin^2\theta} = \frac{sin^2\theta + cos^2\theta}{sin^2\theta - cos^2\theta}$

$\Rightarrow \frac{-sin^2\theta}{cos^2\theta} = \frac{sin^2\theta - cos^2\theta}{sin^2\theta + cos^2\theta}$

$\Rightarrow tan^2\theta = cos^2\theta - sin^2\theta$

Sol.53.(a) There are a total 20 terms and the value of Sinθ can't be greater than 1. Clearly for the sum of 20 terms being 20 values of each term must be 1. So each angle must be 90°

$(\alpha_1 + \alpha_2 + \alpha_3 .... \alpha_{20}) = 90 \times 20 = 1800°$

Sol.54.(a) Given, sin(α + β) = 1

sin(α + β) = sin 90° ⇒ α + β = 90°....(1)

cos(α - β) = $\frac{1}{2}$

Similarly, α - β = 60°.....(2)

Adding (1) and (2)

2α = 150° ⇒ α = 75°

From eq (1) ⇒ β = 90° - 75° = 15°

Sol.55.(b) Given θ = 9°

cotθ.cot2θ.cot3θ.cot4θ.cot5θcot6θ.cot7θ.cot8θ.cot9θ

= cot9.cot18.cot27.cot36.cot45.cot54.cot63.cot72.cot81= 1 × 1 × 1 × 1 × 1 ...(cotAcotB = 1, if A + B = 90°) = 1

Sol.56.(d)

tan30° .tan60° ⇒ $\frac{1}{\sqrt{3}} \times \sqrt{3} = 1$

sin30° ⇒ $\frac{1}{2}$; tan45° ⇒ 1⇒ cos30° = $\frac{\sqrt{3}}{2}$

Clearly cos30° is an irrational quantity.

Sol.57.(c) Values of cosθ, cotθ and cosecθ continuously decreases. Only value of tanθ *is* continuously increases.

Sol.58.(c) Given,

secθ = $4x$ and tanθ = $\frac{4}{x}$

Squaring both sides

$sec^2\theta = 16x^2$ .....(1) and $tan^2\theta = \frac{16}{x^2}$.... (2)

Subtracting (2) from (1)

$sec^2\theta - tan^2\theta = 16x^2 - \frac{16}{x^2}$

⇒ 1 = $2(8x^2 - \frac{8}{x^2})$ ⇒ 8 $(x^2 - \frac{1}{x^2}) = \frac{1}{2}$

Sol.59.(d)

$\sqrt{\frac{1-cos\theta}{1+cos\theta}} \times \sqrt{\frac{cosec\theta - cot\theta}{cosec\theta + cot\theta}} = \frac{1-r}{1+r}$

$\Rightarrow \sqrt{\frac{1-cos\theta}{1+cos\theta}} \times \sqrt{\frac{\frac{1}{sin\theta} - \frac{cos\theta}{sin\theta}}{\frac{1}{sin\theta} + \frac{cos\theta}{sin\theta}}}$

$= \frac{1-r}{1+r} \Rightarrow \sqrt{\frac{1-cos\theta}{1+cos\theta}} \times \sqrt{\frac{1-cos\theta}{1+cos\theta}}$

$= \frac{1-r}{1+r} \Rightarrow \frac{(1-cos\ \theta)}{(1+cos\ \theta)} = \frac{1-r}{1+r}$

Comparing both the terms ⇒ r = cosθ

Sol.60.(c)

$\frac{(sin\theta - cosec\theta)(cos\theta - sec\theta)}{tan^2\theta - sin^2\theta} = r^3$

Put , θ = 30° ⇒ $\frac{(\frac{1}{2} - 2)(\frac{\sqrt{3}}{2} - \frac{2}{\sqrt{3}})}{(\frac{1}{\sqrt{3}})^2 - (\frac{1}{2})^2} = r^3$

⇒ $\frac{(\frac{-3}{2})(\frac{3-4}{2\sqrt{3}})}{\frac{1}{3} - \frac{1}{4}} = r^3 \Rightarrow \frac{(\frac{3}{4\sqrt{3}})}{\frac{1}{12}} = r^3$

⇒ $r^3 = 3\sqrt{3}$ ⇒ r = $\sqrt{3}$

through options ⇒ cotθ ⇒ cot30° = $\sqrt{3}$

Clearly r = cotθ

Sol.61.(d) 3 - $2sin^2\theta$ - 3Cosθ = 0

= 3 - 2(1 - $cos^2\theta$) - 3cosθ = 0

= $2cos^2\theta$ - 3cosθ + 1 = 0

= $2cos^2\theta$ - 2cosθ - cosθ + 1 = 0

= 2cosθ(cosθ - 1) - 1(cosθ - 1) = 0

= cosθ = 1 or $\frac{1}{2}$ ⇒ Clearly θ = 60°

(2Cosecθ + tanθ) ⇒ 2 $(\frac{2}{\sqrt{3}})$ + $\sqrt{3}$

⇒ $\frac{4}{\sqrt{3}} + \sqrt{3} = \frac{7\sqrt{3}}{3}$

Short trick:- put θ = 60°

3 - $2sin^2\theta$ - 3Cosθ = 3 - 2 × $\frac{3}{4}$ - 3 × $\frac{1}{2}$

= 3 - $\frac{3}{2} - \frac{3}{2}$ = 0

Condition satisfied. Clearly θ = 60°

So, (2Cosecθ + tanθ) = 2 $(\frac{2}{\sqrt{3}})$ + $\sqrt{3}$

= $\frac{4}{\sqrt{3}} + \sqrt{3} = \frac{7\sqrt{3}}{3}$

Sol.62.(d)

$(\frac{Sin\theta}{1+cos\theta} + \frac{1+cos\theta}{sin\theta})(\frac{1}{tan\theta + cot\theta})$

$= (\frac{sin^2\theta + (1+cos\theta)^2}{sin\theta(1+cos\theta)})(\frac{1}{\frac{Sin\theta}{cos\theta} + \frac{cos\theta}{sin\theta}})$

$=(\frac{sin^2\theta + 1 + cos^2\theta + 2cos\theta}{sin\theta(1+cos\theta)})(\frac{1}{\frac{sin^2\theta + cos^2\theta}{sin\theta.cos\theta}})$

$= \frac{2 + 2cos\theta}{sin\theta(1+cos\theta)} (\frac{sin\theta.cos\theta}{1})$

$= \frac{2(1+cos\theta)}{sin\theta.(1+cos\theta)} \times sin\theta.cos\theta$ = 2cosθ

Sol.63.(c)

$\frac{(cos9° + sin81°)(sec9° + cosec81°)}{sin\ 56°.sec\ 34° + cos\ 25°.cosec\ 65°}$

$\frac{[cos(90° - 81°) + sin81°][(sec(90° - 81°) + cosec81°]}{sin56°.\ sec(90° - 56°) + cos(90° - 65°).cosec65°} =$

$\frac{(2sin81°)(2cosec81°)}{sin56°.\ cosec56° + sin\ 65°.cosec\ 65°}$

$= \frac{4 \times 1}{1+1} = 2$

Sol.64.(c)

$\frac{(sec\theta + tan\theta)\ (1 - sin\theta)}{cosec\theta(1+cos\theta)\ (cosec\theta - cot\theta)}$

$= \frac{(\frac{1}{cos\theta} + \frac{sin\theta}{cos\theta})\ (1 - sin\theta)}{(cosec\theta + cosec\theta.\ cos\theta)\ (cosec\theta - cot\theta)}$

$= \frac{(\frac{1}{cos\theta})\ (1 + sin\theta)(1 - sin\theta)}{(cosec\theta + cot\theta)\ (cosec\theta - cot\theta)}$

$= \frac{\frac{cos^2\theta}{cos\theta}}{cosec^2\theta - cot^2\theta}$ = cosθ

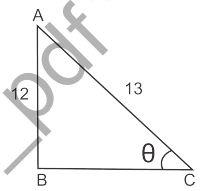
Sol.65.(b) $3cos^2A + 7sin^2A = 4$

$= 3\ cos^2A + 7sin^2A = 4(cos^2A + sin^2A)$

$= 3sin^2A = cos^2A$

$= cot^2A = 3$ ⇒ cotA = $\sqrt{3}$

Sol.66.(d)



Cosecθ = $\frac{AC}{AB} = \frac{13}{12}$

$AB^2 + BC^2 = AC^2$ ⇒ BC = $\sqrt{13^2 - 12^2}$ = 5

Sinθ = $\frac{12}{13}$, $Cos\theta = \frac{5}{13}$ and tanθ = $\frac{12}{5}$

Sinθ + Cosθ - tanθ

= $\frac{12}{13} + \frac{5}{13} - \frac{12}{5} = -\frac{71}{65}$

Sol.67.(c) Given, Sec4θ = Cosec (θ + 20°)

= Cosec(90° - 4θ) = Cosec (θ + 20°)

Clearly, (4θ + θ + 20°) = 90°

5θ = 70° ⇒ θ = 14°

Sol.68.(b) Put θ = 30°

3sinθ = $2cos^2\theta$ = 3 × $\frac{1}{2}$ = 2 × $(\frac{\sqrt{3}}{2})^2$

= $\frac{3}{2} = \frac{3}{2}$ (Condition satisfied)

$(tan^2\theta + sec^2\theta - cosec^2\theta)$

= $(\frac{1}{\sqrt{3}})^2 + (\frac{2}{\sqrt{3}})^2 - (2)^2$

= $\frac{1}{3} + \frac{4}{3} - 4 = -\frac{7}{3}$

Sol.69.(b)

Applying componendo and dividendo

$\frac{tan\theta + sin\theta}{tan\theta - sin\theta} = \frac{k+1}{k-1} \Rightarrow \frac{tan\theta}{sin\theta} = \frac{k}{1}$

⇒ $\frac{sin\theta}{cos\theta.sin\theta}$ = k ⇒ Secθ = k

Sol.70.(b)

$\frac{1}{cosec\ \theta - 1} + \frac{1}{cosec\ \theta + 1}$ = 2 secθ

$= \frac{(cosec\theta + 1) + (cosec\theta - 1)}{(cosec\theta + 1)(cosec\theta - 1)}$ = 2 secθ

$= \frac{2cosec\theta}{(cosec^2\theta - 1)}$ = 2 secθ

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{2cosec\theta}{cot^2\theta} = 2\sec\theta$

$= \frac{2sin^2\theta}{Sin\theta.cos^2\theta} = 2 \times \frac{1}{cos\theta}$

$= \tan\theta = 1 \Rightarrow \theta = 45°$

$(\cot\theta + \cos\theta) \Rightarrow 1 + \frac{1}{\sqrt{2}} = \frac{\sqrt{2}+1}{\sqrt{2}}$

$= \frac{2+\sqrt{2}}{2}$

Short trick :- Put $\theta = 45°$

LHS $\Rightarrow \frac{1}{cosec\,\theta - 1} + \frac{1}{cosec\,\theta + 1}$

$= \frac{1}{\sqrt{2}-1} + \frac{1}{\sqrt{2}+1}$

$= \sqrt{2} + 1 + \sqrt{2} - 1 = 2\sqrt{2}$

RHS = $2\sec\theta = 2\sqrt{2}$

$\cot\theta + \cos\theta \Rightarrow 1 + \frac{1}{\sqrt{2}} = \frac{\sqrt{2}+1}{\sqrt{2}}$

$= \frac{2+\sqrt{2}}{2}$

Sol.71.(a) $\sin\theta = \frac{a}{\sqrt{a^2+b^2}}$

$\cos\theta = \sqrt{1 - (\frac{a}{\sqrt{a^2+b^2}})^2} = \frac{b}{\sqrt{a^2+b^2}}$

$\sec\theta + \tan\theta$

$= \frac{1}{cos\theta} + \frac{sin\theta}{cos\theta} \Rightarrow \frac{1+sin\theta}{cos\theta}$

$= \frac{1 + \frac{a}{\sqrt{a^2+b^2}}}{\frac{b}{\sqrt{a^2+b^2}}} = \frac{\sqrt{a^2+b^2}+a}{b}$

Sol.72.(a) $cos^2\theta - 3\cos\theta + 2 = sin^2\theta$

$\Rightarrow cos^2\theta - 3\cos\theta + 2 = 1 - cos^2\theta$

$= 2cos^2\theta - 3\cos\theta + 1 = 0$

$= 2cos^2\theta - 2\cos\theta - \cos\theta + 1 = 0$

$= 2\cos\theta(\cos\theta - 1) - 1(\cos\theta - 1) = 0$

$\Rightarrow \cos\theta = 1$ or $\frac{1}{2}$

Clearly $\theta = 60$, (as $0° < \theta < 90°$)

$2\operatorname{cosec}\theta + 4\cot\theta$

$= 2(\frac{2}{\sqrt{3}}) + 4(\frac{1}{\sqrt{3}}) = \frac{8\sqrt{3}}{3}$

Sol.73.(b) $\frac{1}{secx - tanx} - \frac{1}{cosx}$

= sec x + tan x - sec x .....{ ∵sec x + tan x

$= \frac{1}{secx - tanx}$} = tanx

Sol.74.(a) $tan^2\theta - 3\sec\theta + 3 = 0$

$\Rightarrow sec^2\theta - 1 - 3\sec\theta + 3 = 0$

$\Rightarrow sec^2\theta - 3\sec\theta + 2 = 0$

$\Rightarrow sec^2\theta - 2\sec\theta - \sec\theta + 2 = 0$

$\Rightarrow \sec\theta(sec\ \theta - 2) - 1(\sec\theta - 2) = 0$

$\Rightarrow (sec\ \theta - 1)(\sec\theta - 2) = 0$

$\Rightarrow \sec\theta = 1$ or 2, Cleary $\theta = 60°$ or $0°$

$\Rightarrow$ But $\theta \neq 0$, so $\theta = 60°$

$\sin\theta + \cot\theta = \frac{\sqrt{3}}{2} + \frac{1}{\sqrt{3}} = \frac{3+2}{2\sqrt{3}} = \frac{5\sqrt{3}}{6}$

Sol.75.(a)

$(1 + tan^2\theta) + (1 + (tan^2\theta)^{-1}) = k$

$\Rightarrow (1 + tan^2\theta) + (1 + cot^2\theta) = k$

$\Rightarrow sec^2\theta + cosec^2\theta = k$

$\Rightarrow \frac{1}{cos^2\theta} + \frac{1}{sin^2\theta} = k$

$\Rightarrow \frac{sin^2\theta + cos^2\theta}{sin^2\theta.cos^2\theta} = k \Rightarrow sec^2\theta.cosec^2\theta = k$

$\Rightarrow sec\ \theta.cosec\ \theta = \sqrt{k}$

Short-Trick: Put $\theta = 45°$

$(1 + tan^2\theta) + (1 + (tan^2\theta)^{-1}) = k$

$\Rightarrow (1 + 1) + (1 + 1) = k$

$\Rightarrow 4 = k \Rightarrow 2 = \sqrt{k}$

Going through options, Option A :

$\operatorname{cosec}\theta\ \sec\theta = \sqrt{2}.\sqrt{2} = 2$

Clearly option (a) is the right answer.

Sol.76.(b) $\frac{1}{sin\theta} - \frac{cot^2\theta}{1+cosec\theta}$

$\Rightarrow \operatorname{cosec}\theta - \frac{(cosec^2\theta - 1)}{1+cosec\theta}$

$\Rightarrow \operatorname{cosec}\theta - \frac{(cosec\ \theta - 1)(cosec\ \theta + 1)}{1+cosec\theta}$

$\Rightarrow \operatorname{cosec}\theta - \operatorname{cosec}\theta + 1 = 1$

Sol.77.(b) $(\frac{1}{1+sin^2\theta} + \frac{1}{1+cosec^2\theta})$

$= (\frac{1}{1+sin^2\theta} + \frac{1}{1+\frac{1}{sin^2\theta}})$

$\Rightarrow (\frac{1}{1+sin^2\theta} + \frac{sin^2\theta}{1+sin^2\theta}) = 1$

Sol.78.(b) $\frac{cos\theta}{1-sin\theta} + \frac{cos\theta}{1+sin\theta} = 4$

$= cos\theta(\frac{1}{1-sin\theta} + \frac{1}{1+sin\theta}) = 4$

$= cos\theta(\frac{1+sin\theta+1-sin\theta}{1-sin^2\theta}) = 4$

$\Rightarrow cos\theta = \frac{1}{2}$, Clearly $\theta = 60°$

So, $\tan\theta + \operatorname{cosec}\theta \Rightarrow \sqrt{3} + \frac{2}{\sqrt{3}}$

$= \frac{3+2}{\sqrt{3}} = \frac{5\sqrt{3}}{3}$

Sol.79.(c) Put $\theta = 45°$,

$\frac{Sin\theta - Cos\theta + 1}{Sin\theta + Cos\theta - 1} = \frac{\frac{1}{\sqrt{2}} - \frac{1}{\sqrt{2}} + 1}{\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}} - 1}$

$= \frac{1}{\sqrt{2}-1} = \sqrt{2} + 1$

Going through the options

$\sec\theta + \tan\theta = \sqrt{2} + 1$

Sol.80.(b) Put $\theta = 45°$

$\sqrt{sec^2\theta + cosec^2\theta} \times \sqrt{tan^2\theta - sin^2\theta}$

$\Rightarrow \sqrt{(\sqrt{2})^2 + (\sqrt{2})^2} \times \sqrt{1 - (\frac{1}{\sqrt{2}})^2} = \sqrt{2}$

On checking all the options one by one, option (b) satisfies.

$sin\ \theta\ sec^2\theta \Rightarrow \frac{1}{\sqrt{2}} \times (\sqrt{2})^2 = \sqrt{2}$

Sol.81.(c) $\sec\theta - \tan\theta = P$

$\sec\theta + \tan\theta = \frac{1}{P}$

$2\sec\theta = P + \frac{1}{P} \Rightarrow \operatorname{Cos}\theta = \frac{2P}{P^2+1}$

$Cos^2\theta = [\frac{2P}{P^2+1}]^2$

$1 - Sin^2\theta = \frac{4P^2}{2P^2+1+P^4}$

$Sin^2\theta = 1 - \frac{4P^2}{2P^2+1+P^4}$

$= \frac{2P^2+1+P^4-4P^2}{2P^2+1+P^4}$

$\operatorname{Sin}\theta = \frac{1-P^2}{P^2+1}$, $\operatorname{cosec}\theta = \frac{P^2+1}{1-P^2}$

Alternate :-

$\sec\theta - \tan\theta = P \Rightarrow \sec\theta + \tan\theta = \frac{1}{P}$

$2\sec\theta = P + \frac{1}{P}$

$\operatorname{Cos}\theta = \frac{2P}{P^2+1} = \frac{base}{hypotenuse}$

Perpendicular = $1 - P^2$

$\operatorname{cosec}\theta = \frac{hypotenuse}{Perpendicular} = \frac{P^2+1}{1-P^2}$

Sol.82.(b) $cos^2\theta = 3cot^2\theta - 3cos^2\theta$

$\Rightarrow 4cos^2\theta = 3cot^2\theta \Rightarrow sin^2\theta = \frac{3}{4}$

$\Rightarrow sin\theta = \frac{\sqrt{3}}{2} \Rightarrow \theta = 60°$

$(\frac{1}{2}sec\theta + sin\theta)^{-1} = \frac{1}{(\frac{1}{2} \times 2 + \frac{\sqrt{3}}{2})}$

$= \frac{2}{\sqrt{3}+2} = 2(2 - \sqrt{3})$

Sol.83.(b) $[\frac{sin\ \theta - 2sin^3\theta}{2cos^3\theta - cos\ \theta}]^2 + 1$

$= [\frac{sin\ \theta(1-2sin^2\theta)}{cos\ \theta(2cos^2\theta - 1)}]^2 + 1$

$= [\frac{sin\ \theta.\ cos2\theta}{cos\ \theta.\ cos2\theta}]^2 + 1$

$= tan^2\theta + 1 = sec^2\theta$

Sol.84.(c) Let A = 45°

$(\operatorname{cosec}A - \sin A)^2 + (\sec A - \cos A)^2 - (\cot A - \tan A)^2$

$= (\operatorname{cosec}45° - \sin45°)^2 + (\sec45° - \cos45°)^2 - (\cot45° - \tan45°)^2$

$= (\sqrt{2} - \frac{1}{\sqrt{2}})^2 + (\sqrt{2} - \frac{1}{\sqrt{2}})^2 - (1 - 1)^2$

$= \frac{1}{2} + \frac{1}{2} - 0 = 1$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.85.(c) $1 + \frac{\tan^2 A}{1+\sec A} = 1 + \frac{\sec^2 A - 1}{1+\sec A}$

= 1 + secA - 1 = secA

Sol.86.(d) Given,

($\sin^6 A + \cos^6 A + 3\sin^2 A.\cos^2 A$) - ($\sin^4 A - \cos^4 A + 1$) $\operatorname{cosec}^2 A$

Put $\angle A = 90°$

⇒ (1 + 0 + 0) - (1 - 0 + 1)1 = 1 - 2 = -1

Sol.87.(d) Given, 3 ($\sec^2 A$ - 1) (cosecA - 1) (cosecA + 1) + 4($\operatorname{cosec}^2 A - \cot^2 A$)

Using identities : $\sec^2 A - 1 = \tan^2 A$, $\operatorname{cosec}^2 A - \cot^2 A = 1$,

$a^2 - b^2 = (a-b)(a+b)$

= 3 $\tan^2 A$ ($Cosec^2 A$ - 1^2) + 4 (1)

= 3 $\tan^2 A \cot^2 A$ + 4 (as $Cosec^2 A$ -1= $\cot^2 A$)

= 3 $\tan^2 A \times \frac{1}{\tan^2 A}$ + 4 (as $\cot^2 A = \frac{1}{\tan^2 A}$)

= 3 + 4 = 7

Sol.88.(d) $\sin^2 30° - \sin^2 40° + \sin^2 45° - \sin^2 55° - \sin^2 35° + \sin^2 45° - \sin^2 50° + \sin^2 60°$

= ($\sin^2 30° + \sin^2 60°$) - ($\sin^2 40° + \sin^2 50°$)

+ ($\sin^2 45° + \sin^2 45°$) - ($\sin^2 55° + \sin^2 35°$)

= 1 - 1 + 1 - 1 ($\because \sin^2\theta + \sin^2(90° - \theta) = 1$)

= 0

Sol.89.(c) $\cos^2 29° + \cos^2 61°$

= $\cos^2 29° + \cos^2(90° - 29°)$

= $\cos^2 29° + \sin^2 29° = 1$

Sol.90.(c) Given : cosec θ = $\frac{5}{3}$

⇒ $(\sec^2\theta - 1) \times \cot^2\theta \times (1 + \cot^2\theta)$

We know,

$\sec^2\theta = 1 + \tan^2\theta$, $\operatorname{cosec}^2\theta = 1 + \cot^2\theta$

and $\tan^2\theta \times \cot^2\theta = 1$

Then, $(1 + \tan^2\theta - 1) \times \cot^2\theta \times (\operatorname{cosec}^2\theta)$

= $\tan^2\theta \times \cot^2\theta \times \operatorname{cosec}^2\theta$

= $\operatorname{cosec}^2\theta = (\frac{5}{3})^2 = \frac{25}{9}$

Sol.91.(a) Identity used:

$a^3 - b^3 = (a-b)(a^2 + b^2 + ab)$

$\frac{\sin^3 A - \cos^3 A}{\sin A - \cos A} =$

$\frac{(\sin A - \cos A)[\sin^2 A + \cos^2 A + \sin A . \cos A]}{\sin A - \cos A}$

$= \frac{(\sin A - \cos A)[1 + \sin A . \cos A]}{\sin A - \cos A}$

$= 1 + \sin A . \cos A$

Sol.92.(c) $\frac{\sec\alpha + \tan\alpha}{\sec\alpha - \tan\alpha} = \frac{7}{4}$

By componendo and dividendo we get;

$\frac{\sec\alpha}{\tan\alpha} = \frac{11}{3}$ ⇒ secα × cotα = $\frac{11}{3}$

$\frac{1}{\cos\alpha} \times \frac{\cos\alpha}{\sin\alpha} = \frac{11}{3}$

$\frac{1}{\sin\alpha} = \frac{11}{3}$ ⇒ cosecα = $\frac{11}{3}$

Sol.93.(a) $\frac{\sin A}{1+\cos A}$

$= \frac{\sin A}{1+\cos A} \times \frac{(1-\cos A)}{(1-\cos A)}$

$= \frac{\sin A(1-\cos A)}{1-\cos^2 A}$

$= \frac{\sin A(1-\cos A)}{\sin^2 A} = \frac{1-\cos A}{\sin A}$

Sol.94.(b) $\frac{7\sin\theta + 4\cos\theta}{9\sin\theta - 2\cos\theta} = \frac{5}{4}$

28sinθ + 16cosθ = 45sinθ - 10cosθ

17sinθ = 26cosθ

$\frac{\sin\theta}{\cos\theta} = \frac{26}{17}$ ⇒ tanθ = $\frac{26}{17}$

Now, $\frac{\tan^2\theta + 5}{\tan^2\theta - 5} = \frac{(\frac{26}{17})^2 + 5}{(\frac{26}{17})^2 - 5}$

$= \frac{\frac{676}{289} + 5}{\frac{676}{289} - 5} = \frac{\frac{676+1445}{289}}{\frac{676-1445}{289}} = \frac{\frac{2121}{289}}{\frac{-769}{289}}$

$= \frac{2121}{289} \times \frac{289}{-769} = -\frac{2121}{769}$

Sol.95.(d) Formula used :

$\sec^2\theta = 1 + \tan^2\theta$ and $\operatorname{cosec}^2\theta = 1 + \cot^2\theta$

now,

$\frac{2 + \tan^2 2A + \cot^2 2A}{\sec 2A.\operatorname{cosec} 2A}$

$= \frac{1 + \tan^2 2A + 1 + \cot^2 2A}{\sec 2A.\operatorname{cosec} 2A}$

$= \frac{\sec^2 2A + \operatorname{cosec}^2 2A}{\sec 2A.\operatorname{cosec} 2A}$

$= \frac{\sec^2 2A.}{\sec 2A.\operatorname{cosec} 2A} + \frac{\operatorname{cosec}^2 2A}{\sec 2A.\operatorname{cosec} 2A}$

$= \frac{\sec 2A.}{.\operatorname{cosec} 2A} + \frac{\operatorname{cosec} 2A}{\sec 2A.}$

$= \frac{\frac{1}{\cos 2A}}{\frac{1}{\sin 2A}} + \frac{\frac{1}{\sin 2A}}{\frac{1}{\cos 2A}} = \frac{\sin 2A}{\cos 2A} + \frac{\cos 2A}{\sin 2A}$

$= \frac{\sin^2 2A + \cos^2 2A}{\cos 2A.\sin 2A} = \frac{1}{\cos 2A.\sin 2A}$

= sec2A.cosec2A

Sol.96.(c)

Using the given options, we have ;

(a) when t = 45°, sin45° = cos45° = $\frac{1}{\sqrt{2}}$;

sin(t) ≠ cos (t) [false]

(b) when t = 30°, sin30° = $\frac{1}{2}$, cos30°

= $\frac{\sqrt{3}}{2}$; sin30° > cos30° [false]

(c) when t = 30°, sin30° = $\frac{1}{2}$, cos30°

= $\frac{\sqrt{3}}{2}$; sin30° < cos30° [true]

(d) when t = 60°, sin60° = $\frac{\sqrt{3}}{2}$, cos60°

= $\frac{1}{2}$; sin60° < cos60° [false]

Clearly, we can see that only option(c) is the correct one.

Sol.97.(d) Given: 2 tanθ = 3

then $\frac{\sin\theta}{\cos\theta} = \frac{3}{2}$ ⇒ sinθ = $\frac{3}{2}$cosθ

Now,

$\frac{3\sin\theta - 2\cos\theta}{3\sin\theta + 2\cos\theta}$

$= \frac{3 \times \frac{3}{2}\cos\theta - 2\cos\theta}{3 \times \frac{3}{2}\cos\theta + 2\cos\theta}$

$= \frac{\frac{9\cos\theta - 4\cos\theta}{2}}{\frac{9\cos\theta + 4\cos\theta}{2}} = \frac{5\cos\theta}{13\cos\theta} = \frac{5}{13}$

Sol.98.(a) Given : cotθ = $\frac{4}{3}$

$= \frac{[\sec\theta(1+\cot^2\theta)(\operatorname{cosec}^2\theta - \cot^2\theta)]}{\operatorname{cosec}^3\theta}$

$= \frac{[\frac{1}{\cos\theta} \times (1 + \frac{\cos^2\theta}{\sin^2\theta})(\frac{1}{\sin^2\theta} - \frac{\cos^2\theta}{\sin^2\theta})]}{(\frac{1}{\sin\theta})^3}$

$= \frac{[\frac{1}{\cos\theta} \times (\frac{\sin^2\theta + \cos^2\theta}{\sin^2\theta})(\frac{1-\cos^2\theta}{\sin^2\theta})]}{\frac{1}{\sin^3\theta}}$

$\because \sin^2\theta + \cos^2\theta = 1, 1 - \cos^2\theta = \sin^2\theta$

$= \frac{\sin^2\theta \times \sin^3\theta}{\cos\theta \times \sin^4\theta} = \frac{\sin\theta}{\cos\theta}$

= tanθ = $\frac{1}{\cot\theta} = \frac{3}{4}$

Sol.99.(d) $\frac{3\sin 58°}{5\cos 32°} + \frac{2\cos 62°}{5\sin 28°}$

$\frac{3\sin(90° - 32)°}{5\cos 32°} + \frac{2\cos(90° - 28°)}{5\sin 28°}$

$\frac{3\cos 32°}{5\cos 32°} + \frac{2\sin 28°}{5\sin 28°} = \frac{3}{5} + \frac{2}{5} = 1$

Sol.100.(a) 7 $\cos^2$ θ + 5 $\sin^2$ θ - 6 = 0

Let θ = 45°

7 × $\frac{1}{2}$ + 5 × $\frac{1}{2}$ - 6 = $\frac{12}{2}$ - 6 = 6 - 6 = 0

Now,

$1 + \sqrt{\frac{\sec\theta + \tan\theta}{\sec\theta - \tan\theta}}$

$= 1 + \sqrt{\frac{\sec 45° + \tan 45°}{\sec 45° - \tan 45°}}$

$= 1 + \sqrt{\frac{\sqrt{2}+1}{\sqrt{2}-1}}$

Now, $1 + \sqrt{\frac{\sqrt{2}+1}{\sqrt{2}-1} \times \frac{\sqrt{2}+1}{\sqrt{2}+1}}$

= 1 + $\sqrt{2}$ + 1 = $\sqrt{2}$ + 2

Sol.101.(a) $\frac{\sec 35°}{\operatorname{cosec} 55°} - \frac{\cos 25°}{\sin 65°}$

$\frac{\sec(90° - 55°)}{\operatorname{cosec} 55°} - \frac{\cos(90° - 65°)}{\sin 65°}$

$\frac{\operatorname{cosec} 55°}{\operatorname{cosec} 55°} - \frac{\sin 65°}{\sin 65°}$ = 1 - 1 = 0

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.102.(d) Concept used :
cosec(90° - θ) = secθ
cos(90° - θ) = sinθ
Now,
cosec 56° cos 34°- cos 59°cosec 31°
cosec(90° - 34°).cos34° - cos 59°cosec(90° - 59°)
sec34°.cos34° - cos 59°.sec59°
1 - 1 = 0

Sol.103.(a) $[\frac{4}{3}$ tan²60°+ 3 cos²30°-2 sec²30°- $\frac{3}{4}$ cot²60°] ÷ [sin 60° cos 30° - cos 60° sin 30°]
$[\frac{4}{3} \times (\sqrt{3})^2 + 3 \times (\frac{\sqrt{3}}{2})^2 - 2 \times (\frac{2}{\sqrt{3}})^2 - \frac{3}{4} \times \frac{1}{\sqrt{3}})^2] \div \sin(60° - 30°)$
$[4 + \frac{9}{4} - \frac{8}{3} - \frac{1}{4}] \div \sin 30°$
$\frac{10}{3} \div \frac{1}{2} = \frac{20}{3} = 6\frac{2}{3}$

Sol.104.(d) sin(90° - θ) = cosθ
tan(90° - θ) = cotθ
Now, sin 74° + tan 74°
sin(90°-16°) + tan(90° - 16°)
cos16° + cot16°

Sol.105.(a) p sin A - cos A = 1
Put A = 90°, we have ;
p - 0 = 1 ⇒ p = 1
Now, p² - (1 + p²) cos A = 1 - (1 + 1) cos 90° = 1 - 0 = 1

Sol.106.(d)
$(\frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta})^3 \frac{1}{\tan\theta} - \sec^2\theta$
$= (\frac{\sin\theta\,(1 - 2\sin^2\theta)}{\cos\theta\,(2\cos^2\theta - 1)})^3 \frac{1}{\tan\theta} - \sec^2\theta$
$[\therefore \cos 2\theta = (2\cos^2\theta - 1) = (1 - 2\sin^2\theta)]$
$= (\frac{\sin\theta\,.\cos 2\theta}{\cos\theta\,.\cos 2\theta})^3 \times \frac{1}{\tan\theta} - \sec^2\theta$
$= (\frac{\sin\theta}{\cos\theta})^3 \times \frac{1}{\tan\theta} - \sec^2\theta$
$= \tan^3\theta \times \frac{1}{\tan\theta} - \sec^2\theta$
$= \tan^2\theta - \sec^2\theta = -1$

Sol.107.(c) $2\operatorname{cosec}^2\theta + 3\cot^2\theta = 17$
By putting the options one by one we get, θ = 30° satisfies the equation:
$2\operatorname{cosec}^2\theta + 3\cot^2\theta = 2\operatorname{cosec}^2 30° + 3\cot^2 30° = 2 \times 4 + 3 \times 3 = 8 + 9 = 17$

Sol.108.(a) $\frac{1}{1 + \cos\theta} + \frac{1}{1 - \cos\theta}$
$\Rightarrow \frac{1 - \cos\theta + 1 + \cos\theta}{1 - \cos^2\theta}$
$\Rightarrow \frac{2}{\sin^2\theta} = 2\operatorname{cosec}^2\theta$

Sol.109.(c) $\frac{7\sin\theta + 5\cos\theta}{7\sin\theta - 2\cos\theta}$
$\Rightarrow \frac{7\tan\theta + 5}{7\tan\theta - 2} = \frac{7 \times \frac{3}{7} + 5}{7 \times \frac{3}{7} - 2}$
$= \frac{3 + 5}{3 - 2} = 8$

Sol.110.(b) cot⁴ϕ - cot²ϕ = 1
⇒ cot⁴ϕ = 1 + cot²ϕ
⇒ cot⁴ϕ = cosec²ϕ ..(cosec²ϕ =1+ cot²ϕ)
⇒ **111** = $\frac{1}{\sin^2\phi}$
⇒ $\cos^4\phi = \sin^2\phi$ .....(i)
Now,
cos⁴ϕ + cos²ϕ = sin²ϕ + cos²ϕ = 1

Sol.111.(d) Given:- tan 4θ. tan6θ = 1
⇒ tan 4θ = $\frac{1}{\tan 6\theta}$
⇒ tan 4θ = cot 6θ
⇒ tan 4θ = tan(90° - 6θ)
⇒ 4θ = 90° - 6θ ⇒ 10θ = 90° ⇒ θ = 9°
Put the value ofθ in Cot5θ
cot 45° = 1

Sol.112.(c) Given, 7 cosA = 6 ,Cos A = $\frac{6}{7}$
Here B = 6 , H = 7 , P = $\sqrt{49 - 36} = \sqrt{13}$
Now , $\frac{\operatorname{cosec}A + \cot A}{\operatorname{cosec}A - \cot A} = \frac{\frac{7}{\sqrt{13}} + \frac{6}{\sqrt{13}}}{\frac{7}{\sqrt{13}} - \frac{6}{\sqrt{13}}}$
$= \frac{13}{1} = 13$

Sol.113.(c)
p(√3 + cot 30°) = tan³60° - 2sin60°
Put the value of cot 30° = √3 , tan 60°
= √3 and sin 60° = $\frac{\sqrt{3}}{2}$
⇒ p(√3 + √3) = $(\sqrt{3})^3 - 2 \times \frac{\sqrt{3}}{2}$
⇒ 2√3p = 3√3 - √3 ⇒ 2√3p = 2√3 ⇒ p = 1

Sol.114.(a)
⇒ $\frac{1}{1 - \sin\theta} + \frac{1}{1 + \sin\theta} = 4\sec\theta$
⇒ $\frac{1 + \sin\theta + 1 - \sin\theta}{1 - \sin^2\theta} = \frac{4}{\cos\theta}$
⇒ $\frac{2}{\cos^2\theta} = \frac{4}{\cos\theta}$
⇒ cosθ = $\frac{1}{2}$ = cos 60° ⇒ θ = 60°
Now,
(cotθ + cosecθ)
= cot 60° + cosec 60°
$= \frac{1}{\sqrt{3}} + \frac{2}{\sqrt{3}} = \frac{3}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \sqrt{3}$

Sol.115.(b) sin 31° = α
sin (90° - 59°) = α
cos 59° = α
sin 59° = $\sqrt{1 - \cos^2 59°}$
$= \sqrt{1 - \alpha^2}$
Now,
cot 59° = $\frac{\cos 59°}{\sin 59°} = \frac{\alpha}{\sqrt{1-\alpha^2}}$

Sol.116.(b) $\frac{\tan(x)}{\sec(x)} = \frac{1}{2}$
$\frac{\frac{\sin x}{\cos x}}{\frac{1}{\cos x}} = \frac{1}{2} \Rightarrow \sin x = \frac{1}{2}$
$\sin x = \sin 30^\circ \Rightarrow x = 30^\circ$
Now,
$(\sin x + \cos x)^2$
$\sin^2 x + \cos^2 x + 2\sin x.\cos x$
$1 + 2\sin x.\cos x$
$1 + 2 \times \sin 30^\circ \times \cos 30^\circ$
$1 + 2 \times \frac{1}{2} \times \frac{\sqrt{3}}{2} \Rightarrow \frac{2 + \sqrt{3}}{2}$

Sol.117.(a) tanA = $\frac{5}{7}$
Now, $\frac{7\sin A - 3\cos A}{7\sin A + 3\cos A} + 4$
On dividing by $\cos A$ in fraction we get,
$\frac{7\tan A - 3}{7\tan A + 3} + 4 = \frac{7 \times \frac{5}{7} - 3}{7 \times \frac{5}{7} + 3} + 4$
$= \frac{5 - 3}{5 + 3} + 4 = \frac{2}{8} + 4 = 4\frac{1}{4}$

Sol.118.(d) $\sin B = \frac{15}{17}$
now, $\cos B(\sec B - \tan B)$
$\cos B \times \frac{1}{\cos B} - \cos B \times \frac{\sin B}{\cos B}$
$= 1 - \sin B = 1 - \frac{15}{17} = \frac{2}{17}$

Sol.119.(b) $(\frac{\operatorname{cosec}A}{\operatorname{cosec}A - 1} + \frac{\operatorname{cosec}A}{\operatorname{cosec}A + 1})$
$(\frac{\sec A}{\sec A - 1} + \frac{\sec A}{\sec A + 1})^{-1}$
$= \frac{\frac{\operatorname{cosec}^2 A + \operatorname{cosec}A + \operatorname{cosec}^2 A - \operatorname{cosec}A}{\operatorname{cosec}^2 A - 1^2}}{\frac{\sec^2 A + \sec A + \sec^2 A - \sec A}{\sec^2 A - 1^2}}$
$= \frac{2\operatorname{cosec}^2 A}{\operatorname{cosec}^2 A - 1} \times \frac{\sec^2 A - 1}{2\sec^2 A}$
$= \frac{\operatorname{cosec}^2 A}{\cot^2 A} \times \frac{\tan^2 A}{\sec^2 A}$
Now , A = 60°
$= \frac{\frac{4}{3}}{\frac{1}{3}} \times \frac{3}{4} = 4 \times \frac{3}{4} = 3$

Sol.120.(b) In right ΔABC, ∠B = 90°
⇒ tan A = 1 ⇒ tan A = tan 45° ⇒ A = 45°
Now,
4sinA.cosA
= 4 × sin45° × cos45°
$= 4 \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} = \frac{4}{2} = 2$

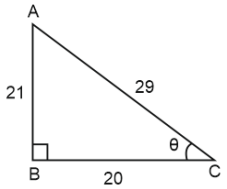
Sol.121.(b) Given :

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\sec\theta = \frac{29}{20} = \frac{hypotenuse}{base}$

By pythagorean triplet (20 , 21 , 29)



Then,

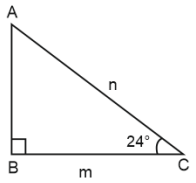
$3\operatorname{cosec}\theta + 3\cot\theta$

$= 3 \times \frac{29}{21} + 3 \times \frac{20}{21}$

$= \frac{87+60}{21} = \frac{147}{21} = 7$

Sol.122.(d) Given: $\cos 24° = \frac{m}{n}$

$= \frac{base}{hypotenuse}$



By using pythagoras theorem,

$AB^2 = AC^2 - BC^2 \Rightarrow AB^2 = n^2 - m^2$

$AB = \sqrt{n^2 - m^2}$

Now,

(cosec 24° - cos 66°)

= cosec 24° - cos (90°- 24°)

= cosec 24° - sin 24°

$= \frac{hypotenuse}{perpendicular} - \frac{perpendicular}{hypotenuse}$

$= \frac{n}{\sqrt{n^2-m^2}} - \frac{\sqrt{n^2-m^2}}{n}$

$= \frac{n^2-n^2+m^2}{n\sqrt{n^2-m^2}} = \frac{m^2}{n\sqrt{n^2-m^2}}$

Sol.123.(a)

$\left[\frac{4\cos(90-\theta)\sin^3(90+\theta) - 4\sin(90+\theta)\cos^3(90-\theta)}{\cos(\frac{180+80}{2})}\right]$

$= \frac{4\sin\theta \times \cos^3\theta - 4\cos\theta \times \sin^3\theta}{-\sin 4\theta}$

$= \frac{4\sin\theta\cos\theta\,(\cos^2\theta - \sin^2\theta)}{-\sin 2 \times (2\theta)}$

$= \frac{4\sin\theta\cos\theta\,(\cos^2\theta - \sin^2\theta)}{-2\sin 2\theta\cos 2\theta}$

$(\because \cos 2\theta = \cos^2\theta - \sin^2\theta)$

$= \frac{2\sin\theta\cos\theta}{-\sin 2\theta} = \frac{2\sin\theta\cos\theta}{-2\sin\theta\cos\theta}$

$= -1\ (\because \sin 2\theta = 2\sin\theta\cos\theta)$

Sol.124.(a) $\sin A + \cos A = \frac{1}{2\sqrt{2}}$

Squaring both side , we get

$\Rightarrow \sin^2 A + \cos^2 A + 2\sin A\cos A = \frac{1}{8}$

$\Rightarrow 2\sin A\cos A = \frac{1}{8} - 1 = \frac{-7}{8}$

$\Rightarrow \sin A\cos A = \frac{-7}{16}$

Now , we know that

$\sin^2 A + \cos^2 A = 1$

Again Squaring both side , we get

$\Rightarrow \sin^4 A + \cos^4 A + 2\sin^2 A\cos^2 A = 1$

$\Rightarrow \sin^4 A + \cos^4 A + 2 \times (\frac{49}{256}) = 1$

$\Rightarrow \sin^4 A + \cos^4 A = 1 - \frac{49}{128} = \frac{79}{128}$

Sol.125.(c) if

$a = x\cos\theta + y\sin\theta$ and $b = x\sin\theta - y\cos\theta$

Then $a^2 + b^2 = x^2 + y^2$ (by using direct result)

Sol.126.(b) Given, cosec x

$= \frac{hypotenuse}{perpendicular} = \frac{5}{4}$

By using pythagorean triplet (4, 3, 5), base = 3

Now,

$\frac{5\sin^2 x + 8\cot^2 x}{27\tan^2 x - 125\cos^2 x}$

$= \frac{5 \times (\frac{4}{5})^2 + 8 \times (\frac{3}{4})^2}{27 \times (\frac{4}{3})^2 - 125 \times (\frac{3}{5})^2}$

$= \frac{5 \times \frac{16}{25} + 8 \times \frac{9}{16}}{27 \times \frac{16}{9} - 125 \times \frac{9}{25}}$

$= \frac{\frac{16}{5} + \frac{9}{2}}{48 - 45} = \frac{32 + 45}{3 \times 10} = \frac{77}{30}$

Sol.127.(b) $\sin\theta + \cos\theta = \sqrt{3}\cos\theta$

$\Rightarrow \sin\theta = \sqrt{3}\cos\theta - \cos\theta$

$\Rightarrow \sin\theta = \cos\theta(\sqrt{3} - 1)$

$\Rightarrow \cot\theta = \frac{1}{\sqrt{3}-1}$

$\Rightarrow \cot\theta = \frac{1}{\sqrt{3}-1} \times \frac{\sqrt{3}+1}{\sqrt{3}+1} = \frac{(\sqrt{3}+1)}{2}$

Sol.128.(a) $\sec(t) = \frac{x}{y} = \frac{Hypotenuse}{Base}$

Perpendicular $= \sqrt{x^2 - y^2}$

$\cot(t) = \frac{Base}{Perpendicular} = \frac{y}{\sqrt{x^2-y^2}}$

Sol.129.(a) As we know that , Sin 45° and Cos 45° have the same value i.e $\frac{1}{\sqrt{2}}$.

Sol.130.(a) Given: $3\sin A + 4\cos A = 5$

Squaring both side , we have

$\Rightarrow (3\sin A + 4\cos A)^2 = 5^2$

$\Rightarrow 9\sin^2 A + 16\cos^2 A + 24\sin A\cos A = 25$

$\Rightarrow 9(1 - \cos^2 A) + 16(1 - \sin^2 A) + 24\sin A\cos A = 25$

$\Rightarrow 16\sin^2 A + 9\cos^2 A - 24\sin A\cos A = 0$

$\Rightarrow (4\sin A - 3\cos A)^2 = 0$

$\Rightarrow 4\sin A = 3\cos A \Rightarrow \tan A = \frac{3}{4}$

Short trick: Given: $3\sin A + 4\cos A = 5$

By using pythagorean triplet = (3, 4 , 5)

$\tan A = \frac{Perpendicular}{Base} = \frac{3}{4}$

Sol.131.(b) $\frac{\tan 55°}{\cot 35°}$

$= \frac{\tan 55°}{\cot(90° - 55°)} = \frac{\tan 55°}{\tan 55°} = 1$

Sol.132.(d) $\frac{\sin A}{1+\cos A} + \cot A$

$= \frac{\sin A}{1+\cos A} + \frac{\cos A}{\sin A}$

$= \frac{\sin^2 A + \cos A + \cos^2 A}{(1+\cos A).\sin A}$

$= \frac{(1+\cos A)}{(1+\cos A).\sin A} = \frac{1}{\sin A} = \operatorname{cosec} A$

Sol.133.(b) $\tan\theta = \frac{8}{15} = \frac{perpendicular}{base}$

By pythagorean triplet = (8, 15 , 17)

Now,

$\frac{\sqrt{1-\sin\theta}}{\sqrt{1+\sin\theta}} = \frac{\sqrt{1-\frac{8}{17}}}{\sqrt{1+\frac{8}{17}}} = \frac{\sqrt{\frac{17-8}{17}}}{\sqrt{\frac{17+8}{17}}}$

$= \sqrt{\frac{9}{25}} = \frac{3}{5}$

Sol.134.(b) $\sqrt{\frac{\sec\theta+1}{\sec\theta-1}} + \sqrt{\frac{\sec\theta-1}{\sec\theta+1}}$

$= \sqrt{\frac{\sec\theta+1}{\sec\theta-1} \times \frac{\sec\theta+1}{\sec\theta+1}} + \sqrt{\frac{\sec\theta-1}{\sec\theta+1} \times \frac{\sec\theta-1}{\sec\theta-1}}$

$= \frac{\sec\theta+1}{\tan\theta} + \frac{\sec\theta-1}{\tan\theta}$

$= \frac{2\sec\theta}{\tan\theta} = 2\operatorname{cosec}\theta$

Sol.135.(a) $\sqrt{\frac{9\sin^2 26° + 9\sin^2 64° + 36}{32 - 7\cos^2 32° - 7\cos^2 58°}}$

$= \sqrt{\frac{9\cos^2 64° + 9\sin^2 64° + 36}{32 - (7\sin^2 58° + 7\cos^2 58°)}}$

$= \sqrt{\frac{9+36}{32-7}} = \sqrt{\frac{45}{25}} = \frac{3\sqrt{5}}{5}$

Sol.136.(c) $\sin x + \operatorname{cosec} x = 2$

Put $x = 90° \Rightarrow 1 + 1 = 2$

$\Rightarrow 2 = 2$ (LHS = RHS)

Now , $\sin^7 x + \operatorname{cosec}^7 x = 1^7 + 1^7 = 2$

Sol.137.(d) $\sin A + \cos A = \sqrt{3}$

Squaring on both side , we get

$\Rightarrow 1 + 2\sin A\cos A = 3$

$\Rightarrow \sin A\cos A = 1$

$\tan A + \cot A + 2\sin A\cos A$

$= \frac{\sin A}{\cos A} + \frac{\cos A}{\sin A} + 2\sin A\cos A$

$= \frac{\sin^2 A + \cos^2 A}{\cos A\sin A} + 2\sin A\cos A$

$= 1 + 2 = 3$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.138.(d) $3\sin^2\theta + 5\cos^2\theta = 4$
$\Rightarrow 3(\sin^2\theta + \cos^2\theta) + 2\cos^2\theta = 4$
$\Rightarrow 2\cos^2\theta = 1 \Rightarrow \cos\theta = \frac{1}{\sqrt{2}} \Rightarrow \theta = 45°$
$\therefore \tan\theta = \tan 45° = 1$

Sol.139.(d) Maximum value of a sin x + b cos x = $\sqrt{(a^2 + b^2)}$
maximum value of (2 sin θ + 3 cos θ) = $\sqrt{4 + 9} = \sqrt{13}$

Sol.140.(c) $[1 - \sin^2 32° + \frac{1}{1+\tan^2 58°}]$
$= \cos^2 32° + \frac{1}{\sec^2 58°}$
$[\because 1 - \sin^2 A = \cos^2 A, 1 + \tan^2 A = \sec^2 A]$
$= \cos^2 32° + \cos^2 58°$
$= \cos^2 32° + \sin^2 32° = 1$

Sol.141.(c) Given, $\tan\theta = \frac{5}{8}$
$\frac{(1+\cos\theta)(1-\cos\theta)}{(1+\sin\theta)(1-\sin\theta)}$
$\frac{1-\cos^2\theta}{1-\sin^2\theta} = \frac{\sin^2\theta}{\cos^2\theta} = \tan^2\theta = (\frac{5}{8})^2 = \frac{25}{64}$

Sol.142.(d) $\tan\theta + \cot\theta = 2$
Taking θ= 45° then satisfies the equation,
LHS = tan 45° + cot 45° = 1 + 1 = 2 = RHS
So, the value of θ will be 45°

Sol. 143.(a) $\sqrt{\frac{1-\cos A}{1+\cos A}} + \sqrt{\frac{1+\cos A}{1-\cos A}}$
$= \sqrt{\frac{1-\cos A}{1+\cos A} \times \frac{1-\cos A}{1-\cos A}} + \sqrt{\frac{1+\cos A}{1-\cos A} \times \frac{1+\cos A}{1+\cos A}}$
$= \sqrt{\frac{(1-\cos A)^2}{1-\cos^2 A}} + \sqrt{\frac{(1+\cos A)^2}{1-\cos^2 A}}$
$= \sqrt{\frac{(1-\cos A)^2}{\sin^2 A}} + \sqrt{\frac{(1+\cos A)^2}{\sin^2 A}}$
$= \frac{1-\cos A}{\sin A} + \frac{1+\cos A}{\sin A}$
$= \frac{1-\cos A + 1 + \cos A}{\sin A} = 2\operatorname{cosec} A$

Sol.144.(c) $\sqrt{3}\cos\theta + \sin\theta = 1$
Putting value of θ = 90° satisfies the given equation,
LHS = $\sqrt{3}\cos\theta + \sin\theta$
$= \sqrt{3} \times \cos 90° + \sin 90°$
$= \sqrt{3} \times 0 + 1 = 1$ = RHS

Sol.145.(b) According to question,
$x^2 + y^2 + z^2$
$= (r\cos t)^2 + (r\sin t.\cos u)^2 + (r\sin t.\sin u)^2$
$= r^2\cos^2 t + r^2\cos^2 u.\sin^2 t + r^2\sin^2 t.\sin^2 u$
$= r^2\cos^2 t + r^2\sin^2 t(\cos^2 u + \sin^2 u)$
$= r^2(\cos^2 t + \sin^2 t) = r^2$

Sol.146.(d) $4\tan\theta - 3 = 0$
$\Rightarrow 4\tan\theta = 3 \Rightarrow \tan\theta = \frac{3}{4}$
Now,
$\frac{1-\cos 2\theta}{1+\cos 2\theta} = \frac{1-1+2\sin^2\theta}{1+2\cos^2\theta-1} = \frac{2\sin^2\theta}{2\cos^2\theta}$
$= \tan^2\theta = (\frac{3}{4})^2 = \frac{9}{16}$

Sol.147.(c) $\sin A - \cos A = \frac{\sqrt{3}-\sqrt{2}}{2}$
Taking square both side,
$(\sin A - \cos A)^2 = (\frac{\sqrt{3}-\sqrt{2}}{2})^2$
$\sin^2 A + \cos^2 A - 2\sin A.\cos A = \frac{3+2-2\sqrt{6}}{4}$
$1 - 2\sin A.\cos A = \frac{5-2\sqrt{6}}{4}$
$2\sin A.\cos A = 1 - \frac{5-2\sqrt{6}}{4}$
$2\sin A.\cos A = \frac{4-5+2\sqrt{6}}{4}$
$\sin A.\cos A = \frac{-1+2\sqrt{6}}{8} = \frac{2\sqrt{6}-1}{8}$

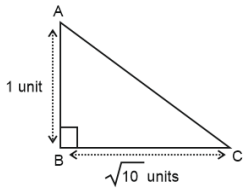
Sol.148.(d) $\cos A + \cos^2 A = 1$
$\Rightarrow \cos A = 1 - \cos^2 A \Rightarrow \cos A = \sin^2 A$
Then,
$\sin^2 A + \sin^4 A = \sin^2 A + \cos^2 A = 1$

Sol.149.(c) $\frac{1}{\operatorname{cosec}\theta - \cot\theta} - \frac{1}{\sin\theta}$
$= \frac{1}{\frac{1}{\sin\theta} - \frac{\cos\theta}{\sin\theta}} - \frac{1}{\sin\theta}$
$= \frac{\sin\theta}{1-\cos\theta} - \frac{1}{\sin\theta} = \frac{\sin^2\theta - 1 + \cos\theta}{(1-\cos\theta)\sin\theta}$
$= \frac{-(1-\sin^2\theta) + \cos\theta}{(1-\cos\theta)\sin\theta} = \frac{-\cos^2\theta + \cos\theta}{(1-\cos\theta)\sin\theta}$
$= \frac{\cos\theta}{\sin\theta} = \cot\theta$

Sol.150.(b) $\frac{\sin^2\theta - 2\sin^4\theta}{2\cos^4\theta + \cos^2\theta}$
$= \frac{(\sin 45°)^2 - 2(\sin 45°)^4}{2(\cos 45°)^4 + (\cos 45°)^2}$
$= \frac{(\frac{1}{\sqrt{2}})^2 - 2(\frac{1}{\sqrt{2}})^4}{2(\frac{1}{\sqrt{2}})^4 + (\frac{1}{\sqrt{2}})^2} = \frac{\frac{1}{2} - 2 \times \frac{1}{4}}{2 \times \frac{1}{4} + \frac{1}{2}}$
$= \frac{0}{1} = 0$

Sol.151.(b) According to the question,
$\sin^2 t = \frac{1}{2} \times \tan^2 t$
$\sin^2 t = \frac{1}{2} \times \frac{\sin^2 t}{\cos^2 t} \Rightarrow \cos^2 t = \frac{1}{2}$
$\cos t = \frac{1}{\sqrt{2}} = \cos 45° \Rightarrow t = 45°$

Sol.152.(c) $\tan A = \frac{1}{\sqrt{10}}$



By using pythagoras theorem,
$AB^2 + BC^2 = AC^2$
$AC^2 = 1^2 + (\sqrt{10})^2 \Rightarrow AC^2 = 1 + 10$
$AC = \sqrt{11}$ units
Now,
sin A + cosec A
$\frac{1}{\sqrt{11}} + \frac{\sqrt{11}}{1} \Rightarrow \frac{1+11}{\sqrt{11}} = \frac{12}{\sqrt{11}}$

Sol.153.(b) $\sec\theta = \sqrt{2}$
$\Rightarrow \sec\theta = \sec 45° \Rightarrow \theta = 45°$
$\therefore \operatorname{cosec} 45° = \sqrt{2}$

Sol.154.(b) $2\sin^2\theta + 3\sin\theta - 2 = 0$
$\Rightarrow 2\sin^2\theta + 3\sin\theta = 2$
if θ = 30°
$\Rightarrow 2 \times \frac{1}{4} + 3 \times \frac{1}{2} = 2 \Rightarrow 2 = 2$
$\therefore \theta = 30°$

Sol.155.(a) We know that
$\sin\theta = \cos(90° - \theta)$
$\sin 3A = \cos(90° - 3A)$
$\Rightarrow \cos(A - 26°) = \cos(90° - 3A)$
$\Rightarrow A - 26° = 90° - 3A \Rightarrow 4A = 116°$
$\Rightarrow A = 29°$

Sol.156.(b)
$(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2$
By value putting method , Let A = 45°
$= (\frac{1}{\sqrt{2}} + \sqrt{2})^2 + (\frac{1}{\sqrt{2}} + \sqrt{2})^2$
$= 2(\frac{1}{\sqrt{2}} + \sqrt{2})^2 = 2 \times \frac{9}{2} = 9$
By checking options one by one , Option (b) is satisfy
I.e. $7 + \tan^2 A + \cot^2 A = 7 + 1 + 1 = 9$

Sol.157.(d) Given : 3 tan A = 4
$\tan A = \frac{4}{3} = \frac{P}{B}$
∴ H = 5 (3 ,4,5 is a triplet)
Now , $4\sin A + 3\cos A = 4 \times \frac{4}{5} + 3 \times \frac{3}{5}$
$= \frac{16}{5} + \frac{9}{5} = 5$

Sol.158.(c) $10\sin^2\theta + 6\cos^2\theta = 7$
$4\sin^2\theta + 6\sin^2\theta + 6\cos^2\theta = 7$
$4\sin^2\theta + 6(\sin^2\theta + \cos^2\theta) = 7$
$4\sin^2\theta = 1$
$\sin^2\theta = \frac{1}{4} \Rightarrow \sin\theta = \frac{1}{2}$
$\sin\theta = \sin 30° \ldots (\sin 30° = \frac{1}{2}) \Rightarrow \theta = 30°$
Now, $\tan 30° = \frac{1}{\sqrt{3}}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.159.(c) $\frac{11\sqrt{2}\cos 3A + 10\sin 2A}{7\sqrt{3}\sin 4A}$

Put A = 15°

$\frac{11\sqrt{2}\cos 3\times 15^\circ + 10\sin 2\times 15^\circ}{7\sqrt{3}\sin 4\times 15^\circ}$

$\frac{11\sqrt{2}\cos 45^\circ + 10\sin 30^\circ}{7\sqrt{3}\sin 60^\circ}$

$\frac{11\sqrt{2}\times\frac{1}{\sqrt{2}} + 10\times\frac{1}{2}}{7\sqrt{3}\times\frac{\sqrt{3}}{2}} \Rightarrow \frac{11+5}{\frac{21}{2}}$

$= \frac{32}{21}$

Sol.160.(b) $2\frac{\tan 54^\circ}{\cot 36^\circ} - \frac{\cot 41^\circ}{\tan 49^\circ}$

$2\frac{\tan 54^\circ}{\cot 36^\circ} - \frac{\cot 41^\circ}{\tan 49^\circ} = 2 - 1 = 1$

Sol.161.(c) $(\text{cosec}\theta - \sin\theta)(\sec\theta - \cos\theta)(\tan\theta + \cot\theta)$

$(\frac{1}{\sin\theta} - \sin\theta)(\frac{1}{\cos\theta} - \cos\theta)(\frac{1}{\cot\theta} + \cot\theta)$

$(\frac{1-\sin^2\theta}{\sin\theta})(\frac{1-\cos^2\theta}{\cos\theta})(\frac{1+\cot^2\theta}{\cot\theta})$

$(\frac{\cos^2\theta}{\sin\theta})(\frac{\sin^2\theta}{\cos\theta})(\frac{\text{cosec}^2\theta}{\cot\theta})$

$(\cos\theta)(\sin\theta)(\frac{\frac{1}{\sin^2\theta}}{\frac{\cos\theta}{\sin\theta}})$

$(\cos\theta)(\sin\theta)(\frac{1}{\sin\theta.\cos\theta}) = 1$

Sol.162.(c) $\Rightarrow m + 5$

$= \sec^2 A.\text{cosec}^2 A(1 - \cos^2 A)(1 - \sin^2 A) + 5$

$\Rightarrow m + 5 = \sec^2 A.\text{cosec}^2 A.\sin^2 A.\cos^2 A + 5$

$\Rightarrow m + 5 = \frac{1}{\cos^2 A}.\frac{1}{\sin^2 A}.\sin^2 A.\cos^2 A + 5 \Rightarrow m = 1$

Sol.163.(a) $\cot^2\theta$ **- 2** $\cos^2\theta$ **= 0**

$\cot^2\theta$ **= 2** $\cos^2\theta \Rightarrow \frac{\cos^2\theta}{\sin^2\theta}$ **= 2** $\cos^2\theta$

$\sin^2\theta = \frac{1}{2} \Rightarrow \sin\theta = \frac{1}{\sqrt{2}} \Rightarrow \theta = 45^\circ$

Sol.164.(a) $x = p\sec A\cos B$

$\frac{x}{p} = \sec A\cos B$ ... (i)

$y = q\sec A\sin B$

$\frac{y}{q} = \sec A\sin B$ ... (ii)

$z = r\tan A$

$\frac{z}{r} = \frac{\sin A}{\cos A}$ ... (iii)

On squaring eq . (i), (ii) and (iii) and then adding (i), (ii) and subtracting (iii) we get,

$\frac{x^2}{p^2} + \frac{y^2}{q^2} - \frac{z^2}{r^2}$

$= \sec^2 A\cos^2 B + \sec^2 A\sin^2 B - \frac{\sin^2 A}{\cos^2 A}$

$= \sec^2 A(\cos^2 B + \sin^2 B) - \frac{\sin^2 A}{\cos^2 A}$

$= \frac{1}{\cos^2 A} - \frac{\sin^2 A}{\cos^2 A} = \frac{1-\sin^2 A}{\cos^2 A} = \frac{\cos^2 A}{\cos^2 A} = 1$

Short trick: Put A = B = 0°

then

$x = p\sec A\cos B$

$\frac{x}{p} = 1$ ...(i)

$y = q\sec A\sin B$

$\frac{y}{q} = 0$ ... (ii)

$z = r\tan A$

$\frac{z}{r} = 0$ ... (iii)

hence,

$\frac{x}{p} + \frac{y}{q} - \frac{z}{r} = 1 + 0 - 0 = 1$

Sol.165.(c) 3 $\sin 15^\circ$ **-4**$\sin^3 15^\circ$

$= \sin 3A = \sin 3\times 15^\circ = \sin 45^\circ = \frac{1}{\sqrt{2}}$

Sol.166.(c) $\sec\theta + \tan\theta = x$ ...(i)

and , $\sec\theta - \tan\theta = \frac{1}{x}$ ...(i)

On adding (i) and (ii) we get,

$2\sec\theta = x + \frac{1}{x}$

$\sec\theta = \frac{x^2+1}{2x} = \frac{hypotenuse}{base}$

then, perpendicular = $x^2 - 1$

$\sin\theta = \frac{perpendicular}{hypotenuse} = \frac{x^2-1}{x^2+1}$

Sol.167.(c) $\sin(48^\circ + k) = \cos 13^\circ$

$\sin(48^\circ + k) = \cos(90^\circ - 77^\circ)$

$\sin(48^\circ + k) = \sin 77^\circ$

$(48^\circ + k) = 77^\circ$

$k = 77^\circ - 48^\circ$ **= 29**

Sol.168.(c)

$\frac{5}{1+\cot^2\theta} + \frac{3}{1+\tan^2\theta} + 2\cos^2\theta$

$\frac{5}{\text{cosec}^2\theta} + \frac{3}{\sec^2\theta} + 2\cos^2\theta$

$5\sin^2\theta + 3\cos^2\theta + 2\cos^2\theta$

$5\sin^2\theta + 5\cos^2\theta \Rightarrow 5(\sin^2\theta + \cos^2\theta) = 5$

Sol.169.(b) $\tan A + \cot A = 2$

Put $A = 45^\circ$

LHS = $\tan 45^\circ + \cot 45^\circ = 1 + 1$ = RHS

Now,

$7\tan^8 45^\circ - 6\cot^8 45^\circ + 8\sec^2 45^\circ$

$7\times(1)^8 - 6\times(1)^8 + 8\times(\sqrt{2})^2$

$\Rightarrow 7 - 6 + 16 = 17$

Sol.170.(a) $\Rightarrow p = \frac{\sin A}{1+\cos A}$

$\Rightarrow p = \frac{\sin A}{1+\cos A}\times\frac{1-\cos A}{1-\cos A}$

$\Rightarrow p = \frac{\sin A(1-\cos A)}{1-\cos^2 A}$

$\Rightarrow p = \frac{\sin A(1-\cos A)}{\sin^2 A}$

$\Rightarrow p = \frac{(1-\cos A)}{\sin A} \Rightarrow \frac{\sin A}{(1-\cos A)} = \frac{1}{P}$

Sol.171.(a) $8\cot\theta = 7$

$\cot\theta = \frac{7}{8} = \frac{Base}{Perpendicular}$

Hence, Hypotenuse = $\sqrt{113}$

$\frac{1+\sin\theta}{\cos\theta} = \frac{1+\frac{perpendicular}{Hypotenuse}}{\frac{Base}{Hypotenuse}}$

$= \frac{1+\frac{8}{\sqrt{113}}}{\frac{7}{\sqrt{113}}} = \frac{\frac{\sqrt{113}+8}{\sqrt{113}}}{\frac{7}{\sqrt{113}}} = \frac{\sqrt{113}+8}{7}$

Sol.172.(a) $\frac{\sin^2 C + \cos^2 C}{1+\cot^2 C}$

$= \frac{1}{1+\frac{1}{\tan^2 C}} = \frac{1}{1+\frac{1}{3}} = \frac{1}{\frac{4}{3}} = \frac{3}{4}$

Sol.173.(b) $\text{Sin}^4\theta + \text{Cos}^4\theta$

$(\text{Sin}^2\theta + \text{Cos}^2\theta)^2 - 2\text{Sin}^2\theta\,\text{Cos}^2\theta$

$1 - 2\text{Sin}^2\theta\,\text{Cos}^2\theta$

As $2\text{Sin}^2\theta\,\text{Cos}^2\theta \geq 0$

hence, $\text{Sin}^4\theta + \text{Cos}^4\theta \leq 1$

Sol.174.(b) $x = a\text{Sec}\theta\text{Cos}\emptyset$

On squaring both side

$\frac{x^2}{a^2} = \text{Sec}^2\theta\text{Cos}^2\emptyset$ ... (i)

$y = b\text{Sec}\theta\text{Sin}\emptyset$

On squaring both side

$\frac{y^2}{b^2} = \text{Sec}^2\theta\text{Sin}^2\emptyset$ .... (ii)

$z = c\tan\theta$

On squaring both side

$\frac{z^2}{c^2} = \tan^2\theta$ ... (iii)

On adding (i), (ii) and then subtracting (iii)

$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2}$

$= \text{Sec}^2\theta\text{Cos}^2\emptyset + \text{Sec}^2\theta\text{Sin}^2\emptyset - \tan^2\theta$

$= \text{Sec}^2\theta(\text{Cos}^2\emptyset + \text{Sin}^2\emptyset) - \tan^2\theta$

$= \text{Sec}^2\theta - \tan^2\theta = 1$

Sol.175.(b) $\cot\theta = \frac{\sqrt{11}}{1} = \frac{base}{perpendicular}$

hypotenuse(h) = $\sqrt{(\sqrt{11})^2 + 1^2} = \sqrt{12}$

Now,

$\frac{\text{cosec}^2\theta - \sec^2\theta}{\text{cosec}^2\theta + \sec^2\theta}$

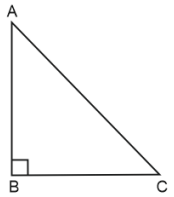
$\frac{(\frac{h}{p})^2 - (\frac{h}{b})^2}{(\frac{h}{p})^2 + (\frac{h}{b})^2} \Rightarrow \frac{(\frac{\sqrt{12}}{1})^2 - (\frac{\sqrt{12}}{\sqrt{11}})^2}{(\frac{\sqrt{12}}{1})^2 + (\frac{\sqrt{12}}{\sqrt{11}})^2}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\frac{12-\frac{12}{11}}{12+\frac{12}{11}} = \frac{132-12}{132+12} = \frac{120}{144} = \frac{5}{6}$

Sol.176.(b)



cosecA = $\frac{AC}{BC} = \frac{2\sqrt{2}}{1}$

AB = $\sqrt{(2\sqrt{2})^2 - (1)^2} = \sqrt{8-1} = \sqrt{7}$

sinA.cosC + cosA.sinC

$= \frac{BC}{AC} \times \frac{BC}{AC} + \frac{AB}{AC} \times \frac{AB}{AC}$

$= \frac{1}{2\sqrt{2}} \times \frac{1}{2\sqrt{2}} + \frac{\sqrt{7}}{2\sqrt{2}} \times \frac{\sqrt{7}}{2\sqrt{2}}$

$= \frac{1}{8} + \frac{7}{8} = 1$

Sol.177.(a) $(2xy : x^2 + y^2 : x^2 - y^2)$ are pythagorean triplet

sinθ = $\frac{Perpendicular}{Hypotenuse} = \frac{2xy}{x^2+y^2}$

So, tanθ = $\frac{Perpendicular}{Base} = \frac{2xy}{x^2-y^2}$

Sol.178.(b)

12 $\sin^2$ A + 2 $\cos^2$ A = 7-------**(i)**

12 (1 - $\cos^2$ A) + 2 $\cos^2$ A = 7

12 - 12 $\cos^2$ A + 2 $\cos^2$ A = 7

- 10$\cos^2$ A = - 5

$\cos^2 A = \frac{1}{2}$ --------**(ii)**

cosA = $\pm\frac{1}{\sqrt{2}}$

From equation (i) and (ii)

12 $\sin^2$ A + 2 × $\frac{1}{2}$ = 7 ⇒ 12 $\sin^2$ A = 6

$\sin^2 A = \frac{1}{2}$ ⇒ sin A = $\pm\frac{1}{\sqrt{2}}$

Now, cot A = $\frac{cosA}{sin\ A} = \frac{\pm\frac{1}{\sqrt{2}}}{\pm\frac{1}{\sqrt{2}}} = \pm 1$

Sol.179.(c) As we know ,

{cos(x + y) = cos x.cos y - sin x. sin y}

{ sin(x - y) = sin x.cos y - cos x. sin y}

{tan(2z) = $\frac{2\ tan\ z}{1-tan^2 z}$}

So, cos(x + y) - sin(x - y) + tan(2z)

= cos x.cos y - sin x. sin y - (sin x.cos y - cos x. sin y) + $\frac{2\ tan\ z}{1-tan^2 z}$

= cos x.cos y - sin x. sin y - sin x.cos y + cos x. sin y + $\frac{2\ tan\ z}{1-tan^2 z}$

Sol.180.(a) sin θ = $\frac{perpendicular}{hypotenuse} = \frac{15}{17}$

Base = $\sqrt{(17)^2 - (15)^2}$

= $\sqrt{289 - 225} = \sqrt{64}$ = 8 unit

now, $cot\ \theta = \frac{base}{perpendicular} = \frac{8}{15}$

$sec\ \theta = \frac{base}{hypotenuse} = \frac{17}{8}$

$\frac{15\ cot\ \theta + 17\ sin\ \theta}{8\ tan\ \theta + 16\ sec\ \theta}$

$= \frac{15\ cot\ \theta + 17\ sin\ \theta}{8 \times \frac{1}{cot\ \theta} + 16\ sec\ \theta}$

$= \frac{15 \times \frac{8}{15} + 17 \times \frac{15}{17}}{8 \times \frac{15}{8} + 16 \times \frac{17}{8}} = \frac{8+15}{15+34} = \frac{23}{49}$

Sol.181.(a) According to the question,

tanθ + cotθ = 2

Let θ = 45° then,

1 + 1 = 2 (satisfied)

Now, put the value of θ = 45° we get,

⇒ $\tan^3\theta + \cot^3\theta + 6\tan^3\theta\cot^2\theta$

⇒ 1 + 1 + 6 = 8

Sol.182.(d) $\sqrt{13}$ sinθ = 2

sinθ = $\frac{2}{\sqrt{13}} = \frac{p}{h}$

b = $\sqrt{(\sqrt{13})^2 - (2)^2}$ = 3

According to the question,

⇒ $\frac{3 \times \frac{2}{3} + \sqrt{13} \times \frac{2}{\sqrt{13}}}{\sqrt{13} \times \frac{3}{\sqrt{13}} - 3 \times \frac{2}{3}} = \frac{2+2}{3-2}$ = 4

Sol.183.(a)

On putting θ = 45° then we get,

⇒ (cot θ + tan θ)(cosec θ − sin θ)(cos θ − sec θ)

⇒ $(1+1)(\sqrt{2} - \frac{1}{\sqrt{2}})(\frac{1}{\sqrt{2}} - \sqrt{2})$

⇒ $(2)(\frac{1}{\sqrt{2}})(\frac{-1}{\sqrt{2}})$ ⇒ -1

Sol.184.(d) Put θ = 0° we get,

sin(30 + 0) - cos(60 - 0) ⇒ $\frac{1}{2} - \frac{1}{2}$ = 0

Sol.185.(c) tan(α + β) = $\frac{tan\alpha + tan\beta}{1 - tan\alpha\ .\ tan\beta}$

Given that α + β = 45°

Then, tan 45° = $\frac{tan\alpha + tan\beta}{1 - tan\alpha\ .\ tan\beta}$ = 1

$tan\alpha + tan\beta = 1 - tan\alpha\ .\ tan\beta$

$tan\alpha + tan\beta + tan\alpha\ .\ tan\beta = 1$ --------(i)

Now, (tan α + 1) (tanβ + 1) = 2x

⇒ $tan\alpha + tan\beta + tan\alpha\ .\ tan\beta + 1 = 2x$

Putting the value from equation (i) we get;

1 + 1 = 2x ⇒ x = 1

Sol.186.(c) According to the question,

tan 570° = tan(180° × 3 + 30°)

[∵ the value of tanθ in 3rd quadrant is positive]

tan30° = $\frac{1}{\sqrt{3}}$

Sol.187.(d)

$\frac{1}{sin^4(90° - 2\alpha)} + \frac{1}{cos^2(90° - 2\alpha) - 1}$

$\frac{1}{cos^4 2\alpha} - \frac{1}{1 - sin^2 2\alpha}$ (∵ sin(90 - θ) = cosθ)

$\frac{1}{cos^4 2\alpha} - \frac{1}{cos^2 2\alpha}$

$\frac{1}{cos^2 2\alpha}(\frac{1}{cos^2 2\alpha} - 1)$

$\frac{1}{cos^2 2\alpha}(\frac{1 - cos^2 2\alpha}{cos^2 2\alpha})$

$\frac{1}{cos^2 2\alpha}(\frac{sin^2 2\alpha}{cos^2 2\alpha})$ = $\sec^2 2\alpha \tan^2 2\alpha$

Sol.188.(c) cotθ + tanθ = 2

Let θ = 45°

cot 45° + tan 45° = 2

1 + 1 = 2 ⇒ 2 = 2 (LHS = RHS)

now, $\tan^{12}\theta + \cot^{12}\theta + 2\tan^5\theta\cot^7\theta$

⇒ $(\tan 45°)^{12} + (\cot 45°)^{12} + 2(\tan 45°)^5 (\cot 45°)^7$ ⇒ 1 + 1 + 2(1)(1) = 4

Sol.189.(b) cos θ = $\frac{base}{hypotenuse} = \frac{24}{25}$

Perpendicular = $\sqrt{(25)^2 - (24)^2}$

= $\sqrt{625 - 576} = \sqrt{49}$ = 7

Now, cot (90 - θ) = tanθ

= $\frac{perpendicular}{base} = \frac{7}{24}$

Sol.190.(c) $[\frac{cosec\ 31° - sec\ 59°}{(sin\ 18° \div cos\ 72°)} \times \frac{tan\ 26°}{cot\ 64°}]$

+ $[\frac{tan\ 30° + tan\ 15°}{(1 - tan\ 30°\ tan\ 15°)}]$

= $[\frac{cosec\ 31° - sec(90° - 31°)}{(sin\ 18° \div cos\ 72°)} \times \frac{tan(90° - 64°)}{cot\ 64°}]$

+ $[\frac{tan\ 30° + tan\ 15°}{(1 - tan\ 30°\ tan\ 15°)}]$

= $[\frac{cosec\ 31° - cosec\ 31°}{(sin\ 18° \div cos\ 72°)} \times \frac{cot\ 64°}{cot\ 64°}]$ + tan (30° + 15°)

= $[\frac{0}{(sin\ 18° \div cos\ 72°)} \times \frac{cot\ 64°}{cot\ 64°}]$ + tan 45°

= 0 + 1 = 1

Sol.191.(d) cotA = $\frac{5}{12} = \frac{b}{p}$

h = $\sqrt{12^2 + 5^2}$ ⇒ h = 13

According to the question,

⇒ $\frac{\sqrt{secA - cosecA}}{\sqrt{secA + cosecA}} - \sqrt{\frac{17}{7}}$

⇒ $\frac{\sqrt{\frac{13}{5} - \frac{13}{12}}}{\sqrt{\frac{13}{5} + \frac{13}{12}}} - \sqrt{\frac{17}{7}}$

⇒ $\frac{\sqrt{\frac{156-65}{60}}}{\sqrt{\frac{156+65}{60}}} - \sqrt{\frac{17}{7}}$

⇒ $\sqrt{\frac{91}{221}} - \sqrt{\frac{17}{7}}$ ⇒ $\frac{\sqrt{13 \times 7}}{\sqrt{13 \times 17}} - \frac{\sqrt{17}}{\sqrt{7}}$

⇒ $\frac{\sqrt{7}}{\sqrt{17}} - \frac{\sqrt{17}}{\sqrt{7}}$ ⇒ $-\frac{10}{\sqrt{119}}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.192.(a) tan(t) = $\frac{perpendicular}{base}$ = $\frac{3}{7}$

Hypotenuse = $\sqrt{(3)^2 + (7)^2}$ = $\sqrt{58}$

cosec(t) = $\frac{hypotenuse}{perpendicular}$ = $\frac{\sqrt{58}}{3}$

Sol.193.(c) sin θ = $\frac{11}{12}$ = $\frac{p}{h}$

b = $\sqrt{(12)^2 - (11)^2}$

b = $\sqrt{144 - 121}$ = $\sqrt{23}$

According to the question,

⇒ (tanθ + secθ) = $\frac{p}{b}$ + $\frac{h}{b}$ = $\frac{p+h}{b}$

⇒ $\frac{11+12}{\sqrt{23}}$ = $\frac{23}{\sqrt{23}}$ = $\sqrt{23}$

Sol.194.(a) $\cos^4\theta - \sin^4\theta = \frac{4}{5}$

$(\cos^2\theta)^2 - (\sin^2\theta)^2 = \frac{4}{5}$

$(\cos^2\theta + \sin^2\theta)(\cos^2\theta - \sin^2\theta) = \frac{4}{5}$

$(\cos^2\theta - \sin^2\theta) = \frac{4}{5}$

$\text{Cos}2\theta = \frac{4}{5}$ [$\text{Cos}2\theta = \cos^2\theta - \sin^2\theta$]

$\text{Cos}^2 2\theta = \frac{16}{25}$

Now, $\sin^2 2\theta = 1 - \text{Cos}^2 2\theta = 1 - \frac{16}{25}$

$\sin^2 2\theta = \frac{9}{25}$ ⇒ $\text{Sin } 2\theta = \frac{3}{5}$

Now, sin4θ = 2sin2θcos2θ

Putting the value of Sin2θ and cos2θ

$\sin 4\theta = 2 \times \frac{3}{5} \times \frac{4}{5} = \frac{24}{25}$

Sol.195.(b) $\frac{P\cos\alpha - Q\sin\alpha}{P\cos\alpha + Q\sin\alpha}$

Divide numerator and denominator by sin α

$$\frac{P \times \frac{\cos\alpha}{\sin\alpha} - Q \times \frac{\sin\alpha}{\sin\alpha}}{P \times \frac{\cos\alpha}{\sin\alpha} + Q \times \frac{\sin\alpha}{\sin\alpha}}$$

$$= \frac{P \times \frac{P}{Q} - Q}{P \times \frac{P}{Q} + Q} = \frac{P^2 - Q^2}{P^2 + Q^2}$$

So, $\frac{P\cos\alpha - Q\sin\alpha}{P\cos\alpha + Q\sin\alpha} - \frac{P^2 - Q^2}{P^2 + Q^2} + 3$

$= \frac{P^2 - Q^2}{P^2 + Q^2} - \frac{P^2 - Q^2}{P^2 + Q^2} + 3 = 3$

Sol.196.(c) sinθ = $\frac{7}{25}$ = $\frac{perpendicular}{hypotenuse}$

base = $\sqrt{(25)^2 - (7)^2}$

base = 24

cosθ = $\frac{24}{25}$, tanθ = $\frac{7}{24}$

Sol.197.(d) Concept :- maximum value of Acosx + Bsinx = $\sqrt{A^2 + B^2}$

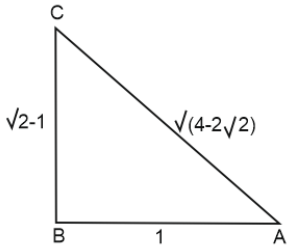
Maximum value (7 cosA + 24 sinA)

= $\sqrt{(7)^2 + (24)^2}$ = $\sqrt{625}$ = 25

So, maximum value of

7 cosA + 24 sinA + 32 = 25 + 32 = 57

Sol.198.(d)



AC = $\sqrt{(\sqrt{2} - 1)^2 + 1^2}$ = $\sqrt{3 - 2\sqrt{2} + 1}$

= $\sqrt{4 - 2\sqrt{2}}$

sinAcosA + tanA

$= \frac{\sqrt{2}-1}{\sqrt{4-2\sqrt{2}}} \times \frac{1}{\sqrt{4-2\sqrt{2}}} + \sqrt{2} - 1$

$= \frac{\sqrt{2}-1}{4-2\sqrt{2}} + \sqrt{2} - 1$

$= \frac{\sqrt{2}-1}{2\sqrt{2}(\sqrt{2}-1)} + \sqrt{2} - 1$

$= \frac{1}{2\sqrt{2}} + \sqrt{2} - 1 = \frac{\sqrt{2}}{4} + \sqrt{2} - 1$

$= \frac{\sqrt{2} + 4\sqrt{2} - 4}{4} = \frac{5\sqrt{2} - 4}{4}$

Sol.199.(c) $4\sin^2\theta - 4\sqrt{3}\sin\theta + 3 = 0$

$4\sin^2\theta - 2\sqrt{3}\sin\theta - 2\sqrt{3}\sin\theta + 3 = 0$

$2\sin\theta(2\sin\theta - \sqrt{3}) - \sqrt{3}(2\sin\theta - \sqrt{3}) = 0$

$(2\sin\theta - \sqrt{3})(2\sin\theta - \sqrt{3}) = 0$

$(2\sin\theta - \sqrt{3})^2 = 0$

$2\sin\theta = \sqrt{3}$ ⇒ $\sin\theta = \frac{\sqrt{3}}{2}$

sinθ = sin 60° So, θ = 60°

Sol.200.(c)

$$\left(\frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta}\right)\left(\frac{1}{\tan\theta + \cot\theta}\right)$$

$$= \frac{\sin^2\theta + (1+\cos\theta)^2}{(1+\cos\theta)\sin\theta} \times \left(\frac{1}{\frac{\sin\theta}{\cos\theta} + \frac{\cos\theta}{\sin\theta}}\right)$$

$$= \frac{\sin^2\theta + 1 + \cos^2\theta + 2\cos\theta}{(1+\cos\theta)\sin\theta} \times \frac{1}{\frac{\sin^2\theta + \cos^2\theta}{\cos\theta\sin\theta}}$$

$$= \frac{2(1+\cos\theta)}{(1+\cos\theta)\sin\theta} \times \cos\theta\sin\theta = 2\cos\theta$$

Sol.201.(d) $\frac{\sin 60° - \cos 60°}{\sin 60° + \cos 60°}$

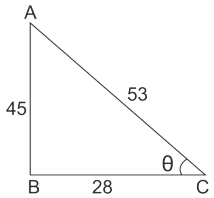
$$\frac{\frac{\sqrt{3}}{2} - \frac{1}{2}}{\frac{\sqrt{3}}{2} + \frac{1}{2}} = \frac{\frac{\sqrt{3}-1}{2}}{\frac{\sqrt{3}+1}{2}}$$

$$= \frac{\sqrt{3}-1}{\sqrt{3}+1} \times \frac{\sqrt{3}-1}{\sqrt{3}-1}$$

$$= \frac{(\sqrt{3}-1)^2}{(\sqrt{3})^2 - (1)^2} = \frac{(\sqrt{3})^2 + (1)^2 - 2\sqrt{3}}{3-1}$$

$$= \frac{3 + 1 - 2\sqrt{3}}{2} = \frac{4 - 2\sqrt{3}}{2} = 2 - \sqrt{3}$$

Sol.202.(d) According to question, we have given triangle :



AC = $\sqrt{45^2 + 28^2}$ = $\sqrt{2809}$ = 53

Now, sinθ - cosθ = $\frac{45}{53} - \frac{28}{53} = \frac{17}{53}$

Sol.203.(b) sec 6A = cosec (A - 29°)

cosec(90°- 6A) = cosec (A - 29°)

⇒ 90°- 6A = A - 29°

7A = 119 ⇒ A = $\frac{119}{7}$ = 17°

Sol.204.(a)

Formula used : $\sin^2 A + \cos^2 A = 1$

$\sec^2 A - \tan^2 A = 1$

$\text{cosec}^2 A - \cot^2 A = 1$

Now, $(1 + \tan^2 A) + (1 + \cot^2 A)$

$= \sec^2 A + \text{cosec}^2 A$

$$\frac{1}{\cos^2 A} + \frac{1}{\sin^2 A} = \frac{\sin^2 A + \cos^2 A}{\sin^2 A \cos^2 A}$$

$$= \frac{1}{\sin^2 A \cos^2 A}$$

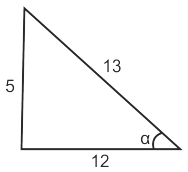
Now, solving option (a) we get ;

$$\frac{1}{\sin^2 A - \sin^4 A} = \frac{1}{\sin^2 A(1 - \sin^2 A)}$$

$$= \frac{1}{\sin^2 A \cos^2 A}$$

So, the correct option is (a).

Sol.205.(b) According to question,



cos α.cosec α.cot α = $\cot^2\alpha = (\frac{12}{5})^2$

$= \frac{144}{25}$

Sol.206.(a)

(1 + cotA - cosecA)(1 + tanA + secA) - 3($\sin^2 A + \cos^2 A$)

$(1 + \frac{\cos A}{\sin A} - \frac{1}{\sin A})(1 + \frac{\sin A}{\cos A} + \frac{1}{\cos A})$

- 3 × 1

$(\frac{\sin A + \cos A - 1}{\sin A})(\frac{\cos A + \sin A + 1}{\cos A})$ - 3

$\frac{(\sin A + \cos A)^2 - 1}{\sin A \cos A}$ - 3

$\frac{\sin^2 A + \cos^2 A + 2\sin A\cos A - 1}{\sin A\cos A}$ - 3

$\frac{1 + 2\sin A\cos A - 1}{\sin A\cos A}$ - 3 = 2 - 3 = -1

Sol.207.(a) Given:

(19 sin θ + 6 cot θ sinθ)

= (19 sin θ + 6 cos θ)

We know that,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

y = (A sin θ + B cos θ) where, A > B

$y_{max} = \sqrt{A^2 + B^2}$

So,

Maximum value of (19 sin θ + 6 cos θ)

$= \sqrt{19^2 + 6^2} = \sqrt{361 + 36} \Rightarrow \sqrt{397}$

Sol.208.(c) Given: tan θ = $\frac{3}{10}$

$\frac{(1+Sin\theta)(1-Sin\theta)}{(1+Cos\theta)(1-Cos\theta)} = \frac{(1)^2-(Sin\theta)^2}{(1)^2-(Cos\theta)^2}$

$\frac{Cos^2\theta}{Sin^2\theta} = \frac{1}{tan^2\theta} = (\frac{10}{3})^2 = \frac{100}{9}$

Sol.209.(c) $x = SinA + CosA$ ... (i)

On squaring both side

$x^2 = Sin^2A + Cos^2A + 2SinA.CosA$

$x^2 = 1 + 2SinA.CosA$

$\frac{x^2-1}{2} = SinA.CosA$ ... (ii)

Now,

$y = SecA + CosecA$

$y = \frac{SinA + CosA}{SinA.CosA}$

$y = \frac{x}{\frac{x^2-1}{2}}$ from (i) and (ii)

$y = \frac{2x}{x^2-1} \Rightarrow (x^2 - 1)y = 2x$

$(x^2y - y) = 2x \Rightarrow x^2y = 2x + y$

Short trick : Put A = 45°

Sol.210.(c) 2 cos²A + 3 cosA - 2 = 0

⇒ 2 cos²A + 4 cosA - cosA - 2 = 0

⇒ 2 cosA (cosA + 2) -1 (cosA + 2) = 0

⇒ (cosA + 2) (2 cosA - 1) = 0

⇒ (cosA + 2) = 0 and (2 cosA - 1) = 0

⇒ cosA = -2 and cosA = $\frac{1}{2}$

CosA = $\frac{1}{2}$ ⇒ CosA = Cos 60° ⇒ A = 60°

Sol.211.(d) $\frac{1-cot^2\theta}{tan^2\theta - 1}$

$\frac{1-\frac{cos^2\theta}{sin^2\theta}}{\frac{sin^2\theta}{cos^2\theta}-1} \Rightarrow \frac{\frac{sin^2\theta - cos^2\theta}{sin^2\theta}}{\frac{sin^2\theta - cos^2\theta}{cos^2\theta}}$

$= \frac{cos^2\theta}{sin^2\theta} = cot^2\theta$

Sol.212.(d) $\frac{(sec\,A + tan\,A)}{sec\,A - tan\,A} = 2\frac{51}{79}$

$\frac{(sec\,A + tan\,A)}{sec\,A - tan\,A} = \frac{209}{79}$

By applying componendo and dividendo rule

$\frac{sec\,A}{tan\,A} = \frac{209+79}{209-79}$

$\frac{sec\,A}{tan\,A} = \frac{288}{130} \Rightarrow \frac{\frac{1}{cosA}}{\frac{Sin\,A}{Cos\,A}} = \frac{288}{130}$

$\frac{1}{sin\,A} = \frac{144}{65} \Rightarrow$ SinA = $\frac{65}{144}$

Sol.213.(a) 4sin² θ = 3(1 + cosθ)

4(1 - cos² θ) = 3(1 + cosθ)

4 (1 - cos θ) (1 + cos θ) = 3(1 + cosθ)

(1 - cos θ) = $\frac{3}{4}$

cos θ = 1 - $\frac{3}{4} = \frac{1}{4} = \frac{base}{hypotenuse}$

Perpendicular = $\sqrt{15}$

Now,

$\sqrt{15}$tanθ + $\frac{4}{\sqrt{15}}$ sinθ + 2secθ

$\sqrt{15} \times \frac{Perpendicular}{base} + \frac{4}{\sqrt{15}} \times \frac{Perpendicular}{hypotenuse} + 2 \times \frac{hypotenuse}{base}$

$\sqrt{15} \times \frac{\sqrt{15}}{1} + \frac{4}{\sqrt{15}} \times \frac{\sqrt{15}}{4} + 2 \times \frac{4}{1}$

15 + 1 + 8 = 24

Sol.214.(b) tan θ + cot θ = 6

On squaring both side,

$(tan\,\theta + cot\,\theta)^2 = 36$

tan²θ + cot²θ + 2 tanθ.cotθ = 36

We know that, tanθ.cotθ = 1

Hence,

tan²θ + cot²θ = 36 -2 = 34

Sol.215.(b) (1 - cos²A) sec²A

Using identity :- sin²A = 1 - cos²A and

sec²A = $\frac{1}{cos^2A}$

then, sin²A × $\frac{1}{cos^2A} = tan^2A$

Sol.216.(d) $sinx + cosx = \sqrt{2}\,sinx$

On squaring both side,

$(sinx + cosx)^2 = (\sqrt{2}\,sinx)^2$

$sin^2x + cos^2x + 2sinx.cosx = 2sin^2x$

$= 1 + 2sinx.cosx = 2sin^2x$

$= 2sinx.cosx = 2sin^2x - 1$ ... (i)

Now, $(sinx - cosx)^2$

$= sin^2x + cos^2x - 2sinx.cosx$

= 1 - 2sinx.cosx ... from (i)

$= 1 - (2sin^2x - 1) = 1 - 2sin^2x + 1$

$= 2 - 2sin^2x = 2(1 - sin^2x)$

$(sinx - cosx)^2 = 2cos^2x$

$sinx - cosx = \sqrt{2}cosx$

Sol.217.(b) In ΔABC

∠A + ∠B + ∠C = 180°

$\frac{\angle A}{2} + \frac{\angle B + \angle C}{2} = 90°$

Now, $\{tan\frac{A}{2} + cosec\frac{B+C}{2}\}\{tan\frac{A}{2} - cosec\frac{B+C}{2}\}$

$\{tan\frac{A}{2} + cosec(90° - \frac{A}{2})\}\{tan\frac{A}{2} - cosec(90° - \frac{A}{2})\}$

$(tan\frac{A}{2} + sec\frac{A}{2})(tan\frac{A}{2} - sec\frac{A}{2})$

$tan^2\frac{A}{2} - sec^2\frac{A}{2} = -1$

Sol.218.(d) $\frac{sin^3A + cos^3A}{sin\,A + cos\,A} =$

$\frac{(sin\,A + cosA)(sin^2A + cos^2A - sinA.cosA)}{sin\,A + cos\,A}$

$= (1 - sinA.cosA)$

Sol.219.(c) sin $(x + y)$ = 1

$x + y = 90°$ .... (as sin90° = 1) ... (i)

cos $(x - y) = \frac{\sqrt{3}}{2}$

x - y = 30° .... (as cos30° = $\frac{\sqrt{3}}{2}$) ... (ii)

From eq . (i) and (ii)

$x = \frac{120°}{2} = 60°$ and $y = 30°$

Sol.220.(c) $(\frac{2\,cos^3\theta - cos\,\theta}{sin\theta - 2\,sin^3\theta})^2 + 1$

$= [\frac{cos\,\theta\,(2\,cos^2\theta - 1)}{sin\theta\,(1 - 2\,sin^2\theta)}]^2 + 1$

$(\because cos\,2A = 2cos^2A - 1 = 1 - 2sin^2A)$

$= cot^2\theta + 1 = cosec^2\theta$

Sol.221.(d) $sin^4\theta + cos^4\theta = 2sin^2\theta cos^2\theta$

$sin^4\theta + cos^4\theta - 2sin^2\theta cos^2\theta = 0$

$(sin^2\theta - cos^2\theta)^2 = 0$

Taking square root

$sin^2\theta - cos^2\theta = 0 \Rightarrow sin^2\theta = cos^2\theta$

$1 = \frac{cos^2\theta}{sin^2\theta} \Rightarrow 1 = cot^2\theta \Rightarrow$ cotθ = 1

Sol.222.(c) $tan^4A + tan^2A$

$tan^2A(tan^2A + 1)$

$(sec^2A - 1)(sec^2A) \Rightarrow sec^4A - sec^2A$

Sol.223.(a)

$[tan\theta + sec\theta + 1][cot\theta - cosec\theta + 1]$

$[\frac{sin\theta}{cos\theta} + \frac{1}{cos\theta} + 1][\frac{cos\theta}{sin\theta} - \frac{1}{sin\theta} + 1]$

$[\frac{(sin\theta + cos\theta) + 1}{cos\theta}][\frac{(sin\theta + cos\theta) - 1}{sin\theta}]$

$[\frac{(cos\theta + sin\theta)^2 - 1^2)}{cos\theta.sin\theta}]$

$[\frac{cos^2\theta + sin^2\theta + 2sin\theta cos\theta - 1}{cos\theta.sin\theta}]$

$[\frac{1 - 1 + 2sin\theta cos\theta}{cos\theta.sin\theta}] = [\frac{2sin\theta cos\theta}{cos\theta.sin\theta}] = 2$

Sol.224.(d)

$(cosec\theta - sin\theta)(sec\theta - cos\theta)$

$(tan\theta + cot\theta)$

$(\frac{1}{sin\,\theta} - sin\,\theta)(\frac{1}{cos\,\theta} - cos\theta)(\frac{sin\,\theta}{cos\,\theta} + \frac{cos\,\theta}{sin\,\theta})$

$(\frac{1 - sin^2\theta}{sin\,\theta})(\frac{1 - cos^2\theta}{cos\,\theta})(\frac{sin^2\theta + cos^2\theta}{cos\,\theta.sin\,\theta})$

$(\frac{cos^2\theta}{sin\,\theta})(\frac{sin^2\theta}{cos\,\theta})(\frac{1}{cos\,\theta.sin\,\theta})$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$(\frac{cos^2\theta}{sin\theta})(\frac{sin^2\theta}{cos\theta})(\frac{1}{cos\theta.sin\theta})$= 1

Short trick :-

Put θ = 45°

Sol.225.(c)

(1 + tanθ + secθ) × (1 + cotθ - cosecθ)

= $(1+\frac{Sin\theta}{Cos\theta}+\frac{1}{Cos\theta})\times(1+\frac{Cos\theta}{Sin\theta}-\frac{1}{Sin\theta})$

= $(\frac{Sin\theta+Cos\theta+1}{Cos\theta})\times(\frac{Sin\theta+Cos\theta-1}{Sin\theta})$

= $(\frac{(Sin\theta+Cos\theta)^2-(1)^2}{Cos\theta.Sin\theta})$

= $(\frac{Sin^2\theta+Cos^2\theta+2Cos\theta.Sin\theta-1}{Cos\theta.Sin\theta})$

= $(\frac{1+2Cos\theta.Sin\theta-1}{Cos\theta.Sin\theta})$ = $(\frac{2Cos\theta.Sin\theta}{Cos\theta.Sin\theta})$

= 2

Short trick -

Put θ = 45°

Sol.226.(a) Formula used :- tan(A + B)

= $\frac{tan\,A+tan\,B}{1-tan\,A.tan\,B}$

Then, $\frac{tan\,71°+tan\,19°}{1-tan\,71°tan\,19°}$

= tan(71° + 19°) = tan(90°) = not defined

Sol.227.(b) sin(x + y) = cos {3(x + y)}

When, Sin a = cos b then a + b = 90°

Hence,

(x + y) + 3(x + y) = 90°

4(x + y) = 90° ⇒ 2(x + y) = 45°

Now,

cot 2(x + y) =cot (45°) = cot 45° = 1

Sol.228.(a)

Identity used :- $Sin2A$ = $2SinA\ CosA$ and $Cos2A$ = 1 - $2Sin^2A$

Now, $\frac{2cos15°\,sin15°}{cos^2 15°-sin^2 15°}$

= $\frac{Sin2(15°)}{1-Sin^2 15°-sin^2 15°}$= $\frac{Sin30°}{1-2Sin^2 15°}$

= $\frac{Sin30°}{Cos2(15°)}$ = $\frac{Sin30°}{Cos30°}$ = $\frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}}$ = $\frac{1}{\sqrt{3}}$

Sol.229.(c) $\frac{17}{sec^2\theta}$ + 10 $sin^2\theta$+ $\frac{7}{1+cot^2\theta}$

= $17cos^2\theta$ + 10 $sin^2\theta$ + $\frac{7}{1+\frac{cos^2\theta}{sin^2\theta}}$

= $17cos^2\theta$ + 10 $sin^2\theta$ + $\frac{7sin^2\theta}{sin^2\theta+cos^2\theta}$

= $17cos^2\theta$ + 10 $sin^2\theta$ + $7sin^2\theta$

= $17(cos^2\theta+sin^2\theta)$ ⇒ 17

Sol.230.(c) $sin^2$15° + $sin^2$25° + $sin^2$35° + $sin^2$45° + $sin^2$55° + $sin^2$65°+ $sin^2$75°

= sin^2(90° - 75°) + sin^2(90° - 65°) + sin^2(90° - 55°) + $sin^2$45° + $sin^2$55° + $sin^2$65°+ $sin^2$75°

= cos^2 75° + cos^2 65° + cos^2 55° + $sin^2$45° + $sin^2$55° + $sin^2$65°+ $sin^2$75°

= cos^2 75° + $sin^2$75° + cos^2 65° + $sin^2$65° + cos^2 55° + $sin^2$55° + $sin^2$45°

= 1 + 1 + 1 + $\frac{1}{2}$ ⇒ 3 + $\frac{1}{2}$ = $\frac{7}{2}$

Sol.231.(a) $7(\frac{cosec\,24°}{sec\,66°})^3$ + $8(\frac{cot\,37°}{tan\,53°})^4$ - $(2\frac{sec\,14°}{cosec\,76°})^2$ + $(-3\frac{tan\,82°}{cot\,8°})^3$

⇒ $7(\frac{cosec\,24°}{sec\,(90-24°)})^3$ + $8(\frac{cot\,37°}{tan\,(90-37°)})^4$ -$(2\frac{sec\,14°}{cosec\,(90-14°)})^2$ + $(-3\frac{tan\,82°}{cot\,(90-82)°})^3$

⇒ $7(\frac{cosec\,24°}{cosec\,24°})^3$ + $8(\frac{cot\,37°}{cot\,37°})^4$ - $(2\frac{sec\,14°}{sec\,14°})^2$ + $(-3\frac{tan\,82°}{tan\,82°})^3$

⇒ $7(1)^3$+ $8(1)^4$- $(2)^2$ + $(-3)^3$

⇒ 7 + 8 - 4 - 27 = -16

Sol.232.(a) Given, 8 tan A = 5

⇒ tan A = $\frac{5}{8}$

Now, $\frac{8sinA-7cosA}{8sinA+11cosA}$

On dividing numerator and denominator by cos A, we get

⇒ $\frac{8\frac{sin\,A}{Cos\,A}-7}{8\frac{Sin\,A}{Cos\,A}+11}$ = $\frac{8\,tan\,A-7}{8\,tan\,A+11}$

⇒ $\frac{8\times\frac{5}{8}-7}{8\times\frac{5}{8}+11}$ ⇒ $\frac{5-7}{5+11}$ = $\frac{-2}{16}$ = $\frac{-1}{8}$

Sol.233.(b) Let A = 45°

(a) LHS = Cos^2A Cot^2A

= $Cos^2$45 $Cot^2$45 = $\frac{1}{2}$

RHS = Cot^2A - Cos^2A

= $Cot^2$45 - $Cos^2$45 = 1 - $\frac{1}{2}$ = $\frac{1}{2}$

(b) $\frac{1+Tan^2A}{Tan^2A}$ = sin^2A

LHS = $\frac{1+Tan^2A}{Tan^2A}$ = $\frac{1+1}{1}$ = 2

RHS = sin^2A = $sin^2$45 = $\frac{1}{2}$

Hence LHS ≠ RHS

⇒ $\frac{1+Tan^2A}{Tan^2A}$ = sin^2A (not the correct formula).

Sol.234.(c) Given expression

$\frac{5cos^2120°+4sec^2 30°-tan^2 135°}{sin^2 30°+cos^2 30°}$

⇒ $\frac{5\,(\frac{1}{2})(\frac{1}{2})+4\,(\frac{2}{\sqrt{3}})(\frac{2}{\sqrt{3}})-(-1)(-1)}{(\frac{1}{2})(\frac{1}{2})+(\frac{\sqrt{3}}{2})\,(\frac{\sqrt{3}}{2})}$

⇒ $\frac{\frac{5}{4}+\frac{16}{3}-1}{\frac{1}{4}+\frac{3}{4}}$ ⇒ $\frac{\frac{67}{12}}{\frac{4}{4}}$ = $\frac{67}{12}$

Sol.235.(b)

$(\frac{sin\,23°\,cos\,67°+cos\,23°\,sin\,67°}{cosec^2\,15°-tan^2\,75°})^3$

⇒ $(\frac{sin23°cos\,(90-23)°+cos23°sin(90-23)°}{cosec^2 15°-tan^2(90-15)°})^3$

⇒ $(\frac{sin\,23°\,sin\,23°+cos\,23°\,cos\,23°}{cosec^2\,15°-cot^2\,15°})^3$

⇒ $(\frac{sin^2\,23°+cos^2\,23°}{1})^3$ (since $cosec^2\,\theta$ - $cot^2\theta$ = 1 and $sin^2\,\theta$ + $cos^2\,\theta$ = 1)

= 1^3 = 1

Sol.236.(a) We know

$Cosec^2A$ - Cot^2A = 1

⇒ $Cosec^2A$ - $(\frac{2p}{p^2-1})^2$ = 1

⇒ $Cosec^2A$ = 1 + $(\frac{2p}{p^2-1})^2$

⇒ $Cosec^2A$ = $\frac{p^4+1-2p^2+4p^2}{(p^2-1)^2}$

⇒ $Cosec^2A$ = $\frac{p^4+1+2p^2}{(p^2-1)^2}$

⇒ $Cosec^2A$ = $\frac{(p^2+1)^2}{(p^2-1)^2}$

⇒ Cosec A = $\frac{p^2+1}{p^2-1}$

Sol.237.(c)

cosecθ $[\frac{1+cos\theta}{sin\theta}+\frac{sin\theta}{1+cos\theta}]$ - 2 $cot^2\theta$

= cosecθ $[\frac{(1+cos\,\theta)^2+sin^2\theta}{(sin\,\theta)(1+cos\theta)}]$ - 2 $cot^2\theta$

= cosecθ $[\frac{1+cos^2\,\theta+2cos\,\theta+sin^2\theta}{(sin\,\theta)(1+cos\theta)}]$ - 2 $cot^2\theta$

= cosecθ $[\frac{1+1+2cos\,\theta}{(sin\,\theta)(1+cos\theta)}]$ - 2 $cot^2\theta$

($\because sin^2\theta$ + $cos^2\theta$ = 1)

= cosecθ × $\frac{2}{sin\,\theta}$ - 2 $cot^2\theta$

= 2 $cosec^2\theta$ - 2 $cot^2\,\theta$ = 2

($\because$ $cosec^2\,\theta$ - $cot^2\,\theta$ = 1)

Sol.238.(c) (sin A + cos A) = $\frac{4}{3}$

Squaring both side , we have ;

sin^2A + cos^2A + 2sinAcosA = $\frac{16}{9}$

1+2sinAcosA = $\frac{16}{9}$(As, sin^2A+cos^2A = 1)

2sinAcosA = $\frac{16}{9}$ - 1 = $\frac{7}{9}$

⇒ sinAcosA = $\frac{7}{9\times2}$ = $\frac{7}{18}$

tanA + cotA = $\frac{sinA}{cosA}$ + $\frac{cosA}{sinA}$

= $\frac{sin^2A+cos^2A}{cosAsinA}$ = $\frac{1}{sinAcosA}$ = $\frac{1}{\frac{7}{18}}$ = $\frac{18}{7}$

Sol.239.(c) $sin^2\theta$ + $cos^2\theta$ − 1 = 0

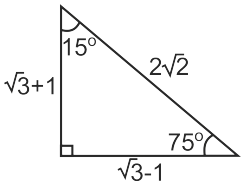
$sin^2\theta$ + $cos^2\theta$ = 1

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Clearly we can see that there are infinitely many values which satisfy the given expression.

Sol.240.(a)



Sin75° = $\frac{\sqrt{3}+1}{2\sqrt{2}}$

Sin15° = $\frac{\sqrt{3}-1}{2\sqrt{2}}$

sin 75° + sin 15° = $\frac{\sqrt{3}+1}{2\sqrt{2}} + \frac{\sqrt{3}-1}{2\sqrt{2}}$

= $\frac{\sqrt{3}+1+\sqrt{3}-1}{2\sqrt{2}} = \frac{2\sqrt{3}}{2\sqrt{2}} = \frac{\sqrt{3}\times\sqrt{2}}{\sqrt{2}\times\sqrt{2}} = \frac{\sqrt{6}}{2}$

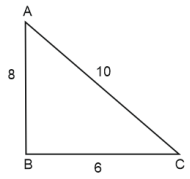
Sol.241.(b) As we know,
sin(90° - θ) = cosθ
cos(90° - θ) = sinθ

$\frac{\cos 25° - \sin 65°}{\cos 25° + \sin 65°} = \frac{\sin 65° - \sin 65°}{\sin 65° + \sin 65°}$

= $\frac{0}{2\sin 65°}$ = 0

Sol.242.(a) sin(5x − 40°) = cos (5y + 40°)
cos[90°- (5x - 40°)] = cos(5y + 40°)
130°- 5x = 5y + 40° ⇒ 5y + 5x = 90°
x + y = 18°

Sol.243.(a) According to the question, we have given triangle;



$\tan^2 A = (\frac{6}{8})^2 = \frac{36}{64} = \frac{9}{16}$

$\cos^2 C = (\frac{6}{10})^2 = \frac{36}{100} = \frac{9}{25}$

$\tan^2 A + \cos^2 C = \frac{9}{16} + \frac{9}{25} = 9(\frac{25+16}{400})$

$= 9 \times \frac{41}{400} = \frac{369}{400}$

Sol.244.(c) sinθ + $\frac{1}{\sin\theta} = \sqrt{5}$

Then, $\sin^3\theta + \frac{1}{\sin^3\theta} = (\sin\theta + \frac{1}{\sin\theta})^3 - 3(\sin\theta + \frac{1}{\sin\theta})$

$= (\sqrt{5})^3 - 3\sqrt{5} = 5\sqrt{5} - 3\sqrt{5} = 2\sqrt{5}$

Sol.245.(b) cos 2θ = 0
cos2θ = cos 90° ⇒ 2θ = 90°
θ = $(\frac{90°}{2})$ = 45°

sin (75° - θ) = sin(75°- 45°) = sin30° = $\frac{1}{2}$

Sol.246.(c) Psin60° = Qcosec45°

P × $\frac{\sqrt{3}}{2}$ = Q × $\sqrt{2}$ ⇒ $\frac{P}{Q} = \frac{2\sqrt{2}}{\sqrt{3}}$

$\frac{P^2+Q^2}{P^2-Q^2} = \frac{(2\sqrt{2})^2+(\sqrt{3})^2}{(2\sqrt{2})^2-(\sqrt{3})^2} = \frac{8+3}{8-3} = \frac{11}{5}$

Sol.247.(d)
$\tan^2\theta + \tan^4\theta = \tan^2\theta(1 + \tan^2\theta)$
$= \tan^2\theta . \sec^2\theta = (\sec^2\theta - 1).\sec^2\theta$
$= \sec^4\theta - \sec^2\theta$

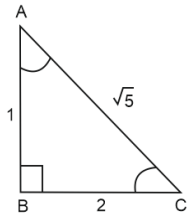
Sol.248.(c) $\cos\theta - \sin\theta = \sqrt{2}\sin\theta$
Squaring both sides we get,
$\Rightarrow (\cos\theta - \sin\theta)^2 = 2\sin^2\theta$
$\Rightarrow \cos^2\theta + \sin^2\theta - 2\cos\theta\sin\theta = 2\sin^2\theta$
$\Rightarrow \cos^2\theta + \sin^2\theta - 2\sin^2\theta = 2\cos\theta\sin\theta$
$\Rightarrow \cos^2\theta - \sin^2\theta = 2\cos\theta\sin\theta$
$\Rightarrow (\cos\theta - \sin\theta)(\cos\theta + \sin\theta)$
$= 2\cos\theta\sin\theta$
$\Rightarrow \sqrt{2}\sin\theta(\cos\theta + \sin\theta) = 2\cos\theta\sin\theta$
$\Rightarrow (\cos\theta + \sin\theta) = \sqrt{2}\cos\theta$

Sol.249.(d) According to the question,
$(1 + \sin^4 A - \cos^4 A)\operatorname{cosec}^2 A$
On Putting A = 90°
$(1 + 1^4 - 0^4)1^2 = 2$

Sol.250.(a) According to the question,
$\cos A = \frac{base}{hypotenuse} = \frac{15}{17}$
So the perpendicular = 8 (8, 15, 17 pythagorean triples)
Cot (90° - A) = tanA
tanA = $\frac{perpendicular}{base} = \frac{8}{15}$

Sol.251.(d)
If sin A = cos B then, A + B = 90°
sin 2A = cos 15°
$\Rightarrow 2A + 15° = 90° \Rightarrow A = 37.5°$

Sol.252.(d)



cos A + tan C = $\frac{1}{\sqrt{5}} + \frac{1}{2} = \frac{2+\sqrt{5}}{2\sqrt{5}}$

Sol.253.(c) According to the question,
secA - tanA = p

secA + tanA = $\frac{1}{p}$ ⇒ secA = $\frac{p^2+1}{2p}$

Sol.254.(d) $\sqrt{\frac{1-\tan A}{1+\tan A}}$

$= \sqrt{\frac{1-\frac{\sin A}{\cos A}}{1+\frac{\sin A}{\cos A}}} = \sqrt{\frac{\frac{\cos A - \sin A}{\cos A}}{\frac{\cos A + \sin A}{\cos A}}}$

$= \sqrt{\frac{\cos A - \sin A}{\cos A + \sin A} \times \frac{\cos A - \sin A}{\cos A - \sin A}}$

$= \sqrt{\frac{(\cos A - \sin A)^2}{\cos^2 A - \sin^2 A}}$

$= \sqrt{\frac{1 - 2\sin A\cos A}{\cos^2 A - \sin^2 A}} = \sqrt{\frac{1-\sin 2A}{\cos 2A}}$

Sol.255.(d)

$\sqrt{\frac{1+\sin A}{1-\sin A}} = \sqrt{\frac{1+\sin A}{1-\sin A} \times \frac{1+\sin A}{1+\sin A}}$

$= \sqrt{\frac{(1+\sin A)^2}{(1-\sin A)(1+\sin A)}}$

$= \frac{(1+\sin A)}{\sqrt{1-\sin^2 A}} = \frac{(1+\sin A)}{\cos A}$ = secA + tanA

Sol.256.(c) sinA = $\frac{2}{3} = \frac{perpendicular}{hypotenuse}$
Then, base = $\sqrt{9-4} = \sqrt{5}$
Now, $(7 - \tan A)(3 + \cos A)$
$= (7 - \frac{2}{\sqrt{5}})(3 + \frac{\sqrt{5}}{3})$
$= (21 - \frac{2}{3}) + (\frac{7\sqrt{5}}{3} - \frac{6}{\sqrt{5}})$
$= \frac{61}{3} + \frac{17}{3\sqrt{5}}$

Sol.257.(b) sinβ = $\frac{1}{3}$
Then, $(\sec\beta - \tan\beta)^2$
$= (\frac{1}{\cos\beta} - \frac{\sin\beta}{\cos\beta})^2 = (\frac{1-\sin\beta}{\cos\beta})^2$
$= \frac{(1-\sin\beta)^2}{\cos^2\beta} = \frac{(1-\sin\beta)^2}{1-\sin^2\beta} = \frac{(1-\frac{1}{3})^2}{1-\frac{1}{9}}$
$= \frac{1}{2}$

Sol.258.(c) $\frac{\sin^2 39° + \sin^2(90° - 39°)}{\cos^2 35° + \cos^2(90° - 35°)}$ + 3tan25°tan 65°
$= \frac{\sin^2 39° + \cos^2 39°}{\cos^2 35 + \sin^2 35}$ + 3tan25° × $\frac{1}{\tan 25°}$
= 1 + 3 = 4

Sol.259.(b) According to the question,
tanθ + cotθ = 2
On Putting θ =45°
1 + 1 = 2 (satisfied)
Now,
$2\tan^{25}\theta + 3\cot^{20}\theta + 5\tan^{30}\theta\cot^{15}\theta$
2 × 1 + 3 × 1 + 5 × 1 × 1 = 10

Sol.260.(b) According to the question,
sin(50° + A) - cos(40° - A)
Let A = 10°
Then sin60° - cos30° = $\frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2}$ = 0

Sol.261.(a) According to the question,
Sinθ + cosθ = $\sqrt{2}$ cosθ
Sinθ = cosθ($\sqrt{2} - 1$)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

now, $\frac{\sin\theta - \cos\theta}{\sin\theta} = \frac{\sin\theta}{\sin\theta} - \frac{\cos\theta}{\sin\theta}$

$1 - \frac{\cos\theta}{\cos\theta(\sqrt{2}-1)}$

$= 1 - \frac{1}{\sqrt{2}-1} \times \frac{(\sqrt{2}+1)}{(\sqrt{2}+1)} = -\sqrt{2}$

Sol.262.(b) $\frac{\cos\theta}{\sec\theta - 1} + \frac{\cos\theta}{\sec\theta + 1}$

$= \cos\theta\left(\frac{\sec\theta + 1 + \sec\theta - 1}{\tan^2\theta}\right)$

$= \cos\theta\left(\frac{2\sec\theta}{\tan^2\theta}\right) = 2\cot^2\theta$

Sol.263.(d) $\sin\theta - \cos\theta = 0$

$\sin\theta = \cos\theta \Rightarrow \theta = 45°$

Now , $\sin(\pi - \theta) + \sin\left(\frac{\pi}{2} - \theta\right)$

$= \sin(\theta) + \cos(\theta) = \sin(45°) + \cos(45°)$

$= \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}} = \sqrt{2}$

Sol.264.(a) $\cos\theta + \sec\theta = \sqrt{3}$

$\cos^3\theta + \sec^3\theta = \left(\sqrt{3}\right)^3 - 3(\sqrt{3}) = 0$

Sol.265.(a)

Pythagoras triplets :- (16 , 63 ,65)

$\cos A = \frac{63}{65} \Rightarrow \sin A = \frac{16}{65}$

Now , $\tan A + \cot A = \frac{1}{\sin A.\cos A}$

$= \frac{65 \times 65}{16 \times 63} = 4.19$

Sol.266.(a) $\frac{\cos\theta}{(1+\sin\theta)} + \frac{\cos\theta}{(1-\sin\theta)} = 4$

$\frac{2}{(\cos^2\theta)} = \frac{4}{\cos\theta} \Rightarrow \cos\theta = \frac{1}{2} \Rightarrow \theta = 60°$

Sol.267.(c) $\sin\alpha + \cos\alpha = \frac{2}{\sqrt{3}}$

$1 + 2\sin\alpha\cos\alpha = \frac{4}{3}$

$\sin 2\alpha = \frac{4}{3} - 1 = \frac{1}{3}$

Now , $\tan\alpha + \cot\alpha = \frac{2}{\sin 2\alpha} = 6$

Sol.268.(d) $(\operatorname{cosec}^2 B - 1)(\sec^2 B - 1)$

$(\cot^2 B)(\tan^2 B) = 1$

Sol.269.(a) $\sin\theta + \cos\theta = \frac{1}{29} \Rightarrow 2\sin\theta$

$\cos\theta = \left(\frac{1}{29}\right)^2 - 1 = \left(\frac{-840}{841}\right)$

$\sin\theta - \cos\theta = \sqrt{1 - \left(\frac{-840}{841}\right)}$

$= \frac{41}{29}$

Now , $\frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta} = \frac{1}{29} \times \frac{29}{41} = \frac{1}{41}$

Sol.270.(c)

$\frac{(1+\tan^2 A)}{\operatorname{cosec}^2 A \times \tan A} = \frac{(\sec^2 A)}{\operatorname{cosec}^2 A \times \tan A}$

$= \frac{(\sin^2 A)}{\cos^2 A \times \tan A} = \tan A$

Sol.271.(b) $\cos^4 A - \sin^4 A$

$= (\cos^2 A - \sin^2 A)(\cos^2 A + \sin^2 A)$

$= 1 - 2\sin^2 A$

Sol.272.(b) $\operatorname{cosec}\theta = \frac{29}{22}$

$\cot^2\theta = \operatorname{cosec}^2\theta - 1 = \frac{841}{484} - 1 = \frac{357}{484}$

Sol.273.(a)

$\sin A\left(1 + \frac{\sin A}{\cos A}\right) + \cos A\left(1 + \frac{\cos A}{\sin A}\right)$

$= \sin A + \frac{\sin^2 A}{\cos A} + \cos A + \frac{\cos^2 A}{\sin A}$

$= \frac{\sin^2 A + \cos^2 A}{\cos A} + \frac{\sin^2 A + \cos^2 A}{\sin A}$

$= \frac{1}{\cos A} + \frac{1}{\sin A} = \sec A + \operatorname{cosec} A$

Sol.274.(a) $\frac{3 - \sin^2 A + \cos^2 A}{2 + 2\cos^2 A}$

$= \frac{\sin^2 A + \cos^2 A + 2 - \sin^2 A + \cos^2 A}{2 + 2\cos^2 A}$

$= \frac{\cos^2 A + 2 + \cos^2 A}{2 + 2\cos^2 A} = 1$

Sol.275.(a) $\sec\theta + \tan\theta = \sqrt{3}$

$\sec\theta - \tan\theta = \frac{1}{\sqrt{3}}$

$\sec\theta = \frac{\sqrt{3} + \frac{1}{\sqrt{3}}}{2} = \frac{2}{\sqrt{3}} \Rightarrow \theta = 30°$

Now , $\sin\theta + \cos\theta = \frac{1}{2} + \frac{\sqrt{3}}{2} = \frac{1+\sqrt{3}}{2}$

Sol.276.(a) $2\tan^2 A + 4\cos^4 A = 3$

Put A = 45°

$2\tan^2 45° + 4\cos^4 45°$

$= 2 \times 1 + 4 \times \left(\frac{1}{\sqrt{2}}\right)^4 = 2 + 1 = 3$

Sol.277.(a) $\cot^2 A - \cos^2 A =$

$\cot^2 A \,.\, \cos^2 A$ ....(identity)

$a^2 = \cot^2 A + \cos^2 A + 2.\cot A.\cos A$

$b^2 = \cot^2 A + \cos^2 A - 2.\cot A.\cos A$

$ab = \cot^2 A - \cos^2 A$

Now ,

$a^2 - b^2 - 4\sqrt{ab} = 4.\cot A.\cos A - 4\sqrt{\cot^2 A - \cos^2 A}$

$= 4.\cot A.\cos A - 4.\cot A.\cos A = 0$

Sol.278.(b) $1 - \frac{\tan^2\phi}{\sec^2\phi} = \frac{\sec^2\phi - \tan^2\phi}{\sec^2\phi}$

$= \frac{1}{\sec^2\phi} = \cos^2\phi = \frac{\sin^2\phi.\cos^2\phi}{\sin^2\phi}$

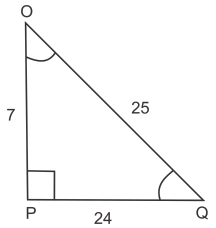
$= \sin^2\phi \,.\, \cot^2\phi$

Sol.279.(c) $1 + \cot^2 B = \operatorname{cosec}^2 B$

$\cot^2 B - \operatorname{cosec}^2 B = -1$

Sol.280.(c)

Pythagoras triplets:- (7 , 24 , 25)



$\sin Q + \cos Q = \frac{7}{25} + \frac{24}{25} = \frac{31}{25}$

Sol.281.(a) $\frac{2\sec A}{\sec^2 A - 1} = \frac{2\cot^2 A}{\cos A}$

$= \frac{2\cos A}{\sin^2 A} = \frac{2\cot A}{\sin A} = 2\operatorname{cosec} A \,.\, \cot A$

Sol.282.(a) $\frac{\cos^2 A}{(1+\sin A)} = \frac{1 - \sin^2 A}{(1+\sin A)}$

$= \frac{(1+\sin A)(1-\sin A)}{(1+\sin A)} = (1 - \sin A)$

Sol.283.(b)

If A + B = 90° then $\sin^2 A + \sin^2 B = 1$

$\sin^2 30° + \sin^2 40° + \sin^2 45° + \sin^2 55° + \sin^2 35° + \sin^2 45° + \sin^2 50° + \sin^2 60°$

$= \sin^2 30° + \sin^2 60° + \sin^2 40° + \sin^2 50° + \sin^2 45° + \sin^2 45° + \sin^2 55° + \sin^2 35°$

$= 1 + 1 + 1 + 1 = 4$

Sol.284.(a)

If A + B = 90° , Then $\sin^2 A + \sin^2 B = 1$

and $\cos^2 A + \cos^2 B = 1$

$\frac{\sin^2 32° + \sin^2 58°}{\cos^2 32° + \cos^2 58°} + \sin^2 53° + \cos 53°.\sin 37°$

$= \frac{\sin^2 32° + \sin^2 58°}{\cos^2 32° + \cos^2 58°} + \sin^2 53° + \cos^2 53$

$= \frac{1}{1} + 1 = 2$

Sol.285.(b) $\frac{1}{\sin\theta} - \frac{\cot^2\theta}{1 + \operatorname{cosec}\theta}$

$= \operatorname{cosec}\theta - \frac{(\operatorname{cosec}\theta - 1)(\operatorname{cosec}\theta + 1)}{1 + \operatorname{cosec}\theta}$

$= \operatorname{cosec}\theta - \operatorname{cosec}\theta + 1 = 1$

Sol.286.(a)

$\frac{\sin 58°}{\cos 32°} + \frac{\sin 55° \,.\, \sec 35°}{\tan 5°.\tan 45°.\tan 85°}$

$= \frac{\cos 32°}{\cos 32°} + \frac{\sin 55° \,.\, \operatorname{cosec} 55°}{\tan 5°.\tan 85°}$

$= 1 + \frac{1}{\tan 5°.\cot 5°} = 1 + 1 = 2$

Sol.287.(c) $\sec\theta = \frac{50}{23} \Rightarrow \sec^2\theta = \frac{2500}{529}$

$\tan^2\theta = \sec^2\theta - 1 = \frac{2500 - 529}{529}$

$= \frac{1971}{529} = 3\frac{384}{529}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.288.(d) $\frac{\cos^2 25° - \sin^2 65°}{\cos^2 25° + \sin^2 65°}$ =

$\frac{\cos^2 25° - \cos^2 25°}{\cos^2 25° + \sin^2 65°}$ = 0

Sol.289.(b) $\frac{\cot^3 A - 1}{\cot A - 1}$

= $\frac{(\cot A - 1)(\cot^2 A + 1^2 + 1 \times \cot A)}{\cot A - 1}$

= $(\operatorname{cosec}^2 A + \cot A)$

Sol.290.(d) If $\sec\theta + \tan\theta$ = a

Then , $\sec\theta - \tan\theta = \frac{1}{a}$

on solving above equation , we get

$\sec\theta = \frac{a + \frac{1}{a}}{2} = \frac{a^2 + 1}{2a}$

Sol.291.(d) $\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A} + 2$

= $\frac{1 - \sin A}{\cos A} + \frac{1 + \sin A}{\cos A} + 2$

= $\frac{1 - \sin A + 1 + \sin A}{\cos A} + 2$

= $2\sec A + 2 = 2(1 + \sec A)$

Sol.292.(a) $\sec\theta + \tan\theta = \frac{1}{\sqrt{3}}$

$\sec\theta - \tan\theta = \sqrt{3}$

$\sec\theta = \frac{\frac{1}{\sqrt{3}} + \sqrt{3}}{2} = \frac{2}{\sqrt{3}} \Rightarrow \cos\theta = \frac{\sqrt{3}}{2}$

Therefore , θ = 30°

Now , $\cot\theta + \cos\theta = \sqrt{3} + \frac{\sqrt{3}}{2} = \frac{3\sqrt{3}}{2}$

Sol.293.(c) $\frac{\sin\theta - \operatorname{Cos}\theta}{\sin\theta + \operatorname{Cos}\theta} = \frac{4}{5}$

$\frac{\sin\theta - \operatorname{Cos}\theta + \sin\theta + \operatorname{Cos}\theta}{\sin\theta - \operatorname{Cos}\theta - \sin\theta - \operatorname{Cos}\theta} = \frac{4 + 5}{4 - 5}$

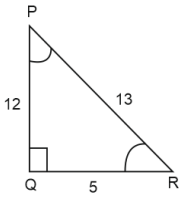
$\frac{2\sin\theta}{-2\operatorname{Cos}\theta} = \frac{9}{-1} \Rightarrow \cot\theta = \frac{1}{9}$

$\operatorname{cosec}^2\theta = 1 + (\frac{1}{9})^2 = (\frac{82}{81})$

Now , $\frac{\operatorname{cosec}^2\theta}{2 - \operatorname{cosec}^2\theta} = \frac{\frac{82}{81}}{2 - \frac{82}{81}}$

= $\frac{82}{80} = \frac{41}{40}$

Sol.294.(c)



$\tan P + \cot R = \frac{5}{12} + \frac{5}{12} = \frac{10}{12}$

Sol.295.(d) $\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A.\tan B}$

= $\frac{\frac{1}{2} + \frac{1}{3}}{1 - \frac{1}{2} \times \frac{1}{3}} = \frac{\frac{5}{6}}{1 - \frac{1}{6}} = 1$

⇒ A + B = 45°

Sol.296.(d) $\tan A = \frac{12}{5}$

$\frac{5(1 - \cos^2 A)}{6(1 - \sin^2 A)} = \frac{5(\sin^2 A)}{6(\cos^2 A)} = \frac{5}{6} \times \tan^2 A$

= $\frac{5}{6} \times \frac{144}{25} = \frac{24}{5}$

Sol.297.(c) $\tan\theta.\tan 2\theta = 1$

Put θ = 30° , Then

$\tan 30°.\tan 60° = \frac{1}{\sqrt{3}} \times \sqrt{3} = 1$

....(satisfied)

$\cot 5\theta = \cot(150°) = \cot(90° + 60°)$

$= -\tan 60° = -\sqrt{3}$

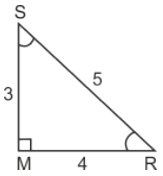
Sol.298.(c) $4\sin^2 A - 3 = 0$

Multiply by $\sin A$, both sides

$4\sin^3 A - 3\sin A = 0$ or

$3\sin A - 4\sin^3 A = 0$

Sol.299.(b) Pythagoras triplets :- (3, 4, 5)



Sec R = $\frac{\text{Hypotenuse}}{\text{Base}} = \frac{5}{4}$

Sol.300.(d) $2(\tan^2 A.\cos^2 A + \cos^2 A)$

= $2\cos^2 A(\tan^2 A + 1)$

= $2\cos^2 A(\sec^2 A) = 2$

Sol.301.(d)

$\tan(A + B - C) = \frac{1}{\sqrt{3}} = \tan 30°$

⇒ (A + B – C) = 30° .....e.q .(1)

$\cos(B + C - A) = \frac{1}{2} = \cos 60°$

⇒ (B + C – A) = 60° .....e.q .(2)

$\sin(C + A - B) = \frac{1}{\sqrt{2}} = \sin 45°$

⇒ (C + A – B) = 45° .....e.q .(3)

Adding e.q .(1) , e.q .(2) and e.q .(3) , we get

A + B + C = 30° + 60° + 45° = 135°

Sol.302.(d) $\frac{(1 + \sec\phi)}{\sec\phi} \times (1 - \cos\phi)$

= $(1 + \cos\phi)(1 - \cos\phi)$

= $(1 - \cos^2\phi) = \sin^2\phi$

Sol.303.(c) $\sec C + \sin C . \sec C$

= $\sec C + \tan C = \sec 45° + \tan 45°$

= $\sqrt{2} + 1$

Sol.304.(b) $4\sin\theta + 5\cos\theta = 3$

$4\cos\theta - 5\sin\theta = x$

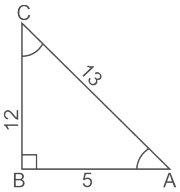
$(4)^2 + (5)^2 = (3)^2 + (x)^2$

$x = \sqrt{16 + 25 - 9} = \sqrt{32} = 4\sqrt{2}$

Sol.305.(b)

Pythagorean triplets:- (5, 12, 13)

$\tan A = \frac{\text{Perpendicular}}{\text{Base}} = \frac{12}{5}$



$\operatorname{cosec} A = \frac{\text{Hypotenuse}}{\text{Perpendicular}} = \frac{13}{12}$

$\sec A = \frac{\text{Hypotenuse}}{\text{Base}} = \frac{13}{5}$

Sol.306.(a) $\cos\theta = \sin\theta \Rightarrow \theta = 45°$

Now , $\sin^8\theta + \cos^8\theta = (\frac{1}{\sqrt{2}})^8 + (\frac{1}{\sqrt{2}})^8$

= $\frac{1}{16} + \frac{1}{16} = \frac{1}{8}$

Sol.307.(d) $\frac{3(\sin^4 Z - \cos^4 Z + 1)}{\sin^2 Z}$

= $\frac{3[(\sin^2 Z + \cos^2 Z)(\sin^2 Z - \cos^2 Z) + 1]}{\sin^2 Z}$ ∵

$(\sin^2 Z + \cos^2 Z = 1)$

= $\frac{3(\sin^2 Z - \cos^2 Z + 1)}{\sin^2 Z}$

= $\frac{3(\sin^2 Z + \sin^2 Z)}{\sin^2 Z}$ ∵ $(1 - \cos^2 Z = \sin^2 Z)$

= $\frac{3 \times 2\sin^2 Z}{\sin^2 Z} = 6$

Short trick : Put Z = 90°

$\frac{3(\sin^4 Z - \cos^4 Z + 1)}{\sin^2 Z} = \frac{3(1 - 0 + 1)}{1} = 6$

Sol.308.(c)

Sin 47° Cos 33°– Cos 43° Sin 57°

= Sin (90° – 43°) Cos 33° – Cos 43° Sin (90° – 33°)

= Cos 43° Cos 33°– Cos 43° cos 33° = 0

Sol.309.(a) $\frac{1 + \sin A}{\cos A} + \frac{\cos A}{1 + \sin A}$

= $\frac{(1 + \sin A)^2 + (\cos A)^2}{(1 + \sin A)\cos A}$

= $\frac{1 + \sin^2 A + 2\sin A + \cos^2 A}{(1 + \sin A)\cos A}$

= $\frac{2 + 2\sin A}{(1 + \sin A)\cos A}$

= $\frac{2(1 + \sin A)}{(1 + \sin A)\cos A}$ = 2 sec A

Sol.310.(b) (1 + tan² A)(1 + cot² A)

(sec² A)(cosec² A) = $\frac{1}{\cos^2 A} \times \frac{1}{\sin^2 A}$

= $\frac{1}{\sin^2 A(1 - \sin^2 A)}$

Sol.311.(c) According to the question,

$\frac{\cos B}{\sin B} - \frac{\sin B}{\cos B}$ × (sin B. cos B)

= $\frac{(\cos B)^2 - (\sin B)^2}{\sin B.\cos B}$ × (sin B. cos B)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= 2\cos^2 B - 1$

Sol.312.(d) Given:- $cot^2\theta - cosec^2\theta$ = ?

$cosec^2\theta - cot^2\theta = 1$

$-(cot^2\theta - cosec^2\theta) = 1$

$cot^2\theta - cosec^2\theta = -1$

Sol.313.(d) According to the question,

$(sin^4\theta + cos^4\theta) = (sin^2\theta + cos^2\theta)^2 - 2sin^2\theta . cos^2\theta$

We know that $(sin^2\theta + cos^2\theta) = 1$

$1^2 - 2 \times (\frac{1}{\sqrt{3}})^2 = \frac{1}{3}$

Sol.314.(d) According to the question,

$\sqrt{\frac{1 + cos P \times (1 + cosP)}{1 - cos P \times (1 + cosP)}} = \frac{1 + cosP}{sinP}$

= cosec P + cot P

Sol.315.(c) $tan(50 + \theta) - cot(40 - \theta)$

$= tan(50 + \theta) - cot[90 - (50 + \theta)]$ { $cot(90 - \theta) = tan\theta$ }

$= tan(50 + \theta) - tan(50 + \theta) = 0$

Sol.316.(a) (1 - sin²A) cosec²A

= (cos²A) cosec²A = $\frac{cos^2A}{sin^2A}$ = cot²A

Sol.317.(d)

Tan15°= 2 - $\sqrt{3}$ ⇒ Cot15° = 2 + $\sqrt{3}$

Tan 15° Cot 75° + Tan 75° Cot 15°

= Tan 15° Cot(90° −15°) + Tan (90°− 15°) Cot 15°

= Tan 15° Tan 15° + Cot 15° Cot 15°

$= (Tan\ 15°)^2 + (Cot\ 15°)^2$

$= (2 - \sqrt{3})^2 + (2 + \sqrt{3})^2$

$= 4 + 3 - 4\sqrt{3} + 4 + 3 + 4\sqrt{3} = 14$

Sol.318.(c) $\frac{3sin\theta - cos\theta}{cos\theta + sin\theta} = 1$

$2sin\theta = 2cos\theta \Rightarrow \frac{cos\theta}{sin\theta} = \frac{2}{2} \Rightarrow cot\theta = 1$

Sol.319.(d) Formula used : cos (A - B)

= cosA .cosB + sinA.sin B

cos(36° + A).cos(36°− A) + cos(54° + A). cos(54°− A)

⇒ cos(36°+ A).cos(36°− A) + cos[90 − (36°− A)] .cos[90−(36°+ A)].

⇒ cos(36°+ A).cos(36°− A) + sin (36°+ A) sin (36°- A)

⇒ cos [36°+ A − (36°− A)] ⇒ cos(2A)

Sol.320.(d)

sin 23° = $\frac{a}{b} = \frac{Perpendicular}{Hypotenuse}$

Base = $\sqrt{b^2 - a^2}$

sec 23° − sin 67° = sec 23° − cos 23°

$= \frac{b}{\sqrt{b^2 - a^2}} - \frac{\sqrt{b^2 - a^2}}{b}$

$= \frac{b^2 - b^2 + a^2}{b\sqrt{b^2 - a^2}} = \frac{a^2}{b\sqrt{b^2 - a^2}}$

Sol.321.(a) $\frac{cos\ \beta}{sec\ \alpha}$ = 15 and $\frac{sin\ \beta}{sec\ \alpha}$ = 16

$\frac{cos\ \beta}{sec\ \alpha} \times \frac{sec\ \alpha}{sin\ \beta} = \frac{15}{16}$

$\Rightarrow cot\ \beta = \frac{15}{16} = \frac{Base}{Perpendicular}$

Hypotenuse = $\sqrt{225 + 256} = \sqrt{481}$

$sin^2\beta = (\frac{Perpendicular}{hypotenuse})^2$

$= (\frac{16}{\sqrt{481}})^2 = \frac{256}{481}$

Sol.322.(c) $\frac{sin^3\alpha + cos^3\alpha}{sin\ \alpha + cos\ \alpha}$

$= \frac{(sin\ \alpha + cos\ \alpha)(sin^2\alpha + cos^2\alpha - sin\ \alpha\ cos\ \alpha)}{sin\ \alpha + cos\ \alpha}$

= 1 − sin α cos α

Sol.323.(a) According to question,

tan$\frac{\pi}{6}$ + sec$\frac{\pi}{6}$ = x ⇒ tan30° + sec30° = x

$\frac{1}{\sqrt{3}} + \frac{2}{\sqrt{3}} \Rightarrow x = \sqrt{3}$

Sol.324.(a) x lies in third quadrant In third quadrant only tanθ and cotθ are positive

Now , $x = cos^{-1}(-\frac{1}{2})$ = 60°

Then, tan x = tan(60°) = $\sqrt{3}$

Sol.325.(c) According to the question,

Cos 75° = cos(45° + 30°)

= cos 45° cos 30° − sin45° sin30°

$= \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2} - \frac{1}{\sqrt{2}} \times \frac{1}{2} = \frac{\sqrt{3}-1}{2\sqrt{2}}$

$= \frac{\sqrt{3} - 1}{2\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{6} - \sqrt{2}}{4}$

Sol.326.(a) According to the question,

$\frac{Sin^4\theta + cos^4\theta}{1 - 2Sin^2\theta.cos^2\theta}$

$= \frac{(Sin^2\theta + cos^2\theta)^2 - 2Sin^2\theta\ cos^2\theta}{1 - 2Sin^2\theta.cos^2\theta}$

$= \frac{1 - 2Sin^2\theta\ cos^2\theta}{1 - 2Sin^2\theta.cos^2\theta} = 1$

Sol.327.(d) $(\frac{sin(x - y)}{sin(x + y)})(\frac{tanx + tany}{tanx - tany})$

$= (\frac{sin\ x\ cos\ y - cos\ x\ sin\ y}{sinx\ cos\ y + cos\ x\ sin\ y})(\frac{tanx + tany}{tanx - tany})$

$= (\frac{\frac{sin\ x\ cos\ y - cos\ x\ sin\ y}{cos\ x\ cos\ y}}{\frac{sinx\ cos\ y + cos\ x\ sin\ y}{cos\ x\ cos\ y}})(\frac{tanx + tany}{tanx - tany})$

$= (\frac{tan\ x - tan\ y}{tan\ x + tan\ y})(\frac{tanx + tany}{tanx - tany}) = 1$

Sol.328.(c) sin $(\frac{A}{2}) = \sqrt{\frac{(1 - cosA)}{2}}$

And, cos $(\frac{A}{2}) = \sqrt{\frac{(1 + cosA)}{2}}$

Given, tan $\frac{A}{2} = x$

$= \sqrt{\frac{(1 - cosA)}{2}} \div \sqrt{\frac{(1 + cosA)}{2}}$

$= \sqrt{\frac{(1 - cosA)}{2}} \times \sqrt{\frac{2}{(1 + cosA)}}$

$= \sqrt{\frac{(1 - cosA)}{(1 + cosA)}}$

Formula :- tan $\frac{A}{2} = \sqrt{\frac{(1 - cosA)}{(1 + cosA)}}$

Sol.329.(d)

$(\frac{1}{sin\ \theta} + \frac{1}{tan\ \theta})(\frac{1}{sin\ \theta} - \frac{1}{tan\ \theta})$

$= (\frac{1}{sin^2\theta} - \frac{1}{tan^2\theta}) \Rightarrow (cosec^2\theta - cot^2\theta) = 1$

Sol.330.(a) sin $2x$ + 2 sin $4x$ + sin $6x$

2 sin $(\frac{6x + 2x}{2})$ cos $(\frac{6x - 2x}{2})$ + 2 sin $4x$

= 2 sin $4x$ cos $2x$ + 2 sin $4x$

= 2 sin $4x$ (cos $2x$ + 1)

= 2 sin $4x$ {2 cos^2x −1 + 1}

= 2 sin $4x$ (2 cos^2x) = 4 cos^2x sin $4x$

Sol.331.(b) In third quadrant , only value of tanθ and cotθ is positive.

Given that , sin A = - $\frac{3}{5}$

$= \frac{Perpendicular}{Hypotenuse}$

Using pythagoras theorem ,

$H^2 = P^2 + B^2 \Rightarrow B^2 = 25 - 9 = 16$

B = $\sqrt{16} = \pm 4$

Now , sec A = $\frac{Hypotenuse}{Base}$ = - $\frac{5}{4}$

Sol.332.(a) $12\ (sin^4\theta + cos^4\theta) + 18\ (sin^6\theta + cos^6\theta) + 78sin^2\theta\ cos^2\theta$

Put θ = 0°

= 12 (0 + 1) + 18 (0 + 1) + 78 × 0 × 1 = 30

Sol.333.(c) Let A = 45° and B = 30°

According to question,

tan(45° − 30°) = $\frac{tan\ 45° - tan30°}{1 + tan\ 45°\ tan30°}$

tan 15° = $\frac{1 - \frac{1}{\sqrt{3}}}{1 + 1 \times \frac{1}{\sqrt{3}}} = \frac{\frac{\sqrt{3}-1}{\sqrt{3}}}{\frac{\sqrt{3}+1}{\sqrt{3}}}$

$= \frac{\sqrt{3} - 1}{\sqrt{3} + 1} = \frac{\sqrt{3} - 1}{\sqrt{3} + 1} \times \frac{\sqrt{3} - 1}{\sqrt{3} - 1}$

$= \frac{3 + 1 - 2\sqrt{3}}{3 - 1} = 2 - \sqrt{3}$

Sol.334.(b) $\frac{sin\ x - cos\ x}{sin\ x + cos\ x} = \frac{2}{5}$

5 $sin\ x$ − 5 $cos\ x$ = 2 $sin\ x$ + 2 $cos\ x$

3 $sin\ x$ = 7 $cos\ x$

$\frac{cos\ x}{sin\ x} = \frac{3}{7} \Rightarrow cot\ x = \frac{3}{7} \Rightarrow cot^2x = \frac{9}{49}$

Now, $\frac{1 + cot^2x}{1 - cot^2x} = \frac{1 + \frac{9}{49}}{1 - \frac{9}{49}} = \frac{\frac{49 + 9}{49}}{\frac{49 - 9}{49}}$

$= \frac{58}{49} \times \frac{49}{40} = \frac{58}{40} = 1.45$

Sol.335.(c) $(sin\theta + cos\theta)^2 + (sin\theta - cos\theta)^2$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= sin^2\theta + cos^2\theta + 2\sin\theta\cos\theta + sin^2\theta + cos^2\theta - 2\sin\theta\cos\theta$

$= 2(sin^2\theta + cos^2\theta) = 2 \times 1 = 2$

Sol.336.(c) $(\frac{cosA}{1-sinA}) + (\frac{cosA}{1+sinA}) = 4$

$cosA\,(\frac{1+sinA+1-sinA}{(1-sinA)(1+sinA)}) = 4$

$cosA(\frac{2}{(1-sin^2A)}) = 4$

$cosA\,(\frac{2}{(cos^2A)}) = 4$

$cosA = \frac{1}{2} \Rightarrow A = 60°$

Sol.337.(a) $\cot(A-B) = \frac{cotAcotB+1}{cotB-cotA}$

Cot 15° = cot(45° − 30°)

$= \frac{cot\,45°\,cot\,30°+1}{cot\,30° - cot\,45°}$

$= \frac{1\times\sqrt{3}+1}{\sqrt{3}-1} = \frac{\sqrt{3}+1}{\sqrt{3}-1} \times \frac{\sqrt{3}+1}{\sqrt{3}+1}$

$= \frac{4+2\sqrt{3}}{3-1} = 2 + \sqrt{3}$

Sol.338.(c) P cosα = 3 ⇒ secα = $\frac{P}{3}$

taking square both sides ,

$sec^2\alpha = \frac{P^2}{9}$ --------(1)

Now, 4tanα = Q ⇒ tanα = $\frac{Q}{4}$

taking square both sides

$tan^2\alpha = \frac{Q^2}{16}$ -------(2)

from equation (1) and (2) , we get

$sec^2\alpha - tan^2\alpha = \frac{P^2}{9} - \frac{Q^2}{16}$

$\therefore \frac{P^2}{9} - \frac{Q^2}{16} = 1$

Sol.339.(b) $\sin\theta + sin^2\theta = 1$

$\sin\theta = 1 - sin^2\theta$

$\sin\theta = cos^2\theta \Rightarrow sin^2\theta = cos^4\theta$

Now ,

$cos^2\theta + cos^4\theta = cos^2\theta + sin^2\theta = 1$

Sol.340.(a) $(a-b)^2 + (a+b)^2 = 2(a^2+b^2)$

$(cosx - sinx)^2 + (cosx + sinx)^2$

$= 2(cos^2x + sin^2x) = 2$

Sol.341.(a) $\frac{sec^2(90°-\theta) - cot^2\theta}{2(sin^2 35° + sin^2 55°)}$

$\frac{cosec^2(\theta) - cot^2\theta}{2(sin^2 35° + cos^2 35°)} = \frac{1}{2} = 0.5$

Sol.342.(c) cosec 2910°= cosec (360° × 8 + 30°) = cosec 30° = 2

sec 4260° = sec (360° × 11 + 300°)

= sec 300° = sec(360° - 60°) = sec 60° = 2

tan 2565° = tan (360° × 7 + 45°)

= tan (45°) = 1

cot 1755° = cot (360° × 4 + 315°)

= cot (315°) = cot (270° + 45°)

= - tan 45° = -1

Now ,

cosec 2910° + sec 4260° + tan 2565° + cot 1755° ⇒ 2 + 2 + 1 −1 = 4

Sol.343.(c) For the maximum value of $sin^{12}\theta + cos^{20}\theta$, Put θ = 90° ,

$sin^{12}(90°) + cos^{20}(90°) = 1 + 0 = 1$

Sol.344.(d) sin(−405°) = − sin(360° + 45°)

= − sin 45° = $\frac{-1}{\sqrt{2}}$

Sol.345.(a) $cos2\theta = (2cos^2\theta - 1)$

$= (1 - 2sin^2\theta)$

Now , $\frac{sin\theta - 2sin^3\theta}{2cos^3\theta - cos\theta} = \frac{sin\theta(1-2sin^2\theta)}{cos\theta(2cos^2\theta - 1)}$

$= tan\theta$

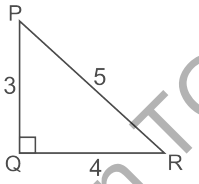
Sol.346.(b) $\frac{1+sint}{4-4\,sin\,t} - \frac{1-sint}{4+4\,sin\,t}$

$= \frac{1}{4}[\frac{1+sint}{(1-sint)} - \frac{1-sint}{(1+sint)}]$

$= \frac{1}{4}[\frac{(1+sint)^2 - (1-sint)^2}{(1-sint)(1+sint)}]$

$= \frac{1}{4}[\frac{4\,sint}{cos^2t}] = \frac{sint}{cost} \times \frac{1}{cost}$ = tan$t$ sec$t$

Sol.347.(c)



sinP = $\frac{4}{5}$, sinQ = 90° = 1 And , sinR = $\frac{3}{5}$

Hence, sin P + sin Q + sin R

$= \frac{4}{5} + 1 + \frac{3}{5} = \frac{12}{5}$

Sol.348.(c) Given, cotθ = $\frac{3}{2}$

$= \frac{Base}{Perpendicular}$

By using pythagoras theorem, we get

Hypotenuse = $\sqrt{13}$

Now, $\frac{\sqrt{13}sin\theta - 3tan\theta}{3tan\theta + \sqrt{13}cos\theta}$

$= \frac{\sqrt{13}\times\frac{2}{\sqrt{13}} - 3\times\frac{2}{3}}{3\times\frac{2}{3} + \sqrt{13}\times\frac{3}{\sqrt{13}}} = 0$

Sol.349.(a)

tan(45° − 30°) = $\frac{tan\,45° - tan\,30°}{(1+tan\,45°\,tan\,30°)}$

$= \frac{1-\frac{1}{\sqrt{3}}}{(1+1\times\frac{1}{\sqrt{3}})} = \frac{\sqrt{3}-1}{\sqrt{3}+1} = 0.268$

Short trick :-

tan 15° = $(2-\sqrt{3})$ = 2 −1.732 = 0.268

Sol.350.(c) If Cosecθ + Cotθ = m ,

Then Cosecθ − Cotθ = $\frac{1}{m}$

Now , $\frac{m^2-1}{m^2+1} = \frac{m-\frac{1}{m}}{m+\frac{1}{m}}$

$= \frac{Cosec\theta + Cot\theta - (Cosec\theta - Cot\theta)}{Cosec\theta + Cot\theta + (Cosec\theta - Cot\theta)}$

$= \frac{2Cot\theta}{2\,Cosec\theta} = cos\theta$

Sol.351.(d) $sin\theta + cosec\theta = \sqrt{5}$

$sin\theta + \frac{1}{sin\theta} = \sqrt{5}$ Then , $sin^3\theta + \frac{1}{sin^3\theta}$

$= (\sqrt{5})^3 - 3\times\sqrt{5} = 2\sqrt{5}$

Sol.352.(c)

Given, cot θ = $\frac{b}{a} = \frac{Base}{Perpendicular}$

By using pythagoras theorem,

Hypotenuse = $\sqrt{b^2+a^2}$

Now, $\frac{bcos\theta - asin\theta}{bcos\theta + asin\theta}$

$= \frac{\frac{b\times b}{\sqrt{b^2+a^2}} - \frac{a\times a}{\sqrt{b^2+a^2}}}{\frac{b\times b}{\sqrt{b^2+a^2}} + \frac{a\times a}{\sqrt{b^2+a^2}}} = \frac{b^2-a^2}{b^2+a^2}$

Sol.353.(c) Let θ = 45°

According to question,

$\frac{1+sin^4\theta + cos^4\theta}{cos^2\theta + sin^4\theta} = \frac{1+sin^4 45° + cos^4 45°}{cos^2 45° + sin^4 45°}$

$= \frac{1+\left(\frac{1}{\sqrt{2}}\right)^4 + \left(\frac{1}{\sqrt{2}}\right)^4}{\left(\frac{1}{\sqrt{2}}\right)^2 + \left(\frac{1}{\sqrt{2}}\right)^4}$

$= \frac{1+\frac{1}{4}+\frac{1}{4}}{\frac{1}{2}+\frac{1}{4}} = \frac{\frac{6}{4}}{\frac{3}{4}} = 2$

Sol.354.(c) cosec (α + β)

$= \frac{sec\alpha\times sec\beta\times cosec\alpha\times cosec\beta}{sec\alpha\times cosec\beta + cosec\alpha\times sec\beta}$

cosec (45° + 30°)

$= \frac{sec45°\times sec30°\times cosec45°\times cosec30°}{sec45°\times cosec30° + cosec45°\times sec30°}$

cosec75° = $\frac{\sqrt{2}\times\frac{2}{\sqrt{3}}\times\sqrt{2}\times 2}{\sqrt{2}\times 2 + \sqrt{2}\times\frac{2}{\sqrt{3}}}$

$= \frac{\sqrt{2}\times\frac{2}{\sqrt{3}}}{1+\frac{1}{\sqrt{3}}} = \frac{2\sqrt{2}}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}+1}$

$= \frac{2\sqrt{2}}{\sqrt{3}+1} \times \frac{\sqrt{3}-1}{\sqrt{3}-1}$

$= \sqrt{2}(\sqrt{3}-1) = \sqrt{6} - \sqrt{2}$

Sol.355.(c) $\sqrt{\frac{1+cos\theta}{1-cos\theta}}$

$= \sqrt{\frac{(1+cos\theta)\times(1+cos\theta)}{(1-cos\theta)\times(1+cos\theta)}}$

$= \sqrt{\frac{(1+cos\theta)^2}{1-cos^2\theta}} = \sqrt{\frac{(1+cos\theta)^2}{sin^2\theta}}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{1+\cos\theta}{\sin\theta} = \operatorname{cosec}\theta + \cot\theta$

Sol.356.(a) $\frac{1}{\sin\theta} - \sin\theta = \frac{1-\sin^2\theta}{\sin\theta}$

$= \frac{\cos^2\theta}{\sin\theta} = \cos\theta.\cot\theta$

Sol.357.(c) $\frac{21\cos A + 3\sin A}{3\cos A + 4\sin A} = 2$

$= 21\cos A + 3\sin A = 6\cos A + 8\sin A$

$= 15\cos A = 5\sin A$

$\Rightarrow \cot A = \frac{5}{15} = \frac{1}{3}$

Sol.358.(c) tan 4384° + cot 6814°

= tan (360° × 12 + 64°) + cot (360° × 18 + 334°) = tan64° + cot(270° + 64°)

= tan64° − tan64° = 0

Sol.359.(a)

$10\sqrt{2}\sin 45° - 7\sqrt{2}\cos 45° + 9\tan 45°$

10 − 7 + 9 = 12

Sol.360.(d)

Sin 600° cos 750° + sin 150° cos 240°

= Sin (180° × 3 + 60°) cos (180° × 4 + 30°) + sin (180°− 30°) cos (180° + 60°)

= − sin 60° cos 30° − sin 30° cos 60°

= − sin (60°+ 30°) = −1

Sol.361.(d) sin 2θ = 2 sinθ cosθ

cos 2θ = $2\cos^2\theta - 1$

$\frac{\sin\theta}{1+\cos\theta} = \frac{2\sin\frac{\theta}{2}\cos\frac{\theta}{2}}{2\cos^2\frac{\theta}{2}} = \tan(\frac{\theta}{2})$

$\Rightarrow \tan(\frac{\theta}{2}) = \frac{\sin\theta}{1+\cos\theta}$

Short trick : put θ = 30°

Sol.362.(c)

$3x = \sec A \Rightarrow 9x^2 = \sec^2 A$ ..... (1)

$\frac{3}{x} = \tan A \Rightarrow \frac{9}{x^2} = \tan^2 A$ .....(2)

Subtracting eqn.(2) from (1) ,we get

$9x^2 - \frac{9}{x^2} = 1 \Rightarrow 9(x^2 - \frac{1}{x^2}) = 1$

Sol.363.(d) $\tan^4\theta + \tan^2\theta = 1$

$\tan^2\theta(\tan^2\theta + 1) = 1 \Rightarrow \tan^2\theta \times \sec^2\theta = 1$

$\frac{\sin^2\theta}{\cos^2\theta} \times \frac{1}{\cos^2\theta} = 1 \Rightarrow \sin^2\theta = \cos^4\theta$

Now , 11 ($\cos^4\theta + \cos^2\theta$)

$= 11(\sin^2\theta + \cos^2\theta) = 11$

Sol.364.(d) $\frac{32}{\sec^2\theta} - \frac{20}{1+\tan^2\theta} + 12\sin^2\theta$

Put , θ = 0° Then

$\frac{32}{\sec^2 0°} - \frac{20}{1+\tan^2 0°} + 12\sin^2 0°$

= 32 − 20 + 0 = 12

Sol.365.(b) $\sin\theta + \cos\theta = \frac{\sqrt{11}}{3}$

$\sin^2\theta + \cos^2\theta + 2\sin\theta\cos\theta = \frac{11}{9}$

$2\sin\theta\cos\theta = \frac{11}{9} - 1 = \frac{2}{9}$

$\sin\theta\cos\theta = \frac{1}{9}$

Now , $\tan\theta + \cot\theta = \frac{\sin\theta}{\cos\theta} + \frac{\cos\theta}{\sin\theta}$

$= \frac{\sin^2\theta + \cos^2\theta}{\sin\theta\cos\theta} = 1 \times \frac{9}{1} = 9$

Sol.366.(c) $1 + \sin^2\theta = a\cos^2\theta$

$\frac{1}{\cos^2\theta} + \frac{\sin^2\theta}{\cos^2\theta} = a$

$\sec^2\theta + \tan^2\theta = a$

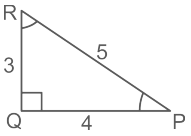
and $\sec^2\theta - \tan^2\theta = 1$ ....(identity)

Now , $\sec^4\theta - \tan^4\theta$

$= (\sec^2\theta + \tan^2\theta)(\sec^2\theta - \tan^2\theta)$

$\sec^4\theta - \tan^4\theta = a \times 1 = a$

Sol.367.(b)



Pythagoras triplets : - (3, 4, 5)

SinP = $\frac{Perpendicular}{Hypotenuse} = \frac{3}{5}$

base = 4 So , $\angle Q = 90° = \frac{\pi}{2}$

Sol.368.(b) Cosec 41° − sec 49°

= Cosec 41° − sec (90°− 41°)

= Cosec 41° − Cosec 41° = 0

Sol.369.(d) $\sin x + \sin^2 x = 1$

$\sin x = \cos^2 x \Rightarrow \cos^4 x = \sin^2 x$. Now ,

$\cos^8 x + 2\cos^6 x + \cos^4 x = (\cos^4 x + \cos^2 x)^2$

$= (\sin^2 x + \cos^2 x)^2 = 1$

Sol.370.(d) $(\frac{1+\sec^2 A}{1+\cos^2 A})(\frac{1+\sin^2 A}{1+\operatorname{cosec}^2 A})$

$= (\frac{1+\frac{1}{\cos^2 A}}{1+\cos^2 A})(\frac{1+\frac{1}{\operatorname{cosec}^2 A}}{1+\operatorname{cosec}^2 A})$

$(\frac{1}{\cos^2 A})(\frac{1}{\operatorname{cosec}^2 A}) = \tan^2 A$

Sol.371.(d) $\frac{\sqrt{(1-\sin A)}}{\sqrt{(1+\sin A)}}$

$= \frac{\sqrt{(1-\sin A)}}{\sqrt{(1+\sin A)}} \times \frac{\sqrt{(1-\sin A)}}{\sqrt{(1-\sin A)}}$

$= \frac{(1-\sin A)}{\sqrt{(1+\sin A)}\sqrt{(1-\sin A)}}$

$= \frac{(1-\sin A)}{\sqrt{1-\sin^2 A}} = \frac{(1-\sin A)}{\cos A}$

$= \sec A - \tan A$

Sol.372.(d)

(1 + tan θ − secθ)(1 + cotθ + cosecθ)

$= (1 + \frac{\sin\theta}{\cos\theta} - \frac{1}{\cos\theta})(1 + \frac{\cos\theta}{\sin\theta} + \frac{1}{\sin\theta})$

$= (1 + \frac{\sin\theta - 1}{\cos\theta})(1 + \frac{\cos\theta + 1}{\sin\theta})$

$= (\frac{\cos\theta + \sin\theta - 1}{\cos\theta})(\frac{\cos\theta + \sin\theta + 1}{\sin\theta})$

$= \frac{(\cos\theta + \sin\theta)^2 - 1^2}{\sin\theta\cos\theta}$

$= \frac{\sin^2\theta + \cos^2\theta + 2\sin\theta\cos\theta - 1}{\sin\theta\cos\theta}$

$= \frac{2\sin\theta\cos\theta}{\sin\theta\cos\theta} = 2$

Sol.373.(d) $\frac{\cos(50° + A) - \sin(40° - A)}{\cos 40°.\sec 40°}$

$= \frac{\cos(50° + A) - \sin(40° - A)}{\cos 40° \times \frac{1}{\cos 40°}}$

Let A = 40° then,

$\frac{\cos(50° + 40°) - \sin(40° - 40°)}{1}$

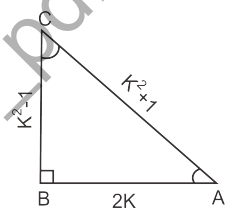
$= \frac{\cos(90°)}{1} = 0$

Sol.374.(d) sec A + tan A = K .... E.q .(1),

sec A − tan A = $\frac{1}{K}$ .... E.q .(2)

On adding e.q .(1) and e.q .(2) , we get

2 secA = $\frac{K^2+1}{K}$ ⇒ cos A = $\frac{2K}{K^2+1}$



Now, $\sin A = \frac{K^2-1}{K^2+1}$

Sol.375.(b) $\frac{\operatorname{cosec} 90°}{(1-\cos^2 60°)}$

$= \frac{1}{(1-\frac{1}{4})} = \frac{1}{(\frac{3}{4})} = \frac{4}{3}$

Sol.376.(d)

$\sqrt{\frac{\operatorname{cosec} A + 1}{\operatorname{cosec} A - 1}} + \sqrt{\frac{\operatorname{cosec} A - 1}{\operatorname{cosec} A + 1}}$

$= \frac{\sqrt{\operatorname{cosec} A + 1}}{\sqrt{\operatorname{cosec} A - 1}} + \frac{\sqrt{\operatorname{cosec} A - 1}}{\sqrt{\operatorname{cosec} A + 1}}$

$= \frac{(\operatorname{cosec} A + 1) + (\operatorname{cosec} A - 1)}{\sqrt{\operatorname{cosec}^2 A - 1}}$

$= \frac{(2\operatorname{cosec} A)}{\sqrt{\cot^2 A}} = \frac{(2\operatorname{cosec} A)}{\cot A}$

$= \frac{2(\frac{1}{\sin A})}{\frac{\cos A}{\sin A}} = 2\sec A$

Sol.377.(d) Putting θ = 45°

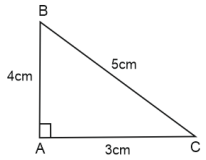
m = sec θ − tan θ = $\sqrt{2} - 1$

n = cosecθ + cot θ = $\sqrt{2} + 1$

Putting the value of m and n in m + n(m -1)

$\sqrt{2} - 1 + (\sqrt{2} + 1)(\sqrt{2} - 1 - 1) = -1$

Sol.378.(d)



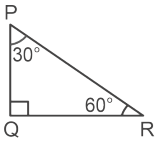
Search on TG: @apna_pdf

Search on Telegram @apna_pdf

cosB = $\frac{4}{5}$ and cotC = $\frac{3}{4}$

cos B + cot C ⇒ $\frac{4}{5}+\frac{3}{4}=\frac{31}{20}$

Sol.379.(d)



cos(30° + 60°) = cos 90° = 0

Sol.380.(b) $\sqrt{3}\,tan^2\theta$ - 4 tanθ + $\sqrt{3}$ = 0

= $\sqrt{3}\,tan^2\theta$ - tanθ - 3tanθ + $\sqrt{3}$ = 0

= tanθ($\sqrt{3}$ tanθ - 1) - $\sqrt{3}$ ($\sqrt{3}$ tanθ - 1) = 0

= ($\sqrt{3}$ tanθ - 1)(tanθ - $\sqrt{3}$)

⇒ tanθ = ($\frac{1}{\sqrt{3}}$ *and* $\sqrt{3}$) [here both value exists] ⇒ θ = 30° and 60°

Then, by putting θ = 30°

$tan^2\theta + cot^2\theta \Rightarrow \frac{1}{3}+3=\frac{10}{3}$

Sol.381.(c) 6Cotθ = 5 ⇒ Cotθ = $\frac{5}{6}$

Now, $\frac{(6cos\theta+sin\theta)}{(6cos\theta-4sin\theta)}=\frac{(6cot\theta+1)}{(6cot\theta-4)}$

$=\frac{(6\times\frac{5}{6}+1)}{(6\times\frac{5}{6}-4)}=6$

Sol.382.(b) $cosec\theta - sin\theta = 6$ Then, formula:- (x + y)² =(x - y)² + 4xy

$cosec\theta + sin\theta = \sqrt{(6^2)+4}=\sqrt{40}$

Sol.383.(d) $\sqrt{2}$sec²θ − 4 secθ + 2$\sqrt{2}$ = 0

$\sqrt{2}$sec²θ − 2 secθ − 2 secθ + 2$\sqrt{2}$ = 0

$\sqrt{2}$secθ(secθ − $\sqrt{2}$) − 2(secθ − $\sqrt{2}$) = 0

Secθ = $\sqrt{2}$, Secθ = $\frac{2}{\sqrt{2}}=\frac{\sqrt{2}}{1}=\frac{H}{B}$

So, P = 1

sin²θ + tan²θ = $\frac{1}{2}+1=\frac{3}{2}$

Short trick :-

$\sqrt{2}$sec²θ − 4 secθ + 2$\sqrt{2}$ = 0

Put θ = 45°

So value of sin²θ + tan²θ = $\frac{1}{2}+1=\frac{3}{2}$

Sol.384.(c) $\frac{sin\,\theta+cos\theta}{sin\,\theta-cos\,\theta}+\frac{sin\,\theta-cos\theta}{sin\,\theta+cos\,\theta}$

$=\frac{sin\,\theta+cos\theta}{sin\,\theta-cos\,\theta}\times\frac{sin\,\theta+cos\theta}{sin\,\theta+cos\,\theta}+\frac{sin\,\theta-cos\theta}{sin\,\theta+cos\,\theta}\times\frac{sin\,\theta-cos\theta}{sin\,\theta-cos\,\theta}$

$=\frac{(sin\,\theta+cos\theta)^2}{sin^2\theta-cos^2\theta}+\frac{(sin\,\theta-cos\theta)^2}{sin^2\theta-cos^2\theta}$

$=\frac{sin^2\theta+cos^2\theta+2sin\,\theta cos\theta+sin^2\theta+cos^2\theta-2sin\,\theta cos\theta}{sin\,\theta^2-cos\,\theta^2}$

$=\frac{2}{(sin^2\theta-cos^2\theta)}$

Sol.385.(c) $\frac{1-sin\,A}{cos\,A}+\frac{cos\,A}{1-sin\,A}$

$=\frac{(1-sin\,A)^2+cos^2A}{(cosA)(1-sinA)}$

$=\frac{(1)^2+sin^2A-2sinA+cos^2A}{(cosA)(1-sinA)}$

$=\frac{2(1-sinA)}{(cosA)(1-sinA)}$ = 2secA

Sol.386.(b) $sec\,x+tan\,x=5$

Then , $sec\,x-tan\,x=\frac{1}{5}$

$cosec\,y-cot\,y=\frac{1}{3}$

then , $cosec\,y+cot\,y=3$

Now,

$(sec\,x+cosec\,y)-(tan\,x-cot\,y)$

$=(sec\,x-tan\,x+cosec\,y+cot\,y)$

$=\frac{1}{5}+3=\frac{16}{5}=3.2$

Sol.387.(c) Put the value of θ = 45 °,

A = a$\sqrt{2}$ + b and B = a + b$\sqrt{2}$

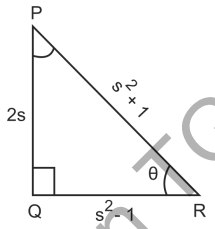
Then, A² = 2a² + b² + 2$\sqrt{2}$ab

B² = a² + 2b² + 2$\sqrt{2}$ab

A² - B² = 2a² + b² + 2$\sqrt{2}$ab - a² - 2b² - 2$\sqrt{2}$ab ⇒ A² - B² = (a² - b²)

Sol.388.(a) Pythagoras triplets :-

$(2s\,,s^2+1\,,s^2-1)$



cosec θ + cot θ = s

cosec θ − cot θ = $\frac{1}{s}$

Cosec θ = $\frac{s^2+1}{2s}$ ⇒ sinθ = $\frac{2s}{s^2+1}$

So that , cosθ = $\frac{s^2-1}{s^2+1}$

Sol.389.(c) x = 30°(put)

sec x + tan x = √3

⇒ $\frac{2}{\sqrt{3}}+\frac{1}{\sqrt{3}}=\sqrt{3}$ (satisfied)

According to the question,

tan x = tan30° = $\frac{1}{\sqrt{3}}$

Sol.390.(b)

Complementary angle of tan = cot

Sol.391.(c) sec θ + tan θ= 2--------(eq . 1)

As we know → $sec^2\theta-tan^2\theta=1$

Then, (sec θ+ tan θ) (sec θ− tan θ) = 1

⇒ (sec θ− tan θ) = $\frac{1}{2}$ -------(eq . 2)

By (eq . 1 and 2)

2 secθ = 2 + $\frac{1}{2}$

⇒ secθ = $\frac{hypotenuse}{base}=\frac{5}{4}$

then , perpendicular = $\sqrt{(5)^2-(4)^2}$ = 3

Therefore, cotθ = $\frac{base}{perpendicular}=\frac{4}{3}$

Sol.392.(a) tan 10°tan 80° + tan 20°tan 70° + tan 30° tan 60° + tan 40°tan 50°)

= tan 10°tan(90°− 10°) + tan 20°tan (90° - 20°) + tan 30° tan(90°− 30°) + tan 40°tan(90°− 40°)

= tan 10°cot 10° + tan 20°cot 20° + tan 30° cot 30° + tan 40°cot 40°

= 1 + 1 + 1 + 1 = 4

Sol.393.(d) Let θ = 45°

$\frac{cot\theta+cosec\theta-1}{cot\theta-cosec\theta+1}=\frac{1+\sqrt{2}-1}{1-\sqrt{2}+1}=\frac{\sqrt{2}}{2-\sqrt{2}}$

$\frac{\sqrt{2}}{\sqrt{2}(\sqrt{2}-1)}$ (multiply by ($\sqrt{2}+1$) in numerator and denominator)

$\frac{(\sqrt{2}+1)}{1}=(\sqrt{2}+1)$

According to the question,

In option d, put θ = 45°

$(cot\theta+cosec\theta)\Rightarrow(1+\sqrt{2})$ (satisfied)

Sol.394.(c) 6secθ = 10

secθ = $\frac{10}{6}=\frac{5}{3}=\frac{Hypotenuse}{Base}$

Using Pythagoras theorem;

Perpendicular = $\sqrt{5^2-3^2}$ = 4 ,

cosecθ = $\frac{5}{4}$ and cotθ = $\frac{3}{4}$

$\frac{(5\,cosec\,\theta-3\,cot\,\theta)}{(4\,cos\,\theta+3\,sin\,\theta).}$

$=\frac{(5\times\frac{5}{4}-3\times\frac{3}{4})}{(4\times\frac{3}{5}+3\times\frac{4}{5}).}=\frac{(\frac{25}{4}-\frac{9}{4})}{(\frac{12}{5}+\frac{12}{5})}$

$=\frac{(\frac{25-9}{4})}{(\frac{12+12}{5})}=\frac{20}{24}=\frac{5}{6}$

Sol.395.(b)

cosec A(1 - cosA)(cosecA + cot A)

$\Rightarrow\frac{1}{sinA}(1-cosA)(\frac{1+cosA}{sinA})$

$\Rightarrow\frac{(1-cos^2A)}{sin^2A}\Rightarrow\frac{(1-cos^2A)}{(1-cos^2A)}$ = 1

Sol.396.(c) $\frac{(2cos^3A-cosA)}{(sinA-2sin^3A)}$ = 1

$\Rightarrow\frac{cosA\,(2cos^2A-1)}{sinA(1-2sin^2A)}=1\Rightarrow\frac{cosA\,.\,cos2A}{sinA.cos2A}$

= 1 ⇒ cotA = 1 ⇒ A = 45°

Sol.397.(c)

(sinθ + cosecθ)² + (cosθ + secθ)²

Putting the value of θ = 45°

($\frac{1}{\sqrt{2}}$ + $\sqrt{2}$)² + ($\frac{1}{\sqrt{2}}$ + $\sqrt{2}$)² = 9

By putting value of θ = 45° in the option (c)

we get, 7 + $tan^2\theta+cot^2\theta$ = 7 + 1 + 1 = 9.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.398.(b)

$tan^2\theta + cot^2\theta - sec^2\theta.cosec^2\theta$

Put θ = 45°

$tan^2 45° + cot^2 45° - sec^2 45°.cosec^2 45°$

⇒ 1 + 1 - 2 × 2 ⇒ - 2

Sol.399.(a) Formula :-

Sin$a$ - Sin$b$ = $2\,Sin(\frac{a-b}{2})\,Cos(\frac{a+b}{2})$

sinα - sinβ = 2cos$\frac{\alpha+\beta}{2}$ sin$\frac{\alpha-\beta}{2}$

Sol.400.(c) In third quadrant value of tan θ and cotθ is +ve .

$tan\,240° = tan\,(180° + 60°)$

$= tan\,60° = \sqrt{3}$

Sol.401.(c) $tan^2\theta = 1 - a^2$

Adding 1 both side ,

$1 + tan^2\theta = 1 - a^2 + 1$

$Sec^2\theta = 2 - a^2$

$Sec\theta = \sqrt{(2 - a^2)}$ ..... (eq .1)

Now, $Sec\theta + tan^3\theta \times Cosec\theta$

$= \frac{1}{Cos\theta} + \frac{Sin^3\theta}{Cos^3\theta} \times \frac{1}{Sin\theta}$

$= \frac{Cos^2\theta + Sin^2\theta}{Cos^3\theta} = Sec^3\theta$ .....(eq .2)

Putting the value of (eq .1) in (eq . 2) , we get , $Sec^3\theta = (2 - a^2)^{\frac{3}{2}}$

Sol.402.(a) Formula :-

$tan(A - B) = \frac{tanA - tanB}{1 + tanA.tanB}$

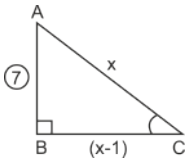
sin(A + B) = cos(A + B) .....(given)

Clearly value of sinθ and cosθ are equal at 45° , (A + B) = 45° ⇒ A = 45° - B

Now, tanA = tan(45° - B)

$= \frac{tan\,45° - tanB}{1 + tan45°.tanB} = \frac{1 - tanB}{1 + tanB}$

Sol.403.(d) Let , the length of side AC = x cm , then BC = (x - 1)cm



Now, using pythagoras theorem :-

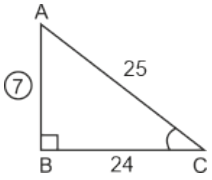
$AC^2 = AB^2 + BC^2 \Rightarrow x^2 = 7^2 + (x - 1)^2$

$x^2 = 49 + x^2 + 1 - 2x$

2x = 50 ⇒ x = 25 cm

Now, SinC = $\frac{perpendicular}{hypotenuse} = \frac{7}{25}$

Short Trick:-



Using pythagoras triplets : (7,24 ,25)

AB = 7 cm

And AC - BC = 25 - 24 = 1 cm ..... (Satisfy the given condition)

Then , Sin C = $\frac{perpendicular}{hypotenuse} = \frac{7}{25}$

Sol.404.(a) Formula :-

$\frac{(1 - cos\theta)}{sin\theta} = \frac{sin\theta}{(1 + cos\theta)}$

$\frac{(1 - cos\theta)}{sin\theta} = \frac{1}{5}$ ....(given)

Then, $\frac{(1 + cos\theta)}{sin\theta} = 5$

Sol.405.(b) $\frac{cosA}{1 + tanA} - \frac{sinA}{1 + cotA}$

$= \frac{cosA}{1 + \frac{sinA}{cosA}} - \frac{sinA}{1 + \frac{cosA}{sinA}}$

$= \frac{cos^2A}{cosA + sinA} - \frac{sin^2A}{sinA + cosA}$

$= \frac{cos^2A - sin^2A}{cosA + sinA}$

$= \frac{(cosA + sinA)(cosA - sinA)}{(cosA + sinA)}$

$= (cosA - sinA)$

Sol.406.(a)

$\frac{1}{1 + cos(90° - \theta)} + \frac{1}{1 - cos(90° - \theta)}$

$= \frac{1}{1 + sin\theta} + \frac{1}{1 - sin\theta}$

$= \frac{(1 - sin\theta) + (1 + sin\theta)}{1 - sin^2\theta}$

$= \frac{2}{cos^2\theta} \Rightarrow 2sec^2\theta$

Sol.407.(d) We know that ,

$cos^2\theta = (1 - sin^2\theta)$

$sin^2\theta + cos^2\theta = 1$ .....eq .(1)

On squaring eq .(1) , we get

$(sin^2\theta + cos^2\theta)^2 = (1)^2$

$sin^4\theta + cos^4\theta + 2sin^2\theta cos^2\theta = 1$

$sin^4\theta + cos^4\theta = 1 - 2sin^2\theta cos^2\theta$

$sin^4 407\theta + cos^4\theta = 1 - 2sin^2\theta(1 - sin^2\theta)$

$sin^4\theta + cos^4\theta = 1 - 2sin^2\theta + 2sin^4\theta$

Sol.408.(c) $\frac{cos\,x - \sqrt{3}\,sin\,x}{2}$

$= \frac{1}{2} \times cos\,x - \frac{\sqrt{3}}{2} \times sin\,x$

$= sin\,30°\,cos\,x - cos\,30°\,sin\,x$

$= sin\,(30 - x) = sin[90° - (60° + x)]$

$= cos\,(60° + x) = cos\,(\frac{\pi}{3} + x)$

Sol.409.(b)

$\sqrt{\frac{1 + cosA}{1 - cosA}} = \sqrt{\frac{1 + cosA}{1 - cosA} \times \frac{1 + cosA}{1 + cosA}}$

$= \sqrt{\frac{(1 + cosA)^2}{1 - cos^2A}} = \frac{1 + cosA}{sinA}$

= cosecA + cotA

Sol.410.(a)

$sin\theta + cos\theta = \frac{\sqrt{3} - 1}{2\sqrt{2}}$ .....eq .(1)

Squaring eq .(1) , we get

$sin^2\theta + cos^2\theta + 2sin\theta cos\theta$

$= (\frac{\sqrt{3} - 1}{2\sqrt{2}})^2 = \frac{4 - 2\sqrt{3}}{8}$

$2sin\theta cos\theta = \frac{4 - 2\sqrt{3}}{8} - 1$

$= \frac{(4 - 2\sqrt{3}) - 8}{8} = \frac{-(2 + \sqrt{3})}{4}$

Now, $tan\theta + cot\theta = \frac{2}{2sin\theta cos\theta}$

$= \frac{-8}{(2 + \sqrt{3})} \times \frac{(2 - \sqrt{3})}{(2 - \sqrt{3})} = 8(\sqrt{3} - 2)$

Sol.411.(d)

If A + B = 90° , then secA = cosecB

sec2θ = cosec(θ - 36°)

Now, 2θ + (θ - 36°) = 90° ⇒ θ = 42°

Sol.412.(d) Formula :-

$tan2x = \frac{2tanx}{(1 - tan^2x)}$

$cosx.cosecx - sinx.secx$

$= cotx - tanx = \frac{1}{tanx} - \frac{tan^2x}{tanx}$

$= \frac{2 \times (1 - tan^2x)}{2 \times tanx} = \frac{2 \times 1}{tan2x}$ = 2cot2x

Sol.413.(b) $cot^2A - cos^2A$

$= \frac{cos^2A}{sin^2A} - cos^2A = cos^2A(cosec^2A - 1)$

$= cos^2A.cot^2A$

Sol.414.(a) $b.sin\theta = a$

$\Rightarrow sin\theta = \frac{a}{b} = \frac{Perpendicular}{hypotenuse}$

by, using pythagoras theorem, we get

Base = $\sqrt{b^2 - a^2}$. Now,

$sec\theta + tan\theta = \frac{b}{\sqrt{b^2 - a^2}} + \frac{a}{\sqrt{b^2 - a^2}}$

$= \frac{b + a}{\sqrt{b^2 - a^2}} = \frac{\sqrt{b + a} \times \sqrt{b + a}}{\sqrt{b + a} \times \sqrt{b - a}} = \sqrt{\frac{b + a}{b - a}}$

Sol.415.(b) Formula :-

$sin3\theta = 3sin\theta - 4sin^3\theta$

Sin10° - $\frac{4}{3}sin^3 10° = \frac{3sin10° - 4sin^3 10°}{3}$

$= \frac{sin\,30°}{3} = \frac{1}{6}$

Sol.416.(c) (i) cos(− θ) = cosθ

(ii) cos(2nπ − θ) = cosθ

Now, cos($\frac{-17\pi}{3}$) = cos($\frac{17\pi}{3}$)

= cos(6π − $\frac{\pi}{3}$) = cos($\frac{\pi}{3}$) = $\frac{1}{2}$

Sol.417.(a) Formula :-

$a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$

$(sinA + cosA)(1 - sinAcosA)$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$=(sinA + cosA)$

$(sin^2A + cos^2A - sinAcosA)$

$= sin^3A + cos^3A$

Sol.418.(d) secθ - 2cosθ = $\frac{7}{2}$

$= sec\theta - \frac{2}{sec\theta} = \frac{7}{2}$

$= sec^2\theta - 2 = \frac{7}{2}sec\theta$

$= 2sec^2\theta - 7sec\theta - 4 = 0$

$= 2sec^2\theta - 8sec\theta + sec\theta - 4 = 0$

$= (sec\theta - 4)(2sec\theta + 1) = 0$

$= sec\theta = 4$

Sol.419.(d) sec3θ = cosec (4θ -15°)

⇒ cosec(90° - 3θ) = cosec (4θ -15°)

⇒ $90° - 3\theta = 4\theta - 15°$

⇒ $7\theta = 90° + 15°$

⇒ $7\theta = 105°$ ⇒ $\theta = 15°$

Then, tan 3θ = tan 45° = 1

Sol.420.(a) In a right angled triangle , right angled at A ,

= ∠A = ∠B + ∠C = 90°

= ∠A - ∠B - ∠C = 0°

tan(A - B - C) = tan0° = 0

tan(A - B - C)

$= \frac{tanA - tanB - tanC - tanAtanBtanC}{1 + tanAtanB - tanBtanC + tanCtanA}$

$tanA - tanB - tanC - tanAtanBtanC = 0$

$tanA - tanB - tanC = tanAtanBtanC$

Sol.421.(d)

$1 + tan^2\alpha = 4 + Q^2$ (adding 1 both sides)

$sec^2\alpha = 4 + Q^2$

$cos\alpha = (4 + Q^2)^{-\frac{1}{2}}$

then , secα + tan³α cosecα

$= \frac{1}{cos\alpha} + \frac{sin^3\alpha}{cos^3\alpha \times sin\alpha}$

$= \frac{1}{cos\alpha} + \frac{sin^2\alpha}{cos^2\alpha \times cos\alpha}$

$= \frac{1 + tan^2\alpha}{cos\alpha} = \frac{(4 + Q^2)}{(4 + Q^2)^{-1/2}} = (4 + Q^2)^{\frac{3}{2}}$

Short Trick:- Put , = 60° , then ,

$tan^2 60° = 3 + Q^2$ ⇒ Q = 0

Now, secα + tan³α cosecα = 2 + $3\sqrt{3} \times \frac{2}{\sqrt{3}}$ = 8 Clearly , option (d) satisfy the given equation

$\Rightarrow (4 + Q^2)^{3/2} = (4 + 0^2)^{3/2}$

$= (2^2)^{3/2} = 2^3 = 8$

Sol.422.(b) $1 + sin\theta$ = m cosθ

$\frac{1 + sin\theta}{cos\theta}$ = m ⇒ $\frac{(1 + sin\theta)^2}{cos^2\theta} = m^2$

$\frac{(1 + sin\theta)^2}{(1 + sin\theta)(1 - sin\theta)} = m^2$

$\frac{(1 + sin\theta)}{(1 - sin\theta)} = m^2$

By using componendo and dividendo ,

we get $\frac{(1 + sin\theta + 1 - sin\theta)}{(1 + sin\theta - 1 + sin\theta)} = \frac{m^2 + 1}{m^2 - 1}$

$\frac{(2)}{(2sin\theta)} = \frac{m^2 + 1}{m^2 - 1}$ ⇒ sinθ = $\frac{m^2 - 1}{m^2 + 1}$

Sol.423.(a) Put θ = 90°

5 (sin⁴ θ + cos⁴ θ) + 3 (sin⁶ θ + cos⁶ θ) + 19sin² θcos² θ

= 5 × 1 + 3 × 1 + 19 × 0 = 8

Sol.424.(d) Formula: cos 2A = 1 - 2 sin²A

Sin Y = x then, cos 2Y = 1 - 2 x²

Sol.425.(d) Formula:- tan(A + B + C)

$= \frac{tanA + tanB + tanC - tanAtanBtanC}{1 - tanAtanB - tanBtanC - tanCtanA}$

In a right angled triangle, right angled at C,

= ∠C = ∠A + ∠B = 90°

= ∠A + ∠B - ∠C = 0°

tan(A + B - C) = tan0° = 0

⇒ tan(A + B - C)

$= \frac{tanA + tanB - tanC + tanAtanBtanC}{1 - tanAtanB + tanBtanC + tanCtanA}$

⇒ tanA + tanB - tanC + tanAtanBtanC = 0

⇒ tanA + tanB - tanC= - tanAtanBtanC

⇒ tanC - tanA - tanB= tanAtanBtanC

Sol.426.(d) x = 8(sin θ + cos θ) and y = 9 (sin θ - cos θ),

$\Rightarrow \frac{x^2}{8^2} + \frac{y^2}{9^2}$

$= \frac{64(sin^2\theta + cos^2\theta + 2sin\theta.cos\theta)}{64}$

$+ \frac{81(sin^2\theta + cos^2\theta - 2sin\theta.cos\theta)}{81}$

$= 1 + 2sin\theta.cos\theta + 1 - 2sin\theta.cos\theta = 2$

Sol.427.(b) 2 cos 135° sin 15°

$= [sin(135° + 15°) - sin(135° - 15°)]$

= sin 150° - sin 120°

= cos60° - cos30° = $\frac{1}{2} - \frac{\sqrt{3}}{2} = \frac{1 - \sqrt{3}}{2}$

Sol.428.(c) secx + cos x =

$\sqrt{(sec\,x - cos\,x)^2 + 4 \times sec\,x\,cos\,x}$

$= \sqrt{4^2 + 4} = \sqrt{20} = 2\sqrt{5}$

$\frac{(1 + cos^2 x)}{cos\,x} = \frac{1}{cos\,x} + \frac{cos^2 x}{cos\,x}$

= sec x + cos x = $2\sqrt{5}$

Sol.429.(c) tanA tanB + $\frac{cos\,x}{cosAcosB}$ = 1

$= \frac{sinAsinB}{cosAcosB} + \frac{cos\,x}{cosAcosB} = 1$

$= \frac{sinAsinB + cos\,x}{cosAcosB} = 1$

= sinA sinB + cos x = cosA cosB

= cos x = cosAcosB - sinAsinB

= cos x = cos(A + B) ⇒ x = A + B

Sol.430.(a) $cos^3 60° - cos^3 240° - cos^3 360°$

$= cos^3 60° - cos^3(180° + 60°) - 1$

$= cos^3 60° + cos^3 60° - 1$

$= (\frac{1}{2})^3 \times 2 - 1 = \frac{1}{4} - 1 = \frac{-3}{4}$

Sol.431.(c) $5sin^2A + 3cos^2A = 4$

$\Rightarrow 2sin^2A + 3sin^2A + 3cos^2A = 4$

$\Rightarrow 2sin^2A + 3(sin^2A + cos^2A) = 4$

$\Rightarrow 2sin^2A + 3 = 4 \Rightarrow 2sin^2A = 1$

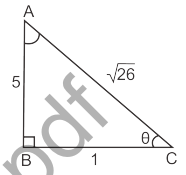
$sin^2A = \frac{1}{2}$ ⇒ sinA = $\frac{1}{\sqrt{2}}$

⇒ A = 45°

then , tanA = tan 45° = 1

Sol.432.(b) $\frac{sin\,\theta + cos\,\theta}{sin\,\theta - cos\,\theta} = \frac{3}{2}$

$\frac{sin\theta}{cos\theta} = \frac{3 + 2}{3 - 2} = \frac{5}{1}$ ⇒ tanθ = $\frac{5}{1}$



$sin^4\theta - cos^4\theta = (\frac{5}{\sqrt{26}})^4 - (\frac{1}{\sqrt{26}})^4$

$= \frac{625}{676} - \frac{1}{676} = \frac{624}{676} = \frac{12}{13}$

Sol.433.(c)

cosec²θ + sec²θ = $\frac{1}{sin^2\theta} + \frac{1}{cos^2\theta}$

$= \frac{sin^2\theta + cos^2\theta}{sin^2\theta\,cos^2\theta} = \frac{1}{\frac{2}{9}} = \frac{9}{2}$

Sol.434.(c) Formula :- (cos2x = $2cos^2x$ - 1)

$2\frac{cos^2x - sec^2x}{tan^2x}$ = a + bcos2x

$\Rightarrow 2\frac{cos^2x - \frac{1}{cos^2x}}{\frac{sin^2x}{cos^2x}} = 2\frac{cos^4x - 1}{sin^2x}$

$= 2\frac{(cos^2x - 1)(cos^2x + 1)}{1 - cos^2x}$

= - $2(cos^2x + 1)$ = - $2cos^2x$ - 2

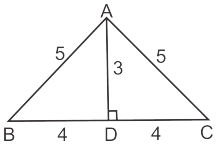
= - (cos2x + 1) - 2 = a + bcos2x

- 3 - cos2x = a + bcos2x

Comparing both side, we get,

a = - 3 and b = - 1

Sol.435.(b)



Since, △ABC is an isosceles triangle then, AD(median) divides BC in the ratio of 1 : 1.

By the given figure,

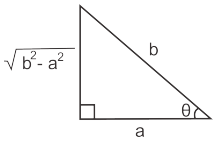
tanC = $\frac{3}{4}$, cotB = $\frac{4}{3}$

So, tanC - cotB = $\frac{3}{4} - \frac{4}{3} = \frac{9 - 16}{12} = \frac{-7}{12}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.436.(c) b cosθ = a ⇒ cosθ = $\frac{a}{b}$

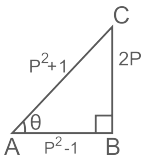


p = $\sqrt{b^2 - a^2}$ (using pythagoras theorem)

cosecθ + cotθ = $\frac{b}{\sqrt{b^2 - a^2}} + \frac{a}{\sqrt{b^2 - a^2}}$

= $\frac{b+a}{(\sqrt{b-a})(\sqrt{b+a})} = \sqrt{\frac{b+a}{b-a}}$

Sol.437.(a)



cosecθ + cotθ = p -------- (1)

cosecθ - cotθ = $\frac{1}{p}$ -------- (2)

(As $cosec^2\theta - cot^2\theta = 1$)

Adding eq . (1) and (2) we get :

cosecθ = $\frac{P^2+1}{2p}$. then, cotθ = $\frac{p^2-1}{2p}$

Now, $\frac{\frac{p^2-1}{2p}}{\frac{p^2+1}{2p}} = \frac{p^2-1}{p^2+1} = \frac{cot\theta}{cosec\theta}$ = cosθ

Sol.438.(d) $sin^2\theta$ - 3sinθ + 2 = 0

$sin^2\theta$ - 2sinθ - sinθ + 2 = 0

sinθ(sinθ - 2) - 1(sinθ - 2) = 0

(sinθ - 1)(sinθ - 2) = 0 ⇒ sinθ = 1 (Sinθ ≠2 ∵ (-1 ≤ sinθ ≤ 1))

So, sinθ = 1 (As, 0° ≤ θ ≤ 90°) ⇒ θ = 90°

Sol.439.(b) tan3θ.tan7θ = 1

tan3θ = $\frac{1}{tan7\theta}$ = cot7θ

tan3θ = tan(90 - 7θ)

3θ = 90° - 7θ ⇒ 10θ = 90°

⇒ θ = $\frac{90}{10}$ = 9°

So, cot 15θ = cot 135° = - 1

Sol.440.(b) 2sinθ + 2$sin^2\theta$ = 2

sinθ + $sin^2\theta$ = 1 ⇒ sinθ = 1 - $sin^2\theta$

⇒ sinθ = $cos^2\theta$

So, 2$cos^4\theta$ + 2$cos^2\theta$ = 2($cos^4\theta$+$cos^2\theta$)

= 2($sin^2\theta$ + $cos^2\theta$) = 2 × 1 = 2

Sol.441.(a) cosθ + $cos^2\theta$ = 1

cosθ = 1 - $cos^2\theta$ ⇒ cosθ = $sin^2\theta$

So, $\sqrt{sin^4\theta + cos^2\theta} = \sqrt{cos^2\theta + cos^2\theta}$

= $\sqrt{2cos^2\theta} = \sqrt{2}$cosθ

Sol.442.(c) $sec^2A + tan^2A = 3$

$1 + tan^2A + tan^2A = 3$

$1 + 2tan^2A = 3 \Rightarrow 2tan^2A = 2$

$tan^2A = 1 \Rightarrow \frac{1}{cot^2A} = 1$

$cot^2A = 1 \Rightarrow cotA = 1$

Sol.443.(b) cosec 15°sec 15°

= $\frac{1}{sin15°cos15°} = \frac{2}{2sin15°cos15°}$

= $\frac{2}{sin30°} = \frac{2}{\frac{1}{2}}$ = 4

Sol.444.(d) $\frac{cos\,A}{1 - tan\,A} + \frac{Sin\,A}{1 - cot\,A}$

= $\frac{cos\,A}{1 - \frac{sinA}{cosA}} + \frac{Sin\,A}{1 - \frac{cosA}{sinA}}$

= $\frac{cos^2A}{cosA - sinA} - \frac{sin^2A}{cosA - sinA}$

= $\frac{cos^2A - sin^2A}{cosA - sinA}$

= $\frac{(cosA + sinA)(cosA - sinA)}{cosA - sinA}$

= sinA + cosA

Sol.445.(c) tan40° = cot50° = a

So, $\frac{tan\,320° - tan310°}{1 + tan320°.tan310°}$

= $\frac{tan(360° - 40°) - tan(360° - 50°)}{1 + tan(360° - 40°).tan(360° - 50°)}$

= $\frac{-tan40° + tan50°}{1 + tan40°tan50°}$

= $\frac{-a + \frac{1}{a}}{1 + a \times \frac{1}{a}} = \frac{1 - a^2}{2a}$

Sol.446.(a) Formula :-

tan(A + B) = $\frac{tanA + tanB}{1 - tanAtanB}$

tan2α = tan{(α + β) + (α − β)}

= $\frac{tan(\alpha+\beta) + tan(\alpha-\beta)}{1 - tan(\alpha+\beta)tan(\alpha-\beta)} = \frac{a+b}{1-ab}$

Sol.447.(b) Short trick :

Putting θ = 45°, we have ,

$x = \frac{2sin45°}{1 + cos45° + sin45°} = \frac{\sqrt{2}}{1 + \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}}}$

= $\frac{2}{\sqrt{2} + 2} = \frac{\sqrt{2}}{1 + \sqrt{2}}$

Now,

$\frac{1 - cos\theta + sin\theta}{1 + sin\theta} = \frac{1 - cos45° + sin45°}{1 + sin45°}$

= $\frac{1 - \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}}}{1 + \frac{1}{\sqrt{2}}} = \frac{\sqrt{2} - 1 + 1}{\sqrt{2} + 1}$

= $\frac{\sqrt{2}}{\sqrt{2} + 1} = x$

Sol.448.(b) $\{(\frac{sec\theta - 1}{sec\theta + 1})\}^n$ = cosecθ - cotθ

$\{\frac{(sec\theta - 1)(sec\theta - 1)}{(sec\theta + 1)(sec\theta - 1)}\}^n$ = cosecθ − cotθ

$\{\frac{(sec\theta - 1)}{tan\theta}\}^{2n}$ = cosecθ − cotθ

$\{cosec\theta - cot\theta\}^{2n}$ = cosecθ - cotθ

Comparing both side, we get

2n = 1 ⇒ n = $\frac{1}{2}$ = 0.5

Sol.449.(a)

(2$cos^2\theta$ - 1) [$\frac{1 + tan\theta}{1 - tan\theta} + \frac{1 - tan\theta}{1 + tan\theta}$]

= cos2θ [$\frac{(1 + tan\theta)^2 + (1 - tan\theta)^2}{1 - tan^2\theta}$]

(∵cos2θ = $cos^2\theta$ - $sin^2\theta$ = 2$cos^2\theta$ − 1)

= cos2θ [$\frac{2(1 + tan^2\theta)}{1 - tan^2\theta}$]

= cos2θ [$\frac{2(cos^2\theta + sin^2\theta)}{cos^2\theta - sin^2\theta}$]

= cos2θ × $\frac{2}{cos2\theta}$ = 2

Sol.450.(d) $\frac{sin8\theta cos\theta - sin6\theta cos3\theta}{cos2\theta cos\theta - sin3\theta sin4\theta}$

Multiplying by 2 in numerator and denominator,

$\frac{2sin8\theta cos\theta - 2sin6\theta cos3\theta}{2cos2\theta cos\theta - 2sin3\theta sin4\theta}$

= $\frac{sin9\theta + sin7\theta - (sin9\theta + sin3\theta)}{cos3\theta + cos\theta - (cos\theta - cos7\theta)}$

= $\frac{sin7\theta - sin3\theta}{cos3\theta + cos7\theta} = \frac{2cos5\theta.sin2\theta}{2cos5\theta.cos2\theta}$ = tan2θ

Sol.451.(a)

(1 + cotA - cosecA) (1 + tanA + secA) - 1

Putting A = 45°, we have :

(1 + cot45° - cosec45°)(1 + tan45° + sec45°) - 1

= (2 - $\sqrt{2}$) (2 + $\sqrt{2}$) - 1 ⇒ 4 - 2 - 1 = 1

Sol.452.(c) As we know that,

$cos^2\theta + sin^2\theta = 1$

Then, cosA = $\sqrt{1 - (\frac{1}{3})^2} = \sqrt{\frac{8}{9}}$

= − $\frac{2\sqrt{2}}{3}$ and cosB = $\sqrt{1 - (\frac{1}{5})^2}$

= $\sqrt{\frac{24}{25}}$ = − $\frac{2\sqrt{6}}{5}$

(∵ A and B are in second quadrant)

cos(A − B) = cosA.cosB + sinAsinB

= (- $\frac{2\sqrt{2}}{3}$) × (- $\frac{2\sqrt{6}}{5}$) + $\frac{1}{3} \times \frac{1}{5}$

= $\frac{8\sqrt{3} + 1}{15}$

Sol.453.(a)

$\frac{sin(A + B)}{sinAcosB} = \frac{sinAcosB + cosAsinB}{sinAcosB}$

= 1 + $\frac{cosAsinB}{sinAcosB}$ = 1 + cotA tanB

Sol.454.(a) $cos^2 45°$ + $cos^2 135°$ + $cos^2 225°$ + $cos^2 315°$

= $(\frac{1}{\sqrt{2}})^2$ + cos^2(90°+45°) + cos^2(270° − 45°) + cos^2(360° - 45°)

= $(\frac{1}{\sqrt{2}})^2 + (-\frac{1}{\sqrt{2}})^2 + (-\frac{1}{\sqrt{2}})^2 + (\frac{1}{\sqrt{2}})^2 = \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$ = 2

Sol.455.(c) Formula used :

Search on TG: @apna_pdf

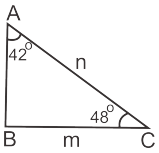
Search on Telegram @apna_pdf

$\cos 2\theta = 2\cos^2\theta - 1$ or $1 - 2\sin^2\theta$

Now, $\frac{2\cos^3\theta - \cos\theta}{\sin\theta - 2\sin^3\theta} = \frac{\cos\theta(2\cos^2\theta - 1)}{\sin\theta(1 - 2\sin^2\theta)}$

$= \frac{\cos\theta.\cos 2\theta}{\sin\theta.\cos 2\theta} = \cot\theta$

Sol.456.(d)



Sec48° = $\frac{n}{m}$ and cot 42° = $\frac{\sqrt{n^2 - m^2}}{m}$

So, Sec 48° − cot 42° = $\frac{n}{m} - \frac{\sqrt{n^2 - m^2}}{m}$

$= \frac{n - \sqrt{n^2 - m^2}}{m}$

Sol.457.(c) $\sec^2\theta\sqrt{(1 - \sin^2\theta)}$

$= \sec^2\theta \times \sqrt{\cos^2\theta} = \sec^2\theta \times \cos\theta = \sec\theta$

Sol.458.(a) As we know, that

$\operatorname{cosec}^2 A - \cot^2 A = 1$

= (cosecA + cotA)(cosecA − cotA) = 1

= m × (cosecA − cotA) = 1

⇒ (cosecA − cotA) = $\frac{1}{m}$

Sol.459.(d) (cosecA + cotA)(1 - cosA)

$= (\frac{1}{\sin A} + \frac{\cos A}{\sin A})(1 - \cos A)$

$= \frac{1 + \cos A}{\sin A} \times (1 - \cos A)$

$= \frac{(1 - \cos^2 A)}{\sin A} = \frac{\sin^2 A}{\sin A} = \sin A$

Sol.460.(a) cos A = sin²A,

a sin¹²A + b sin¹⁰A + c sin⁸A + sin⁶ A = 1

$= a\cos^6 A + b\cos^5 A + c\cos^4 A + \cos^3 A$

$= 1$..... (1)

We know that, $(\cos A + \cos^2 A)^3 =$

$= \cos^3 A + \cos^6 A + 3\cos^3 A(\cos A + \cos^2 A)$

$= \cos^6 A + 3\cos^5 A + 3\cos^4 A + \cos^3 A$

$= 1$..... (2)

from eq . (2) with (1),

a = 1 , b = 3 and c = 3

Then, a + b + c = 7

Sol.461.(c) $4\cos\theta + 3\sin\theta = x$..... (1)

$4\sin\theta - 3\cos\theta = y$..... (1)

Squaring eq .(1) and (2), we get

$16\cos^2\theta + 9\sin^2\theta + 24\sin\theta.\cos\theta$

$= x^2$..... (3)

$16\sin^2\theta + 9\cos^2\theta - 24\sin\theta.\cos\theta$

$= y^2$..... (4)

Adding eq . (3) and (4),

$16(\sin^2\theta + \cos^2\theta) + 9(\sin^2\theta + \cos^2\theta)$

$= x^2 + y^2$

then $x^2 + y^2 = 16 + 9 = 25$

Sol.462.(c) $\frac{\cos^4\theta - \sin^4\theta}{\sin^2\theta}$

$= \frac{(\cos^2\theta - \sin^2\theta)(\sin^2\theta + \cos^2\theta)}{\sin^2\theta}$

= cot²θ - 1

Sol.463.(b)

$\frac{\sin A}{\cot A + \operatorname{cosec} A} - \frac{\sin A}{\cot A - \operatorname{cosec} A} + 1$

$= \frac{\sin A\cot A - 1 - \sin A\cot A - 1}{\cot^2 A - \operatorname{cosec}^2 A} + 1$

$= \frac{-2}{-1} + 1 = 3$

Sol.464.(b) Put θ = 45 °

1 + sin² θ − 3sinθ cosθ = 0

$\Rightarrow 1 + \frac{1}{2} - \frac{3}{2} = 0$

Now, cotθ = 1

Sol.465.(b) cos⁴ α − sin⁴ α = $\frac{5}{6}$

⇒ (cos² α − sin² α)$(\cos^2\alpha + \sin^2\alpha) = \frac{5}{6}$

$\Rightarrow \cos^2\alpha - (1 - \cos^2\alpha) = \frac{5}{6}$

$\Rightarrow \cos^2\alpha + \cos^2\alpha - 1 = \frac{5}{6}$

then, $2\cos^2\alpha - 1 = \frac{5}{6}$

Sol.466.(a)

$[\frac{\cos\theta}{\sin\theta} + \frac{\sin\theta}{\cos\theta}] = \frac{\cos^2\theta + \sin^2\theta}{\sin\theta \times \cos\theta}$

$= \frac{1}{\sin\theta \times \cos\theta}$ = cosecθ.secθ

Sol.467.(b)

$\frac{\cos 50°}{\sin 40°} + \frac{3\operatorname{cosec} 80°}{\sec 10°}$ - 2cos50°.cosec 40°

$= \frac{\sin 40°}{\sin 40°} + \frac{3\sec 10°}{\sec 10°}$ - 2sin40°.cosec 40°

$= 1 + 3 - 2(\sin 40° \times \frac{1}{\sin 40°})$

= 1 + 3 - 2(1) = 4 - 2 = 2

Sol.468.(d) $\sqrt{3}$tanθ = 3sinθ

$\Rightarrow \frac{\tan\theta}{\sin\theta} = \frac{3}{\sqrt{3}} = \sqrt{3} \Rightarrow \frac{1}{\cos\theta} = \sqrt{3}$

$\Rightarrow \cos^2\theta = (\frac{1}{\sqrt{3}})^2 = \frac{1}{3}$

As per trigonometric identities , we have

$\sin^2\theta + \cos^2\theta = 1$

$\Rightarrow \sin^2\theta = 1 - \frac{1}{3} = \frac{2}{3}$

So, $\sin^2\theta - \cos^2\theta = \frac{2}{3} - \frac{1}{3} = \frac{1}{3}$

Sol.469.(a) $\frac{1}{\tan\theta} + \tan\theta = \frac{\cos\theta}{\sin\theta} + \frac{\sin\theta}{\cos\theta}$

$= \frac{\cos^2\theta + \sin^2\theta}{\sin\theta \times \cos\theta} = \frac{1}{\sin\theta \times \cos\theta}$

$= \frac{\sec\theta \times \operatorname{cosec}\theta}{1} = \sec\theta \times \operatorname{cosec}\theta$

Sol.470.(a)

$[(\sin\theta\tan\theta + \cos\theta)^2 - 1] = \sin^2\theta$

$\tan^2\theta + \cos^2\theta + 2\sin\theta.\tan\theta.\cos\theta - 1$

$= \sin^2\theta\tan^2\theta + \cos^2\theta + 2\sin^2\theta - 1$

$= \sin^2\theta\tan^2\theta + \cos^2\theta + \sin^2\theta + \sin^2\theta - 1$

$= \sin^2\theta(1 + \tan^2\theta) + (\sin^2\theta + \cos^2\theta) - 1$

$= \sin^2\theta.\sec^2\theta + 1 - 1 = \tan^2\theta$

Short Trick:- Put θ = 45°

$[(\sin\theta\tan\theta + \cos\theta)^2 - 1]$

$[(\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}})^2]$- 1 = 1

Only option (a) satisfies the given condition. ⇒ $\tan^2\theta = 1$

Sol.471.(b)

$\sin^2\frac{2\pi}{3} + \cos^2\frac{5\pi}{6} - \tan^2\frac{3\pi}{4}$

$= \sin^2 120° + \cos^2 150° - \tan^2 135°$

$= (\frac{\sqrt{3}}{2})^2 + (\frac{-\sqrt{3}}{2})^2 - 1$

$= \frac{3}{4} + \frac{3}{4} - 1 = \frac{6}{4} - 1 = \frac{1}{2}$

Sol.472.(a)

$\frac{2\sin\theta}{\sqrt{4 - 4\sin^2\theta}} = \frac{2\sin\theta}{\sqrt{4(1 - \sin^2\theta)}}$

$= \frac{2\sin\theta}{\sqrt{4\cos^2\theta}} = \frac{2\sin\theta}{2\cos\theta}$ = tanθ

Sol.473.(c)

$\frac{1}{\cos x}\sqrt{\frac{\cos(\pi + x)\cos(-x)}{\sin(\pi - x)\cos(\frac{\pi}{2} + x)}}$

$= \frac{1}{\cos x}\sqrt{\frac{-\cos x\cos x}{\sin x(-\sin x)}}$

$= \frac{1}{\cos x} \times \frac{\cos x}{\sin x} = \frac{1}{\sin x}$ = cosec x

Sol.474.(b) cosθ = sin(2θ)

sin(90° - θ) = sin(2θ) ⇒ 90° - θ = 2θ

⇒ 90° = 3θ ⇒ θ = 30° . Now,

$(\cos^4 30° + \cos^3 30° + \cos 30°) + (\sin^4 30° + \sin^3 30° + \sin 30°) + (\sin^2 30° + \cos^2 30°)$

$= (\frac{9}{16} + \frac{3\sqrt{3}}{8} + \frac{\sqrt{3}}{2}) + (\frac{1}{16} + \frac{1}{8} + \frac{1}{2}) + 1$

$= (\frac{9 + 14\sqrt{3}}{16}) + \frac{11}{16} + 1$

$= \frac{9 + 14\sqrt{3} + 11 + 16}{16} = \frac{36 + 14\sqrt{3}}{16}$

$= \frac{2(18 + 7\sqrt{3})}{16} = \frac{18 + 7\sqrt{3}}{8}$

Sol.475.(b)

$\frac{x(1 - \operatorname{cosec}^2 30°)}{1 + \operatorname{cosec}^2 30°} = (\frac{1}{2})^2 + (1 \times 4) - 2^2$

$\frac{x(1 - 4)}{1 + 4} = \frac{1}{4} + 4 - 4$

$x \times \frac{-3}{5} = \frac{1}{4} \Rightarrow x = \frac{1}{4} \times \frac{5}{-3} = -\frac{5}{12}$

Sol.476.(a) Given that 14sec θ = x

sec θ - cos θ = 14

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\sec\theta - \frac{1}{\sec\theta} = 14 \Rightarrow \frac{\sec^2\theta - 1}{\sec\theta} = 14$

[14 sec θ = x , given]

14 sec θ = $\sec^2\theta - 1 = \tan^2\theta$

14sec θ = x = $\tan^2\theta$

Sol.477.(d) (1 + tan10°)(1 + tan35°)

We know,

If A + B = 45° or 225° then, (1 + tanA)(1 + tanB) = 2

(1 + tan10°)(1 + tan35°) = 2

Sol.478.(a) $\frac{\sin 4\theta + \sin 2\theta}{\cos 4\theta + \cos 2\theta}$

$= \frac{2\sin\left(\frac{4\theta + 2\theta}{2}\right)\cos\left(\frac{4\theta - 2\theta}{2}\right)}{2\cos\left(\frac{4\theta + 2\theta}{2}\right)\cos\left(\frac{4\theta - 2\theta}{2}\right)}$

$= \frac{\sin 3\theta \cos\theta}{\cos 3\theta \cos\theta} = \frac{\sin 3\theta}{\cos 3\theta}$ = tan 3θ

Sol.479.(d) Sin x - 3cosx = $\sqrt{3}$ cosx

Sin x = $\sqrt{3}$ cosx + 3 cosx

Dividing both side by cosx. we get

tanx = $\sqrt{3}$ + 3

Cotx = $\frac{1}{\sqrt{3}+3} = \frac{\sqrt{3}-3}{3-9}$

$= -\frac{\sqrt{3}-3}{6} = \frac{3-\sqrt{3}}{6}$

Sol.480.(b) As per trigonometric identity,

we have Sin3x = 3sinx - $4\sin^3 x$

Now, $(4\sin^3 x - 3\sin x + \sin 3x)$

= $4\sin^3 x$ - 3sinx + 3sinx - $4\sin^3 x$ = 0

Sol.481.(c)

$\cos^2(90° - \theta) - \left[\frac{\cos(90° - \theta)\cos\theta}{\cot\theta}\right]$

$= \sin^2\theta - \left[\frac{\sin\theta\cos\theta}{\cot\theta}\right]$

$= \sin^2\theta - \left[\sin\theta\cos\theta \times \frac{\sin\theta}{\cos\theta}\right]$

$\Rightarrow \sin^2\theta - \sin^2\theta = 0$

Sol.482.(d) Sin 2θ $\left(\frac{\sin\theta}{\cos\theta} + \frac{\cos\theta}{\sin\theta}\right)$

$\Rightarrow 2\sin\theta\cos\theta\left(\frac{\sin^2\theta + \cos^2\theta}{\cos\theta\sin\theta}\right)$

$\Rightarrow 2\sin\theta\cos\theta \times \frac{1}{\sin\theta\cos\theta} = 2$

Sol.483.(b) Formula used:-

2cosA cosB = cos(A + B) + cos(A – B)

Putting A = 75°, B = 15°. We have ,

2 × cos 75°cos 15° = cos(75° + 15°) + cos(75° - 15°)

2 × cos 75°cos15° = cos 90° + cos 60°

cos75 °cos15° = $\frac{1}{2}\left(0 + \frac{1}{2}\right)$

$= \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

Sol.484.(a) 1 + tanθ = $\sqrt{3}$

tanθ = $\sqrt{3}$ - 1

$\sqrt{3}$ cotθ - 1 = $\sqrt{3} \times \frac{1}{\sqrt{3}-1}$ - 1

$\Rightarrow \frac{\sqrt{3}(\sqrt{3}+1)}{2} - 1 = \frac{3+\sqrt{3}-2}{2}$

$\Rightarrow \frac{\sqrt{3}+1}{2}$

Sol.485.(b) $\operatorname{cosec}^2\theta + \cot^2\theta = \frac{5}{3}$

$\Rightarrow \frac{1}{\sin^2\theta} + \frac{\cos^2\theta}{\sin^2\theta} = \frac{5}{3}$

$\Rightarrow \frac{1 + 1 - \sin^2\theta}{\sin^2\theta} = \frac{5}{3} \Rightarrow \frac{2 - \sin^2\theta}{\sin^2\theta} = \frac{5}{3}$

$\Rightarrow 6 - 3\sin^2\theta = 5\sin^2\theta$

$\Rightarrow 6 = 8\sin^2\theta \Rightarrow \sin^2\theta = \frac{6}{8} = \frac{3}{4}$

$\Rightarrow \sin\theta = \frac{\sqrt{3}}{2}$ = sin60° ⇒ θ = 60°

Cot2θ = cot(2 × 60°) = cot120° = $-\frac{1}{\sqrt{3}}$

Short trick:- Put θ = 60°

$\operatorname{cosec}^2\theta + \cot^2\theta = \left(\frac{2}{\sqrt{3}}\right)^2 + \left(\frac{1}{\sqrt{3}}\right)^2 = \frac{5}{3}$

LHS = RHS . Now,

Cot2θ = cot(2×60°) = cot120° = $-\frac{1}{\sqrt{3}}$

Sol.486.(b) $(\operatorname{cosec}\theta - \cot\theta)^2$

$= \left(\frac{1}{\sin\theta} - \frac{\cos\theta}{\sin\theta}\right)^2$

$= \frac{(1-\cos\theta)^2}{\sin^2\theta} = \frac{(1-\cos\theta)(1-\cos\theta)}{1-\cos^2\theta}$

$= \frac{(1-\cos\theta)(1-\cos\theta)}{(1-\cos\theta)(1+\cos\theta)} = \frac{(1-\cos\theta)}{(1+\cos\theta)}$

Sol.487.(a) Put x = 45°

$\tan\frac{45°}{2} = \frac{1-\cos 45°}{\sin 45°}$

$\tan 22.5° = \frac{1 - \frac{1}{\sqrt{2}}}{\frac{1}{\sqrt{2}}} \Rightarrow \tan 22.5° = \sqrt{2} - 1$

Sol.488.(a) $4\sin^2\theta = 3(1 + \cos\theta)$

$4\sin^2\theta = 3 + 3\cos\theta$

$4(1 - \cos^2\theta) = 3 + 3\cos\theta$

$4 - 4\cos^2\theta = 3 + 3\cos\theta$

$-4\cos^2\theta - 3\cos\theta + 1 = 0$

$4\cos^2\theta + 3\cos\theta - 1 = 0$

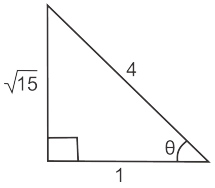
$4\cos^2\theta + 4\cos\theta - \cos\theta - 1 = 0$

$4\cos\theta(\cos\theta + 1) - 1(\cos\theta + 1) = 0$

$(\cos\theta + 1)(4\cos\theta - 1) = 0$

cosθ = –1 not possible as 0°< θ < 90°, so

$\cos\theta = \frac{1}{4}$



2tanθ + 4sinθ – secθ

$= 2\left(\frac{\sqrt{15}}{1}\right) + 4\left(\frac{\sqrt{15}}{4}\right) - \frac{4}{1}$

$= 2\sqrt{15} + \sqrt{15} - 4 = 3\sqrt{15} - 4$

Sol.489.(c) $3\sec^2\theta + \tan\theta - 7 = 0$

$3(1 + \tan^2\theta) + \tan\theta - 7 = 0$

$3 + 3\tan^2\theta + \tan\theta - 7 = 0$

$3\tan^2\theta + \tan\theta - 4 = 0$

$3\tan^2\theta + 4\tan\theta - 3\tan\theta - 4 = 0$

$3\tan^2\theta - 3\tan\theta + 4\tan\theta - 4 = 0$

$3\tan\theta(\tan\theta - 1) + 4(\tan\theta - 1) = 0$

$\tan\theta = -\frac{4}{3}$ not possible as 0° < θ < 90°, $\tan\theta$ = 1, hence θ = 45°

So, $\frac{2\sin\theta + 3\cos\theta}{\operatorname{cosec}\theta + \sec\theta}$

$= \frac{2\sin 45° + 3\cos 45°}{\operatorname{cosec} 45° + \sec 45°}$

$= \frac{2\left(\frac{1}{\sqrt{2}}\right) + 3\left(\frac{1}{\sqrt{2}}\right)}{\sqrt{2} + \sqrt{2}} = \frac{\frac{5}{\sqrt{2}}}{2\sqrt{2}} = \frac{5}{4}$

Alternate :- Put θ = 45°

$3\sec^2\theta + \tan\theta - 7 = 3 \times (\sqrt{2})^2 + 1 - 7$

= 6 + 1 - 7 = 0 (LHS = RHS)

So, $\frac{2\sin\theta + 3\cos\theta}{\operatorname{cosec}\theta + \sec\theta}$

$= \frac{2\sin 45° + 3\cos 45°}{\operatorname{cosec} 45° + \sec 45°}$

$= \frac{2\left(\frac{1}{\sqrt{2}}\right) + 3\left(\frac{1}{\sqrt{2}}\right)}{\sqrt{2} + \sqrt{2}} = \frac{\frac{5}{\sqrt{2}}}{2\sqrt{2}} = \frac{5}{4}$

Sol.490.(d) Putting θ = 45°

$1 + \sqrt{\frac{\cot\theta + \cos\theta}{\cot\theta - \cos\theta}}$

$= 1 + \sqrt{\frac{\cot 45° + \cos 45°}{\cot 45° - \cos 45°}}$

$= 1 + \sqrt{\frac{1 + \frac{1}{\sqrt{2}}}{1 - \frac{1}{\sqrt{2}}}} = 1 + \sqrt{\frac{\sqrt{2}+1}{\sqrt{2}-1}}$

$= 1 + \sqrt{\frac{\sqrt{2}+1}{\sqrt{2}-1} \times \frac{\sqrt{2}+1}{\sqrt{2}+1}}$

$= 1 + \sqrt{\frac{(\sqrt{2}+1)^2}{1}} = 1 + \sqrt{2} + 1 = 2 + \sqrt{2}$

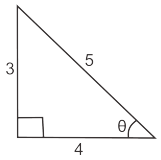
Putting θ = 45° in options, we find that option (d) gets satisfied.

1 + secθ + tanθ

= 1 + sec 45° + tan 45°

$= 1 + \sqrt{2} + 1 \Rightarrow 2 + \sqrt{2}$

Sol.491.(c) In this question, we will put the value of pythagoras triplet.



$\left(\frac{1-\cot\theta}{1-\tan\theta}\right)^2 - 1 = \left(\frac{1 - \frac{4}{3}}{1 - \frac{3}{4}}\right)^2 - 1$

$\Rightarrow \left(\frac{-\frac{1}{3}}{\frac{1}{4}}\right)^2 - 1 = \left(\frac{-4}{3}\right)^2 - 1$

Search on TG : @apna_pdf

Search on Telegram @apna_pdf

$\Rightarrow \frac{16}{9} - 1 = \frac{7}{9}$

Putting given triplets in options, we find that option (c) gets satisfied.

$\cot^2\theta - 1 = (\frac{4}{3})^2 - 1 = \frac{16}{9} - 1 = \frac{7}{9}$

Sol.492.(a) L et θ = 45°, now

$(cos^6\theta + sin^6\theta - 1)$

$(tan^2\theta + cot^2\theta + 2) + 3$

$= [(\frac{1}{\sqrt{2}})^6 + (\frac{1}{\sqrt{2}})^6 - 1][1^2 + 1^2 + 2] + 3$

$= [\frac{1}{8} + \frac{1}{8} - 1][4] + 3 = -3 + 3 = 0$

Sol.493.(c) $\sin^2\theta - \cos^2\theta - 3\sin\theta + 2 = 0$

$\sin^2\theta - (1 - \sin^2\theta) - 3\sin\theta + 2 = 0$

$\sin^2\theta - 1 + \sin^2\theta - 3\sin\theta + 2 = 0$

$2\sin^2\theta - 3\sin\theta + 1 = 0$

$2\sin^2\theta - 2\sin\theta - \sin\theta + 1 = 0$

$2\sin\theta(\sin\theta - 1) - 1(\sin\theta - 1) = 0$

$(\sin\theta - 1)(2\sin\theta - 1) = 0$

$\sin\theta = 1$ not possible, so $\sin\theta = \frac{1}{2}$,

θ = 30° ⇒ So, 1 + secθ + tanθ

= 1 + sec30° + tan30°

$= 1 + \frac{2}{\sqrt{3}} + \frac{1}{\sqrt{3}} = 1 + \frac{3}{\sqrt{3}} = 1 + \sqrt{3}$

Alternate :- put θ = 30°, 60° one by one , we find that θ = 30° satisfies the given terms.

$\sin^2\theta - \cos^2\theta - 3\sin\theta + 2$

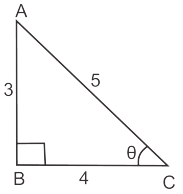
$= (\frac{1}{2})^2 - (\frac{\sqrt{3}}{2})^2 - 3 \times \frac{1}{2} + 2$

$= \frac{1}{4} - \frac{3}{4} - \frac{3}{2} + 2 = 0$ (LHS = RHS)

So,1 + secθ + tanθ ⇒ 1 + sec30° + tan30°

$= 1 + \frac{2}{\sqrt{3}} + \frac{1}{\sqrt{3}} = 1 + \frac{3}{\sqrt{3}} = 1 + \sqrt{3}$

Sol.494.(b) In this question, we will use pythagorean triplets of 3, 4, 5.



$\sec\theta = \frac{5}{4}$, $\tan\theta = \frac{3}{4}$, $\sin\theta = \frac{3}{5}$ and

$\cos\theta = \frac{4}{5}$

$(\sec\theta - \tan\theta)^2 (1 + \sin\theta)^2 \div \cos^2\theta$

$= (\frac{5}{4} - \frac{3}{4})^2 (1 + \frac{3}{5})^2 \div (\frac{4}{5})^2$

$= (\frac{1}{2})^2 \times (\frac{8}{5})^2 \div (\frac{4}{5})^2$

$= \frac{1}{4} \times \frac{64}{25} \div \frac{16}{25} = \frac{1}{4} \times \frac{64}{25} \times \frac{25}{16} = 1$

Sol.495.(c) $2\sin^2\theta + 3\cos\theta = 3$

$2(1 - cos^2\theta) + 3\cos\theta = 3$

$2 - 2cos^2\theta + 3\cos\theta = 3$

$-2cos^2\theta + 3\cos\theta - 1 = 0$

$2cos^2\theta - 3\cos\theta + 1 = 0$

$2cos^2\theta - 2\cos\theta - \cos\theta + 1 = 0$

$2\cos\theta(\cos\theta - 1) - 1(\cos\theta - 1) = 0$

$(\cos\theta - 1)(2\cos\theta - 1) = 0$

$\cos\theta = 1$ not possible as $0^o < \theta < 90^o$,

so $\cos\theta = \frac{1}{2}$, θ = 60°

So, $sec^2\theta + cot^2\theta = sec^2 60° + cot^2 60°$

$= (2)^2 + (\frac{1}{\sqrt{3}})^2 = 4 + \frac{1}{3} = 4\frac{1}{3}$

Alternate method :- put θ = 60°

$2\sin^2\theta + 3\cos\theta = 2 \times (\frac{\sqrt{3}}{2})^2 + 3 \times \frac{1}{2}$

$= 2 \times \frac{3}{4} + \frac{3}{2} = \frac{3}{2} + \frac{3}{2} = 3$ i.e LHS = RHS

So, $sec^2\theta + cot^2\theta = sec^2 60° + cot^2 60°$

$= (2)^2 + (\frac{1}{\sqrt{3}})^2 = 4 + \frac{1}{3} = 4\frac{1}{3}$

Sol.496.(d) Put A = 135°

$\frac{Cos\,A}{1 - tan\,A} + \frac{Sin\,A}{1 - Cot\,A} - Sin\,A$

$= \frac{-\frac{1}{\sqrt{2}}}{1 - (-1)} + \frac{\frac{1}{\sqrt{2}}}{1 - (-1)} - \frac{1}{\sqrt{2}} = -\frac{1}{\sqrt{2}}$

Only cosA gives $-\frac{1}{\sqrt{2}}$ at A = 135°,

so CosA is answer

Sol.497.(d)

$\text{cosec}^4A(1 - \cos^4A) - 2\cot^2A - 1$

Put A = 45° in equation because all option gives different values at A = 45°

$(\sqrt{2})^4\{1 - (\frac{1}{\sqrt{2}})^4\} - 2 \times (1)^2 - 1$

$= 4 \times \frac{3}{4} - 3 = 3 - 3 = 0$

Sol.498.(d) 6tanA(tanA + 1) = 5 - tanA ,

$6\tan^2A + 6\tan A + \tan A - 5 = 0$

$6\tan^2A + 7\tan A - 5 = 0$

$6\tan^2A + 10\tan A - 3\tan A - 5 = 0$

$2\tan A(3\tan A + 5) - 1(3\tan A + 5) = 0$

$(2\tan A - 1)(3\tan A + 5) = 0$

$\tan A = \frac{1}{2}, -\frac{5}{3}$

Taking $\tan A = \frac{1}{2}$ ...$(0 < A < \frac{\Pi}{2})$

$\sin A = \frac{1}{\sqrt{5}}$, $\cos A = \frac{2}{\sqrt{5}}$

$\sin A + \cos A = \frac{1}{\sqrt{5}} + \frac{2}{\sqrt{5}} = \frac{3}{\sqrt{5}}$

Sol.499.(a)

$(\frac{1 - cot\theta}{1 - tan\theta})^2 + 1 \Rightarrow (\frac{1 - cot\theta}{1 - \frac{1}{cot\theta}})^2 + 1$

$= (\frac{1 - cot\theta}{cot\theta - 1})^2 \times cot^2\theta + 1$

$= (-1)^2 \times cot^2\theta + 1 = \text{cosec}^2\theta$

$\Rightarrow cot^2\theta + 1 = \text{cosec}^2\theta$

Sol.500.(b) $\frac{sin^2\theta - 3sin\theta + 2}{cos^2\theta} = 1$

$sin^2\theta - 3sin\theta + 2 = \cos^2\theta$

$sin^2\theta - 3sin\theta + 2 = 1 - \sin^2\theta$

$2sin^2\theta - 3sin\theta + 1 = 0$

$2sin^2\theta - 2sin\theta - sin\theta + 1 = 0$

$2sin\theta(sin\theta - 1) - 1(sin\theta - 1) = 0$

$(2sin\theta - 1)(sin\theta - 1) = 0$

$sin\theta = \frac{1}{2}$, 1 θ = 30°, 90°

90° is not possible because cosθ cannot be 0. ⇒ cos2θ - sin3θ + cosec2θ

Cos 60° - sin 90° + cosec 60°

$= \frac{1}{2} - 1 + \frac{2}{\sqrt{3}} = \frac{-3 + 4\sqrt{3}}{6}$

Sol.501.(d)

$\frac{1 + cos\theta - sin^2\theta}{sin\theta(1 + cos\theta)} \times \frac{\sqrt{sec^2\theta + cosec^2\theta}}{tan\theta + cot\theta}$

$= \frac{1 - sin^2\theta + cos\theta}{sin\theta(1 + cos\theta)} \times \frac{\sqrt{\frac{1}{cos^2\theta} + \frac{1}{sin^2\theta}}}{\frac{sin\theta}{cos\theta} + \frac{cos\theta}{sin\theta}}$

$= \frac{cos^2\theta + cos\theta}{sin\theta(1 + cos\theta)} \times \frac{\sqrt{\frac{sin^2\theta + cos^2\theta}{cos^2\theta \times sin^2\theta}}}{\frac{sin^2\theta + cos^2\theta}{cos\theta \times sin\theta}}$

$= \frac{cos\theta\,(1 + cos\theta)}{sin\theta(1 + cos\theta)} \times \frac{\frac{1}{cos\theta \times sin\theta}}{\frac{1}{cos\theta \times sin\theta}}$

$= \frac{cos\theta}{sin\theta} = cot\theta$

Sol.502.(d)

$1 + 2tan^2\theta + 2sin\theta\, sec^2\theta = \frac{a}{b}$

$1 + tan^2\theta + tan^2\theta + 2sin\theta\, sec^2\theta = \frac{a}{b}$

$sec^2\theta + tan^2\theta + 2sin\theta\, sec^2\theta = \frac{a}{b}$

$sec^2\theta + sec^2\theta - 1 + 2sin\theta\, sec^2\theta = \frac{a}{b}$

$\frac{2sec^2\theta - 1 + 2sin\theta\, sec^2\theta}{1} = \frac{a}{b}$

Using componendo and dividendo,

$\frac{2sec^2\theta - 1 + 2sin\theta\, sec^2\theta + 1}{2sec^2\theta - 1 + 2sin\theta\, sec^2\theta - 1} = \frac{a + b}{a - b}$

So, $\frac{a + b}{a - b} = \frac{2sec^2\theta + 2sin\theta\, sec^2\theta}{2sec^2\theta - 2 + 2sin\theta\, sec^2\theta}$

$= \frac{\frac{2}{cos^2\theta} + \frac{2sin\theta}{cos^2\theta}}{\frac{2}{cos^2\theta} - 2 + \frac{2sin\theta}{cos^2\theta}}$

$= \frac{2 + 2\,sin\theta}{2 - 2\,cos^2\theta + 2sin\theta}$

$\Rightarrow \frac{2 + 2\,sin\theta}{2sin^2\theta + 2sin\theta} = \frac{2\,(1 + sin\theta)}{2sin\theta\,(1 + sin\theta)}$

$\Rightarrow \frac{1}{sin\theta} = \text{cosec}\theta$

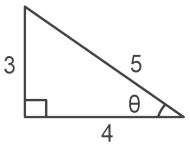
Sol.503.(d)

$\frac{(1 + sec\theta cosec\theta)^2 (sec\theta - tan\theta)^2 (1 + sin\theta)}{(sin\theta + sec\theta)^2 + (cos\theta + cosec\theta)^2}$

.....(1)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf



Put $\tan\theta = \frac{3}{4}$, $\sin\theta = \frac{3}{5}$, $\cos\theta = \frac{4}{5}$ and so on.

Putting respective values in (1), we get

$$\frac{(1+\sec\theta\,\mathrm{cosec}\theta)^2(\sec\theta-\tan\theta)^2(1+\sin\theta)}{(\sin\theta+\sec\theta)^2+(\cos\theta+\mathrm{cosec}\theta)^2}$$

$$=\frac{(1+\frac{5}{4}\times\frac{5}{3})^2(\frac{5}{4}-\frac{3}{4})^2(1+\frac{3}{5})}{(\frac{3}{5}+\frac{5}{4})^2+(\frac{4}{5}+\frac{5}{3})^2}$$

$$=\frac{(1+\frac{25}{12})^2\times(\frac{1}{4})\times(\frac{8}{5})}{(\frac{12+25}{20})^2+(\frac{12+25}{15})^2}$$

$$=\frac{\frac{1}{12\times12}\times\frac{1}{4}\times\frac{8}{5}}{\frac{1}{400}+\frac{1}{225}}=\frac{\frac{1}{12\times6}\times\frac{1}{5}}{\frac{625}{400\times225}}=\frac{2}{5}$$

Among all the given options, only option (d) satisfies the above obtained value.

Sol.504.(c) $(\frac{\tan^3\theta}{\sec^2\theta}+\frac{\cot^3\theta}{\mathrm{cosec}^2\theta}+2\sin\theta\cos\theta)\div(1+\mathrm{cosec}^2\theta+\tan^2\theta)$

$$=(\frac{\sin^3\theta}{\cos^3\theta\times\sec^2\theta}+\frac{\cos^3\theta}{\sin^3\theta\times\mathrm{cosec}^2\theta}+2\sin\theta\cos\theta)\div(\sec^2\theta+\mathrm{cosec}^2\theta)$$

$$=(\frac{\sin^3\theta}{\cos\theta}+\frac{\cos^3\theta}{\sin\theta}+2\sin\theta\cos\theta)\div(\frac{1}{\sin^2\theta}+\frac{1}{\cos^2\theta})$$

$$=(\frac{\sin^4\theta+\cos^4\theta+2\sin^2\theta\cos^2\theta}{\sin\theta\cos\theta})\div(\frac{\cos^2\theta+\sin^2\theta}{\sin^2\theta\cos^2\theta})$$

$$=\frac{(\sin^2\theta+\cos^2\theta)^2}{\sin\theta\cos\theta}\div(\frac{1}{\sin^2\theta\cos^2\theta})$$

$$=\frac{1}{\sin\theta\cos\theta}\div(\frac{1}{\sin^2\theta\cos^2\theta})=\sin\theta\cos\theta$$

Sol.505.(d) $\frac{\tan^6\theta-\sec^6\theta+3\sec^2\theta\tan^2\theta}{\tan^2\theta+\cot^2\theta+2}$

Putting θ = 45° in above expression, we get

$$\frac{\tan^6 45°-\sec^6 45°+3\sec^2 45°\tan^2 45°}{\tan^2 45°+\cot^2 45°+2}$$

$$=\frac{(1)^6-(\sqrt{2})^6+3(\sqrt{2})^2(1)^2}{(1)^2+(1)^2+2}$$

$$=\frac{1-8+6}{4}=\frac{-1}{4}$$

If we put θ = 45° in given options, then only option (d) satisfies the above value.

Sol.506.(b)

$$\frac{\cos^4\theta-\sin^4\theta+2\sin^2\theta+3}{(\mathrm{cosec}\theta+\cot\theta+1)(\mathrm{cosec}\theta-\cot\theta+1)-2}$$

$$=\frac{\cos^2\theta-\sin^2\theta+2\sin^2\theta+3}{(\mathrm{cosec}+1)^2-\cot^2-2}$$

$$=\frac{\cos^2\theta+\sin^2\theta+3}{\mathrm{cosec}^2\theta+1+2\mathrm{cosec}\theta-\cot^2\theta-2}$$

$$=\frac{1+3}{1+1+2\mathrm{cosec}\theta-2}=\frac{4}{2\mathrm{cosec}\,\theta}=2\sin\theta$$

Sol.507.(d)

$$\frac{(1-\sin\theta+\cos\theta)^2(1-\cos\theta)\sec^3\theta\,\mathrm{cosec}^2\theta}{(\sec\theta-\tan\theta)(\tan\theta+\cot\theta)}$$

Putting θ = 45°,

$$=\frac{(1-\frac{1}{\sqrt{2}}+\frac{1}{\sqrt{2}})^2(1-\frac{1}{\sqrt{2}})(\sqrt{2})^3(\sqrt{2})^2}{(\sqrt{2}-1)(1+1)}$$

$$=\frac{(1)^2(\frac{\sqrt{2}-1}{\sqrt{2}})4\sqrt{2}}{(\sqrt{2}-1)(1+1)}=\frac{4}{2}=2$$

Put θ = 45° in options

So, option (d) satisfies. ⇒ 2 tan 45° = 2

Sol.508.(d) $\frac{\sin^2\theta}{\cos^2\theta-3\cos\theta+2}=1$

⇒ $\sin^2\theta = \cos^2\theta - 3\cos\theta + 2$

⇒ $1-\cos^2\theta = \cos^2\theta - 3\cos\theta + 2$

⇒ $2\cos^2\theta - 3\cos\theta + 1 = 0$

⇒ $2\cos^2\theta - 2\cos\theta - \cos\theta + 1 = 0$

⇒ $2\cos\theta(\cos\theta-1) - 1(\cos\theta-1) = 0$

⇒ $(2\cos\theta-1)(\cos\theta-1) = 0$

For $\cos\theta = \frac{1}{2}$, θ = 60° and for $\cos\theta = 1$, θ = 0°,

as value of θ lies in first quadrant which is not possible in case of $\cos\theta = 1$,

so value of $\cos\theta = \frac{1}{2}$ and θ = 60° is admissible and correct.

Putting θ = 60°, in $\frac{\tan^2\frac{\theta}{2}+\sin^2\frac{\theta}{2}}{\tan\theta+\sin\theta}$

we get, $\frac{\tan^2\frac{60°}{2}+\sin^2\frac{60°}{2}}{\tan 60°+\sin 60°}$

$$=\frac{\tan^2 30°+\sin^2 30°}{\tan 60°+\sin 60°}$$

$$=\frac{(\frac{1}{\sqrt{3}})^2+(\frac{1}{2})^2}{\sqrt{3}+\frac{\sqrt{3}}{2}}=\frac{\frac{1}{3}+\frac{1}{4}}{\frac{3\sqrt{3}}{2}}=\frac{\frac{7}{12}}{\frac{3\sqrt{3}}{2}}$$

$$=\frac{14}{36\sqrt{3}}=\frac{7}{18\sqrt{3}}=\frac{7}{18\sqrt{3}}\times\frac{\sqrt{3}}{\sqrt{3}}$$

(multiplying numerator and denominator by $\sqrt{3}$) $=\frac{7\sqrt{3}}{54}$

Sol.509.(b)

$$\frac{(1-2\sin^2\theta\cos^2\theta)(\cot\theta+1)\cos\theta}{(\sin^4\theta+\cos^4\theta)(1+\tan\theta)\,\mathrm{cosec}\theta}-1$$

Put θ = 45°

$$\frac{\{(1-2(\frac{1}{\sqrt{2}})^2(\frac{1}{\sqrt{2}})^2\}(1+1)\frac{1}{\sqrt{2}}}{[(\frac{1}{\sqrt{2}})^4+(\frac{1}{\sqrt{2}})^4](1+1)\sqrt{2}}-1$$

$$=\frac{(1-\frac{1}{2})(1+1)\frac{1}{\sqrt{2}}}{[\frac{1}{4}+\frac{1}{4}]2\sqrt{2}}-1=\frac{\frac{1}{\sqrt{2}}}{\frac{1}{2}\times2\sqrt{2}}-1$$

$$=\frac{1}{\sqrt{2}\times\sqrt{2}}-1=\frac{1}{2}-1=-\frac{1}{2}$$

on putting θ = 45° in given options, then only option (b) satisfies .

⇒ $-\sin^2\theta = -(\frac{1}{\sqrt{2}})^2 = -\frac{1}{2}$

Sol.510.(b) As, $(\cos^2\theta+\sin^2\theta) = 1$

So,

$(\cos^2 x+\sin^2 x)+(\cos^2 2x+\sin^2 2x)+(\cos^2 3x+\sin^2 3x)+\ldots\ldots+(\cos^2 30x+\sin^2 30x)$

= 1 + 1 + 1 + ... + 1 = 1 × 30 = 30

So, required average = $\frac{30}{60}$ = 0.5

Sol.511.(b)

$$=\frac{\mathrm{cosec}\theta}{\mathrm{cosec}\theta-1}+\frac{\mathrm{cosec}\theta}{\mathrm{cosec}\theta+1}-\tan^2\theta$$

$$=\frac{\mathrm{cosec}^2\theta+\mathrm{cosec}\theta+\mathrm{cosec}^2\theta-\mathrm{cosec}\theta}{\mathrm{cosec}^2\theta-1}-\tan^2\theta$$

$$=\frac{2\mathrm{cosec}^2\theta}{\mathrm{cosec}^2\theta-1}-\tan^2\theta=\frac{2\mathrm{cosec}^2\theta}{\cot^2\theta}-\tan^2\theta$$

$= 2\sec^2\theta - \tan^2\theta = \sec^2\theta + \sec^2\theta - \tan^2\theta$

$= \sec^2\theta + 1$

Sol.512.(a) $2\cos^2\theta = 3\sin\theta$

$2(1-\sin^2\theta) = 3\sin\theta$ ⇒ $2 - 2\sin^2\theta = 3\sin\theta$

$2\sin^2\theta + 3\sin\theta - 2 = 0$ ⇒ $\sin\theta = -2$ or 0.5

So, θ = 30°

$(\sec^2\theta-\tan^2\theta+\cos^2\theta)$

Putting θ = 30° ⇒ $\frac{4}{3}-\frac{1}{3}+\frac{3}{4}=\frac{7}{4}$

Sol.513.(a) $\frac{\tan(45°-\alpha)}{\cot(45°+\alpha)}$

$$-\frac{(\cos 19°+\sin 71°)(\sec 19°+\mathrm{cosec}\,71°)}{\tan 12°.\tan 24°.\tan 66°.\tan 78°}$$

Let α = 0° ⇒ $\frac{\tan(45°)}{\cot(45°)}$

$$-\frac{(\cos 19°+\cos 19°)(\sec 19°+\sec 19°)}{\tan 12°.\tan 24°.\cot 24°\cot 12°}$$

$$1-\frac{2\cos 19°.2\sec 19°}{1}\Rightarrow 1-\frac{2\times2}{1}$$

⇒ 1 - 4 = - 3

Sol.514.(d) $1 + 2\tan^2\theta + 2\sin\theta\sec^2\theta$

$= \sec^2\theta + \tan^2\theta + 2\sin\theta\frac{\sec\theta}{\cos\theta}$

$= \sec^2\theta + \tan^2\theta + 2\sec\theta\tan\theta$

$=(\sec\theta+\tan\theta)^2$

$$=(\frac{1}{\cos\theta}+\frac{\sin\theta}{\cos\theta})^2=(\frac{1+\sin\theta}{\cos\theta})^2$$

$$=\frac{(1+\sin\theta)^2}{\cos^2\theta}=\frac{(1+\sin\theta)^2}{(1+\sin\theta)(1-\sin\theta)}$$

$$=\frac{1+\sin\theta}{1-\sin\theta}$$

Sol.515.(b) $\sin(\frac{2A+B}{2})=\frac{\sqrt{3}}{2}$ = sin 60°

⇒ 2A + B = 120° ....(eq .1)

$\cos(\frac{2A-B}{2})=\frac{\sqrt{3}}{2}$ = cos 30°

⇒ 2A - B = 60° ...(eq .2)

On solving eq . (1) and (2) we get,

A = 45° and B = 30°

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

sin[3(A - B)] = sin 45° = $\frac{1}{\sqrt{2}}$

Sol.516.(c)

$(\sqrt{sec^2\theta + cosec^2\theta})\ (\frac{sin\theta\ (1+cos\theta)}{1+cos\theta - sin^2\theta})$

$(\sqrt{\frac{1}{cos^2\theta} + \frac{1}{sin^2\theta}})(\frac{sin\theta\ (1+cos\theta)}{1+cos\theta - 1 + cos^2\theta})$

$= \frac{1}{sin\theta.cos\theta} \times \frac{sin\theta}{cos\theta} = sec^2\theta$

Sol.517.(d) $\frac{1}{cos\theta} + \frac{1}{tan\theta - sec\theta}$

$= \frac{1}{cos\theta} - \frac{(tan\theta - sec\theta)(tan\theta + sec\theta)}{tan\theta - sec\theta}$

= secθ - tanθ - secθ = - tanθ

Sol.518.(b) 4sin²(2x - 10)° = 3

sin²(2x - 10)° = 3/4 ⇒ sin(2x - 10)° = $\frac{\sqrt{3}}{2}$

(2x - 10)° = 60° ⇒ x = 35°

$\frac{Sin^4(x-5)° + cos^4(x-5)°}{1 - 2sin^2(3x-15)°\ cos^2(3x-15)°}$

$\Rightarrow \frac{Sin^4 30° + cos^4 30°}{1 - 2sin^2 90°\ cos^2 90°}$

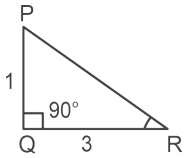
$= \frac{(\frac{1}{2})^4 + (\frac{\sqrt{3}}{2})^4}{1 - 2 \times 1 \times 0} = \frac{\frac{1}{16} + \frac{9}{16}}{1} = \frac{5}{8}$

Sol.519.(d) $\frac{\sqrt{2}tan(60° - \theta)\ tan(30° + \theta)}{sin^2\ (45° + \theta) + sin^2\ (45° - \theta)}$

Put θ = 0° ⇒ $\frac{\sqrt{2}tan(60°)\ tan(30°)}{sin^2\ (45°) + sin^2\ (45°)}$

$\Rightarrow \frac{\sqrt{2} \times \sqrt{3} \times \frac{1}{\sqrt{3}}}{\frac{1}{2} + \frac{1}{2}} = \sqrt{2}$

Sol.520.(d)



PR = $\sqrt{3^2 + 1^2} = \sqrt{10}$

$\frac{secP(cosR + sinP)}{cosecR(sinR - cosecP)}$

$= \frac{\frac{\sqrt{10}}{1}(\frac{3}{\sqrt{10}} + \frac{3}{\sqrt{10}})}{\frac{\sqrt{10}}{1}(\frac{1}{\sqrt{10}} - \frac{\sqrt{10}}{3})} = \frac{\frac{6\sqrt{10}}{\sqrt{10}}}{\frac{3-10}{3}} = \frac{6}{\frac{-7}{3}}$

$= -\frac{18}{7}$

Sol.521.(a)

$(sec\theta + tan\theta)^2 + \frac{1 + cosec\theta}{1 - cosec\theta}$

$= (sec\theta + tan\theta)^2 + \frac{(1 + cosec\ \theta)^2}{1 - cosec^2\ \theta}$

$\Rightarrow sec^2\theta + tan^2\theta + 2sec\theta \times tan\theta + \frac{1 + cosec^2\ \theta + 2cosec\ \theta}{-cot^2\theta}$

$\Rightarrow sec^2\theta + tan^2\theta + 2sec\theta \times tan\theta - tan^2\theta - sec^2\theta - 2sec\theta \times tan\theta = 0$

Sol.522.(b) $sin^6\theta + cos^6\theta = \frac{1}{3}$

$(sin^2\theta + cos^2\theta)\ [(sin^2\theta + cos^2\theta)^2 - 3\ sin^2\theta.cos^2\theta] = \frac{1}{3}$

$[1 - 3sin^2\theta.cos^2\theta] = \frac{1}{3}$

$\Rightarrow 3sin^2\theta.cos^2\theta = \frac{2}{3}$

$sin^2\theta.cos^2\theta = \frac{2}{9} \Rightarrow sin\theta.cos\theta = \frac{\sqrt{2}}{3}$

Sol.523.(d) 2cos²θ - 5cosθ + 2 = 0

Put θ = 60°

= 2cos²60°- 5cos 60° + 2 = 0

= 2 × $\frac{1}{4}$ - $\frac{5}{2}$ + 2 = 0 ⇒ 0 = 0 , satisfy then

(secθ + tanθ) = sec 60° + tan 60°

= 2 + $\sqrt{3}$

Sol.524.(a) $sec^4\theta(1 - sin^4\theta) - 2tan^2\theta$

$= sec^4\theta cos^2\theta(1 + sin^2\theta) - 2tan^2\theta$

$= sec^2\theta + sec^2\theta.sin^2\theta - tan^2\theta - tan^2\theta$

= 1 + 0 = 1

Sol.525.(a) sin²θ - cos²θ - 3sinθ + 2 = 0

Put θ = 30° ⇒ $\frac{1}{4} - \frac{3}{4} - \frac{3}{2} + 2 = 0$

⇒ $\frac{9}{4} - \frac{9}{4} = 0$

⇒ 0 = 0 (condition satisfied). So,

$\frac{1}{\sqrt{sec\ \theta - tan\theta}} = \frac{1}{\sqrt{\frac{2}{\sqrt{3}} - \frac{1}{\sqrt{3}}}} = \sqrt[4]{3}$

Sol.526.(c) $\sqrt{\frac{sec^2\theta + cosec^2\theta}{tan^2\theta - sin^2\theta}}$

$= \sqrt{\frac{\frac{1}{cos^2\theta} + \frac{1}{sin^2\theta}}{sin^2\theta(\frac{1}{cos^2\theta} - 1)}}$

$= \sqrt{\frac{\frac{1}{sin^2\theta.cos^2\theta}}{\frac{sin^2\theta.sin^2\theta}{cos^2\theta}}} = \sqrt{cosec^6\theta}$ = cosec³θ

Short trick :

Put θ = 30° ⇒ $\sqrt{\frac{sec^2 30° + cosec^2 30°}{tan^2 30° - sin^2 30°}}$ = 8

Check option (c) ⇒ $Cosec^3 30°$ = 8

Sol.527.(c) $\frac{1}{1 - sin\theta} + \frac{1}{1 + sin\theta}$ = 4 secθ

$\frac{2}{1 - sin^2\theta}$ = 4 secθ ⇒ $\frac{2}{cos^2\theta} = \frac{4}{cos\theta}$

secθ = 2, θ = 60° , then

cot 60° + cosec 60° = $\frac{1}{\sqrt{3}} + \frac{2}{\sqrt{3}} = \sqrt{3}$

Sol.528.(c) sin²θ = 2 sinθ - 1,

sin²θ - 2 sinθ + 1 = 0 ⇒ (sinθ - 1)² = 0

sin θ = 1 so, θ = 90°

$\frac{1 + cosec\theta}{1 - cos\ \theta} = \frac{1+1}{1-0}$ = 2

Sol.529.(b)

sin²59° + $\frac{1}{sec^2 31°}$ - $\frac{1}{sin^2 59° cosec^2 59°}$

⇒ cos²31° + $\frac{1}{x^2}$ - $\frac{1}{1}$

⇒ $\frac{1}{x^2} + \frac{1}{x^2} - 1 = \frac{2}{x^2} - 1 = \frac{2 - x^2}{x^2}$

Sol.530.(d) $2\ cos\theta + sec\theta - 2\sqrt{2} = 0$

Put θ = 45°

2 cos 45° + sec 45° - 2$\sqrt{2}$ = 0

= 2 $\frac{1}{\sqrt{2}}$ + $\sqrt{2}$ - 2$\sqrt{2}$ = 0

= $\sqrt{2}$ + $\sqrt{2}$ - 2$\sqrt{2}$ = 0 ⇒ 0 = 0, satisfy

Sol.531.(d) As we know that

cot θ = $\frac{B}{P} = \frac{\sqrt{2}+1}{1}$

Applying pythagoras theorem

H² = B² + P² = 2 + 1 + 2$\sqrt{2}$ + 1 = 4 + 2$\sqrt{2}$

CosecθSec θ = $\frac{H^2}{B \times P} = \frac{4 + 2\sqrt{2}}{\sqrt{2}+1}$ = 2$\sqrt{2}$

Sol.532.(b) Put θ = 30° in

$\frac{(1 - sin\theta)\ (sec\theta + tan\theta)\ tan\theta}{(sec\theta + tan\theta + 1)\ (cot\theta - cosec\theta + 1)}$

$= \frac{(1 - \frac{1}{2})\ (\frac{2}{\sqrt{3}} + \frac{1}{\sqrt{3}})\frac{1}{\sqrt{3}}}{(\frac{2}{\sqrt{3}} + \frac{1}{\sqrt{3}} + 1)\ (\sqrt{3} - 2 + 1)}$

$= \frac{(\frac{1}{2})\ (\frac{3}{\sqrt{3}})\frac{1}{\sqrt{3}}}{(\frac{3}{\sqrt{3}} + 1)\ (\sqrt{3} - 1)}$

$= \frac{(\frac{1}{2})}{(\sqrt{3} + 1)\ (\sqrt{3} - 1)} = \frac{1}{4} = \frac{sin\theta}{2}$

Sol.533.(d) $\frac{3\sqrt{3}\ sec\theta + 4\ tan\theta}{3tan\theta + \sqrt{3}\ sec\theta}$ = 2

3$\sqrt{3}$secθ + 4 tanθ = 2 × (3tanθ + $\sqrt{3}$secθ)

3$\sqrt{3}$secθ + 4 tanθ = 6 tanθ + 2$\sqrt{3}$ secθ

$\sqrt{3}$secθ = 2 tanθ

sinθ = $\frac{\sqrt{3}}{2}$, θ = 60° ⇒ cos 60° = $\frac{1}{2}$

Sol.534.(a) Y = tan 35°

Y = cot 55° (tanA = cotB, if A + B = 90°)

Now, 2 tan 55° + cot 55°

$= \frac{2 + cot^2 55°}{cot\ 55°} = \frac{2 + Y^2}{Y}$

Sol.535.(d) $tan\theta + cot\theta = 4$

Squaring both sides

$tan^2\theta + cot^2\theta$ = 14 .....(1)

Also, $tan\theta + cot\theta = 4$

$\frac{sin\theta}{cos\theta} + \frac{cos\theta}{sin\theta}$ = 4 ⇒ cosecθsecθ = 4

$cosec^2\theta\ sec^2\theta$ = 16 .....(2)

On putting value from eq .1 and 2

$\frac{3(tan^2\theta + cot^2\theta)}{(2\ cosec^2\theta\ sec^2\theta - 4)} = \frac{3 \times 14}{2 \times 16 - 4}$

$= \frac{42}{28}$ = 3 : 2

Sol.536.(c) $3(sec^2\theta + tan^2\theta) = 5$

θ = 30° (by hit and trial)⇒ Cosec30° = 2

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.537.(c)

$(cos^2\theta - 1)(2sec^2\theta) + sec^2\theta + 2tan^2\theta = 2$

$\Rightarrow (2 - 2sec^2\theta) + sec^2\theta + 2tan^2\theta = 2$

$\Rightarrow -2tan^2\theta + sec^2\theta + 2tan^2\theta = 2$

$\Rightarrow sec^2\theta = 2 \Rightarrow \theta = 45$

$\frac{(sec\theta + sin\theta)}{(cosec\theta - cos\theta)} = \frac{\sqrt{2} + \frac{1}{\sqrt{2}}}{\sqrt{2} - \frac{1}{\sqrt{2}}} = 3$

Sol.538.(a)

$\frac{(1+cos\theta)(cosec\theta - cot\theta)sec\theta}{sin\theta(1-sin\theta)(sec\theta + tan\theta)}$

$= \frac{(1+cos\theta)(1-cos\theta)\frac{1}{sin\theta cos\theta}}{sin\theta(1-sin\theta)(1+sin\theta)\frac{1}{cos\theta}}$

$= \frac{\frac{sin\theta}{cos\theta}}{sin\theta cos\theta} = sec^2\theta$

Sol.539.(d) $sin\theta(2sin\theta + 3) = 2$

$\theta = 30°$ (by hit and trial)

$sec^2\theta + cot^2\theta - cos^2\theta$

$= sec^2 30 + cot^2 30 - cos^2 30$

$= \frac{4}{3} + 3 - \frac{3}{4} = \frac{43}{12}$

Sol.540.(b) $sin\theta = \frac{2\sqrt{ab}}{a+b}$

Let a = 2, b = 1

Then $sin\theta = \frac{2\sqrt{2}}{3}$, $cos\,\theta = \frac{1}{3}$

Now, $\frac{cos\theta + 1}{cos\theta - 1} = \frac{\frac{1}{3} + 1}{\frac{1}{3} - 1} = \frac{-2}{1}$

When the value of a and b are put in all options, option (b) is the correct answer.

Sol.541.(c) $\frac{3cos^2 27° - 5 + 3cos^2 63°}{tan^2 32° + 4 - cosec^2 58°}$

$+ sin35° cos55° + cos35° sin55°$

We know that sinA = cosB, if A + B = 90°

So, $\frac{3cos^2 27° - 5 + 3sin^2 27°}{cot^2 58° + 4 - cosec^2 58°}$

$+ sin\,35° sin\,35° + cos\,35° cos\,35°$

$= \frac{3-5}{-1+4} + 1 = \frac{1}{3}$

Sol.542.(b) $2cos^2\theta = 3(1 - sin\theta)$

Put θ = 30°

$\Rightarrow 2\,cos^2 30° = 3(1 - sin30°) \Rightarrow \frac{3}{2} = \frac{3}{2}$

θ = 30° satisfies the given equation.

$(tan2\theta + cosec3\theta - sec2\theta) = \sqrt{3} + 1 - 2$

$= \sqrt{3} - 1$

Sol.543.(a)

$sec^2\theta + (1 - \sqrt{3})tan\theta - (1 + \sqrt{3}) = 0,$

$1 + tan^2\theta + tan\theta - \sqrt{3}tan\theta - 1 - \sqrt{3} = 0$

$tan\theta(tan\theta + 1) - \sqrt{3}(tan\theta + 1) = 0$

$(tan\theta + 1)(tan\theta - \sqrt{3}) = 0$

$tan\theta = -1, \sqrt{3} \Rightarrow \theta = 60°$

Sol.544.(b)

$cosec^2\theta(cos\theta - 1)(1 + cos\theta) = k,$

$cosec^2\theta\{-(1 - cos\theta)(1 + cos\theta)\}$

$- cosec^2\theta \times sin^2\theta = k \Rightarrow k = -1$

Sol.545.(a)

$\frac{cot\theta + cos\theta}{cot\theta - cos\theta} = \frac{k+1}{1-k}$

(By using componendo and dividendo)

$\frac{cot\theta}{cos\theta} = \frac{2}{2k} \Rightarrow k = sin\theta$

Sol.546.(c) $cos^2\theta - sin^2\theta - 3cos\theta + 2 = 0$,

Put θ = 60°

$cos^2 60° - sin^2 60° - 3cos60° + 2 = 0,$

$\frac{1}{4} - \frac{3}{4} - \frac{3}{2} + 2 = 0$

⇒ 0 = 0 (LHS = RHS)

$sec\theta - cos\theta = 2 - \frac{1}{2} = \frac{3}{2}$

Sol.547.(b) $\frac{cosec^2\theta}{cosec^2\theta - cot^2\theta} = \frac{13}{4}$

$\Rightarrow cosec^2\theta = \frac{13}{4}(cosec^2\theta - cot^2\theta = 1)$

$sin\theta = \frac{2}{\sqrt{13}} = \frac{Perpendicular}{Hypotenuse}$

By pythagoras theorem

Base = $\sqrt{Hypotenuse^2 - Perpendicular^2}$

⇒ Base = 3

$cos\theta = \frac{3}{\sqrt{13}}$, $sec\theta = \frac{\sqrt{13}}{3}$,

$tan\theta = \frac{2}{3}$, $cot\theta = \frac{3}{2}$

$\frac{52cos^2\theta - 9tan^2\theta}{18sec^2\theta + 8cot^2\theta} = \frac{52 \times \frac{9}{13} - 9 \times \frac{4}{9}}{18 \times \frac{13}{9} + 8 \times \frac{9}{4}}$

$= \frac{36-4}{26+18} = \frac{32}{44} = \frac{8}{11}$

Sol.548.(a) $\frac{3(cot^2 46° - sec^2 44°)}{2(sin^2 28° + sin^2 62°)} +$

$\frac{2cos^2 60° tan^2 33° tan^2 57°)}{sec^2(90° - \theta) - cot^2\theta°}$

$\Rightarrow \frac{3(tan^2 44° - sec^2 44°)}{2(sin^2 28° + cos^2 28°)} +$

$\frac{2cos^2 60° tan^2 33° cot^2 33°)}{cosec^2\theta - cot^2\theta} \Rightarrow \frac{-3}{2} + \frac{1}{2} = -1$

Sol.549.(b) $3sec\theta + 4cos\theta = 4\sqrt{3}$,

Put θ = 30°

$3 \times \frac{2}{\sqrt{3}} + 4 \times \frac{\sqrt{3}}{2} = 4\sqrt{3}$(Equation satisfies)

$(1 - sin\theta + cos\theta) = (1 - sin30° + cos30°) = \frac{1+\sqrt{3}}{2}$

Sol.550.(d) $\frac{5cot\theta + \sqrt{3}cosec\theta}{2\sqrt{3}cosec\theta + 3cot\theta} = 1$

$\Rightarrow 5cos\theta + \sqrt{3} = 2\sqrt{3} + 3cos\theta$

$2cos\theta = \sqrt{3} \Rightarrow cos\theta = \frac{\sqrt{3}}{2}$, θ = 30°

$\Rightarrow \frac{\frac{7}{2}cot^2\theta - \frac{3}{4}cosec^2\theta}{4sin^2\theta + \frac{3}{2}tan^2\theta}$

$= \frac{\frac{7}{2} \times 3 - \frac{3}{4} \times 4}{4 \times \frac{1}{4} + \frac{3}{2} \times \frac{1}{3}} = 5$

Sol.551.(c) $(1 + cot^2\theta) + (1 + (cot^2\theta)^{-1})$

$\Rightarrow cosec^2\theta + (1 + tan^2\theta)$

$\Rightarrow cosec^2\theta + sec^2\theta \Rightarrow \frac{1}{sin^2\theta} + \frac{1}{cos^2\theta}$

$\Rightarrow cosec^2\theta.sec^2\theta$

$k = cosec^2\theta.sec^2\theta \Rightarrow \sqrt{k} = cosec\theta.sec\theta$

Sol.552.(c) $\frac{sec\theta\, cosec\theta}{2 + tan^2\theta + cot^2\theta}$

$= \frac{sec\theta\, cosec\theta}{sec^2\theta + cosec^2\theta} = \frac{sec\theta\, cosec\theta}{\frac{1}{sin^2\theta} + \frac{1}{cos^2\theta}}$

$= sec\theta.cosec\theta sin^2\theta cos^2\theta = sin\theta cos\theta$

Sol.553.(c) cotA + cosecA = 2 ----- (1)

$cosec^2 A - cot^2 A = 1$

(cosecA + cotA) (cosecA - cotA) = 1

(cosecA - cotA) = $\frac{1}{2}$ ----- (2)

Adding (1) and (2)

$2cosecA = \frac{5}{2} \Rightarrow cosecA = \frac{5}{4}$

$sinA = \frac{4}{5}$; $tanA = \frac{4}{3}$

$\frac{9tanA + 16cosecA}{5sinA + 3tan\,A} = \frac{9 \times \frac{4}{3} + 16 \times \frac{5}{4}}{5 \times \frac{4}{5} + 3 \times \frac{4}{3}} = 4$

Sol.554.(c) $cot^2\theta + cot^4\theta = 2$

$cot^2\theta(1 + cot^2\theta) = 2$

$cot^2\theta = 2\,sin^2\theta \Rightarrow cot^4\theta = 4\,sin^4\theta$

$2sin^4\theta + sin^2\theta = \frac{cot^4\theta}{2} + \frac{cot^2\theta}{2}$

$= \frac{cot^2\theta + cot^4\theta}{2} = 1$

Short-Trick: put θ = 45°

Sol.555.(c) $sin\alpha + cosec\alpha = tan\frac{\pi}{3}$

$sin\alpha + cosec\alpha = \sqrt{3}$

$sin^3\alpha + cosec^3\alpha = a^3 - 3a$

$= (\sqrt{3})^3 - 3(\sqrt{3}) = 0$

Sol.556.(c) $\frac{sin^2 52° + 2 + sin^2 38°}{4cos^2 43° - 5 + 4cos^2 47°}$

$\frac{sin^2 52° + 2 + cos^2 52°}{4cos^2 43° - 5 + 4sin^2 43°}$

$\frac{1+2}{4cos^2 43° + 4sin^2 43° - 5} = \frac{3}{-1} = -3$

Sol.557.(d)

$4(cosec^2 57° - tan^2 33°) - cos90°$

$+ y \times tan^2 66° \times tan^2 24° = \frac{y}{2}$,

We know $cosec^2\theta = 1 + cot^2\theta$

And TanATanB = 1 if(A + B = 90°)

So. $4(1 + cot^2 57° - cot^2 57°) - Cos90° +$

$y \times 1 = \frac{y}{2} \Rightarrow 4 + y = \frac{y}{2}$

$\Rightarrow \frac{y}{2} = -4 \Rightarrow Y = -8$

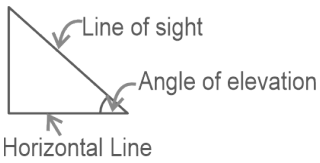
Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Height and Distance

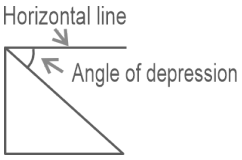
In this chapter following concepts / terminologies will be used.

Angle Of Elevation



The angle made by the line of sight with the horizontal line is called the angle of elevation.

Angle Of Depression



The angle made by the line of sight with the horizontal line is called the angle of depression.

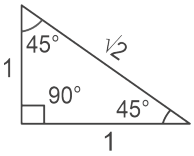
Note: When we come near object, the angle of elevation increases and when we go away from the object, the angle of elevation decreases.

Note: Angle of elevation and angle of depression are always equal.

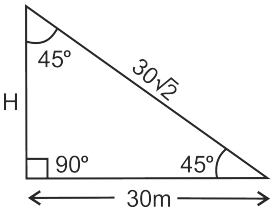
In this chapter trigonometric ratio and concepts will be used which we have discussed in detail in the trigonometry chapter.

Some important relation

Case :- (1)



Example :- The angle of elevation of the top of a tower from a point on the ground, 45° which is 30 m from the foot of the tower. Find the height of the tower?



Let the height of the tower be 'H'

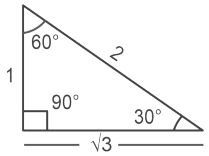
tan 45° = $\frac{H}{30}$

1 = $\frac{H}{30}$ ⇒ H = 30 m

Short Trick :- 1 → 30 m

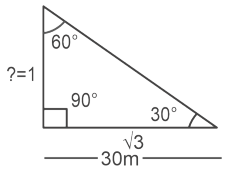
1 → ? ⇒ ? = 30 m

Case :- (2)



Example :- The angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of the tower is 30°. Find the height of the tower ?

Solution :-



Let , the height of the tower be 'H'

tan30° = $\frac{H}{30}$

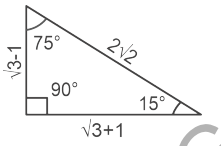
$\frac{1}{\sqrt{3}} = \frac{H}{30}$ ⇒ H = $\frac{30}{\sqrt{3}}$ m = 10 √3 m

Short Trick :-

√3 → 30 m

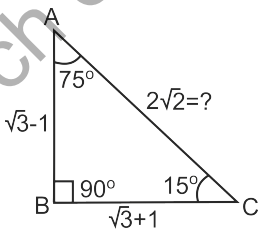
1 → ? ⇒ ? = $\frac{30}{\sqrt{3}}$ m = 10 √3 m

Case :- (3)



Example :- The angle of elevation of a ladder leaning against a wall is 15° and the foot of the ladder is 4 m away from the wall. The length of the ladder is :

Solution :-



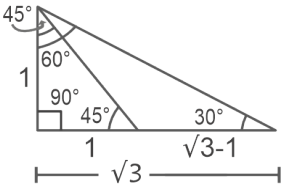
Let AB be the wall and AC be the ladder.

Then, ∠ACB = 15° and BC = 4 m.

√3 + 1 → 4 m

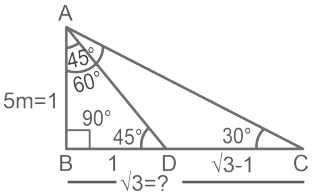
2√2 → ? ⇒ ? = $\frac{8\sqrt{2}}{\sqrt{3}+1}$

Case :- (4)



Example :- A man on the top of a vertical observation tower observes a car moving at a uniform speed coming directly towards it and the angle of depression to change from 30° to 45° . if The height of the tower is 5 m then find the value of the total covered distance by the car ?

Solution :-



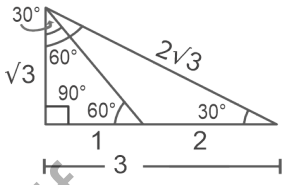
Let AB = Height of tower = 1 And total covered distance by the car = BC = √3

So , ATQ

1 = 5 m

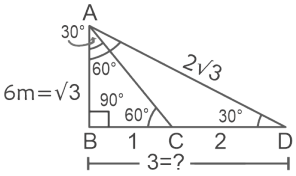
√3 = ? ⇒ 5√3

Case :- (5)



Example :- A man on the top of a vertical observation tower observes a car moving at a uniform speed coming directly towards it and the angle of depression to change from 30° to 60° .if The height of the tower is 6 m then find the value of the total covered distance by the car ?

Solution :-



Let AB = Height of tower = √3

And total covered distance by the car = BD = 3

So , A/Q

√3 = 6 m

3 = ? ⇒ 6√3 m

Variety Questions

Q.1. A man looks at the reflection of the top of the lamp-post on the mirror that is 6.6 m away from the foot of the lamppost. The man's height is 1.25 m and he is standing 2 m away from the mirror. Assuming that the mirror is placed on the ground, facing the sky and the man, and that the mirror and the lamp-post are in a same line, find the height of the lamp-post (in metres).

SSC CHSL 04/07/2024 (1st Shift)

(a) 3.97 (b) 4.28 (c) 4.45 (d) 4.13

Q.2. The shadow of a tower standing on level ground is found to be 40 m longer when the Sun's altitude is 30° than when it was 45°. Find the height (in meters) of the tower.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL Tier II 10/01/2024
(a) $10(\sqrt{3}-1)$ (b) $20(\sqrt{3}-1)$
(c) $20(\sqrt{3}+1)$ (d) $10(\sqrt{3}+1)$

Q.3. Two pillars of equal height stand on either side of a roadway which is 150 m wide. At a point in the road between pillars, the elevations of the pillars are x° and y° so that $tanx° = \frac{2}{5}, tany° = \frac{3}{5}$, then the height of each pillar is :
SSC CGL Tier II (26/10/2023)
(a) 39 m (b) 36 m (c) 42 m (d) 33 m

Q.4. Subhas, a 3.15 m tall tree, and an 11.25 m tall building are positioned such that their feet on the ground are collinear and the tree is located between Subhas and the building. The tree is located at a distance of 7.5 m from Subhas and at a distance of 45 m from the building. Further, the eyes of Subhas, the top of the tree, and the top of the building fall in one line. Find the height (in m) from the ground at which Subhas' eyes are situated.
SSC CHSL 09/08/2023 (4th Shift)
(a) 1.75 (b) 1.8 (c) 1.6 (d) 1.5

Q.5. From the top of an upright pole 17.75 m high, the angle of elevation of the top of an upright tower was 60°. If the tower was 57.75 m tall, how far away (in m) from the foot of the pole was the foot of the tower?
SSC CGL Tier II (03/03/2023)
(a) $40\sqrt{3}$ (b) $\frac{151\sqrt{3}}{6}$ (c) $\frac{77}{4}\sqrt{3}$ (d) $\frac{40\sqrt{3}}{3}$

Q.6. A pole 23 m long reaches a window which is $3\sqrt{5}$ m above the ground on one side of a street. Keeping its foot at the same point, the pole is turned to the other side of the street to reach a window $4\sqrt{15}$ m high. What is the width (in m) of the street?
SSC CGL 11/04/2021 (Afternoon)
(a) 17 (b) 35 (c) 39 (d) 22

Q.7. A person was standing on a road near a mall. He was 1215 m away from the mall and able to see the top of the mall from the road in such a way that the top of a tree, which is in between him and the mall, was exactly in line of sight with the top of the mall. The tree height is 20m and it is 60m away from him. How tall (in m) is the mall?
SSC CPO 25/11/2020 (Morning)
(a) 405 (b) 250 (c) 300 (d) 375

Q.8. A ladder leaning against a wall makes an θ with the horizontal ground such that cosθ = $\frac{5}{13}$. If the height of the top of the ladder from the wall is 18m, then what is the distance (in cm) of the foot of the ladder from the wall?
SSC CPO 23/11/2020 (Morning)
(a) 19.5 (b) 13 (c) 7.5 (d) 18

Q.9. A pole stands vertically on a road, which goes in the north- south direction. P, Q are two points towards the north of the pole, such that PQ = b, and the angles of elevation of the top of the pole at P, Q are α , β respectively. Then the height of the pole is:.
SSC CPO 09/12/2019 (Morning)
(a) $\frac{b}{tan\beta + tan\alpha}$ (b) $\frac{b}{cot\beta - cot\,\alpha}$
(c) $\frac{b}{tan\beta - tan\,\alpha}$ (d) $\frac{b\,tan\alpha}{tan\beta}$

Q.10. A clock tower stands at the crossing Of two roads which point in the north-south and the east-west directions. P,Q,R and S are points on the roads due north, east, south and west respectively, where the angles of elevation of the top of the tower are respectively, α, β, γ and δ . Then $(\frac{PQ}{RS})^2$ is equal to :
SSC CPO 09/12/2019 (Morning)
(a) $\frac{tan^2\alpha + tan^2\delta}{tan^2\gamma + tan^2\beta}$ (b) $\frac{tan^2\alpha + tan^2\beta}{tan^2\gamma + tan^2\delta}$
(c) $\frac{cot^2\alpha + cot^2\beta}{cot^2\gamma + cot^2\delta}$ (d) $\frac{cot^2\alpha + cot^2\delta}{cot^2\gamma + cot^2\beta}$

Q.11. From a point exactly midway between the foot of two towers P and Q, the angles of elevation of their tops are 30° and 60° respectively. The ratio of the height of P to that of Q is :
SSC CGL Tier II (12/09/2019)
(a) 1 : 3 (b) 1 : 2 (c) $1 : 2\sqrt{3}$ (d) $2 : 3\sqrt{3}$

Q.12. The angle of elevation of a flying drone from a point on the ground is 60°. After flying for 5 seconds the angle of elevation drops to 30°. If the drone is flying horizontally at a constant height of $1000\sqrt{3}$ m, the distance (in m) travelled by the drone is:
SSC CPO 16/03/2019 (Afternoon)
(a) 2000 (b) 1000 (c) 3000 (d) 4000

Q.13. At a certain time of a day a tree 5.4 m height casts a shadow of 9 m. If a pole casts a shadow of 13.5 m at the same time, the height of the pole is:
SSC CPO 16/03/2019 (Morning)
(a) 8.1 m (b) 9.9 m (c) 7.2 m (d) 6.3 m

Q.14. What is the angle of elevation of the sun from the top of a pillar, when its height is equal to the length of its shadow?
SSC CPO 15/03/2019 (Evening)
(a) 30° (b) 90° (c) 45° (d) 60°

Q.15. The top of a broken tree touches the ground at a 60° angle, 45 meters away from the root of the tree. What will be the total height (in m) of the tree? (Use $\sqrt{3}$ = 1.73 and $\sqrt{2}$ = 1.41)
SSC CPO 14/03/2019 (Evening)
(a) 153.45 (b) 141.3 (c) 167.85 (d) 137.24

Q.16. From the top of the 120 m high lighthouse, the angle of depression of two ships on opposite sides of the base of the lighthouse is 30° and 60°. What is the distance between the ships? (rounded off)
SSC CPO 14/03/2019 (Morning)
(a) 327 m (b) 127 m (c) 277 m (d) 177 m

Q.17. From the top of 75 m high tower, the angle of depression of two points P and Q on opposite side of the base of the tower on level ground is θand ϕ, such that tanθ = $\frac{3}{4}$ and tanϕ = $\frac{5}{8}$. What is the distance (in m) between the points P and Q ?
SSC CPO 13/03/2019 (Morning)
(a) 190 (b) 200 (c) 180 (d) 220

Q.18. From the top of a 12 m high building, the angle of elevation of the top of the tower is 60° and the angle of depression of the foot of the tower is θ, such that tanθ = $\frac{3}{4}$. What is the height of the tower ? ($\sqrt{3}$ = 1.73)
SSC CPO 12/03/2019 (Evening)
(a) 41.41 (b) 36.22 (c) 39.68 (d) 37.95

Q.19. A ladder leaning against a wall makes an angle α with the horizontal ground such that tan α = $\frac{3}{4}$. If the foot of the ladder is 5 m away from the wall, what is the length (in m) of the ladder?
SSC CPO 12/03/2019 (Morning)
(a) 5.25 (b) 3.75 (c) 6.25 (d) 4.5

Practice Questions

SSC CGL 2024 Tier - 1

Q.20. A pole 10 m long rests slantly against a vertical wall AB making an angle 30° with the horizontal (ground). Find how far the foot of the pole is from the wall (in metres).
SSC CGL 10/09/2024 (1st Shift)
(a) 15 (b) $\frac{5}{\sqrt{3}}$ (c) 10 (d) $5\sqrt{3}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 2024 Tier - 1

Q.21. A mirror is placed on the ground facing upwards. A man sees the top of a tower in the mirror which is at a distance of 105 m from the mirror. The man is 0.5 m away from the mirror, and his height is 1.5 m. Find the height of the tower (in metres).
SSC CHSL 10/07/2024 (1st Shift)
(a) 280 (b) 115 (c) 315 (d) 210

Q.22. A vertical pole of length 6 m casts a 4 m long shadow on the ground. At the same time, a tower casts a 28 m long shadow. Find the height of the tower.
SSC CHSL 11/07/2024 (2nd Shift)
(a) 48 m (b) 32 m (c) 36 m (d) 42 m

SSC CHSL 2023 Tier - 2

Q.23. A pole stands vertically on the ground with the help of a 12-metre steel wire tied to its top and affixed on the ground. If the steel wire makes an angle of 30° with the horizontal ground, then the height of the pole is equal to:
SSC CHSL Tier II 02/11/2023
(a) 8 meters (b) $6\sqrt{3}$ meters
(c) $8\sqrt{3}$ meters (d) 6 meters

Q.24. A man observed the top of an electric pole at angles of elevation of 60° and 30°, respectively, from two different observation points P and Q . If the distance between P and Q is 10 m, find the height of the pole (in m).
SSC CHSL Tier II 10/01/2024
(a) $5\sqrt{3}$ (b) 5 (c) 15 (d) $15\sqrt{3}$

SSC CGL 2023 Tier - 2

Q.25. From the top of a tower, the angle of depression of the top of a 10 m high building is 60°. If the distance between the tower and the building is $50\sqrt{3}$ m, find the height of the tower.
SSC CGL Tier II (26/10/2023)
(a) 150 m (b) 100 m (c) 160 m (d) 140 m

SSC CHSL 2023 Tier - 1

Q.26. A vertical pillar 42 cm long casts a 35 cm long shadow. At the same time, a tower casts a shadow 25 m long. Find the height of the tower.
SSC CHSL 07/08/2023 (4th Shift)
(a) 28 m (b) 35 m (c) 32 m (d) 30 m

Q.27. Suhas, a 3.15 m tall tree, and a building are positioned such that their feet on the ground are collinear and the tree is located between Suhas and the building. The tree is located at a distance of 7.5 m from Suhas and at a distance of 45 m from the building. Further, the eyes of Suhas, the top of the tree, and the top of the building fall in one line, and the eyes of Suhas are at a height of 1.8 m from the ground. Find the height (in m) of the building.
SSC CHSL 14/08/2023 (2nd Shift)
(a) 11.25 (b) 11.50 (c) 10.25 (d) 10.75

Q.28. Suhas, a tree, and an 11.25 m tall building are positioned such that their feet on the ground are collinear and the tree is located between Suhas and the building. The tree is located at a distance of 7.5 m from Suhas and at a distance of 45 m from the building. Further, the eyes of Suhas, the top of the tree, and the top of the building fall in one line, and the eyes of Suhas are at a height of 1.8 m from the ground. Find the height (in m) of the tree.
SSC CHSL 17/08/2023 (2nd Shift)
(a) 3.00 (b) 3.30 (c) 3.15 (d) 3.45

SSC CGL 2023 Tier - 1

Q.29. A person standing at a distance looks at a building having a height of 1000 metres. The angle between the top of the building and the ground is 30°. At what approximate distance (in metres) is the person standing away from the building.
SSC CGL 17/07/2023 (4th shift)
(a) 1000 (b) 936 (c) 1732 (d) 1542

Q.30. A vertical pole of 28m height casts a 19.2m long shadow. At the same time, find the length of the shadow cast by another pole of 52.5m height.
SSC CGL 20/07/2023 (4th shift)
(a) 36 m (b) 35 m (c) 40 m (d) 30 m

SSC CGL 2022 Tier - 2

Q.31. Two ships are on the opposite side of a lighthouse such that all three of them are collinear. The angles of depression of the two ships from the top of the lighthouse are 30° and 60°. If the ships are $230\sqrt{3}$ m apart, then find the height of the light house (in m).
SSC CGL Tier II (02/03/2023)
(a) 175.4 (b) 165.2 (c) 172.5 (d) 180.5

Q.32. From the top of an upright pole 24 $\sqrt{3}$ feet high, the angle of elevation of the top of an upright tower was 60°. If the foot of the pole was 60 feet away from the foot of the tower, what tall (in feet) was the tower?
SSC CGL Tier II (06/03/2023)
(a) $84\sqrt{3}$ (b) $36\sqrt{3}$ (c) $44\sqrt{3}$ (d) $60\sqrt{3}$

Q.33. The angle of elevation of the top of a tower from the top of a building whose height is 680 m is 45° and the angle of elevation of the top of the same tower from the foot of the same building is 60°. What is the height (in m) of the tower?
SSC CGL Tier II (07/03/2023)
(a) 340(3 + √3) (b) 310(3 - √3)
(c) 310(3 + √3) (d) 340(3 - √3)

SSC CGL 2022 Tier - 1

Q.34. An airplane goes 14 km due east and then 48 km due north. How far is it from its initial position?
SSC CGL 13/12/2022 (3rd Shift)
(a) 14 km (b) 48 km (c) 50 km (d) 28 km

SSC CGL 2021 Tier - 2

Q.35. A person 1.8 metre tall is $30\sqrt{3}$ metres away from a tower. If the angle of elevation from his eye to the top of the tower is 30 degree, then what is the height (in m) of the tower?
SSC CGL Tier II (08/08/2022)
(a) 32.5 (b) 37.8 (c) 30.5 (d) 31.8

SSC CHSL 2021 Tier - 1

Q.36. The foot of a ladder 25 m long is 7 m from the base of the building. If the top of the ladder slips by 4 m, then by how much distance will the foot of the ladder slide?
SSC CHSL 24/05/2022 (Morning)
(a) 9 m (b) 7 m (c) 6 m (d) 8 m

SSC CGL 2021 Tier - 1

Q.37. The angle of elevation of the top of an unfinished tower at a point distant 78 m from its base is 30°. How much higher must the tower be raised (in m) so that the angle of elevation of the top of the finished tower at the same point will be 60°?
SSC CGL 11/04/2022 (Morning)
(a) $78\sqrt{3}$ (b) 80 (c) $52\sqrt{3}$ (d) $26\sqrt{3}$

Q.38. A vertical pole and a vertical tower are on the same level ground in such a way that, from the top of pole, the angle of elevation of the top of the tower is 60° and the angle of depression of the bottom of the tower is 30°. If the height of the pole is 24 m, then find the height of the tower (in m).
SSC CGL 12/04/2022 (Morning)
(a) 24√3(√3 + 1) (b) 72
(c) 96 (d) 24(√3 + 1)

Q.39. The angle of elevation of the top of

Search on TG : @apna_pdf

Search on Telegram @apna_pdf

a tall building from the points M and N at the distances of 72m and 128m , respectively, from the base of the building and in the same straight line with it , are complementary . The height of the building (in m) is ?
SSC CGL 12/04/2022 (Afternoon)
(a) 84 (b) 96 (c) 80 (d) 90

Q.40. Exactly midway between the foot of two towers P and Q, the angle of elevation of their tops are 45° and 60°, respectively. The ratio of the heights of P and Q is:
SSC CGL 18/04/2022 (Morning)
(a) 1 : √3 (b) 3 : 1 (c) 1 : 3 (d) √3 : 1

Q.41. A poster is on top of a building. A person is standing on the ground at a distance of 50m from the building. The angles of elevation to the top of the poster and bottom of the poster are 45° and 30° , respectively . What is 200% of the height (in m) of the poster?
SSC CGL 18/04/2022 (Afternoon)
(a) $\frac{25}{3}(3-\sqrt{3})$ (b) $\frac{75}{3}(3-\sqrt{3})$
(c) $\frac{50}{3}(3-\sqrt{3})$ (d) $\frac{100}{3}(3-\sqrt{3})$

SSC CGL 2020 Tier - 2

Q.42. Two pillars A and B of the same height are on opposite sides of a road which is 40 m wide. The angles of elevation of the tops of the pillars A and B are 30° and 45°, respectively, at a point on the road between the pillars. What is the distance(in m) of the point from the foot of pillar A?
SSC CGL Tier II (03/02/2022)
(a) $40(\sqrt{3}-1)$ (b) $20(2-\sqrt{3})$
(c) $20(3-\sqrt{3})$ (d) $39\sqrt{3}$

SSC CHSL 2020 Tier - 1

Q.43. As observed from the top of a lighthouse, 42 m high above sea level, The angle of depression of a ship sailing directly towards it changes from 30° to 45°. The distance travelled by the ship during the period of observation is:
SSC CHSL 04/08/2021 (Evening)
(a) $42(1-\sqrt{3})$ (b) $42(\sqrt{3}+1)$
(c) $42(\sqrt{3}-1)$ (d) 42

SSC CPO 2020 Tier - 1

Q.44. A person was standing on a road near a mall. He was 1425 m away from the mall and able to see the top of the mall from the road in such a way that the top of the tree, which is in between him and the mall, was exactly in line of sight with the top of the mall. The tree height is 10m and it is 30m away from him. How tall (in m) is the mall?
SSC CPO 23/11/2020 (Morning)
(a) 475 (b) 300 (c) 425 (d) 525

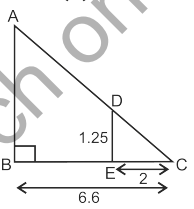
Q.45. The length of the shadow of a vertical pole on the ground is 18m. If the angle of elevation of the sun at that time is θ,such that cosθ = $\frac{12}{13}$, then what is the height (in m) of the pole ?
SSC CPO 23/11/2020 (Evening)
(a) 18 (b) 9 (c) 7.5 (d) 12

Answer Key :-

1.(d)	2.(c)	3.(b)	4.(b)
5.(d)	6.(c)	7.(a)	8.(c)
9.(b)	10.(c)	11.(a)	12.(a)
13.(a)	14.(c)	15.(c)	16.(c)
17.(d)	18.(c)	19.(c)	20.(d)
21.(c)	22.(d)	23.(d)	24.(a)
25.(c)	26.(d)	27.(a)	28.(c)
29.(c)	30.(a)	31.(c)	32.(a)
33.(a)	34.(c)	35.(d)	36.(d)
37.(c)	38.(c)	39.(b)	40.(a)
41.(d)	42.(c)	43.(c)	44.(a)
45.(c)			

Solutions :-

Sol.1.(d)

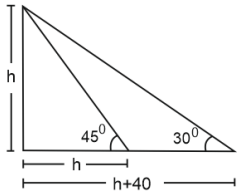


From similarity concept :- $\frac{EC}{ED} = \frac{BC}{AB}$

$\frac{2}{1.25} = \frac{6.6}{AB}$

(height of the lamp post) AB = 3.3 × 1.25 = 4.125 m (4.13 approx)

Sol.2.(c)



$tan30° = \frac{h}{h+40}$

$\frac{1}{\sqrt{3}} = \frac{h}{h+40}$

$h + 40 = \sqrt{3}h$

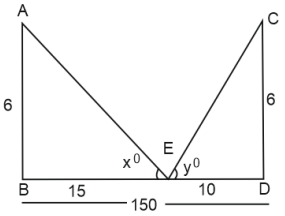
∴ height of tower $(h) = \frac{40}{\sqrt{3}-1}$

$= 20(\sqrt{3}+1)$ meter

Sol.3.(b) Let AB and CD be the two pillars of equal height

$tanx° = \frac{AB}{BE} = \frac{2}{5}$ or $\frac{6}{15}$

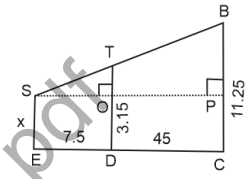
$tany° = \frac{CD}{DE} = \frac{3}{5}$ or $\frac{6}{10}$



ATQ,
15 + 10 = 25 unit ---------- 150 m

Then, 6 unit ---------- $\frac{150}{25} \times 6 = 36$ m

Sol.4.(b)



EC = SP = 7.5 + 45 = 52.5 metre
BP = 11.25 − x metre
$\Delta SOT \backsim \Delta SPB$

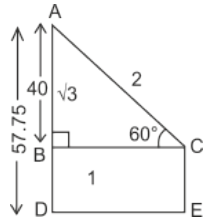
$\frac{SO}{SP} = \frac{TO}{BP} \Rightarrow \frac{7.5}{52.5} = \frac{TO}{BP} \Rightarrow \frac{TO}{BP} = \frac{1}{7}$

6 units = $(11.25 - 3.15)$ = 8.1 metre

TO (1 unit) = $\frac{8.1}{6}$ = 1.35 metre

SE = OD = $(3.15 - 1.35)$ = 1.8 meter

Sol.5.(d)

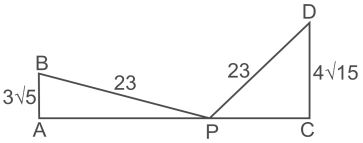


Angle → 30° : 60° : 90°
Side → 1 : $\sqrt{3}$: 2
In ΔABC ,

$\sqrt{3}$ units = 40m ⇒ 1 unit = $\frac{40\sqrt{3}}{3}$ m

So, The foot of the tower is $\frac{40\sqrt{3}}{3}$ m away from the foot of the pole.

Sol.6.(c)



Let P be the fixed point of the pole and B and D are two windows.,

In ΔABP, AP = $\sqrt{(23)^2 - (3\sqrt{5})^2}$
= $\sqrt{529 - 45} = \sqrt{484}$ = 22 m.

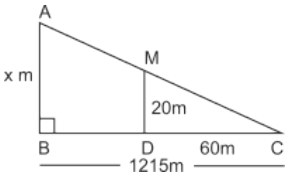
In ΔDPC, PC = $\sqrt{(23)^2 - (4\sqrt{15})^2}$
= $\sqrt{529 - 240} = \sqrt{289}$ = 17 m.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

So, width of street = 22 + 17= 39 m

Sol.7.(a)

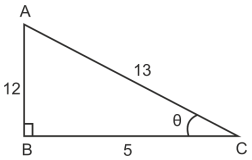


we have to find out the length of AB

△ABC ~ △MDC(by AAA rule)

$\frac{X}{20} = \frac{1215}{60} \Rightarrow x = \frac{1215 \times 20}{60} = 405$ m

Sol.8.(c)



It is given that

$\cos\theta = \frac{base}{hypotenuse} = \frac{BC}{AC} = \frac{5}{13}$

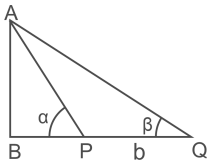
Using pythagoras theorem,

we have AB = 12 unit

ATQ, 12 unit = 18 m

Then, 5 unit = $\frac{18}{12} \times 5 = 7.5$ m

Sol.9.(b) Let the pole length be AB



In △ABP, we have ;

$\tan\alpha = \frac{AB}{BP} \Rightarrow BP = AB \cot\alpha$

In ΔABQ, we have ;

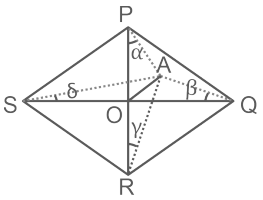
$\tan\beta = \frac{AB}{BQ} \Rightarrow BQ = AB \cot\beta$

Now, b = BQ - BP

b = AB cotβ - AB cotα = AB(cotβ-cotα)

$AB = \frac{b}{\cot\beta - \cot\alpha}$

Sol.10.(c)



Let OA be a straight tower.

P, Q, R and S are points on the roads due north, east, south and west respectively.

In Δ POQ and ΔORS

$PQ^2 = PO^2 + OQ^2$

$RS^2 = OR^2 + OS^2$

$\frac{(PQ)^2}{(RS)^2} = \frac{PO^2 + OQ^2}{OR^2 + OS^2}$ --------- (1)

Here, ∠AOQ = ∠AOP = ∠AOR = ∠AOS = 90°(as AO is a straight tower)

Now,

the angle of elevation are α, β, γ and δ.

In ΔAOP, , $\tan\alpha = \frac{OA}{OP} \Rightarrow OP = AO \cot\alpha$

In ΔAOS, $\tan\delta = \frac{OA}{OS} \Rightarrow OS = OA \cot\delta$

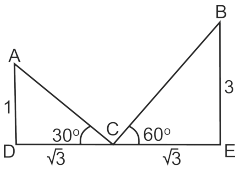
Similarly, OQ = AO cotβ and OR = AO $\cot\gamma$

Putting the value of PO, OQ, OR, OS in eqn (1), we have

$\frac{(PQ)^2}{(RS)^2} = \frac{(AO\cot\alpha)^2 + (AO\cot\beta)^2}{(AO\cot\gamma)^2 + (AO\cot\delta)^2}$

$= \frac{\cot^2\alpha + \cot^2\beta}{\cot^2\gamma + \cot^2\delta}$

Sol.11.(a)

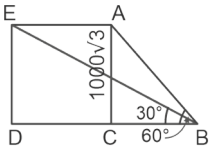


Let the height of tower P and Q be AD and BE respectively and C be the midpoint of DE.

From the given figure, we have ;

Required ratio = AD : BE = 1 : 3

Sol.12.(a)



In △ACB, we have :

$\tan 60° = \frac{1000\sqrt{3}}{BC} \Rightarrow \sqrt{3} = \frac{1000\sqrt{3}}{BC}$

BC = 1000 m

In △EDB, we have :

$\tan 30° = \frac{1000\sqrt{3}}{BD} \Rightarrow \frac{1}{\sqrt{3}} = \frac{1000\sqrt{3}}{BD}$

BD = 3000 m

Distance covered by drone = BD − BC

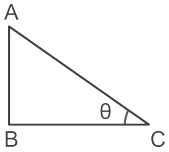
= 3000 − 1000 = 2000 m

Sol.13.(a) Let the height of the pole be h.

ATQ , $\frac{h}{13.5} = \frac{5.4}{9}$

9h = 72.9 ⇒ h = 8.1 m

Sol.14.(c)



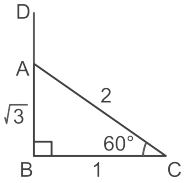
Let AB and BC be the length of pole and and the length of shadow respectively

AB = BC (given)

$\tan\theta = \frac{AB}{BC} = 1 = \tan 45° \Rightarrow \theta = 45°$

Short trick : If the height of an object and length of its shadow is equal. Then, the angle is 45°

Sol.15.(c)



Let BD be the total height of the tree.

AD = AC (given)

Here, 1 unit = 45 m

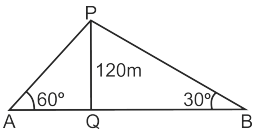
Then, $\sqrt{3}$ unit = $45\sqrt{3}$ m

and 2 unit = 45 × 2 = 90 m

So, the total height of tree = $45\sqrt{3}$ + 90

= 77.85 + 90 = 167.85 m

Sol.16.(c)



In △APQ, we have ; $\tan 60° = \frac{PQ}{AQ}$

$\sqrt{3} = \frac{120}{AQ} \Rightarrow AQ = \frac{120}{\sqrt{3}} = 40\sqrt{3}$

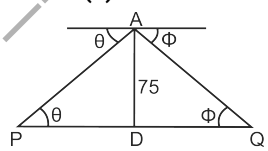
In △BPQ, we have ; $\tan 30° = \frac{PQ}{QB}$

$\frac{1}{\sqrt{3}} = \frac{120}{QB} \Rightarrow QB = 120\sqrt{3}$

Therefore,

$AB = 40\sqrt{3} + 120\sqrt{3} = 160\sqrt{3} \approx 277$ m

Sol.17.(d)



Let AD be the height of the tower.

$\tan\theta = \frac{AD}{PD} = \frac{3}{4}$, $\tan\phi = \frac{AD}{DQ} = \frac{5}{8}$

Here, 3 unit = 75 m

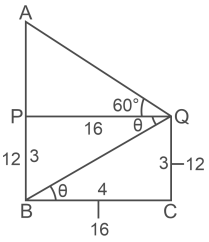
Then, 4 unit = $\frac{75}{3} \times 4 = 100$ m

Again, 5 unit = 75 m

Then, 8 unit = $\frac{75}{5} \times 8 = 120$ m

So, PQ = 100 + 120 = 220 m

Sol.18.(c) As per the directions given, we have following figure :

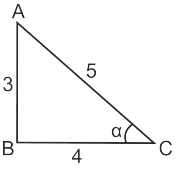


In AQP, $\tan 60° = \frac{AP}{16} \Rightarrow \sqrt{3} = \frac{AP}{16}$

$AP = 16\sqrt{3} = 16 \times 1.73 = 27.68$

So, height of tower = 27.68 + 12 = 39.68 m

Sol.19.(c) Let AB and AC be the height of wall and ladder respectively



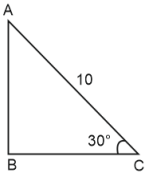
Here, 4 unit = 5

Then, 5 unit = $\frac{5}{4} \times 5 = \frac{25}{4} = 6.25\ m$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.20.(d) Let AB and AC be the length of wall and pole respectively.



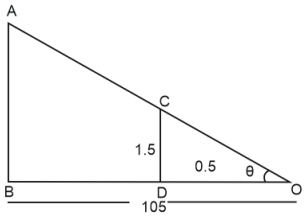
In △ABC, cos30° = $\frac{BC}{10}$

$\frac{\sqrt{3}}{2} = \frac{BC}{10}$

BC = $\frac{10\sqrt{3}}{2}$ = $5\sqrt{3}$ m

So, the foot of the pole is $5\sqrt{3}$ m away from the wall.

Sol.21.(c) Let AB be the height of tower and CD be the height of person and Mirror is placed at O.



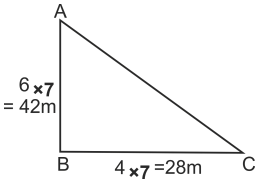
△OCD ~ △OAB (By AAA rule)

$\frac{CD}{AB} = \frac{OD}{OB} \Rightarrow \frac{1.5}{AB} = \frac{0.5}{105}$

AB = $\frac{1.5 \times 105}{0.5}$ = 315 m

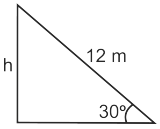
Sol.22.(d)

Let AB be the length of the pole and BC be the shadow on the ground.



So, the height of tower = 42 m

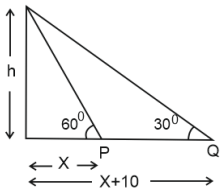
Sol.23.(d)



Sin30° = $\frac{h}{12}$

$\frac{1}{2} = \frac{h}{12}, h = 6$ m

Sol.24.(a)



$tan\ 60° = \frac{h}{x}$

$h = \sqrt{3}x$ .....(i)

$tan\ 30° = \frac{h}{x+10}$

$\sqrt{3}h = x + 10$

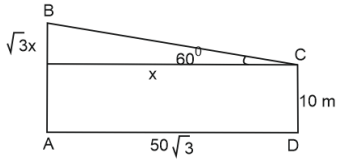
$h = \frac{x+10}{\sqrt{3}}$ .....(ii)

From equations (i) and (ii) we get

$\sqrt{3}x = \frac{x+10}{\sqrt{3}}$,

$\therefore x = 5 \Rightarrow h = 5\sqrt{3}$ m

Sol.25.(c) Let AB and CD be the height of tower and building respectively.



Height of tower = ($\sqrt{3}$x + 10)m

ATQ, x = $50\sqrt{3}$

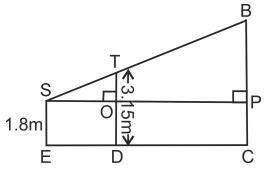
Then, height of tower = ($\sqrt{3} \times 50\sqrt{3}$ + 10)

= 150 + 10 = 160m

Sol.26.(d)

$\frac{42}{35} = \frac{x}{25} \Rightarrow x = \frac{42 \times 25}{35}$ = 30 m

Sol.27.(a)



TO = TD − OD = 3.15 − 1.8 = 1.35 m

$\Delta SOT \cong \Delta SPB$

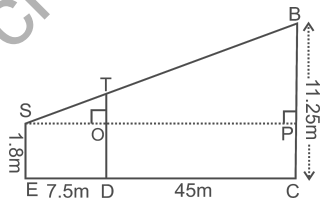
$\frac{SO}{SP} = \frac{TO}{BP} \Rightarrow \frac{7.5}{45+7.5} = \frac{1.35}{BP}$

BP = $\frac{1.35 \times 52.5}{7.5}$ = 9.45 m

Height of the building = (BP + PC)

= 9.45 + 1.8 = 11.25 m

Sol.28.(c)



PB = BC − PC = 11.25 − 1.8 = 9.45 m

$\Delta SOT \cong \Delta SPB$

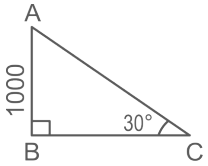
$\frac{SO}{SP} = \frac{TO}{BP} \Rightarrow \frac{7.5}{7.5+45} = \frac{TO}{9.45}$

TO = $\frac{7.5 \times 9.45}{52.5}$ = 1.35 m

Length of tree (TD) = TO + OD

= 1.35 + 1.8 = 3.15 m

Sol.29.(c)



tan 30° = $\frac{1000}{BC} \Rightarrow \frac{1}{\sqrt{3}} = \frac{1000}{BC}$

BC = $1000\sqrt{3}$ m = 1000 × 1.732 = 1732 m

Alternate method :

Ratio of length of side corresponding to 30°, 60° and 90° = 1 : $\sqrt{3}$: 2

1 unit = 1000 m

(distance between building and man)

$\sqrt{3}$ units = 1000 × 1.732 = 1732 m

Sol.30.(a)

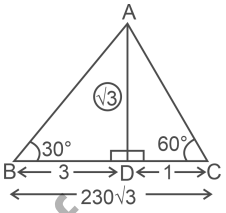
Shadow of pole ∝ height of pole

A pole of 28 m height casts a shadow of 19.2 m long .

52.5 m long pole casts a shadow of

= $\frac{19.2}{28} \times 52.5$ = 36 metre

Sol.31.(c) Let B and C be two ships and AD be the lighthouse



In triangle ADC

Angle → 30° : 60° : 90°

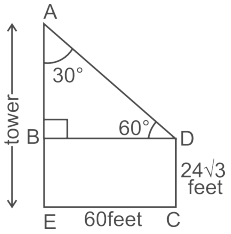
Side → 1 : $\sqrt{3}$: 2

4 units = $230\sqrt{3}\ m$

Height of the light house ($\sqrt{3} units$)

= $\frac{230\sqrt{3}}{4} \times \sqrt{3} = \frac{690}{4}$ = 172.5 meters.

Sol.32.(a)



Angle → 30° : 60° : 90°

Side → 1 : $\sqrt{3}$: 2

BD = EC = 60 feet and DC

= BE = $24\sqrt{3}$ feet ⇒ AB = $\sqrt{3}$, BD = 1

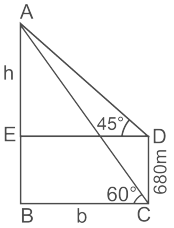
According to the questions ,

1 unit = 60 feet ⇒ $\sqrt{3}$ units = $60\sqrt{3}$ feet

Height of tower (AE) = $60\sqrt{3} + 24\sqrt{3}$

= $84\sqrt{3}$ feet

Sol.33.(a)



Let AB be the length of the tower and CD be the length of the building

BE = CD = 680 m

AE = h meter and DE = b meter

Then, In Δ AED

tan45° = $\frac{h}{b}$ = 1 (so b = h)

Then, In Δ ABC

tan60° = $\frac{h+680}{b} = \sqrt{3}$

Search on TG : @apna_pdf

Search on Telegram @apna_pdf

h + 680 = $\sqrt{3}$ b (∵ b = h)

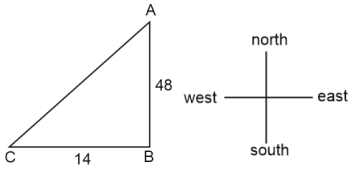
680 = h ($\sqrt{3}$ - 1) ⇒ h = $\frac{680}{(\sqrt{3}-1)} \times \frac{(\sqrt{3}+1)}{(\sqrt{3}-1)}$

h = $\frac{680}{2} \times (\sqrt{3}+1)$ ⇒ h = 340 $(\sqrt{3}+1)$

⇒ AB = h + BE ⇒ AB = 340(1 + √3) + 680

AB = 340(3 + √3) m

Sol.34.(c) Applying the directions given in the question, we have following figure:



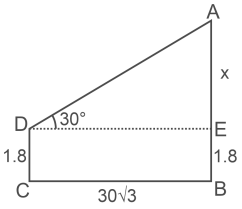
AC = $\sqrt{48^2 + 14^2} = \sqrt{2304 + 196}$

= $\sqrt{2500}$ = 50 km

Sol.35.(d) Let the AB be a tower and AE = x, so AB = (1.8 + x)

DE = CB = 30$\sqrt{3}$ m

According to the question,



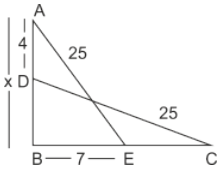
In ΔADE,

tan30° = $\frac{AE}{DE} \Rightarrow \frac{1}{\sqrt{3}} = \frac{x}{30\sqrt{3}} \Rightarrow x$ = 30 m

So, height of tower = 1.8 + x = 1.8 + 30

= 31.8 m

Sol.36.(d)



Length of the ladder AE = DC = 25m

Distance of foot from the base (BE) = 7m

In triangle ABE,

$AB^2 + BE^2 = AE^2 \Rightarrow x^2 + 7^2 = 25^2$

x = $\sqrt{625 - 49}$ = 24 m

DB = 24 – 4 = 20 m

Now in triangle DBC,

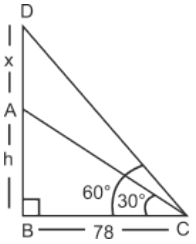
$DB^2 + BC^2 = DC^2 \Rightarrow 20^2 + BC^2 = 25^2$

BC^2 = 625 - 400 = 225 ⇒ BC = $\sqrt{225}$ = 15 m

EC = BC – BE = 15 – 7 = 8m

Hence, the foot of the ladder will slide by 8m.

Sol.37.(c) Let AB be the height of tower and the AD be the height of the tower to be raised



In ΔABC, tan30° = $\frac{h}{78}$

$\frac{1}{\sqrt{3}} = \frac{h}{78} \Rightarrow h = 26\sqrt{3}$

In ΔDBC,

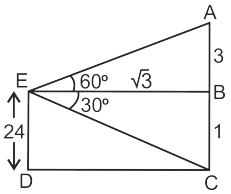
Tan 60° = $\frac{26\sqrt{3}+x}{78} \Rightarrow \sqrt{3} = \frac{26\sqrt{3}+x}{78}$

78$\sqrt{3}$ = 26$\sqrt{3}$ + x = x = 52$\sqrt{3}$ m

So, the required height of tower = 52$\sqrt{3}$ m

Sol.38.(c) Let ED and AC be the height of pole and tower respectively

ATQ, we have following figure;

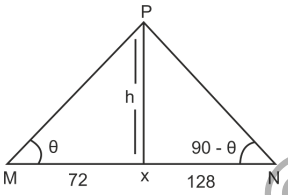


Here, 1 unit ------- 24m

Then, (3 + 1) = 4 unit ------ 24 × 4 = 96m

So, the height of tower = 96m

Sol.39.(b) Let the height of building be h

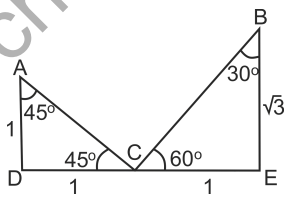


when angles are complementary

h^2 = Product of the distance of two points from the building

$h = \sqrt{72 \times 128} = \sqrt{9216}$ = 96 m

Sol.40.(a) Let the height of tower P and Q be AD and BE respectively and C be the midpoint of DE.

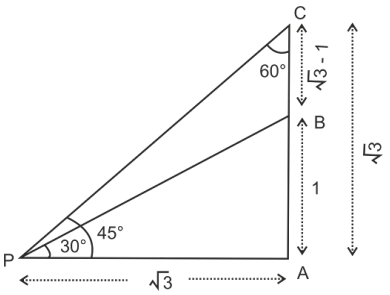


From the given figure, we have ;

The ratio of the heights of P and Q = 1:$\sqrt{3}$

Sol.41.(d) Let the height of the building be AB and that of the poster be BC.

and "P" be the position of the standing person.we get following figure



According to the question,

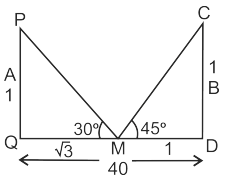
$\sqrt{3}$ unit = 50 m

($\sqrt{3}$ – 1) unit = $\frac{50}{\sqrt{3}} \times (\sqrt{3} - 1)$ m

$\frac{50}{\sqrt{3}} \times (\sqrt{3} - 1) \times \frac{\sqrt{3}}{\sqrt{3}} \Rightarrow \frac{50}{3}(3 - \sqrt{3})$

200% of the poster = $\frac{100}{3}(3 - \sqrt{3})$ m.

Sol.42.(c)



Let the height of pillars A and B be PQ and CD respectively and M be the point on the road between the pillars.

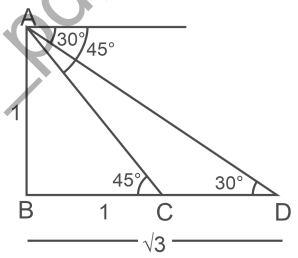
According to the question,

($\sqrt{3}$ + 1) unit = 40 m

$\sqrt{3}$ unit = $\frac{40 \times \sqrt{3}}{(\sqrt{3}+1)}$

= $\frac{40 \times \sqrt{3}(\sqrt{3}-1)}{(\sqrt{3}+1)(\sqrt{3}-1)}$ = 20(3 - $\sqrt{3}$) m

Sol.43.(c)



From the given figure, we have;

CD = BD - BC = ($\sqrt{3}$ - 1) unit

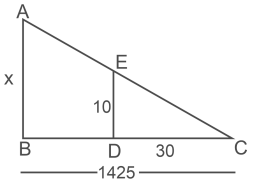
Here, 1 unit ---------- 42 m

Then, ($\sqrt{3}$ - 1) unit -------- 42($\sqrt{3}$ – 1) m

So, the distance travelled by the ship during the period of observation

= 42($\sqrt{3}$ – 1) m

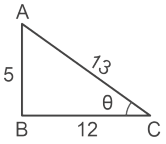
Sol.44.(a)



From the given figure, we can clearly see that $\frac{10}{x} = \frac{30}{1425}$ (As, △CED ~△CAB)

⇒ x = $\frac{1425 \times 10}{30}$ = 475 m

Sol.45.(c)



It is given that

cosθ = $\frac{base}{hypotenuse} = \frac{BC}{AC} = \frac{12}{13}$

Using pythagoras theorem,

we have AB = 5 unit

ATQ, 12 unit → 18 m

Then, 5 unit → $\frac{18}{12}$ × 5 = 7.5 m

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Mensuration

2- D: Under 2 dimensions we will study
- Triangles
- Quadrilateral
- Polygons
- Circle

3 - D: Under 3 dimensions we will study
- Cube
- Cuboids
- Box
- Cylinder
- Prism
- Cone
- Pyramid
- Frustum
- Sphere
- Hemisphere
- Tetrahedral

Note: For 2D figures, area and perimeter are calculated and for 3D figures, volume and surface area are calculated.

TWO DIMENSIONAL FIGURES

TRIANGLE

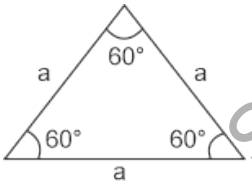
For a triangle with height, h, and base, b;

Area = $\frac{1}{2} \times b \times h$

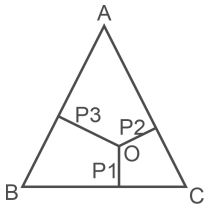
Perimeter = Sum of all sides

Special cases:

1) Equilateral Triangle - All sides are equal and each angle is $60°$.



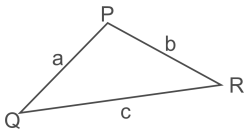
- Area = $\frac{\sqrt{3}}{4}a^2$
- Height = $\frac{\sqrt{3}}{2}a$
- Perimeter = $3a$
- Inradius(r) = $\frac{a}{2\sqrt{3}}$
- Circumradius(R) = $\frac{a}{\sqrt{3}}$



If P1, P2 and P3 are perpendicular to a side from a point inside the triangle, then

- Height of triangle = P1+P2+P3

2) Scalene Triangle – All sides will be unequal lengths.



Area = $\sqrt{s(s-a)(s-b)(s-c)}$,

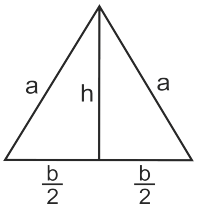
This formula is called Heron's formula.

Where, Semi-perimeter,

$s = \frac{a+b+c}{2}$

- Perimeter = $a + b + c$

3) Isosceles Triangle :- two sides and two angles are equal. Altitude bisects the base.

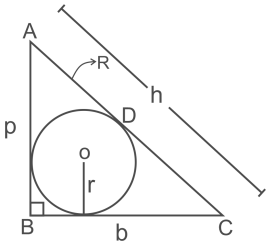


- Area = $\frac{b}{4}\sqrt{4a^2 - b^2}$
- Height = $\sqrt{a^2 - \left(\frac{b}{2}\right)^2}$

  = $\frac{1}{2}\sqrt{4a^2 - b^2}$
- Perimeter = $a + a + b$

  = $2a + b$

4) Right angled Triangle :- One of the angles is 90°.



Here, p = perpendicular , b = base and h = hypotenuse

- Area = $\frac{1}{2} \times b \times p$
- Perimeter = $p + b + h$
- Pythagoras Theorem:

  $h^2 = p^2 + b^2$
- Inradius(r) = $\frac{p+b-h}{2}$
- Circumradius(R) = $\frac{h}{2}$

Note: Common Pythagoras triplets:

(1, 1, $\sqrt{2}$) ; (1, 2, $\sqrt{5}$) ; (3, 4, 5); (5, 12, 13); (7, 24, 25); (20, 21, 29), (9, 40, 41); (8, 15, 17) (12, 35, 37) (60, 11, 61) (65, 72 97) (96, 110, 146).

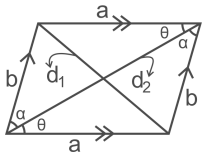
Try remembering them.

QUADRILATERAL

A figure enclosed by four sides is called a quadrilateral. A quadrilateral has four angles and sum of these angles is equal to 360°.

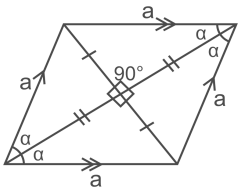
Special Cases:

1) Parallelogram - It is a quadrilateral with opposite sides parallel and equal.



- Area = base x height
- Perimeter = 2 (a + b)
- $d_1^2 + d_2^2 = 2(a^2 + b^2)$
- In a parallelogram, opposite sides are equal, opposite angles are equal and diagonals bisect each other.

2) Rhombus - It is a parallelogram with all four sides equal. The opposite angles in a rhombus are equal.

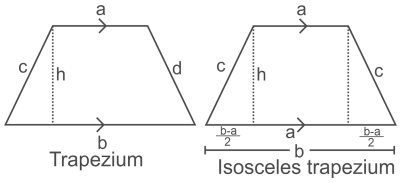


Here, a = side; d_1 and d_2 are diagonals.

- Area = $\frac{1}{2} \times d_1 \times d_2$
- Side (a) = $\frac{1}{2}\sqrt{d_1^2 + d_2^2}$
- Perimeter = 4a
- $4a^2 = d_1^2 + d_2^2$

  Diagonals bisect each other at right angles .

3) Trapezium – It is a quadrilateral with one pair of opposite sides parallel.



Here, a and b are parallel sides and h is the height or perpendicular distance between a and b.

- Area = $\frac{1}{2} \times height$

  $\times$ (sum of parallel sides)

  = $\frac{1}{2} \times h \times (a + b)$

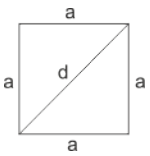
Search on TG: @apna_pdf

Search on Telegram @apna_pdf

4) Rectangle– It is a parallelogram with equal opposite sides and each angle is 90°

- Area = Length × Breadth = L × B
- Perimeter = 2 (L + B)
- Diagonal (d) = $\sqrt{L^2 + B^2}$
- Area of the walls of a rectangular room
  = $2 \times (L + B) \times H$

5) Square – It is a parallelogram with all four sides equal and each angle is equal to 90°.



- Area = $(side)^2 = a^2 = \frac{1}{2}d^2$
- Perimeter = 4 × side = 4a
- Diagonal (d) = $a\sqrt{2}$

NOTE: Important points about Quadrilaterals

1. The diagonals of a parallelogram bisect each other.
2. Diagonal of a parallelogram divides it into two triangles of equal area.
3. The diagonals of a rectangle are of equal lengths and bisect each other.
4. The diagonals of a square are equal and bisect each other at right angles.
5. A rhombus has unequal diagonals and they bisect each other at right angles.
6. A parallelogram and a rectangle have equal areas if they are on the same base and between the same parallel Lines.

REGULAR POLYGON

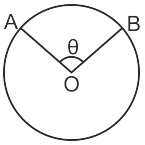
In a regular polygon all sides and all interior angles are equal. A polygon is called a pentagon, hexagon , heptagon , octagon, nonagon and a decagon as they have 5, 6, 7 , 8, 9, 10 sides, respectively.

If each side of a regular polygon of 'n' sides is equal to 'a' then:

- Area of regular pentagon
  = $\frac{6.9}{4} \times a^2$
- Area of regular hexagon
  = $6 \times \frac{\sqrt{3}}{4} a^2$
- Each exterior angle = $\frac{360°}{n}$
- Each interior angle
  = 180° − Exterior angle
- Number of diagonals
  = $\frac{n(n-3)}{2}$
- Sum of all interior angles
  = $(n - 2) \times 180$
- Sum of all exterior angle = 360°

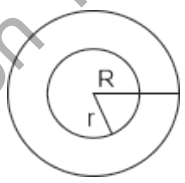
CIRCLE

It is a plane figure enclosed by a line on which every point is equally distant from a fixed point (centre) inside the circle.



- Area = πr^2
- Circumference (perimeter)
  = $2\pi r$
- Diameter = 2r
- Length of Arc (AB)
  = $2\pi r \times \frac{\theta}{360°}$
- Area of sector AOB
  = $\pi r^2 \times \frac{\theta}{360°}$
- Length of Arc (AB) = $angle \times radius$, (where angle in radian)

CIRCULAR RING



Here, R = radius of bigger ring ,
r = radius of smaller ring

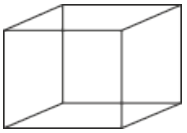
- Area = $\pi(R^2 - r^2)$
- Difference in circumference of both the rings = $2\pi R - 2\pi r$

Short Cut methods/Tricks

1. If the length and breadth of a rectangle are increased by a% and b%, the area of the rectangle will be increased by
   $(a + b + \frac{ab}{100})\%$
2. If any of the two sides of the rectangle is decreased then use '−ve' values for that side.
3. All the sides of any two dimensional figure changed by a%, then its area will change by $(2a + \frac{a^2}{100})\%$
   Whenever there is a decrease, use negative value for 'a'
4. If all the sides of any two dimensional figure has changed (increased or decreased) by a% then its perimeter also changes by a%. In the case of a circle such changes take place because of the change in radius (or diameter).
5. If the area of a square is 'a' square unit. Then the area of the circle formed with the same perimeter is given by square units.
6. Area of a square inscribed in a circle of radius 'r' is equal to $2r^2$.
7. The area of the largest triangle inscribed in a semicircle of radius r is equal to r^2.
8. If a pathway of width x is made inside or outside a rectangular plot of length L and breath B, then area of the pathway is
   (i) $2x(L + B + 2x)$, if path is made outside the plot
   (ii) $2x(L + B - 2x)$, if a path is made inside the plot.
9. If two paths, each of width x are made parallel to length (L) and breadth (B) of the rectangular plot in the middle of the plot crossing each other, then,
   Area of the path = $x(L + B - x)$

THREE DIMENSIONAL FIGURES

CUBE



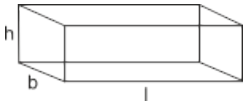
All sides are equal. It has six faces and 12 edges.

- Volume = a^3
- Total surface area = $6a^2$
- Diagonal = $a\sqrt{3}$
- Sum of all edges = 12a

Here, a = length of the side

CUBOID

A rectangular body having 3D rectangular shape, is called a cuboid.



- Volume = $l \times b \times h$
- Total surface area = $2(lb + bh + lh)$
- Diagonal = $\sqrt{l^2 + b^2 + h^2}$

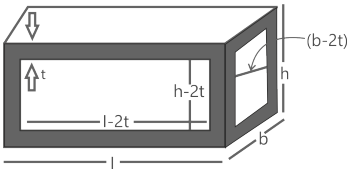
BOX

A box has its shape like a cube or cuboid. The amount that a box can hold or

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

contain is called the capacity of the box. Capacity means internal volume.



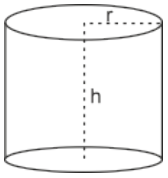
- Surface area of an open box
  = 2 (length + breadth) × height + length × breadth
  = $2(l + b) \times h + l \times b$
- Capacity of box
  = $(l - 2t)\,(b - 2t)(h - 2t)$;
  where, t = thickness of box
- Volume of the material of the box = External volume – Internal volume(or capacity) = $lbh - (l - 2t)(b - 2t)$ $(h - 2t)$

ROOM

A rectangular room has four walls (surfaces) and opposite walls have equal area.

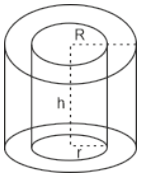
- Total Area of walls
  = $2(l + b) \times h$
- Total volume of the room
  = $l \times b \times h$
- Area of floor or roof = $l \times b$

CYLINDER



- Volume of cylinder = area of base × height = $\pi r^2 h$
- Curved surface area = Perimeter of base × height = $2\pi rh$
- Total surface Area = curved surface area + area of both the circles
  = $2\pi rh + 2\pi r^2 = 2\pi(r + h)r$
- When the rectangular sheet is folded along its length, then the length becomes the circumference of the base of the cylinder and breadth becomes the height of the cylinder.

HOLLOW CYLINDER



- Volume of hollow cylinder
  = $\pi(R^2 - r^2)h$
- Curved surface area
  = $2\pi(R + r)h$
- Total surface area
  = $2\pi(R + r)h + 2\pi(R^2 - r^2)$
  = $2\pi(R + r)\{h + R - r\}$

Where, R = External radius of cylinder , r = internal radius of cylinder , h = height

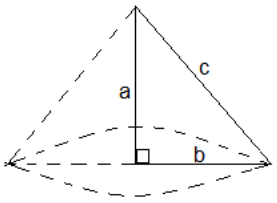
PRISM

- Volume of prism
  = area of base × height
- Lateral surface area = Perimeter of base × height
- Total surface Area = Lateral surface area + area of base and top surface

CONE

A solid and round body with a round base and pointed peak.

- Volume = $\frac{1}{3}$ × $base\ area$ × height = $\frac{1}{3}\pi r^2 h$
- Slant height $(l) = \sqrt{r^2 + h^2}$
- Curved surface area = πrl
  $= \pi r\sqrt{r^2 + h^2}$
- Total surface area = $\pi rl + \pi r^2$
  $= \pi r(l + r)$
- Cone formed by rotating right angled triangle about its height:



- Volume of cone so formed
  = $\frac{1}{3}\pi b^2 a$
- Similarly, Cone formed by rotating right angled triangle about its base:
  Volume of cone so formed
  = $\frac{1}{3}\pi a^2 b$
- Similarly, Cone formed by rotating right angled triangle about its hypotenuse :
  Volume of cone so formed
  = $\frac{1}{3}\pi r^2 c$, (where r is the altitude on hypotenuse and r = $\frac{a \times b}{c}$)

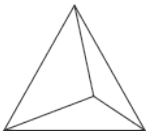
Note: If the base is not round, it will be called a pyramid. A pyramid can have various shapes of the base example: square, rectangular, triangular etc.

PYRAMID

- Pyramid means a structure with regular polygon as its base and sloping sides that meet in a point at the top.
- In Pyramid, with n sided regular polygon at its base, total number of vertices = n + 1
- Volume = $\frac{1}{3}$×base area × height
- Slant height (l) = $\sqrt{r^2 + h^2}$
- Lateral surface area
  = $\frac{Perimeter \times slant\ height}{2}$
- Total Surface area = Lateral surface area + Area of base

TETRAHEDRON

It is a 3D figure made by joining four equilateral triangles.



- Volume (V)
  = $\frac{1}{3} \times base\ area \times height$
  ⇒ V = $\frac{1}{3} \times \frac{\sqrt{3}}{4}$
  $a^2 \times \left(\frac{\sqrt{6}}{12}a + \frac{\sqrt{6}}{4}a\right)$
  ⇒ V = $\frac{\sqrt{2}}{12}a^3$ (Remember this formula)
- Lateral surface area = 3 × $\frac{\sqrt{3}}{4}a^2$
- Total surface area
  = 4 × $\frac{\sqrt{3}}{4}a^2$
- Height of Tetrahedron = $\frac{\sqrt{6}}{3}a$

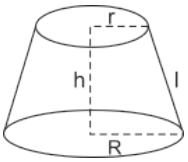
FRUSTUM OF CONE

If a cone is cut by a plane parallel to its base, so as to divide the cone into two

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

parts: upper part and lower part, then the lower part is called frustum.



- Slant height (l)
  $= \sqrt{h^2 + (R - r)^2}$
- Curved Surface Area
  $= \pi(R + r)l$
- Total surface area
  $= \pi(R + r)l + \pi R^2 + \pi r^2$
  $= \pi\{(R + r)l + R^2 + r^2\}$
- Volume $= \frac{1}{3}\pi h(r^2 + R^2 + rR)$

SPHERE

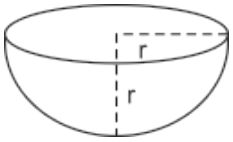
- Volume of sphere $= \frac{4}{3}\pi r^3$
- Curved Surface area
  = Total surface area = $4\pi r^2$

HOLLOW SPHERE OR SPHERICAL SHELL:

- Volume of hollow sphere
  $= \frac{4}{3}\pi(R^3 - r^3)$
- Internal surface area $= 4\pi r^2$
- External surface area $= 4\pi R^2$

Here R = external radius and
r = internal radius

HEMISPHERE



- Volume of the hemisphere
  $= \frac{2}{3}\pi r^3$
- Total surface area = $3\pi r^2$
- Curved surface area $= 2\pi r^2$
  Where, r = radius

IMP. UNIT CONVERSION :

- $1m^3$ = 1000 litres and
- 1 litre = 1000 cm^3
- 1 meter = 10 decimeter
  = 100 cm = 1000 millimeter
- 1 meter = 10^{-1} decameter
  $= 10^{-2}$ hectometer
  $= 10^{-3}$ kilometer

Variety Questions

Q.1. At what angle is the arc length half the perimeter of the circle?
SSC CGL 17/09/2024 (1st Shift)
(a) 120° (b) 180° (c) 90° (d) 270°

Q.2. What is the central angle of a sector of a circle whose area and perimeter are, respectively, equal to 209 cm^2 and 63 cm if it is given that its radius is a non-negative integer (roundup to one decimal place) ?
SSC CGL 10/09/2024 (3rd Shift)
(a) 55.5° (b) 53.5° (c) 49.5° (d) 51.5°

Q.3. The area of a square is $16x^2 + 40x + 25$ square units. Find the perimeter of the square.
SSC CGL 10/09/2024 (3rd Shift)
(a) $3(10x + 8)$ (b) $3(8x + 10)$
(c) $2(10x + 8)$ (d) $2(8x + 10)$

Q.4. A right triangle with sides 3 cm, 4 cm and 5 cm is rotated about the sides of 3 cm to form a cone. The volume of the cone so formed is:
SSC CGL 10/09/2024 (2nd Shift)
(a) 20π cm^3 (b) 16π cm^3
(c) 25π cm^3 (d) 28π cm^3

Q.5. Find the area (in cm^2) of the sector whose perimeter is $\frac{64}{3}$ cm and central angle is 60°. (Use π = $\frac{22}{7}$)
SSC CGL 09/09/2024 (3rd Shift)
(a) $\frac{47}{3}$ (b) $\frac{77}{3}$ (c) $\frac{68}{3}$ (d) $\frac{85}{3}$

Q.6. A cuboid with dimensions 20cm, 12cm, and 10 cm is cut into 8 identical pieces by 3 cuts. What will be the total surface area of all the pieces?
SSC CHSL 10/07/2024 (3rd Shift)
(a) 2240 cm^2 (b) 1220 cm^2
(c) 3360 cm^2 (d) 1680 cm^2

Q.7. A rectangle with the largest area is cut out of a circle with radius 5 units. What is the area of the remaining portion?
SSC CHSL 10/07/2024 (1st Shift)
(a) 25(2π - 3) (b) 25(2π - 5)
(c) 25(π - 3) (d) 25(π - 2)

Q.8. A cylinder has a curved surface area equal to 350% of the curved surface area of another cylinder. If their radii are in the ratio 3 : 1, then the volume of the smaller cylinder is approximately _____% of the larger cylinder (the smaller cylinder has its radius and height smaller when compared to the larger).
SSC CHSL 09/07/2024 (1st Shift)
(a) 10.16 (b) 8.86 (c) 7.28 (d) 9.52

Q.9. The inner and outer radii of a hemispherical wooden bowl are 6 cm and 8 cm, respectively. Its entire surface has to be polished and the cost of polishing π cm^2 is Rs.50. How much will it cost to polish the bowl?
SSC CHSL 08/07/2024 (4th Shift)
(a) Rs.11,600 (b) Rs.11,400
(c) Rs.10,000 (d) Rs.12,000

Q.10. Which of the following statements is INCORRECT about the circle?
SSC CHSL 08/07/2024 (4th Shift)
(a) The area of a sector = $\frac{1}{2}$ (arc length × R)
(b) The radius of an incircle of an equilateral triangle of side 's' is $\frac{s}{2\sqrt{3}}$
(c) The length of an arc = $\frac{central\ angle\ made\ by\ the\ arc}{360°} \times \pi r^2$.
(d) Circles are congruent if they have same radii while similar circles may have different radii.

Q.11. The average of the areas of 2 similar triangles is 706.5 m^2 whose perimeters are in the ratio of 6 : 11. What is 20% of the difference (in m^2) in areas of both triangles ?
SSC CHSL 08/07/2024 (1st Shift)
(a) 164 (b) 149 (c) 153 (d) 157

Q.12. Two equal circles are drawn on a square in such a way that opposite side of the square forms the diameter of each circle. If the remaining area of the square is 42 cm^2, what is the measurement (in cm) of the diameter of each circle?
SSC CHSL 02/07/2024 (2nd Shift)
(a) 14 (b) 2.5 (c) 7 (d) 3.5

Q.13. The ratio of the diameters of two spheres is given as 1 : 4. The larger sphere is melted and 125 identical spheres are made out of the molten material. The smaller sphere is melted and 27 identical spheres are made out of the molten material. If the ratio of the volume of each of the 125 identical spheres to the volume of each of the 27 identical spheres is given as 1 : m, what is the value of m ?
SSC CHSL 01/07/2024 (1st Shift)
(a) $\frac{1728}{125}$ (b) $\frac{125}{1728}$ (c) $\frac{27}{8000}$ (d) $\frac{64}{3375}$

Q.14. Two rectangular sheets of paper, each 60 cm × 36 cm, are made into two right circular cylinders, one by rolling the paper along its length and the other along the breadth. The ratio of the volumes of the two cylinders, thus formed, is:
SSC CPO 29/06/2024 (3rd Shift)
(a) 5 : 6 (b) 8 : 3 (c) 7 : 4 (d) 5 : 3

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.15. Three circles each of radius 5 cm touch one another. The area (in cm²) subtended between them is:
SSC CPO 28/06/2024 (3rd Shift)
(a) 50 ($\sqrt{3}$ - $\frac{\pi}{2}$) (b) 25 ($\sqrt{3}$ + $\frac{\pi}{2}$)
(c) 25 ($2\sqrt{3}$ - $\frac{\pi}{2}$) (d) 25 ($\sqrt{3}$ - $\frac{\pi}{2}$)

Q.16. A gear 15 cm in diameter is turning a gear 21 cm in diameter. When the smaller gear has 105 revolutions, how many has the larger one made?
SSC CPO 28/06/2024 (3rd Shift)
(a) 75 (b) 100 (c) 85 (d) 90

Q.17. A solid metal cylinder of 12 cm height and 7 cm radius is melted and recast into two cones in the proportion of 1 : 2 (volume), keeping the height 12 cm. What would be the percentage change in the flat surface area before and after [use $\pi = \frac{22}{7}$] ?
SSC CPO 28/06/2024 (3rd Shift)
(a) 35% (b) 20% (c) 45% (d) 50%

Q.18. Three solid iron cubes of edges 8 cm, 10 cm and 12 cm are melted together to make a new cube. It is observed that 496 cm³ of the melted material is lost due to improper handling. The area (in cm²) of the whole surface of the newly formed cube is :
Matriculation Level 26/06/2024 (Shift - 1)
(a) 1331 (b) 1176 (c) 2197 (d) 3375

Q.19. If the semi-perimeter and area of a rectangular field whose length and breadth are 'x' and 'y' is 12 cm and 28 cm², respectively, then find the value of $x^4 + x^2y^2 + y^4$.
Graduate Level 20/06/2024 (Shift - 3)
(a) 6690 (b) 6960 (c) 6609 (d) 6906

Q.20. The base of a right prism is an equilateral triangle with each side measuring 4 cm. If the lateral surface area is 120 cm², find the volume (in cm³) of the prism.
SSC CHSL Tier II (10/01/2024)
(a) $30\sqrt{3}$ (b) $40\sqrt{3}$ (c) $10\sqrt{3}$ (d) $20\sqrt{3}$

Q.21. Some ice pieces, spherical in shape, of diameter 6 cm are dropped in a cylindrical container containing some juice and are fully submerged. If the diameter of the container is 18 cm and level of juice rises by 40 cm, then how many ice pieces are dropped in the container ?
SSC CPO 05/10/2023 (3rd Shift)
(a) 90 (b) 80 (c) 85 (d) 95

Q.22. Some medicine in liquid form is prepared in a hemispherical container of diameter 36 cm. When the container is full of medicine, the medicine is transferred to small cylindrical bottles of diameter 6 cm and height 6 cm. How many bottles are required to empty the container ?
SSC CPO 04/10/2023 (2nd Shift)
(a) 70 (b) 75 (c) 72 (d) 76

Q.23. The length and the breadth of the floor of a rectangular hall are 126 feet and 90 feet, respectively. What will be the area (in square feet) of each of the largest identical square tiles that can be used to tile this floor in a way that no part of the floor remains uncovered?
SSC CPO 03/10/2023 (3rd Shift)
(a) 196 (b) 256 (c) 324 (d) 484

Q.24. The radii of the ends of a frustum of a solid right-circular cone 45 cm high are 28 cm and 7 cm. If this frustum is melted and reconstructed into a solid right circular cylinder whose radius of base and height are in the ratio 3 : 5, find the curved surface area (in cm²) of this cylinder. [Use $\pi = \frac{22}{7}$.]
SSC CPO 03/10/2023 (1st Shift)
(a) 4610 (b) 4620 (c) 4580 (d) 4640

Q.25. A square and a rhombus have the same base and the rhombus is inclined at 45°, then what will be the ratio of the area of the square to the area of the rhombus?
SSC MTS 14/09/2023 (3rd Shift)
(a) $\sqrt{3}$: 1 (b) 1 : $\sqrt{3}$ (c) $\sqrt{2}$: $\sqrt{3}$ (d) $\sqrt{2}$: 1

Q.26. A closed wooden box measures externally 10 cm long. 8 cm broad and 6 cm high. If the thickness of the wood is 0.5 cm, then the volume of wood required is
SSC MTS 14/09/2023 (3rd Shift)
(a) 165 cm³ (b) 300 cm³
(c) 230 cm³ (d) 150 cm³

Q.27. The weight of a cube varies directly as the product of its volume and its density. The ratio of densities of the materials of the first cube and second cube is 27:16. If the weight of the first cube is 4 times the weight of the second cube, then what is the ratio of the edges of the first cube and second cube?
SSC MTS 14/09/2023 (2nd Shift)
(a) 2 : 3 (b) 3 : 2 (c) 3 : 4 (d) 4 : 3

Q.28. The weight of a circular disc varies directly as the product of the square of the radius and its thickness. Two identical/similar discs have their thickness in the ratio of 16 : 9. What is the ratio of their radii if the weight of the first is four times that of the second ?
SSC MTS 12/09/2023 (3rd Shift)
(a) 3 : 2 (b) 2 : 3 (c) 1 : 2 (d) 2 : 1

Q.29. A hemispherical dome of a building needs to be painted. If the circumference of the base of the dome is 154 cm, then find the cost of painting it if the cost of painting is ₹4 per 100 cm² (use $\pi = \frac{22}{7}$).
SSC CHSL 10/08/2023 (4th Shift)
(a) ₹150.92 (b) ₹ 150.66
(c) ₹ 105.29 (d) ₹ 105.66

Q.30. The area of a sector of a circle is 616 cm² with a central angle of 10°. The radius of the circle is _____.(use $\pi = \frac{22}{7}$)
SSC CHSL 08/08/2023 (2nd Shift)
(a) 84 cm (b) 21 cm (c) 48 cm (d) 28 cm

Q.31. Find the volume of the largest right circular cone that can be cut out from a cube whose edge is $3\frac{1}{2}$ cm, correct to two places of decimals (use $\pi = \frac{22}{7}$).
SSC CHSL 07/08/2023 (4th Shift)
(a) 13.21 cm³ (b) 21.31 cm³
(c) 11.23 cm³ (d) 12.13 cm³

Q.32. The sum of the radius of the base and the height of a cylinder is 42 m. If the total surface area of the cylinder is 6336 m^2, find the curved surface area of the cylinder correct to two places of decimals (use $\pi = \frac{22}{7}$)
SSC CHSL 02/08/2023 (4th Shift)
(a) 2157.43 m^2 (b) 2571.43 m^2
(c) 2715.43 m^2 (d) 2517.43 m^2

Q.33. Three cubes with sides in the ratio of 3 : 4 : 5 are melted to form a single cube whose diagonal is 18√3 cm. The sides of the three cubes are:
SSC CGL 20/07/2023 (1st shift)
(a) 21 cm, 28 cm and 35 cm
(b) 9 cm, 12 cm and 15 cm
(c) 18 cm, 24 cm and 30 cm
(d) 12 cm, 16 cm and 20 cm

Q.34. The perimeter of equilateral triangle is 3 × $\left(\sqrt[4]{\frac{16}{3}}\right)$ units. Determine the area of the triangle.
Matriculation Level 30/06/2023 (Shift - 4)
(a) 4 unit² (b) 1 unit² (c) 3 unit² (d) 2 unit²

Q.35. A spherical ball of diameter 8 cm is cut into two equal parts. The curved area of one such part has to be painted with green colour, while the other part has to be painted with red colour. The bases of both the hemispheres are to be painted with blue colour. The cost of painting with blue is ₹2/cm², while the

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

cost of painting the curved area is ₹3/cm². What will be the cost (in₹) of painting the hemispheres? Take л = 3.14
Matriculation Level 28/06/2023 (Shift - 4)
(a) ₹451.92 (b) ₹492.92
(c) ₹803.84 (d) ₹401.92

Q.36. A cube of side 5 cm, has been assembled using 125 cubes each of 1 cm edge. One cube is removed from the middle of each of the faces of the cube. What is the surface area (in cm²) of the remaining solid?
SSC CHSL Tier II (26/06/2023)
(a) 155 (b) 144 (c) 150 (d) 174

Q.37. A prism and a pyramid have the same base and the same height. Find the ratio of the volumes of the prism and the pyramid.
SSC CGL Tier II (07/03/2023)
(a) 2 : 3 (b) 3 : 1 (c) 1 : 3 (d) 3 : 2

Q.38. How many metres of 2 m wide cloth will be required to make a conical tent with the diameter of the base as 14 m and slant height as 9 m to ignore wastage ?
SSC CGL 12/12/2022 (1st Shift)
(a) 66 m (b) 88 m (c) 99 m (d) 77 m

Q.39. The minute hand of a clock is 20 cm long. Find the area on the face of the clock swept by the minute hand between 8 a.m. and 8:45 a.m.
SSC CGL 12/12/2022 (1st Shift)
(a) $\frac{6600}{7}$ cm² (b) $\frac{6600}{9}$ cm²
(c) $\frac{6600}{18}$ cm² (d) $\frac{6600}{14}$ cm²

Q.40. The external diameter of an iron pipe is 20 cm and its length is 12 cm. If the thickness of the pipe is 1 cm, find the surface area of the pipe (take $\pi = \frac{22}{7}$) correct to two places of decimal.
SSC CGL 06/12/2022 (2nd Shift)
(a) 1,662.67 cm² (b) 1,552.57 cm²
(c) 1,442.48 cm² (d) 1,772.76 cm²

Q.41. If the length of a certain rectangle is decreased by 4 cm and breadth is increased by 2 cm, it would result in a square of the same area. What is the perimeter of the original rectangle ?
SSC CGL 06/12/2022 (1st Shift)
(a) 15 cm (b) 24 cm (c) 20 cm (d) 10 cm

Q.42. Two identical circles each of radius 30 cm intersect each other such that the circumference of each one passes through the center of the other. What is the area of the intersecting region?
SSC CGL 03/12/2022 (4th Shift)
(a) 400π - 250 $\sqrt{3}$ cm²
(b) 300π - 150 $\sqrt{3}$ cm²
(c) 500π - 350 $\sqrt{3}$ cm²
(d) 600π - 450 $\sqrt{3}$ cm²

Q.43. If the sum of the diagonals of a rhombus is L and the perimeter is 4P, find the area of the rhombus?
SSC CPO 11/11/2022 (Morning)
(a) $\frac{1}{4}$(L² - P²) (b) $\frac{1}{4}$(L² - 4P²)
(c) $\frac{1}{2}$ (L² - 4P²) (d) $\frac{1}{4}$(L² + 3P²)

Q.44. Water is flowing through a cylindrical canal with an internal diameter of 7 m at the speed of 18 km/h. Find the volume of water flowing through the canal in 30 minutes. (take $\pi = \frac{22}{7}$)
SSC CPO 09/11/2022 (Afternoon)
(a) 3,76,500 m³ (b) 3,56,500 m³
(c) 3,66,500 m³ (d) 3,46,500 m³

Q.45. ABCDEF is a regular hexagon. Side of the hexagon is 36 cm. What is the area of the triangle ABC ?
SSC CGL Tier II (08/08/2022)
(a) $324\sqrt{3}\ cm^2$ (b) $360\sqrt{3}\ cm^2$
(c) $240\sqrt{3}\ cm^2$ (d) $192\sqrt{3}\ cm^2$

Q.46. The frustum of a right circular cone has the radius of the base as 5 cm, radius of the top as 3 cm, and height as 6 cm. What is its volume ?
SSC CHSL 27/05/2022 (Afternoon)
(a) 98 π cm^3 (b) 100 π cm^3
(c) 96 π cm^3 (d) 90 π cm^3

Q.47. Three sides of a triangle are $\sqrt{a^2+b^2}, \sqrt{(2a)^2+b^2}$ and $\sqrt{a^2+(2b)^2}$ units. What is the area (in unit squares) of a triangle?
SSC CGL Tier II (03/02/2022)
(a) $\frac{5}{2}ab$ (b) $3ab$ (c) $4ab$ (d) $\frac{3}{2}ab$

Q.48. A square park has been divided into two rectangles of equal area. If the perimeter of each of these rectangles is 39 m, then what will be the perimeter of the square park ?
SSC CHSL 09/08/2021 (Afternoon)
(a) 104 m (b) 39 m (c) 78 m (d) 52 m

Q.49. The circumference of a circle is 'aπ' units and the area of the circle is '$b\pi$' square units. If a:b is equal to 4:5, then the radius of the circle is:
SSC CHSL 06/08/2021 (Evening)
(a) 3 cm (b) 2.5 cm (c) 5 cm (d) 2 cm

Q.50. The area of a triangular field whose sides are 65m, 72m and 97m is equal to the area of a rectangular park whose sides are in the ratio of 5 : 13. What is the perimeter (in m) of the rectangular park?
SSC CHSL 19/04/2021 (Morning)
(a) 108 (b) 180 (c) 216 (d) 144

Q.51. A bicycle wheel has a radius of 42 cm. It makes 40 revolutions in 25 seconds. What is its speed (in kmph, up to one decimal place) ?
SSC CHSL 16/04/2021 (Morning)
(a) 3.5 (b) 11.6 (c) 15.2 (d) 9.5

Q.52. A wire is bent to form a square of area 169 cm^2. If the same wire is bent to form a circle, then what is its area in cm^2 (to the nearest whole number) ?
SSC CHSL 13/04/2021 (Afternoon)
(a) 215 (b) 227 (c) 532 (d) 531

Q.53. A sector of radius 10.5 cm with the central angle 120° is folded to form a cone by joining the two bounding radii of the sector. What is the volume (in cm^3) of the cone so formed ?
SSC CGL Tier II (13/09/2019)
(a) $\frac{343\sqrt{2}}{6}\pi$ (b) $\frac{343\sqrt{3}}{6}\pi$
(c) $\frac{343\sqrt{3}}{12}\pi$ (d) $\frac{343\sqrt{2}}{12}\pi$

Q.54. The base of a right prism is a triangle with sides 20 cm, 21 cm and 29 cm. If its volume is $7560cm^3$, then its lateral surface area (in cm^2) is :
SSC CGL Tier II (12/09/2019)
(a) 2484 (b) 2556 (c) 2520 (d) 2448

Q.55. If the radius of a sphere is increased by 4 cm, its surface area is increased by $464\pi cm^2$. What is the volume (in cm^3) of the original sphere ?
SSC CGL Tier II (11/09/2019)
(a) $\frac{15625}{6}\pi$ (b) $\frac{35937}{8}\pi$
(c) $\frac{11979}{2}\pi$ (d) $\frac{15625}{8}\pi$

Q.56. The base of right prism is a trapezium whose parallel sides are 11 cm and 15cm and the distance between them is 9 cm. If the volume of the prism is 1731.6 cm^3, then the height (in cm) of the prism will be :
SSC CGL Tier II (11/09/2019)
(a) 15.6 (b) 15.2 (c) 14.8 (d) 14.2

Q.57. A ribbon of equal width and length l is wrapped around the curved surface of a right circular cylinder to cover it completely. If the base circumference of this cylinder is c, then how many times the ribbon was wrapped around the cylinder ?
SSC MTS 05/08/2019 (Evening)
(a) $\frac{l}{4c}$ (b) $\frac{l}{c}$ (c) $\frac{l}{2c}$ (d) $\frac{2l}{c}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.58. ABCD is a rhombus with each side being equal to 8 cm. If BD = 10 cm, AC = $2\sqrt{x}$ cm, what is the value of $\sqrt{x+10}$?
SSC CHSL 11/07/2019 (Afternoon)
(a) $2\sqrt{3}$ (b) $3\sqrt{2}$ (c) 7 (d) 5

Q.59. The two diagonals of a rhombus are respectively, 14 cm and 48 cm. The perimeter of the rhombus is equal to :
SSC CHSL 11/07/2019 (Morning)
(a) 120cm (b) 160cm (c) 80cm (d) 100cm

Q.60. The area of a sector of a circle with central angle 60° is A. The circumference of the circle is C. Then A is equal to :
SSC CHSL 10/07/2019 (Evening)
(a) $\frac{c^2}{6\pi}$ (b) $\frac{c^2}{18\pi}$ (c) $\frac{c^2}{24\pi}$ (d) $\frac{c^2}{4\pi}$

Q.61. Equilateral triangles are drawn on the hypotenuse and one of the perpendicular sides of a right-angled isosceles triangle. Their areas are H and A respectively. $\frac{A}{H}$ is equal to :
SSC CHSL 10/07/2019 (Afternoon)
(a) $\frac{1}{4}$ (b) $\frac{1}{2}$ (c) $\frac{1}{\sqrt{2}}$ (d) $\frac{1}{\sqrt[2]{2}}$

Q.62. Twelve sticks, each of length one unit, are used to form an equilateral triangle. The area of the triangle is :
SSC CHSL 10/07/2019 (Morning)
(a) $3\sqrt{3}$ (b) $2\sqrt{3}$ (c) $4\sqrt{3}$ (d) $8\sqrt{3}$

Q.63. If the length of a rectangle is decreased by 11% and the breadth is increased by 11%, its area will undergo :
SSC CHSL 09/07/2019 (Afternoon)
(a) 13.13% increase (b) 1.21% increase
(c) 1.21%decrease (d) 13.13% decrease

Q.64. In triangle ABC, the length of BC is less than twice the length of AB by 2 cm. The length of AC exceeds the length of AB by 10 cm. The perimeter is 32cm. The length (in cm) of the smallest side of the triangle is :
SSC CHSL 05/07/2019 (Afternoon)
(a) 4 (b) 10 (c) 8 (d) 6

Q.65. The parallel sides of a trapezium are 20 cm and 10 cm and its non-parallel sides are equal to each other. If its area is 180 cm^2, then what is the length (in cm) of each non parallel side?
SSC CHSL 04/07/2019 (Morning)
(a) 11 (b) 13 (c) 12 (d) 15

Q.66. The length of a rectangular park is 20m more than its breadth. If the cost of fencing the park at Rs. 53 per metre is Rs. 21,200, then what is the area (In square metres) of the park ?
SSC CHSL 03/07/2019 (Evening)
(a) 9504 (b) 8925 (c) 9240 (d) 9900

Q.67. A wire is in the shape of a rectangle whose sides are in the ratio 7 : 4. It was initially in the shape of a circle of radius , very nearly equal to 31.5 cm. The length of smaller side of the rectangle is : (Take $\pi = \frac{22}{7}$)
SSC CHSL 03/07/2019 (Afternoon)
(a) 44 cm (b) 36 cm (c) 40 cm (d) 32cm

Q.68. A circle circumscribes a rectangle whose sides are in the ratio 4 : 3. If the perimeter of the rectangle is 56 cm, then what is the area (In square cm) of the circle ?
SSC CHSL 03/07/2019 (Morning)
(a) 70π (b) 96π (c) 90π (d) 100π

Q.69. The curved surface area and volume of a cylindrical pole are 132 square metres and 528 cubic metres, respectively. What is the height (In m) of the pole ? (Take $\pi = \frac{22}{7}$)
SSC CHSL 02/07/2019 (Afternoon)
(a) $2\frac{1}{2}$ (b) $3\frac{5}{8}$ (c) $3\frac{1}{2}$ (d) $2\frac{5}{8}$

Q.70. The area of a field in the shape of a hexagon is 2400√3 square meters. What will be the cost(Rs.) of fencing it at Rs. 18.50 per meter?
SSC CHSL 01/07/2019 (Evening)
(a) 4440 (b) 5920 (c) 5550 (d) 5180

Q.71. Six cubes, each of edge 2 cm, are joined end to end. What is the total surface area of the resulting cuboid
SSC CGL 13/06/2019 (Morning)
(a) $96cm^2$ (b) $144cm^2$
(c) $104cm^2$ (d) $128cm^2$

Q.72. The radius of a sphere is reduced by 40%. By what percent, will its volume decrease?
SSC CGL 10/06/2019 (Afternoon)
(a) 60% (b) 64% (c) 72.5% (d) 78.4%

Q.73. The area of a field in the shape of a triangle with each side x meter is equal to the area of another triangular field having sides 50m, 70m and 80m. The value of x is closest to :
SSC CGL 07/06/2019 (Afternoon)
(a) 65.5 (b) 63.2 (c) 62.4 (d) 61.8

Q.74. A sector is cut out from a circle of diameter 42 cm. If the angle of the sector is 150°, then its area (in square cm) is : (Take $\pi = \frac{22}{7}$)
SSC CGL 07/06/2019 (Morning)
(a) 564 (b) 574 (c) 580.6 (d) 577.5

Q.75. The radii of three concentric circles are in the ratio of 4:5:7. What is the ratio of the area between the two inner circles to that between the two outer circles ?
SSC CGL 06/06/2019 (Evening)
(a) 4 : 7 (b) 5 : 9 (c) 4 : 5 (d) 3 : 8

Q.76. The length of the metallic pipe is 7.56 m. Its external and internal radii are 2.5 cm and 1.5 cm respectively. If 1 cubic cm of the metal weigh 7.5 g, then the weight(kg) of the pipe is
SSC CGL 06/06/2019 (Afternoon)
(a) 72.82 (b) 70.14 (c) 71.28 (d) 69.68

Q.77. The volume of a metallic cylindrical pipe is 7480 cm^3. If its length is 1.4 m and its external radius is 9 cm, then its thickness (given π = $\frac{22}{7}$) is:
SSC CGL 06/06/2019 (Morning)
(a) 1 cm (b) 0.8 cm (c) 0.9 cm (d) 1.2cm

Q.78. The areas of the three adjacent faces of a cuboid are $32cm^2$, $24cm^2$ and $48cm^2$. What is the volume (in cm^3) of the cuboid ?
SSC CGL 04/06/2019 (Evening)
(a) 192 (b) 256 (c) 288 (d) 128

Q.79. The area of a triangle is 15 sq cm and the radius of its incircle is 3 cm. Its perimeter is equal to :
SSC CGL 04/06/2019 (Evening)
(a) 12 cm (b) 20 cm (c) 5 cm (d) 10 cm

Q.80. How much iron sheet (in m^2) will be needed to construct a rectangular tank measuring $10\,m \times 8\,m \times 6\,m$, if a circular opening of radius one meter is to be left at the top of the tank? (correct to one decimal place)
SSC CGL 04/06/2019 (Afternoon)
(a) 371.6 (b) 370.4 (c) 372.9 (d) 370.8

Q.81. A solid cube of volume 13824 cm^3 is cut into 8 cubes of equal volumes. The ratio of the surface area of the original cube to the sum of the surface areas of three of the smaller cubes is :
SSC CGL 04/06/2019 (Morning)
(a) 2 : 3 (b) 4 : 3 (c) 8 : 3 (d) 2 : 1

Q.82. The unequal side of an isosceles triangle is 2cm. The medians drawn to the equal sides are perpendicular. The area of the triangle is :
SSC CPO 16/03/2019 (Evening)
(a) $2cm^2$ (b) $3cm^2$ (c) $5cm^2$ (d) $1cm^2$

Q.83. A steel vessel has a base of length 60 cm and breadth 30 cm. Water is poured in the vessel. A cubical steel box having an edge of 30 cm is immersed completely in the vessel. By how much will the water rise?
SSC CPO 16/03/2019 (Evening)
(a) 12 cm (b) 15 cm (c) 10 cm (d) 9 cm

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.84. Original breadth of a rectangular box is 20cm. The box was then remade in such a way that its length increased by 30% but the breadth decreased by 20% and the area increased by 100 cm^2. What is the new area(in cm^2) of the box ?
SSC CPO 16/03/2019 (Evening)
(a) 2500 (b) 2200 (c) 2600 (d) 2400

Q.85. Find the cost of carpeting a room which is 11m long and 6m broad by a carpet which is 60cm broad at the rate of rs 112.50 per meter.
SSC CPO 16/03/2019 (Afternoon)
(a) 12,375 (b) 13,280
(c) 11,695 (d) 12,040

Q.86. A field is 119m × 18m in dimension. A tank 17m × 6m × 3m is dug out in the middle and the soil removed is evenly spread over the remaining part of the field. The increase in the level on the remaining part of the field is: (in cm)
SSC CPO 16/03/2019 (Afternoon)
(a) 14 cm (b) 13 cm (c) 15 cm (d) 12 cm

Q.87. A swimming pool is 40 m in length, 30 m in breadth and 2.2 m in depth. The cost of cementing its floor and the four sides at Rs. 25/m^2 is:
SSC CPO 16/03/2019 (Afternoon)
(a) Rs.43,980 (b) Rs.37540
(c) Rs.34260 (d) Rs.37700

Q.88. A square cardboard with side 3 m is folded through one of its diagonal to make a triangle, the height(m) of the triangle is :
SSC CPO 16/03/2019 (Morning)
(a) $\frac{3}{\sqrt{2}}$ (b) $2\sqrt{3}$ (c) $3\sqrt{2}$ (d) $\frac{2}{\sqrt{3}}$

Q.89. If the area of a regular hexagon is $108\sqrt{3}cm^2$, its perimeter (in cm) is:
SSC CPO 15/03/2019 (Evening)
(a) $36\sqrt{2}$ (b) $42\sqrt{3}$ (c) $28\sqrt{3}$ (d) 24

Q.90. A square piece of cardboard with side 12 cm has a small square of 2 cm cut out from each of the corners. The resulting flaps are turned up to make a box 2 cm deep. The volume (in cm^3) of the box is:
SSC CPO 15/03/2019 (Evening)
(a) 128 (b) 94 (c) 102 (d) 11

Q.91. The area (in cm^2)of a right angled triangle having base 24 cm and hypotenuse 25 cm is :
SSC CPO 15/03/2019 (Evening)
(a) 72 (b) 108 (c) 92 (d) 84

Q.92. The length of the longest pole that can be placed in a room 16 m long, 8 m wide and 11 m high is:
SSC CPO 15/03/2019 (Evening)
(a) 21 m (b) 20 m (c) 18 m (d) 19 m

Q.93. If the height of an equilateral triangle is $10\sqrt{3}$ cm, the area (in cm^2) is:
SSC CPO 15/03/2019 (Morning)
(a) $124\sqrt{3}$ (b) $75\sqrt{3}$ (c) $80\sqrt{3}$ (d) $100\sqrt{3}$

Q.94. The dimensions of a swimming pool are 66m× $35m \times 3m$. How many hours will it take to fill the pool by a pipe of diameter 35 cm with water flowing at speed 8 m/s ?
SSC CPO 15/03/2019 (Morning)
(a) 2.75 h (b) 3.5 h (c) 2.5 h (d) 3.2 h

Q.95. Which of the following has the maximum number of vertices ?
SSC CPO 14/03/2019 (Evening)
(a) Cuboid
(b) Triangular Prism
(c) Hexagonal pyramid
(d) Tetrahedron

Q.96. A diagonal of a quadrilateral is 40 cm. The length of the perpendicular to the opposite ends is 7.5 cm and 8.6 cm. What is the area (in cm^2) of quadrilateral?
SSC CPO 14/03/2019 (Evening)
(a) 434 (b) 322 (c) 368 (d) 28

Q.97. The area of each square of a chessboard having 64 squares is 4 cm^2. If there is a border on all the sides of the chessboard of 2 cm, then the perimeter of the chessboard is:
SSC CPO 14/03/2019 (Morning)
(a)128cm (b) 80cm (c)70cm (d)256cm

Q.98. The sides of a triangle are 24cm, 45cm and 51cm. At each of its vertices, circles of radius 10.5cm are drawn. What is the area of the triangle, excluding the portion covered by sectors of the circles?
SSC CPO 13/03/2019 (Evening)
(a) 244.75cm^2 (b) 366.75cm^2
(c) 464.75cm^2 (d) 327.75cm^2

Q.99. The radius of a cylinder is increased by 150 % and its height is decreased by 20 %. What is the percentage increase in its volume?
SSC CPO 12/03/2019 (Morning)
(a) 400% (b) 600% (c) 500% (d) 80%

Practice Questions

SSC CHSL 2024 Tier - 2

Q.100. The surface area of a cube is 1728 cm². Find its volume.
SSC CHSL Tier II (18/11/2024)
(a) $6453\sqrt{2}$ cm³ (b) $5436\sqrt{2}$ cm³
(c) $3456\sqrt{2}$ cm³ (d) $4356\sqrt{2}$ cm³

Q.101. A cylinder has a radius $\frac{8}{\pi}$ cm and its volume is 448 cm³. What is the height of the cylinder (taken π = $\frac{22}{7}$) ?
SSC CHSL Tier II (18/11/2024)
(a) 24 cm (b) 21 cm (c) 23 cm (d) 22 cm

Q.102. The radii of the two spheres are in the ratio 4 : 5. Their volume will be in the ratio:
SSC CHSL Tier II (18/11/2024)
(a) 64 : 125 (b) 125 : 64
(c) 16 : 25 (d) 4 : 5

Q.103. For making a toy, a hemisphere is attached at one end of a cylinder and a cone is attached at the other end of the cylinder. The cylinder, the cone and the hemisphere have a common radius of 4.2 cm. The height of the cylinder and that of the cone is 7 cm. Find the volume (in cm³) of the toy. (Use π = $\frac{1}{22}$)
SSC CHSL Tier II (18/11/2024)
(a) 358.8 (b) 762.255
(c) 672.672 (d) 863.25

SSC MTS 2024 Tier - 1

Q.104. The area of a regular hexagon is $2048\sqrt{3}$ cm². What is the length (in cm) of each side of the hexagon ?
SSC MTS 30/09/2024 (Morning)
(a) $32\sqrt{3}$ (b) $\frac{64\sqrt{3}}{3}$ (c) $\frac{32\sqrt{3}}{3}$ (d) $64\sqrt{3}$

Q.105. A right circular cone of height h and radius R is cut by a plane parallel to the base at a distance $\frac{h}{4}$ from the base. The ratio of the curved surface areas of the resulting cone to the frustum is:
SSC MTS 30/09/2024 (Afternoon)
(a) 7 : 16 (b) 16 : 9 (c) 16 : 7 (d) 9 : 7

Q.106. What is the number of gold coins, each having a radius of 0.875 cm and a thickness of 2 mm, that need to be melted to create a cuboid with dimensions 5.5 cm × 5 cm × 3.5 cm ?
(Use π = $\frac{22}{7}$)
SSC MTS 30/09/2024 (Evening)
(a) 250 (b) 175 (c) 200 (d) 225

Q.107. A cylindrical tank of height 10 m and radius 5 m has a small circular cut of 0.5 m radius on its top surface. What would be the total surface area of the tank ?
SSC MTS 01/10/2024 (Morning)
(a) $\frac{599\pi}{4}$ m² (b) 156 π m²

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(c) $\frac{299\pi}{2}$ m^2 (d) 150 π m²

Q.108. A solid cylinder with a height of 8 units and a radius of 3.5 units is to be covered with a paper sheet. If the cost of the paper sheet is ₹40 per 5 square units, the cost (in ₹) of covering the cylinder is _____ (Take π = $\frac{22}{7}$)
SSC MTS 01/10/2024 (Afternoon)
(a) 2268 (b) 1664 (c) 2024 (d) 1012

Q.109. A hemispherical bowl is 264 cm round at the brim. Suppose that the bowl is half-full of beverage. If the beverage is served in hemispherical glasses 6 cm in the diameter at the top, how many people would be served ?
SSC MTS 07/10/2024 (Morning)
(a) 1170 (b) 1372 (c) 1270 (d) 1470

Q.110. What is the area of the remaining portion of a circle of radius 14 cm when a square with maximum possible area inscribed in it is removed from it? (Use π = $\frac{22}{7}$)
SSC MTS 07/10/2024 (Morning)
(a) 518 cm^2 (b) 520 cm^2
(c) 224 cm^2 (d) 616 cm^2

Q.111. The volume of the hemisphere is 486π cm³. If the radius is tripled, then what will be its curved surface area (in cm²) ?
SSC MTS 07/10/2024 (Afternoon)
(a) 1458 (b) 1025π (c) 1458π (d) 1546

Q.112. A hemispherical bowl of internal radius 15 cm contains a liquid. The liquid is to be filled into cylindrical shaped bottles of diameter 5 cm and height 6 cm. The number of bottles required to empty the bowl is:
SSC MTS 08/10/2024 (Morning)
(a) 40 (b) 30 (c) 60 (d) 50

Q.113. A solid cone of base radius 7 cm and height 18 cm is melted and recast into a hollow metal hemisphere of internal and external radii 20 cm and R cm, respectively. What is the value of R (in cm)?
SSC MTS 08/10/2024 (Afternoon)
(a) $\sqrt[3]{8144}$ (b) $\sqrt[3]{8441}$
(c) $\sqrt[3]{8448}$ (d) $\sqrt[3]{8568}$

Q.114. A solid spherical item is melted into the shape of a cylinder mounted by a cone having same radius. The diameters of the cylinder and sphere are 21 cm each. What is the height (in cm) of the cone if the height of the cylinder is 7 cm? (Take π = $\frac{22}{7}$)
SSC MTS 08/10/2024 (Evening)
(a) 21 (b) 10.5 (c) 14 (d) 7

Q.115. ABCDEF is a regular hexagon, and m ($\overline{AD}$) = 12 cm. What is the area (in cm^2) of the given hexagon ?
SSC MTS 09/10/2024 (Morning)
(a) $216\sqrt{3}$ (b) $54\sqrt{3}$ (c) $108\sqrt{3}$ (d) $162\sqrt{3}$

Q.116. A right circular cone of height h and radius R is cut by a parallel to the base at a distance $\frac{h}{5}$ from the base. The ratio of the curved surface area of the frustum and total surface area of the resulting cone is:
SSC MTS 09/10/2024 (Afternoon)
(a) 16 (R + L) : 9L (b) 9 (R + L) : 16L
(c) 16L : 9 (R + L) (d) 9L : 16 (R + L)

Q.117. The radius of the base and height of a right circular cone are in the ratio 8 : 15. Find the slant height of the cone if its volume is $1005\frac{5}{7}$ cm^3
SSC MTS 09/10/2024 (Afternoon)
(a) 12 cm (b) 17 cm (c) 21 cm (d) 15 cm

Q.118. A rectangular sheet of length 28 cm and breadth 16 cm is folded to meet the edges so that it is made into a cylindrical pipe in two possible ways – one along the length and the other along the breadth. The larger volume is how much percentage of smaller volume ?
SSC MTS 09/10/2024 (Evening)
(a) 165% (b) 180% (c) 185% (d) 175%

Q.119. A conical tent is to accommodate 12 persons. Each person must have 5 m^2 of the space on the ground and 20 m^3 of air to breathe. The height of the tent should be:
SSC MTS 09/10/2024 (Evening)
(a) 12 m (b) 13 m (c) 12.5 m (d) 22 m

Q.120. A medicine capsule is shaped like a cylinder with two hemispheres attached to each of its ends. The length of the entire capsule is 15 mm, and its diameter is 6 mm. Calculate the surface area (in mm², rounded to the nearest integer) of the capsule. (Use π = $\frac{22}{7}$)
SSC MTS 14/10/2024 (Afternoon)
(a) 286 (b) 283 (c) 289 (d) 280

Q.121. A hemispherical container of total surface area 7392 cm² is filled with oil. However, $\frac{1}{4}$ of the container is empty. This oil is to be transferred in small hemispherical bottles having radius of 6.3 cm. How many bottles will be required (rounded off to the nearest whole number)? (Take π = $\frac{22}{7}$.)
SSC MTS 14/10/2024 (Evening)
(a) 351 (b) 66 (c) 75 (d)156

Q.122. A cone of radius 16 cm and height 12 cm is cut, parallel to the base, at some height closer to the top. If the ratio of the heights of the solids is 1 : 3, then the ratio of the total surface areas of the two solids formed is approximately given by:
SSC MTS 17/10/2024 (Morning)
(a) 9 : 143 (b) 1 : 8 (c) 2 : 15 (d) 7 : 180

Q.123. A conical cavity is drilled in a solid circular cylinder of 7 cm height and 48 cm base diameter. The height and base diameter of the cone are the same as those of the cylinder. What is the total surface area of the remaining solid ?
SSC MTS 17/10/2024 (Afternoon)
(a) 1512π cm^2 (b) 1076π cm^2
(c) 1420π cm^2 (d) 1654π cm^2

Q.124. The side of a square exceeds the side of another square by 3 cm and the sum of the areas of the two squares is 225 cm^2. Find the sum of the perimeter (in cm) of both squares.
SSC MTS 17/10/2024 (Evening)
(a) 84 (b) 74 (c) 64 (d) 94

Q.125. The external curved surface area of a metallic hemispherical bowl is 308 cm^2 . If the density of metal is 8.7 gm per cm^3 , then the mass of the bowl is equal to: (Take π = $\frac{22}{7}$)
SSC MTS 18/10/2024 (Morning)
(a) 6254.2 gm (b) 6252.4 gm
(c) 5262.4 gm (d) 5264.2 gm

Q.126. From a square with area a^2 another square made on mid points of the sides of the square is removed. What is the area left in the square ?
SSC MTS 18/10/2024 (Morning)
(a) $\frac{a^2}{2}$ (b) $\frac{2a^2}{3}$ (c) $\frac{a^2}{4}$ (d) $\frac{3a^2}{4}$

Q.127. In a lead pipe 4.2 m long, the external diameter is 5.4 cm and the thickness of the pipe is 3 mm. Find the weight of the pipe, if 1 cm³ of lead mass is 25 grams. (Use π = $\frac{22}{7}$)
SSC MTS 18/10/2024 (Afternoon)
(a) 54.90 kg (b) 45.09 kg
(c) 59.40 kg (d) 50.49 kg

Q.128. A solid sphere of iron having radius 15 cm is to be melted and recast in the shape of a cylindrical pipe having internal and external radii 4 cm and 6 cm, respectively. Find the length (in m) of the pipe thus formed.
SSC MTS 18/10/2024 (Evening)
(a) 2.15 (b) 2.25 (c) 2.45 (d) 2.35

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.129. The sum of the radius and slant height of a cone is square of the height of the cone, while the difference between the radius and slant height is 1 cm only. What is the total surface area (in cm²) of the cone having height of 9 cm ? (Take π = $\frac{22}{7}$) (Rounded off to 2 decimal places)
SSC MTS 21/10/2024 (Morning)
(a) 10,437.43 (b) 11,282.85
(c) 10,182.86 (d) 10,128.85

Q.130. A cylinder of radius 10 cm and height 30 cm is cut, parallel to the base, into two pieces of different sizes. The total surface area of the larger piece formed is 70% of that of the given cylinder. The smaller piece is melted and made into a sphere. The radius (in cm) of the sphere is:
SSC MTS 21/10/2024 (Morning)
(a) $\sqrt[3]{821}$ (b) $\sqrt[3]{900}$ (c) $\sqrt[3]{986}$ (d) $\sqrt[3]{844}$

Q.131. Find the volume of the largest right circular cone which is inscribed in a hollow cube of length 6 units and is standing on its base.
SSC MTS 21/10/2024 (Afternoon)
(a) 18π units^3 (b) 9π units^3
(c) 21π units^3 (d) 10π units^3

Q.132. A cylindrical vessel of height 14 cm has outer and inner radii 14 cm and 10 cm, respectively. It is to be filled by transferring water in it by using a small cylinder of height 7 cm and outer and inner radii 7 cm and 5 cm, respectively. What will be the unfilled height of the big vessel after transferring water 6 times by using the smaller cylinder? (Use π = $\frac{22}{7}$)
SSC MTS 21/10/2024 (Evening)
(a) 2.2 cm (b) 3.5 cm
(c) 2.9 cm (d) 3.8 cm

Q.133. A cylindrical tube, which is open at both ends, is crafted from a metal. The internal diameter of the tube is 12 cm, and its length is 35 cm. The metal throughout has a thickness of 2 cm. Determine the total surface area (in cm^2) of the metal tube. (Take $\pi = \frac{22}{7}$)
SSC MTS 22/10/2024 (Morning)
(a) 3696 (b) 3256 (c) 3854 (d) 3145

Q.134. The perimeter of a rhombus is 160 cm and one of its diagonals has a length 50 cm. Find the area (in cm^2) of the rhombus.
SSC MTS 22/10/2024 (Morning)
(a) $280\sqrt{39}$ (b) $300\sqrt{39}$
(c) $250\sqrt{39}$ (d) $175\sqrt{39}$

Q.135. The diagonals of two squares are in the ratio of 5 : 6. What is the ratio of their areas ?
SSC MTS 22/10/2024 (Afternoon)
(a) 18 : 20 (b) 25 : 36 (c) 23 : 18 (d) 2 : 3

Q.136. An ice-cream cone with a lid has a total surface area equal to the area of another circle of certain radius. If the radius of the circle is equal to average of the slant height and the radius of the cone, then the ratio of the slant height of the cone to the radius of the circle is:
SSC MTS 23/10/2024 (Morning)
(a) 3 : 1 (b) 2 : 3 (c) 3 : 2 (d) 1 : 3

Q.137. The diameter of a hollow hemisphere is 30 cm. Water is filled in it up to its brim. When spherical lead shots each of radius 0.75 cm are dropped into the hemisphere, two-fifth of the water flows out. How many lead shots were dropped into the hemisphere ?
SSC MTS 29/10/2024 (Evening)
(a) 1575 (b) 2250 (c) 1600 (d) 1380

Q.138. In a conical tent of diameter 13.2 m and vertical height 14 m, how many full bags of wheat can be emptied, if the space required for the wheat in each bag is 29.04 m^3 ? [Use π = $\frac{22}{7}$]
SSC MTS 30/10/2024 (Afternoon)
(a) 25 (b) 28 (c) 22 (d) 21

Q.139. What is the radius of the largest right circular cone that can be cut out from a cube of edge 8.4 cm ?
SSC MTS 12/11/2024 (Morning)
(a) 4.1 cm (b) 4.2 cm
(c) 2.2 cm (d) 2.1 cm

Q.140. A right circular solid metallic cone is 7.2 cm high and radius of its base 3.5 cm. It is melted and recast into two right circular solid metallic cones equal in all respects, each with base radius 2.1 cm and height 'h'. What is the value of 'h' (in cm) ?
SSC MTS 13/11/2024 (Morning)
(a) 14 (b) 10 (c) 21 (d) 12

Q.141. The radius of a circle is equal to the side of a square. The perimeters of the square and circle are in the ratio 7 : 11, then the ratio of the areas will be :
(Use π = $\frac{22}{7}$)
SSC MTS 13/11/2024 (Afternoon)
(a) 14 : 22 (b) 22 : 14 (c) 22 : 7 (d) 7 : 22

Q.142. The internal and external diameters of a bowl in the shape of a hemisphere are 26.6 cm and 28 cm, respectively. What is the cost (in ₹, to the nearest rupee) of painting it, all over, at the rate of ₹3.75/cm² ? (Take π = $\frac{22}{7}$).
SSC MTS 13/11/2024 (Afternoon)
(a) 9,380 (b) 9,015 (c) 8,950 (d) 9,000

Q.143. If the radii of two right circular cylinders are in the ratio of 2 : 3 and their heights are in the ratio of 5 : 4, then find the ratio of their curved surface areas ?
SSC MTS 14/11/2024 (Morning)
(a) 6 : 5 (b) 5 : 6 (c) 6 : 10 (d) 10 : 6

Q.144. A hollow hemispherical steel bowl can contain $\frac{686}{3}\pi$ cubic unit of liquid. The outer radius is 9 units. How much steel is used in making the bowl ?
SSC MTS 14/11/2024 (Afternoon)
(a) $\frac{772}{3}\pi$ cubic units
(b) $\frac{433}{3}\pi$ cubic units
(c) $\frac{727}{3}\pi$ cubic units
(d) $\frac{343}{3}\pi$ cubic units

Q.145. Air is leaking from a spherical-shaped advertising balloon at the rate of 24 cubic feet per minute. If the radius of the balloon is 8 feet, how long would it take for the balloon to empty? Round your answer to the nearest minute. Use the approximate of value of π, that is 3.14.
SSC MTS 14/11/2024 (Afternoon)
(a) 89 minutes (b) 80 minutes
(c) 65 minutes (d) 94 minutes

Q.146. A solid hemisphere of radius 12 cm is melted into N identical cones, each of radius 6 cm and height 8 cm. What is the value of N ?
SSC MTS 14/11/2024 (Evening)
(a) 12 (b) 8 (c) 10 (d) 15

SSC CGL 2024 Tier - 1

Q.147. The radii of the two cones are in the ratio of 2 : 5 and their volumes are in the ratio of 3 : 5. What is the ratio of their heights?
SSC CGL 09/09/2024 (1st Shift)
(a) 15 : 4 (b) 11 : 15 (c) 13 : 11 (d) 4 : 11

Q.148. What is the volume (in cm³) of a cylinder if the radius of the cylinder is 8 cm and the height is 14 cm?
(Take π = $\frac{22}{7}$)
SSC CGL 09/09/2024 (2nd Shift)
(a) 2686 (b) 2816 (c) 2784 (d) 2456

Q.149. From a circle with the radius of 15.75 cm, a sector with the arc length of 11 cm is cut off. Find the area (in cm^2) of this sector.
SSC CGL 09/09/2024 (2nd Shift)
(a) 86.525 (b) 86.625

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(c) 86.875 (d) 86.125

Q.150. A right-angled isosceles triangle has an area of 50 square units. Its hypotenuse is (in units):
SSC CGL 09/09/2024 (2nd Shift)
(a) $10\sqrt{3}$ (b) $5\sqrt{5}$ (c) $10\sqrt{2}$ (d) $5\sqrt{2}$

Q.151. What is the perimeter (in cm, rounded off to one decimal place) of the sector of a circle with a radius of 10 cm and of angle 30°? (Use π = 3.14)
SSC CGL 09/09/2024 (3rd Shift)
(a) 20.4 (b) 35.7 (c) 82.8 (d) 25.2

Q.152. If a right circular cone of height 24 cm has a volume of 1232 cm^3 , then the total surface area of the cone is
(use $\pi = \frac{22}{7}$) :
SSC CGL 10/09/2024 (1st Shift)
(a) 806 cm^2 (b) 704 cm^2
(c) 904 cm^2 (d) 608 cm^2

Q.153. A rectangular piece of paper is 50 cm long and 22 cm wide. If a cylinder is formed by rolling the paper along its breadth, then the volume of the cylinder is:
SSC CGL 10/09/2024 (3rd Shift)
(a) 2,125 cm^3 (b) 1,925 cm^3
(c) 2,025 cm^3 (d) 1,825 cm^3

Q.154. A rectangular courtyard is 4m 95cm long and 16m 65cm broad. It is to be paved with the square tiles of the same size. Find the least number of such square tiles required to pave the rectangular courtyard.
SSC CGL 11/09/2024 (1st Shift)
(a) 877 (b) 944 (c) 388 (d) 407

Q.155. The inner and outer radii of a circular track are 28 m and 25 m, respectively. The cost (in ₹) of levelling the track at ₹28 per m^2 is: (Use $\pi = \frac{22}{7}$)
SSC CGL 11/09/2024 (1st Shift)
(a) 15,421 (b) 13,992
(c) 11,229 (d) 17,355

Q.156. If the perimeter of an equilateral triangle is 36 units, then its area is (in square units):
SSC CGL 11/09/2024 (1st Shift)
(a) $144\sqrt{2}$ (b) $36\sqrt{2}$ (c) $144\sqrt{3}$ (d) $36\sqrt{3}$

Q.157. If the ratio of the areas of two similar triangles is 25 : 144, the ratio of their corresponding sides is:
SSC CGL 11/09/2024 (2nd Shift)
(a) 5 : 12 (b) 5 : 144 (c) 25 : 12 (d) 12 : 5

Q.158. A cuboid of dimensions 50 cm, 150 cm, 175 cm can be divided into how many identical largest cubes ?
SSC CGL 11/09/2024 (3rd Shift)
(a) 75 (b) 84 (c) 85 (d) 90

Q.159. The height of a cylinder is 20 cm. The lateral surface area is 1760 cm^2 . Its volume is:
SSC CGL 12/09/2024 (1st Shift)
(a) 12032 cm^3 (b) 12302 cm^3
(c) 12203 cm^3 (d) 12320 cm^3

Q.160. Two cylinders have the radii of their bases in the ratio 4 : 5 and their heights are in the ratio 5 : 7. Find the ratio of their curved surface areas.
SSC CGL 12/09/2024 (2nd Shift)
(a) 5 : 4 (b) 4 : 7 (c) 1 : 2 (d) 4 : 5

Q.161. The circumference of the base of a conical tent of height 8 m is 32 πm. Find its curved surface area.
SSC CGL 12/09/2024 (3rd Shift)
(a) $164\sqrt{5}$ πm² (b) $162\sqrt{3}$ πm²
(c) $132\sqrt{3}$ πm² (d) $128\sqrt{5}$ πm²

Q.162. A circular arc whose radius is 12 cm makes an angle of 30° at the centre. Find the perimeter (in cm) of the sector formed. (Use π = 3.14)
SSC CGL 12/09/2024 (3rd Shift)
(a) 32.38 (b) 30.28 (c) 28.64 (d) 26.24

Q.163. One-quarter of a circular pizza of radius 21 cm was removed from the whole pizza. What is the perimeter (in cm) of the remaining pizza? (Use $\pi = \frac{22}{7}$)
SSC CGL 13/09/2024 (1st Shift)
(a) 99 (b) 141 (c) 128 (d) 131

Q.164. What is the height (in m) of a conical water tank having radius of 70 m and volume of 46,200 m³? (Take $\pi = \frac{22}{7}$)
SSC CGL 13/09/2024 (1st Shift)
(a) 27 (b) 9 (c)18 (d) 54

Q.165. A and B are centres of two circles with radii 2 cm and 1 cm respectively, where AB = 5 cm. C is the centre of another circle of radius r cm, which touches each of the above two circles externally. If ∠ACB = 90° , then the value of r is:
SSC CGL 13/09/2024 (1st Shift)
(a) 5 cm (b) 2 cm (c) 3 cm (d) 4 cm

Q.166. From a circle of radius 7 units, an arc length is cut by a chord of length 7 units. What is the arc length of the smaller portion (in units)?
SSC CGL 13/09/2024 (1st Shift)
(a) $\frac{8}{3}\pi$ (b) $\frac{7}{6}\pi$ (c) $\frac{7}{3}\pi$ (d) $\frac{7}{4}\pi$

Q.167. A chord of the larger among two concentric circles is of length 20 cm and it is tangent to the smaller circle. What is the area (in cm^2) of the annular portion between the two circles ?
SSC CGL 13/09/2024 (2nd Shift)
(a) 100π (b) 164π (c) 122π (d) 175π

Q.168. What is the volume in cubic units of a cylinder with a height equal to the diameter and a radius is 4 units ?
SSC CGL 13/09/2024 (2nd Shift)
(a) 128π (b) $\frac{64\pi}{3}$ (c) 32π (d) $\frac{32\pi}{3}$

Q.169. The angle turned by minutes hand in 25 minutes in a clock is:
SSC CGL 13/09/2024 (3rd Shift)
(a) π (b) $\frac{\pi}{2}$ (c) $\frac{5\pi}{3}$ (d) $\frac{5\pi}{6}$

Q.170. Find the measure of the central angle of a sector if its area is 16π and the radius is 8.
SSC CGL 17/09/2024 (1st Shift)
(a) 75° (b) 60° (c) 108° (d) 90°

Q.171. The circumference of the base of a cylindrical vessel is 44 cm and its height is 25 cm. How many liters of water can it hold? (Take $\pi = \frac{22}{7}$)
SSC CGL 17/09/2024 (1st Shift)
(a) 38.5 (b) 3.58 (c) 3.85 (d) 83.5

Q.172. M and N are, respectively, the centres of two circles of radii 12 cm and 8 cm. QR is the common tangent to the circles. If MN = 16 cm, then what will be the length of QR ?
SSC CGL 17/09/2024 (2nd Shift)
(a) $5\sqrt{17}$ cm (b) $4\sqrt{15}$ cm
(c) $3\sqrt{19}$ cm (d) $6\sqrt{8}$ cm

Q.173. AB and CD are two parallel chords drawn in a circle with centre O. The distance between the two chords is 21 cm. If the lengths of AB and CD are 24 cm and 18 cm, respectively, then the radius of the circle is equal to:
SSC CGL 17/09/2024 (2nd Shift)
(a) 15 cm (b) 20 cm (c) 18 cm (d) 24 cm

Q.174. Find the length of the longest stick that can be fitted in a cubical vessel of edge 70 cm.
SSC CGL 17/09/2024 (2nd Shift)
(a) $35\sqrt{3}$ cm (b) $70\sqrt{3}$ cm
(c) $10\sqrt{3}$ cm (d) $70\sqrt{2}$ cm

Q.175. In a rhombus PQRS, O is any interior point such that OP = OR. What is the degree measure of ∠SOQ?
SSC CGL 17/09/2024 (2nd Shift)
(a) 120° (b) 180° (c) 240° (d) 200°

Q.176. If the height and diameter of a cylinder are 12 cm and 28 cm, respectively, then find the ratio of the total surface area to the curved surface

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

area.
SSC CGL 17/09/2024 (2nd Shift)
(a) 13 : 5 (b) 10 : 3 (c) 13 : 6 (d) 11 : 6

Q.177. A circular arc makes an angle of 15° at the centre. If the radius of the circular arc is 14 cm, what is the perimeter (correct up to two decimal places) of the sector so formed? (π = 3.14)?
SSC CGL 17/09/2024 (3rd Shift)
(a) 17.66 cm (b) 21.32 cm
(c) 35.32 cm (d) 31.66 cm

Q.178. The perimeter of a rectangular garden is 48 m. If the length is 6 m more than the breadth, the area (in m^2) of the garden is:
SSC CGL 18/09/2024 (1st Shift)
(a) 135 (b) 96 (c) 84 (d) 112

Q.179. If three cubes of volume 512 cm^3 each are joined end to end, find the surface area of the resulting cuboid.
SSC CGL 18/09/2024 (1st Shift)
(a) 896 cm^2 (b) 986 cm^2
(c) 895 cm^2 (d) 869 cm^2

Q.180. The radius of the base of a right circular cone is 9 cm and its slant height is 49 cm. Find the curved surface area of the cone.
SSC CGL 18/09/2024 (2nd Shift)
(a) 1386 cm^2 (b) 1265 cm^2
(c) 1262 cm^2 (d) 1490 cm^2

Q.181. The area of a parallelogram with base 26 cm and height 18 cm is:
SSC CGL 19/09/2024 (1st Shift)
(a) 234 cm^2 (b) 936 cm^2
(c) 932 cm^2 (d) 468 cm^2

Q.182. The base radius of a circular cylinder is 10.5 cm. If the area of its curved surface is 792 cm^2 , then what is the volume of the cylinder?
SSC CGL 19/09/2024 (2nd Shift)
(a) 4185 cm^3 (b) 4518 cm^3
(c) 4152 cm^3 (d) 4158 cm^3

Q.183. In a rectangular field, the sum of the length and the breadth is 9 cm and area is 18 cm^2. If the length is 'a' and breadth is 'b', then find the value of (a^2 - ab + b^2).
SSC CGL 19/09/2024 (3rd Shift)
(a) 36 (b) 24 (c) 18 (d) 27

Q.184. If the area of a sector of a circle is 462 cm^2 and the central angle is 120°, then its radius is _____.
SSC CGL 19/09/2024 (3rd Shift)
(a) 18 cm (b) 17 cm (c) 21 cm (d) 14 cm

Q.185. The total surface area of a closed cube is given as 1152 cm^2 . What is the length (in cm) of each side of the cube?
SSC CGL 19/09/2024 (3rd Shift)
(a) $9\sqrt{2}$ (b) $4\sqrt{13}$ (c) $8\sqrt{3}$ (d) $8\sqrt{2}$

Q.186. The length, breadth and height of a room is 15 m, 9 m, and 5 m, respectively. From each can of paint 40 square metre of area is painted. How many cans of paint will be needed to paint only the walls of the room?
SSC CGL 23/09/2024 (2nd Shift)
(a) 12 (b) 6 (c) 4 (d) 8

Q.187. The volume of a right circular cylindrical box of radius 30cm is 600cm^3. Find the height of the box.
SSC CGL 24/09/2024 (1st Shift)
(a) 0.61cm (b) 0.31cm
(c) 0.51cm (d) 0.21cm

Q.188. The radii of two circles are 8 cm and 15 cm.The perimeter of the circle having area equal to the sum of the areas of the two circles (in cm) is:
SSC CGL 24/09/2024 (2nd Shift)
(a) 32π (b) 30π (c) 28π (d) 34π

Q.189. The ratio of the length, the breadth, and the height of a solid cuboid is given as 3 : 2 : 1, and the breadth of this cuboid is given as 12 cm. Find the volume (in cm^3) of the cuboid.
SSC CGL 24/09/2024 (3rd Shift)
(a) 1250 (b) 1296 (c) 1200 (d) 1500

Q.190. The circumference of the base of the cylindrical vessel is 154 cm and its height is 49 mm. How many litres of water can it hold? (correct to three places of decimals, use π = $\frac{22}{7}$)
SSC CGL 25/09/2024 (1st Shift)
(a) 9.244 (b) 2.439 (c) 3.924 (d) 4.329

Q.191. A cylindrical tank of radius 14 cm is full of water. If 616 litres of water are drawn out, then the water level in the tank is dropped by ___ m. (Take π = $\frac{22}{7}$)
SSC CGL 25/09/2024 (2nd Shift)
(a) 1000 (b) 100 (c) 1 (d) 10

Q.192. Find the diameter (in cm) of a circle whose circumference is equal to the sum of the circumferences of two circles of radii 12 cm and 16 cm.
SSC CGL 25/09/2024 (2nd Shift)
(a) 32 (b) 56 (c) 64 (d) 28

Q.193. A well with 14 cm radius is dug 23 cm deep. Find the volume of the earth taken out of it.
SSC CGL 25/09/2024 (3rd Shift)
(a) 14,178 cm^3 (b) 14,108 cm^3
(c) 14,168 cm^3 (d) 15,168 cm^3

Q.194. What is the total surface area of a cone whose curved surface area is 550 cm^2 and radius is 7 cm?
(Take $\pi = \frac{22}{7}$)
SSC CGL 26/09/2024 (1st Shift)
(a) 764.71 cm^2 (b) 704.00 cm^2
(c) 682.60 cm^2 (d) 714.05 cm^2

Q.195. From a point A, which is at a distance of 17 cm from the centre C of a circle with radius 8 cm, the pair of tangents AB and AD to the circle are drawn. The area of the quadrilateral ABCD is _____ cm^2.
SSC CGL 26/09/2024 (1st Shift)
(a) 192 (b) 120 (c) 60 (d) 360

Q.196. The central angle of a sector is 80° and whose length is 96π. What is the radius of the circle ?
SSC CGL 26/09/2024 (2nd Shift)
(a) 196 units (b) 204 units
(c) 116 units (d) 216 units

SSC CHSL 2024 Tier - 1

Q.197. A largest possible sphere is carved from a cube of side 14 cm. What is its volume in cm^3?
SSC CHSL 01/07/2024 (1st Shift)
(a) $205\frac{1}{3}$ (b) $1707\frac{1}{3}$
(c) $1437\frac{1}{3}$ (d) $1600\frac{1}{3}$

Q.198. The respective ratio between numerical values of the curved surface area and the volume of a right circular cylinder is 2 : 3. If the respective ratio between the radius and the height of the cylinder is 3 : 7, what is the total surface area of the cylinder?
SSC CHSL 01/07/2024 (2nd Shift)
(a) 62 π cm^2 (b) 45 π cm^2
(c) 65 π cm^2 (d) 60 π cm^2

Q.199. The surface areas of two spheres are in the ratio 25 : 36. What is the ratio of their volumes?
SSC CHSL 01/07/2024 (2nd Shift)
(a) $\frac{36}{115}$ (b) $\frac{125}{216}$ (c) $\frac{36}{125}$ (d) $\frac{25}{36}$

Q.200. The sides of a cuboid are in the ratio 3 : 4 : 5 and its surface area is equal to the surface area of the cube with side 6 units. What is the approximate volume of the Cuboid?
SSC CHSL 01/07/2024 (2nd Shift)
(a) 240 (b) 210 (c) 150 (d) 180

Q.201. The radius of a roller is 49 cm and its length is 200 cm. It takes 700 complete revolutions to move once over to level a playground. Find the area of the playground (Use π = $\frac{22}{7}$)
SSC CHSL 01/07/2024 (3rd Shift)
(a) 4312×10^4 cm^2 (b) 4312×10^2 cm^2
(c) 4322×10^4 cm^2 (d) 4312×10^3 cm^2

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.202. The curved surface area of a cone is 2200 cm² and its radius is 28 cm, what is the slant height (in cm) of the cone? (Use $\pi = \frac{22}{7}$)
SSC CHSL 01/07/2024 (3rd Shift)
(a) 22 (b) 23 (c) 24 (d) 25

Q.203. If the side of a cube is 3, which of the following options is equal to the ratio between the surface area and the volume of the cube ?
SSC CHSL 01/07/2024 (4th Shift)
(a) 2 : 3 (b) 2 : 1 (c) 2 : 5 (d) 2 : 7

Q.204. The surface area of a sphere is 2464 cm^2. Find its volume.
SSC CHSL 01/07/2024 (4th Shift)
(a) $13121\frac{1}{3}$ cm^3 (b) $11498\frac{2}{3}$ cm^3
(c) $11892\frac{2}{3}$ cm^3 (d) $11621\frac{1}{3}$ cm^3

Q.205. Which of the following are the sides of a right - angled triangle ?
SSC CHSL 01/07/2024 (4th Shift)
(a) 16 cm, 31 cm, 34 cm
(b) 12 cm, 16 cm, 20 cm
(c) 6 cm, 7 cm, 10 cm
(d) 5 cm, 11 cm, 13 cm

Q.206. Find the diameter of a spherical ball whose volume is 38.808 cm³.
(Use $\pi = \frac{22}{7}$)
SSC CHSL 01/07/2024 (4th Shift)
(a) 4.8 cm (b) 4.4 cm
(c) 4.6 cm (d) 4.2 cm

Q.207. The perimeter of a minor sector of a circle of radius 4 units subtending an angle of 45° is :
SSC CHSL 02/07/2024 (1st Shift)
(a) 4 − π units (b) 8 + π units
(c) 8 − π units (d) 4 + π units

Q.208. If the diameter of a hemisphere is 21 cm, then the curved surface area (in cm²) of the hemisphere is : Take $\pi = \frac{22}{7}$
SSC CHSL 02/07/2024 (1st Shift)
(a) 639 (b) 939 (c) 693 (d) 963

Q.209. The capacity of a cylinder tank is 8316 cm^3. If the radius of its base is 21 cm, then find the depth of the tank.
SSC CHSL 02/07/2024 (1st Shift)
(a) 6 cm (b) 8 cm (c) 4 cm (d) 10 cm

Q.210. The volume of a cube is reduced to 72.9%. By how much is the side of the cube reduced ?
SSC CHSL 02/07/2024 (2nd Shift)
(a) 9.5% (b) 10% (c) 9% (d) 8.5%

Q.211. A hemisphere has a radius of 6.2 cm. Find its total surface area (use π = 3.14) (round off to two decimal places).
SSC CHSL 02/07/2024 (2nd Shift)
(a) 276.35 cm² (b) 282.25 cm²
(c) 358.52 cm² (d) 362.10 cm²

Q.212. If the side of a square is increased by 5%, then the percentage increase in its area will be:
SSC CHSL 02/07/2024 (2nd Shift)
(a) 11% (b) 10.25% (c) 10% (d) 10.5%

Q.213. If the brick size is 25 cm × 12 cm × 9 cm, then how many bricks are required to construct a wall of length 10 m, breadth 22.5 cm and height 6 m ?
SSC CHSL 02/07/2024 (2nd Shift)
(a) 4500 (b) 6000 (c) 8000 (d) 5000

Q.214. An iron box with external dimensions 60 cm, 40 cm, and 20 cm is made of 1 cm thick sheet. If 1 cm^3 of iron weighs 50 gm, the weight of the empty box is:
SSC CHSL 02/07/2024 (3rd Shift)
(a) 416.40 kg (b) 240 kg
(c) 214.05 kg (d) 400 kg

Q.215. If the diameter of a hemisphere is 42 cm, then the volume of hemisphere (in cm³) is : Take $\pi = \frac{22}{7}$
SSC CHSL 02/07/2024 (3rd Shift)
(a) 19154 (b) 19254 (c) 19444 (d) 19404

Q.216. Find the difference between the curved surface area and total surface area of a right circular cylinder having a length of 68 cm and base diameter of 28 cm.
SSC CHSL 02/07/2024 (3rd Shift)
(a) 1432 cm^2 (b) 1332 cm^2
(c) 1132 cm^2 (d) 1232 cm^2

Q.217. The perimeter of a triangle is 36 units. Its area cannot be more than _____ square units.
SSC CHSL 02/07/2024 (3rd Shift)
(a) $12\sqrt{7}$ (b) $36\sqrt{2}$ (c) $36\sqrt{3}$ (d) $18\sqrt{5}$

Q.218. The outer surface of a sphere having diameter 10 m is painted at the rate of ₹ $\frac{80}{\pi}$ per m². What is the cost of painting?
SSC CHSL 02/07/2024 (4th Shift)
(a) ₹8,000 (b) ₹9,000
(c) ₹4,000 (d) ₹6,000

Q.219. The triangle has sides 3 cm, 4 cm and 5 cm. What is the length of the perpendicular from the opposite vertex to the side whose length is 5 cm ?
SSC CHSL 02/07/2024 (4th Shift)
(a) 3.5 cm (b) 2.4 cm
(c) 2.2 cm (d) 1.4 cm

Q.220. The radius and height of a cylinder are in the ratio 6 : 7 and its volume is 792 cm^3 . Calculate its curved surface area in cm^2
SSC CHSL 02/07/2024 (4th Shift)
(a) 262 (b) 490 (c) 264 (d) 226

Q.221. The internal length, breadth and height of a cardboard box are 6 cm, 10 cm and 12 cm, respectively. How many boxes are needed in which cubes whose volume is 2160 cm^3 can be packed ?
SSC CHSL 03/07/2024 (1st Shift)
(a) 6 (b) 5 (c) 3 (d) 4

Q.222. The heights of two cones are in the ratio of 5 : 3 and their radii are in the ratio 6 : 5. Find the ratio of their volumes.
SSC CHSL 03/07/2024 (1st Shift)
(a) 10 : 5 (b) 13 : 5 (c) 12 : 5 (d) 11 : 5

Q.223. If the radius of a sphere is doubled, then the volume of the sphere becomes ___ times the previous volume.
SSC CHSL 03/07/2024 (1st Shift)
(a) two (b) one (c) eight (d) four

Q.224. The curved surface area of a right circular cylinder of height 14 cm, is 88 cm^2. Find the total surface area of the cylinder.
SSC CHSL 03/07/2024 (2nd Shift)
(a) $\frac{360}{7}$ cm^2 (b) $\frac{660}{7}$ cm^2
(c) $\frac{560}{7}$ cm^2 (d) $\frac{460}{7}$ cm^2

Q.225. The area of a rectangular field is 3600 m^2. If the field is 45 m long, what is its perimeter ?
SSC CHSL 03/07/2024 (2nd Shift)
(a) 255 m (b) 260 m (c) 250 m (d) 265 m

Q.226. If the surface area of cuboid is 108 m^2, then find the height of the cuboid, whose length is 6 m and breadth is 3 m.
SSC CHSL 03/07/2024 (2nd Shift)
(a) 5.5 m (b) 5 m (c) 4.5m (d) 4 m

Q.227. For a given circle of radius 4 cm, the angle of its sector is 45°. Find the area (in cm^2) of the sector. (Use π = 3.14.)
SSC CHSL 03/07/2024 (3rd Shift)
(a) 7.28 (b) 6.28 (c) 6.18 (d) 7.18

Q.228. If the height of a right circular cone is 24 cm and radius of its base is 10.5 cm, then the volume of right circular cone (in cm³) is : Take $\pi = \frac{22}{7}$
SSC CHSL 03/07/2024 (3rd Shift)
(a) 2727 (b) 2772 (c) 2277 (d) 2237

Q.229. If the radius of a sphere is increased by 12 percent, then the volume will be increased by approximately:
SSC CHSL 03/07/2024 (3rd Shift)
(a) 41.49 percent (b) 45.49 percent

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(c) 40.49 percent (d) 42.5 percent

Q.230. A cylindrical iron rod whose height is twelve times its radius is melted and cast into spherical balls, the radius of each of which is one third of the radius of the cylinder. Find the number of spherical balls.
SSC CHSL 03/07/2024 (4th Shift)
(a) 243 (b) 198 (c) 224 (d) 212

Q.231. If the area of a triangle whose base measures 6 cm is 18 cm^2, then its height is:
SSC CHSL 03/07/2024 (4th Shift)
(a) 6 cm (b) 3.1 cm (c) 9 cm (d) 2.2 cm

Q.232. The edges of a rectangular box are in the ratio of 3 : 5 : 8, and its surface area is 632 cm^2.
What will be the volume of the box ?
SSC CHSL 04/07/2024 (1st Shift)
(a) 801 cm^3 (b) 960 cm^3
(c) 990 cm^3 (d) 510 cm^3

Q.233. Three solid cubes of metal have sides 6 cm, 8 cm and 10 cm, respectively. They are melted to form a new cube. What is the surface area of this new cube?
SSC CHSL 04/07/2024 (1st Shift)
(a) 812 cm^2 (b) 950 cm^2
(c) 915 cm^2 (d) 864 cm^2

Q.234. If the diameter of the base and curved surfaced area of a cylinder are 14cm and 352 cm^2 ,respectively, then the total surface area of the cylinder is equal to:
SSC CHSL 04/07/2024 (1st Shift)
(a) 660 cm^2 (b) 654 cm^2
(c) 760 cm^2 (d) 754 cm^2

Q.235. The radius of a sphere is increased by 25%. What is the increase percent in surface area?
SSC CHSL 04/07/2024 (2nd Shift)
(a) 15.55% (b) 36.45%
(c) 56.25% (d) 25.25%

Q.236. What is the curved surface area of cylinder whose radius is 3cm and height is 14cm ? (Take $\pi = \frac{22}{7}$)
SSC CHSL 04/07/2024 (2nd Shift)
(a) 262 cm^2 (b) 264 cm^2
(c) 263 cm^2 (d) 261 cm^2

Q.237. The total surface area of a solid hemisphere of diameter 28 cm is:
SSC CHSL 04/07/2024 (3rd Shift)
(a) 1848 cm^2 (b) 1784 cm^2
(c) 1488 cm^2 (d) 1648 cm^2

Q.238. Find the capacity of an overhead cylindrical water tank, in litres, whose radius is 2.1 m and height is 6.3 m.
SSC CHSL 04/07/2024 (3rd Shift)
(a) 61802 (b) 611726
(c) 87318 (d) 65622

Q.239. The diameter of a cylinder is 14 cm and its height is 9 cm. Find the total surface area of the cylinder.
SSC CHSL 04/07/2024 (3rd Shift)
(a) 704 cm^2 (b) 714 cm^2
(c) 708 cm^2 (d) 700 cm^2

Q.240. From a circle, a sector with a central angle of 30° is cut off. If the length of the arc of this sector is 5.5 cm, then find the radius (in cm) of the circle.
[Use $\pi = \frac{22}{7}$]
SSC CHSL 04/07/2024 (4th Shift)
(a) 12 (b) 10 (c) 11 (d) 10.5

Q.241. If the height of a solid right circular cylinder is 27 cm and diameter of its base is 30 cm, the total surface area (in cm^2) of the right circular cylinder is:
(Take $\pi = \frac{22}{7}$)
SSC CHSL 04/07/2024 (4th Shift)
(a) 3978 (b) 3960 (c) 3976 (d) 3964

Q.242. 3 solid spheres of diameters 6 cm, 8 cm and 10 cm are melted together to form a single solid sphere. Find its radius.
SSC CHSL 04/07/2024 (4th Shift)
(a) 3 cm (b) 12 cm (c) 9 cm (d) 6 cm

Q.243. The ratio of the lateral surface area to the total surface area of a cylinder with base diameter 60 cm and height 10 cm is:
SSC CHSL 04/07/2024 (4th Shift)
(a) 1 : 9 (b) 1 : 3 (c) 1 : 7 (d) 1 : 4

Q.244. The length, breadth and height of a cuboid are in ratio of 3 : 4 : 5. If the volume of the cuboid is 1620 m^3, find the total surface area of the cuboid.
SSC CHSL 05/07/2024 (1st Shift)
(a) 646 m^2 (b) 846 m^2
(c) 423 m^2 (d) 712 m^2

Q.245. A cylindrical oil tank has a radius of 5 m and a total surface area of 628 m^2, what would be its curved surface area? (round off to the second decimal place)
SSC CHSL 05/07/2024 (1st Shift)
(a) 401.43 m^2 (b) 371.83 m^2
(c) 470.8 m^2 (d) 481.43 m^2

Q.246. Rajesh is playing with a football having diameter of 28 cm. He wants to get a photo of his favourite player painted on the entire ball. The painter charges ₹2/cm^2. What will be the cost (in ₹) of painting the ball (take $\pi = \frac{22}{7}$) ?
SSC CHSL 05/07/2024 (1st Shift)
(a) 4,928 (b) 2,414 (c) 4,828 (d) 2,464

Q.247. A solid copper sphere of radius 9 cm is drawn into a wire of radius 4 mm. Find the length of the wire
SSC CHSL 05/07/2024 (2nd Shift)
(a) 70.25 m (b) 60.75 m
(c) 20.75 m (d) 65.25 m

Q.248. Find the height of the triangle whose base is two-thirds of its height and whose area is 363 cm^2
SSC CHSL 05/07/2024 (2nd Shift)
(a) 33 cm (b) 27 cm (c) 29 cm (d) 31 cm

Q.249. Find the percentage increase in surface area of a cube by triple each side.
SSC CHSL 05/07/2024 (3rd Shift)
(a) 700% (b) 800% (c) 650% (d) 500%

Q.250. If the length, breadth and total surface area of a cuboid are 30 cm, 20 cm and 2600 cm^2, respectively, then find its height.
SSC CHSL 05/07/2024 (3rd Shift)
(a) 50 cm (b) 30 cm (c) 14 cm (d) 15 cm

Q.251. Two similar triangles have area 490 sq . cm. and 640 sq . cm. If the length of the one side of the first triangle is 21 cm, then what is the length of the corresponding side of the second triangle?
SSC CHSL 05/07/2024 (4th Shift)
(a) 16 cm (b) 14 cm (c) 24 cm (d) 21 cm

Q.252. The diameter of a roller is 35 cm and its length is 100 cm. It takes 200 complete revolutions to level a playground. Find the area of the playground in m^2
SSC CHSL 05/07/2024 (4th Shift)
(a) 220 (b) 2,20,00,000
(c) 1,10,000 (d) 110

Q.253. The perimeter of a rectangle is 70 cm and its diagonal is 25 cm. The area of the rectangle is :
SSC CHSL 08/07/2024 (1st Shift)
(a) 425 cm^2 (b) 420 cm^2
(c) 300 cm^2 (d) 625 cm^2

Q.254. A solid sphere of radius 8 cm is melted and then recast into small spherical balls each of diameter 4 cm. Find the number of balls thus obtained (used $\pi = \frac{22}{7}$).
SSC CHSL 08/07/2024 (1st Shift)
(a) 64 (b) 48 (c) 32 (d) 24

Q.255. If the radius of a sphere is increased by 3.5 cm, its surface area increases by 550 cm^2. What was the original radius of the sphere ?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(use $\pi = \frac{22}{7}$)
SSC CHSL 08/07/2024 (2nd Shift)
(a) 4 cm (b) 4.5 cm (c) 6 cm (d) 3.5 cm

Q.256. The perimeter of a square whose area is the same as the area of a semi-circle of radius $2\sqrt{2}$ cm is:
SSC CHSL 08/07/2024 (2nd Shift)
(a) $8\sqrt{\pi}$ cm (b) $8\sqrt{2\pi}$ cm
(c) $16\sqrt{\pi}$ cm (d) $4\sqrt{\pi}$ cm

Q.257. A metallic solid cuboid of dimensions 36 cm × 22 cm × 12 cm is melted and recast in the form of cubes of side 6 cm. Find the number of the cubes so formed.
SSC CHSL 08/07/2024 (2nd Shift)
(a) 45 (b) 46 (c) 43 (d) 44

Q.258. The area of an isosceles right angled triangle is 16 m^2 . Its hypotenuse is _____.
SSC CHSL 08/07/2024 (3rd Shift)
(a) 0.8 m (b) 8 m (c) 4 m (d) 8 cm

Q.259. Find the cost of painting a ball that is in the shape of a sphere with a radius of 14 cm. The painting cost of the ball is ₹5 per square centimetre
(take $\pi = \frac{22}{7}$).
SSC CHSL 08/07/2024 (4th Shift)
(a) ₹12,230 (b) ₹12,320
(c) ₹13,022 (d) ₹13,220

Q.260. Two cubes, each of edge 5 cm, are joined face to face. Find the surface area of the cuboid thus formed.
SSC CHSL 08/07/2024 (4th Shift)
(a) 250 cm^2 (b) 300 cm^2
(c) 125 cm^2 (d) 200 cm^2

Q.261. The length of a rectangular shaped
park exceeds its breadth by 15 m. If the perimeter of the park is 110 m, find the length of the park (in m).
SSC CHSL 09/07/2024 (1st Shift)
(a) 35 (b) 40 (c) 25 (d) 20

Q.262. If the lateral surface area of a cube is 144 cm^2 , then find its volume.
SSC CHSL 09/07/2024 (1st Shift)
(a) 864 cm^3 (b) 1728 cm^3
(c) 117.58 cm^3 (d) 216 cm^3

Q.263. If the areas of three adjacent faces of a cuboid are 5 cm^2 , 15 cm^2 , 27 cm^2 , respectively, the surface area of the cuboid is:
SSC CHSL 09/07/2024 (1st Shift)
(a) 75 cm^2 (b) 47 cm^2
(c) 45 cm^2 (d) 94 cm^2

Q.264. A closed cylindrical tank of radius 1.5 m and height 3 m is made from a sheet of metal, how much sheet of metal is required to do it ?
SSC CHSL 09/07/2024 (2nd Shift)
(a) 42.24 square metre
(b) 24.24 square metre
(c) 42.42 square metre
(d) 24.42 square metre

Q.265. Two cubes have their volumes in the ratio 1 : 125. Find the ratio of their surface areas.
SSC CHSL 09/07/2024 (2nd Shift)
(a) 1 : 125 (b) 1 : 25 (c) 1 : 5 (d) 25 : 1

Q.266. If the radius of the base and slant height of the cone is 6 cm and 10 cm, respectively, then the volume of the cone is equal to:
SSC CHSL 09/07/2024 (3rd Shift)
(a) 108 π cm^3 (b) 98 π cm^3
(c) 106 π cm^3 (d) 96 π cm^3

Q.267. Find the number of paper balls, each 2 cm in diameter, that can be made from a sphere of diameter 18 cm.
SSC CHSL 09/07/2024 (4th Shift)
(a) 1020 (b) 484 (c) 625 (d) 729

Q.268. A cuboidal water purifier can carry 10 litres of water. Its breadth is $\frac{1}{5}$ of its height and length is $\frac{1}{3}$ of the sum of the breadth and height. The height of the tank is:
SSC CHSL 10/07/2024 (1st Shift)
(a) 20 cm (b) 10 cm (c) 80 cm (d) 50 cm

Q.269. A cube of edge 4 cm is cut into cubes each of edge of 2 cm. The ratio of the total surface area of one of the small cubes to that of the large cube is equal to:
SSC CHSL 10/07/2024 (2nd Shift)
(a) 1 : 4 (b) 1 : 64 (c) 1 : 8 (d) 1 : 16

Q.270. The curved surface area of a right circular cone is 20π cm^2. If its radius is 4 cm, then find the volume of cone.
SSC CHSL 10/07/2024 (2nd Shift)
(a) 21 π cm^3 (b) 20 π cm^3
(c) 16 π cm^3 (d) 18 π cm^3

Q.271. The ratio of the outer and the inner circumference of a circular path is 7 : 6. If the path is 45 m wide, then what is the radius (in m) of the inner circle?
SSC CHSL 10/07/2024 (2nd Shift)
(a) 240 (b) 270 (c) 150 (d) 120

Q.272. A solid metallic cube having surface area of 54 cm^2 is melted to form smaller cubes of surface area $\frac{8}{12}$ cm^2 each. Find the number of smaller cubes.
SSC CHSL 10/07/2024 (4th Shift)
(a) 512 (b) 343 (c) 216 (d) 729

Q.273. Find the surface area (in cm^2) of a cardboard box in the shape of a cuboid whose length is 60 cm, breadth is half its length and height is one-third of its breadth.
SSC CHSL 11/07/2024 (1st Shift)
(a) 2700 (b)10800 (c) 8100 (d) 5400

Q.274. From a circle of radius r units, the largest equilateral triangle is cut out. What is the length (in units) of the side of the triangle?
SSC CHSL 11/07/2024 (1st Shift)
(a) $\frac{r}{\sqrt{2}}$ (b) $\sqrt{2}r$ (c) $\sqrt{3}r$ (d) $\frac{r}{\sqrt{3}}$

Q.275. If the area of a rhombus is 70 m^2 and its height is 5 m, its perimeter is ____.
SSC CHSL 11/07/2024 (2nd Shift)
(a) 64 m (b) 35 m (c) 56 m (d) 25 m

Q.276. The measure of each side of an equilateral triangle is 16 cm. What is the ratio of its perimeter to the sum of its medians?
SSC CHSL 11/07/2024 (2nd Shift)
(a) $\sqrt{3} : 2$ (b) $2\sqrt{3} : 1$ (c) $2 : \sqrt{3}$ (d) $1 : 2\sqrt{3}$

Q.277. A hemispherical bowl is made of silver and has an inner diameter of 4 cm if the thickness of silver is 0.5 cm. Find the volume of silver used in making the bowl correct to two places of decimals (use π = 3.14)
SSC CHSL 11/07/2024 (2nd Shift)
(a) 15.69 cm^3 (b) 51.96 cm^3
(c) 15.96 cm^3 (d) 51.69 cm^3

Q.278. The volume of the rectangular block is 12288 m^3. Its dimensions are in the ratio of 4 : 3 : 2. If the entire surface is polished at the rate 2 paise per m^2,then find the total cost of polishing :
SSC CHSL 11/07/2024 (4th Shift)
(a) ₹44.42 (b) ₹11.14
(c) ₹66.56 (d) ₹33.28

SSC CPO 2024 Tier - 1

Q.279. A hemispherical bowl is 88 cm round the brim. Assuming it to be full, how many persons may be served from it in hemispherical glasses, 7 cm in diameter at the top ?(Where $\pi = \frac{22}{7}$)
SSC CPO 27/06/2024 (1st Shift)
(a) 74 (b) 68 (c) 64 (d) 70

Q.280. The chord length of a chord made on an arc of a circle is equal to the radius of the circle. The length of the arc is _____ (in units), if the radius of the circle is 21 units. (Take $\pi = \frac{22}{7}$)
SSC CPO 27/06/2024 (1st Shift)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) 20 (b) 22 (c) 24 (d) 21

Q.281. The base of a parallelogram is twice its height. If the area of the parallelogram is 338 cm^2, then find its height (in cm).
SSC CPO 27/06/2024 (1st Shift)
(a) 13 (b) 11 (c) 14 (d) 12

Q.282. What is the total surface area of a cone whose radius is $\frac{r}{4}$ and slant height is $4l$?
SSC CPO 27/06/2024 (1st Shift)
(a) $8\pi r(l + r)$ (b) $\pi r(l + \frac{r}{16})$
(c) $\pi r(l + \frac{r}{4})$ (d) $4\pi r(l + r)$

Q.283. How many metres of cloth will be required to make a conical tent, the radius of whose base is 21 metres and height is 28 metres. The width of the cloth is 5 metres. (Where $\pi = \frac{22}{7}$)
SSC CPO 27/06/2024 (1st Shift)
(a) 470 (b) 462 (c) 456 (d) 478

Q.284. The volume of a cube is four times the volume of a cuboid. If the sides of the cuboid are 32 cm, 8 cm and 4 cm, then find the ratio of the total surface area of the cube to that of the cuboid.
SSC CPO 27/06/2024 (2nd Shift)
(a) 23 : 13 (b) 24 : 13
(c) 21 : 13 (d) 22 : 13

Q.285. A copper sphere of diameter 12 cm is drawn into a wire of diameter 4 mm. What is the length (in cm) of the wire? (Where $\pi = \frac{22}{7}$)
SSC CPO 27/06/2024 (2nd Shift)
(a) 7200 (b) 7823 (c) 8342 (d) 9000

Q.286. The length of the largest possible rod that can be placed in a cubical room is $42\sqrt{3}$ m. The surface area (in m²) of the largest possible sphere that fit within the cubical room is: [Use $\pi = \frac{22}{7}$]
SSC CPO 27/06/2024 (2nd Shift)
(a) 3590 (b) 4589 (c) 2564 (d) 5544

Q.287.Find the area of a minor sector of a circle whose circumference is 88 cm and the length of its minor arc is 22 cm (use $\pi = \frac{22}{7}$).
SSC CPO 27/06/2024 (2nd Shift)
(a) 154 cm^2 (b) 451 cm^2
(c) 415 cm^2 (d) 145 cm^2

Q.288. A rectangular sheet of metal is 60 cm by 25 cm. Equal squares of side 5 cm are cut off at the corners and the remainder is folded up to form an open rectangular box. Find the volume of the box.
SSC CPO 27/06/2024 (3rd Shift)
(a) 2750 cm^3 (b) 5750 cm^3
(c) 3750 cm^3 (d) 4750 cm^3

Q.289. A drainage tile is a cylindrical shell 42 cm long. The inside and outside diameters are 8 cm and 14 cm, respectively. What is the volume (in cm^3) of clay required for the tile? ((Use $\pi = \frac{22}{7}$)
SSC CPO 27/06/2024 (3rd Shift)
(a) 5241 (b) 4356 (c) 4881 (d) 4125

Q.290. One laddoo with a radius of 5 cm belongs to a shopkeeper. How many laddoos of radius 2.5 cm may be created from the same one laddoo ?
SSC CPO 28/06/2024 (1st Shift)
(a) 2 (b) 6 (c) 4 (d) 8

Q.291. The cost of painting a spherical vessel of diameter 14 cm is ₹21,560. What is the cost of painting (in ₹) per square centimetre ? (Use $\pi = \frac{22}{7}$)
SSC CPO 28/06/2024 (1st Shift)
(a) 30 (b) 32 (c) 28 (d) 35

Q.292. The radius of the base and height of a cone are 5 cm and 6 cm, respectively, whereas the radius of the base and height of a cylinder are 2.5 cm and 3 cm, respectively. The ratio of the volume of the cone to that of the cylinder is: (Where $\pi = \frac{22}{7}$)
SSC CPO 28/06/2024 (1st Shift)
(a) 8 : 5 (b) 9 : 4 (c) 8 : 3 (d) 3 : 5

Q.293. A cylinder of radius 7 cm has a curved surface area of 2200 cm². Find its total surface area. (Use $\pi = \frac{22}{7}$)
SSC CPO 28/06/2024 (2nd Shift)
(a) 2508 cm² (b) 2260 cm²
(c) 2550 cm² (d) 1580 cm²

Q.294. A hollow sphere of external and internal diameters of 10 cm and 6 cm, respectively, is melted and made into another solid in the shape of a right circular cone of base diameter 10 cm. Find the height of the cone.
SSC CPO 28/06/2024 (2nd Shift)
(a) 13.68 cm (b) 14.68 cm
(c) 16.68 cm (d) 15.68 cm

Q.295. A spherical box has a surface area 528 cm². Find the radius of the spherical box.
SSC CPO 28/06/2024 (2nd Shift)
(a) $\sqrt{37}$ cm (b) $\sqrt{42}$ cm
(c) $\sqrt{29}$ cm (d) $\sqrt{35}$ cm

Q.296. The distance between the parallel sides of a trapezium is 18 cm. If the area of the trapezium is 1188 cm^2 , then what is the sum of the lengths of the parallel sides?
SSC CPO 28/06/2024 (3rd Shift)
(a) 150 cm (b) 115 cm
(c) 126 cm (d) 132 cm

Q.297. The area of the canvas cloth needed to erect a right conical tent of height 20ft. and circular base of circumference 30π ft. is:
SSC CPO 28/06/2024 (3rd Shift)
(a) 455π sq .ft. (b) 375π sq .ft.
(c) 589π sq .ft. (d) 470π sq .ft.

Q.298. The volume of a right circular cone is 150π cm³ and its height is 18 cm. Find its slant height (in cm) (correct to 2 decimal places).
SSC CPO 28/06/2024 (3rd Shift)
(a) 18.68 (b) 25.35 (c) 28.68 (d) 15.25

Q.299. A school has two rectangular playgrounds, which are similar in shape. If the length and the breadth of the first playground are given as 224 m and 160 m, respectively, then which of the following options CANNOT be the dimensions of the second playground ?
SSC CPO 29/06/2024 (1st Shift)
(a) Length = 273 m; Breadth = 195 m
(b) Length = 168 m; Breadth = 120 m
(c) Length = 210 m; Breadth = 150 m
(d) Length = 343 m; Breadth = 255 m

Q.300. The height and radius of a cone-shaped storage tank are 9 ft. and 7 ft., respectively. Find the volume of water the tank can hold ? (Use $\pi = \frac{22}{7}$)
SSC CPO 29/06/2024 (1st Shift)
(a) 462 cubic ft. (b) 527 cubic ft.
(c) 1386 cubic ft. (d) 1423 cubic ft.

Q.301. The breadth of a room is twice its height and half its length. The volume of the room is 1728 m^3.The length of the room is:
SSC CPO 29/06/2024 (1st Shift)
(a) 20 m (b) 24 m (c) 34 m (d) 28 m

Q.302. A woman working in a company was supplied a rectangular solid (cuboid shape) of wax with dimensions 70 cm , 44 cm and 20 cm to prepare cylindrical candles, each 14 cm in diameter and 20 cm of height. Find the number of candles.
SSC CPO 29/06/2024 (1st Shift)
(a) 15 (b) 20 (c) 10 (d) 30

Q.303.A cone of slant height 4.2 units has a lateral surface area 13.2 $units^2$. The radius of the base is:

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CPO 29/06/2024 (1st Shift)
(a) 1 unit (b) 1.5 units
(c) 2.5 units (d) 2 units

Q.304. The in-radius of a triangle is 8 cm, and the sum of the lengths of its sides is 125 cm. The area of the triangle (in cm²) is
SSC CPO 29/06/2024 (2nd Shift)
(a) 480 (b) 1000 (c) 250 (d) 500

Q.305. Melting a metal ball of radius 3 units, 27 identical dice and a ball of radius 1 units are made. What is the side of dice?
SSC CPO 29/06/2024 (2nd Shift)
(a) 1.7 units (b) 1.5 units
(c) 1.6 units (d) 1.4 units

Q.306. The ratio of the slant height and the height of a cone is 4 : 3. If the curved surface area of the cone is $4\sqrt{7}\pi$ square units, then the radius of the cone is _____units.
SSC CPO 29/06/2024 (3rd Shift)
(a) $7\sqrt{7}$ (b) 7 (c) $\sqrt{7}$ (d) $\frac{\sqrt{7}}{7}$

Q.307. The length of a side of an equilateral triangle is 18 cm. The area (in cm²) of the region lying between the circumcircle and the incircle of the triangle is [use $\pi = \frac{22}{7}$]
SSC CPO 29/06/2024 (3rd Shift)
(a) $254\frac{3}{7}$ (b) $254\frac{1}{7}$
(c) $254\frac{2}{7}$ (d) $254\frac{4}{7}$

Q.308. The area of a circle is 256π square cm. The length of its longest chord (in cm) is:
SSC CPO 29/06/2024 (3rd Shift)
(a) 34 (b) 36 (c) 6 (d) 32

SSC Selection Post (Phase - XII)

Q.309. The perimeter of one face of a cube is 40 cm. Its volume will be:
Matriculation Level 20/06/2024 (Shift - 1)
(a) 10 cm³ (b) 100 cm³
(c) 1000 cm³ (d) 10000 cm³

Q.310. If the length of each of the two equal sides of an isosceles triangle is 15 cm and the adjacent angle is 30°, then the area of the triangle is:
Matriculation Level 20/06/2024 (Shift - 1)
(a) 66.25 cm² (b) 36.25 cm²
(c) 56.25 cm² (d) 26.25 cm²

Q.311. The lateral surface area of a cone is 550 cm². If the diameter of the cone is 14 cm, then the height of the cone is:
Matriculation Level 20/06/2024 (Shift - 1)
(a) 24 cm (b) 12.5 cm
(c) 12 cm (d) 25 cm

Q.312. The radius of a hemisphere is 9 cm. Its volume will be:
Matriculation Level 20/06/2024 (Shift - 4)
(a) 712π cm³ (b) 243π cm³
(c) 486π cm³ (d) 972π cm³

Q.313. If the cylinder height is 9 cm and the base area is 25π cm², then find the total surface area.
Matriculation Level 20/06/2024 (Shift - 4)
(a) 240 cm² (b) 140 cm²
(c) 440 cm² (d) 340 cm²

Q.314. The height of one cone is 3 times the height of another cone, while its radius is half of the radius of the other cone. If their total volume is 100 unit³, then the difference in the volumes of the cones is _____ unit³.
Matriculation Level 21/06/2024 (Shift - 1)
(a) 12.5 (b) 14.3 (c) 13.4 (d) 15.5

Q.315. A cube is having surface area of 5400 square units. Its volume would increase approximately _____ if the side is increased by 5 units.
Matriculation Level 21/06/2024 (Shift - 1)
(a) 59% (b) 45% (c) 55% (d) 50%

Q.316. If the radius of a sphere is increased by 2 cm, its surface area increases by 704 cm². What was the radius of the sphere before the increase? (Use $\pi = \frac{22}{7}$)
Matriculation Level 21/06/2024 (Shift - 1)
(a) 14 cm (b) 11 cm (c) 12 cm (d) 13 cm

Q.317. What must be the total percentage change in the volume of a cuboid if its length and breadth are decreased by 10% and 20%, respectively, while its height is increased by 40%?
Matriculation Level 21/06/2024 (Shift - 4)
(a) 0.8% increase (b) 0.8% decrease
(c) 1.8% increase (d) 1.8% decrease

Q.318. There is a large cone with a diameter of 14 m and height of 12 m. It is being filled with water at a rate of 2 m³ in every 20 seconds. How long will it take to fill the cone?
Matriculation Level 21/06/2024 (Shift - 4)
(a) 313 sec (b) 6160 sec
(c) 616 sec (d) 12320 sec

Q.319. The volume of a cuboid is twice the volume of a cube. If the dimensions of the cuboid are 12 cm, 16 cm and 18 cm, then the total surface area of the cube is:
Matriculation Level 21/06/2024 (Shift - 4)
(a) 625 cm² (b) 864 cm²
(c) 484 cm² (d) 764 cm²

Q.320. The height of a solid cylinder is 4 times its radius. Its curved surface area is _____ times its base area.
Matriculation Level 21/06/2024 (Shift - 4)
(a) 2 (b) 6 (c) 8 (d) 4

Q.321. The lateral surface area of a cylinder is 3862.2 cm² and its height is 15 cm. Find its volume (take π = 3.14) correct to one decimal place.
Matriculation Level 24/06/2024 (Shift - 1)
(a) 79175.1 cm³ (b) 88275.2 cm³
(c) 78275.2 cm³ (d) 89175.1 cm³

Q.322. The length of cold storage of cuboidal shape is double its breadth and its height is half of its breadth. If its volume is 216 m³, then what are the dimensions of the cold storage?
Matriculation Level 24/06/2024 (Shift - 1)
(a) 12 m × 6m × 3m (b) 12 m × 9m × 5m
(c) 14 m × 7m × 5m (d) 8m × 4m × 2m

Q.323. The volume of a right circular cylinder of base radius r is obtained by multiplying its curved surface area by :
Matriculation Level 24/06/2024 (Shift - 4)
(a) $\frac{2}{r}$ (b) $\frac{1}{2r}$ (c) 2r (d) $\frac{r}{2}$

Q.324. How many cubes of length 50 cm can be accommodated in a container of 5 m in length, 2 m in width and 5 m in height ?
Matriculation Level 25/06/2024 (Shift - 1)
(a) 400 (b) 500 (c) 450 (d) 250

Q.325. Find the area of a right angle whose base is 15 cm and hypotenuse is 17 cm.
Matriculation Level 26/06/2024 (Shift - 1)
(a) 40 cm² (b) 55 cm²
(c) 60 cm² (d) 75 cm²

Q.326. The dimensions of a rectangular field when extended by 6 metres are in the ratio of 4 : 3 and when decreased by 6 metres are in the ratio of 2 : 1. Find the dimensions of the field.
Higher Secondary 20/06/2024 (Shift - 2)
(a) 16 metres, 12 metres
(b) 10 metres, 6 metres
(c) 18 metres, 12 metres
(d) 14 metres, 10 metres

Q.327. The radius of a circle is increased in such a way that its circumference increases by 7%. As a result, the area of the circle also increases by:
Higher Secondary 20/06/2024 (Shift - 2)
(a) 18.69% (b) 10.28%
(c) 14.49% (d) 12.20%

Q.328. The radii of the two concentric circles are 27 cm and 18 cm. The area (in cm^2) of the closed figure bounded by the boundaries of the circle is:

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Higher Secondary 20/06/2024 (Shift - 2)
(a) 505 π (b) 405 π (c) 288 π (d) 504 π

Q.329. A hemispherical bowl has a 21 cm radius. It is to be painted inside as well as outside. The cost of painting it at the rate of ₹0.05 per cm^2 and assuming that the thickness of the bowl is negligible, is:(Use $\pi = \frac{22}{7}$)
Higher Secondary 24/06/2024 (Shift - 2)
(a) ₹410.10 (b) ₹188.30
(c) ₹277.20 (d) ₹388.20

Q.330. If the area of a regular pentagon is 3920 $\sqrt{3}$ cm², then how long is its each side?
Higher Secondary 25/06/2024 (Shift - 2)
(a) 38 cm (b) 56 cm (c) 58 cm (d) 46 cm

Q.331. The base of a parallelogram is thrice its height. If the area of the parallelogram is 1020 cm^2 , then what is its height?
Higher Secondary 25/06/2024 (Shift - 2)
(a) $2\sqrt{85}$ cm (b) $\sqrt{89}$ cm
(c) $\sqrt{82}$ cm (d) $2\sqrt{84}$ cm

Q.332. A sphere and a cube have equal surface areas. The ratio of the volume of the sphere to
that of the cube is:
Higher Secondary 25/06/2024 (Shift - 4)
(a) $\sqrt{6} : \sqrt{\pi}$ (b) $\sqrt{\pi} : \sqrt{8}$
(c) $\sqrt{3} : \sqrt{\pi}$ (d) $\sqrt{2} : \sqrt{\pi}$

Q.333. The surface area of a sphere is 2464 cm². Calculate its volume.
(Use $\pi = \frac{22}{7}$)
Higher Secondary 26/06/2024 (Shift - 2)
(a) 11598.67 cm³ (b) 11478.67 cm³
(c) 11488.67 cm³ (d) 11498.67 cm³

Q.334. The area of the rhombus (in cm^2) having each side equal to 13 cm and one of its diagonals equal to 24 cm is:
Graduate Level 20/06/2024 (Shift - 3)
(a) 110 (b) 120 (c) 60 (d) 130

Q.335. Find the area (in cm^2) of a circle with a maximum radius that can be inscribed in a rectangle of length 18 cm and breadth 12 cm.
Graduate Level 20/06/2024 (Shift - 3)
(a) 72π (b) 28π (c) 136π (d) 36π

Q.336. The difference between the total surface area and lateral surface area of a cube, if the side of the cube is 11 cm (in square cm), is _____ .
Graduate Level 26/06/2024 (Shift - 3)
(a) 244 (b) 243 (c) 242 (d) 241

Q.337. If the radius of the right circular cone is increased by 20% and its height is decreased by 25%, then the volume of the right circular cone will be increased by:
Graduate Level 26/06/2024 (Shift - 4)
(a) 15% (b) 12% (c) 10% (d) 8%

Q.338. Half the perimeter of a rectangular garden, whose length is 8 cm more than its width, is 42 cm. Find the area of the rectangular garden.
Graduate Level 26/06/2024 (Shift - 4)
(a) 524 cm^2 (b) 425 cm^2
(c) 254 cm^2 (d) 542 cm^2

Q.339. The volume of a cube is 64 cm^3 . The total surface area of the cube is:
Graduate Level 26/06/2024 (Shift - 4)
(a) 16 cm^2 (b) 64 cm^2
(c) 96 cm^2 (d) 128 cm^2

SSC CHSL 2023 Tier - 2

Q.340. The diameter of a sphere is increased by 30%. What is the percentage increase in its volume ?
SSC CHSL Tier II (02/11/2023)
(a) 69% (b) 119.7% (c) 41.7% (d) 90.5%

Q.341. The diameter of a hemispherical bowl is 21 cm. The volume of the bowl is equal to: (use $\pi = \frac{22}{7}$)
SSC CHSL Tier II (02/11/2023)
(a) 2,624.5 cm³ (b) 2,425.5 cm³
(c) 2,725.5 cm³ (d) 2,524.5 cm³

Q.342. The radius and height of a right circular cone is increased by 25%. Find the increase in percentage of the volume of the cone (rounded off to 2 decimal places).
SSC CHSL Tier II (02/11/2023)
(a) 94.31% (b) 95.31%
(c) 94.51% (d) 93.51%

Q.343. A hollow cube is made of paper to have a volume of 512 cubic units. How much paper in square units will be required to make the cube?
SSC CHSL Tier II (10/01/2024)
(a) 328 (b) 348 (c) 288 (d) 384

Q.344. A right rectangular box's measurements are 1.6 m long, 90 cm wide, 60 cm in height. Soap cakes of measurement 6 cm × 5 cm × 40 mm are to be packed in the box, so that no space is left. How many cakes can be packed in the box ?
SSC CHSL Tier II (10/01/2024)
(a) 6000 (b) 5600 (c) 6500 (d) 7200

SSC CGL 2023 Tier - 2

Q.345. The ratio of the length, width and height of a closed cuboid is given as 6 : 3 : 2. The total surface area of this cuboid is given as 1800 cm^2. Find the volume (in cm^3) of this cuboid.
SSC CGL Tier II (26/10/2023)
(a) 4650 (b) 4800 (c) 4500 (d) 4200

Q.346. A solid cube, whose each edge is of length 48 cm, is melted. Identical solid cubes, each of volume 64 cm^3, are made out of this molten cube, without any wastage. How many such small cubes are obtained ?
SSC CGL Tier II (26/10/2023)
(a) 1728 (b) 1718 (c) 1748 (d) 1738

SSC CPO 2023 Tier - 1

Q.347. The cost of painting the total surface area of a 30 m high solid right circular cylinder at the rate of ₹25 per m^2 is ₹18,425. What is the volume (in m^3) of this cylinder [use $\pi = \frac{22}{7}$] ?
SSC CPO 03/10/2023 (2nd Shift)
(a) 1210 (b) 1155 (c) 1145 (d) 1122

Q.348. What will be the difference between the total surface area and the curved surface area of a hemisphere having 4 cm diameter ?
SSC CPO 03/10/2023 (2nd Shift)
(a) 4.4π cm^2 (b) 5π cm^2
(c) 4π cm^2 (d) 8π cm^2

Q.349. A conical shape vessel has a radius of 21 cm and has a slant height of 25 cm. If the curved part of the vessel is to be painted white, find the cost (in ₹) of painting at the rate of ₹1.5 per cm^2.
SSC CPO 03/10/2023 (2nd Shift)
(a) 2475 (b) 825 (c) 1650 (d) 1250

Q.350. A solid sphere made of wax of radius 12 cm is melted and cast into solid hemispheres of radius 4 cm each. Find the number of such solid hemispheres.
SSC CPO 03/10/2023 (3rd Shift)
(a) 14 (b) 54 (c) 28 (d) 27

Q.351. Find the area of a rhombus if the perimeter of the rhombus is 52 cm, and one of its diagonals is 10 cm long.
SSC CPO 03/10/2023 (3rd Shift)
(a) 164 cm² (b) 144 cm²
(c) 160 cm² (d) 120 cm²

Q.352. The total surface area of a square-based right pyramid is 1536 m², of which 37.5% is the area of the base of the pyramid. What is the volume (in m³) of this pyramid ?
SSC CPO 04/10/2023 (1st Shift)
(a) 3108 (b) 3048 (c) 3072 (d) 3144

Q.353. If the diameter of a sphere is reduced to its half, then the volume would be :
SSC CPO 04/10/2023 (2nd Shift)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) reduced by $\frac{1}{8}$ of the former volume
(b) increased by $\frac{1}{4}$ of the former volume
(c) reduced by $\frac{1}{4}$ of the former volume
(d) increased by $\frac{1}{8}$ of the former volume

Q.354. The heights of two cones are in the ratio 7 : 5 and their diameters are in the ratio 10 : 21. What is the ratio of their volumes ? (Where π = $\frac{22}{7}$)
SSC CPO 04/10/2023 (2nd Shift)
(a) 17 : 21 (b) 14 : 19
(c) 20 : 63 (d) 26 : 47

Q.355. The diameter of a hemisphere is equal to the diagonal of a rectangle of length 4 cm and breadth 3 cm. Find the total surface area (in cm^2) of the hemisphere.
SSC CPO 04/10/2023 (3rd Shift)
(a) 25π (b) $\frac{50\pi}{4}$ (c) $\frac{25\pi}{4}$ (d) $\frac{75\pi}{4}$

Q.356. The height and the radius of the base of a right circular cone are in the ratio of 12 : 5. If its volume is 314 cm^3, then what is the slant height of the cone ? (Use π = 3.14)
SSC CPO 05/10/2023 (1st Shift)
(a) 11 cm (b) 14 cm (c) 12 cm (d) 13 cm

Q.357. A right square pyramid having lateral surface area is 624 cm^2. If the length of the diagonal of the square is 24 $\sqrt{2}$, then the volume of the pyramid is:
SSC CPO 05/10/2023 (1st Shift)
(a) 780 cm^3 (b) 1150 cm^3
(c) 1083 cm^3 (d) 960 cm^3

Q.358. A cylinder has some water in it at a height of 16 cm. If a sphere of radius 9 cm is put into it, then find the rise in the height of the water if the radius of the cylinder is 12 cm.
SSC CPO 05/10/2023 (1st Shift)
(a) 1.6 cm (b) 8.75 cm
(c) 8 cm (d) 6.75 cm

Q.359. What will be the area of a plot of quadrilateral shape, one of whose diagonals is 20 m and lengths of the perpendiculars from the opposite vertices on it are 12 m and 18 m, respectively ?
SSC CPO 05/10/2023 (2nd Shift)
(a) 250 m^2 (b) 400 m^2
(c) 200 m^2 (d) 300 m^2

Q.360. Two metallic balls P and Q are such that the diameter of P is four times the diameter of Q . What is the ratio between the volumes of P and Q?
SSC CPO 05/10/2023 (2nd Shift)
(a) 8 : 1 (b)16 : 1 (c) 64 : 1 (d) 32 : 1

Q.361. If the slant height of a cone is 29 cm and its height is 20 cm, find the ratio between the magnitudes of total surface area and the volume.
SSC CPO 05/10/2023 (3rd Shift)
(a) 3 : 7 (b) 3 : 14 (c) 5 : 14 (d) 7 : 15

Q.362. The radius of a metallic spherical ball is 3 cm. If the metallic ball is melted and recast into x number of hemispheres of radius equal to half the radius of the metallic spherical ball, then find the value of x.
SSC CPO 05/10/2023 (3rd Shift)
(a) 14 (b) 16 (c) 13 (d) 15

Q.363. A hollow cylindrical tube made of plastic is 3 cm thick. If the external diameter is 20 cm and length of the tube is 49 cm, find the volume of the plastic.
SSC CPO 05/10/2023 (3rd Shift)
(a) 7644 cm^3 (b) 7238 cm^3
(c) 7854 cm^3 (d) 7546 cm^3

SSC MTS 2023 Tier - 1

Q.364. The diameter of a metallic sphere is 6 cm. It is melted and drawn into a wire having a diameter of the cross section as 0.4 cm. Find the length of the wire (in meters).
SSC MTS 01/09/2023 (1st Shift)
(a) 18 (b) 9 (c) 12 (d) 10

Q.365. From a cuboid of dimension of 8 × 6 × 6 units, small cubes of dimension 0.5 × 0.5 × 0.5 unit are cut. How many small cubes can be cut from the big cuboid ?
SSC MTS 01/09/2023 (3rd Shift)
(a) 576 (b) 1152 (c) 2304 (d) 1552

Q.366. The radius and the height of a right circular cone are in the ratio 3 : 4. If its volume is 301.44m^3, find the slant height (use π = 3.14).
SSC MTS 04/09/2023 (1st Shift)
(a) 5 cm (b) 20 cm (c) 10 cm (d) 15 cm

Q.367. Water is pouring into a cuboidal reservoir at the rate of 50 litres per minute. The volume of the reservoir is 120 m^3 . How many hours will it take to fill the reservoir ?
SSC MTS 04/09/2023 (3rd Shift)
(a) 35 (b) 45 (c) 40 (d) 30

Q.368. Using the middle points of sides of a square with an area of 36 square units, another square is made. What is the area of a new square made in square units?
SSC MTS 05/09/2023 (2nd Shift)
(a) 24 (b) 27 (c) 18 (d) 21

Q.369. The length of the median of an equilateral triangle is $6\sqrt{3}$ cm. The area of the triangle is :
SSC MTS 05/09/2023 (3rd Shift)
(a) $36\sqrt{3}$ cm^2 (b) 36 cm^2
(c) 72 cm^2 (d) $72\sqrt{3}$ cm^2

Q.370. The areas of three adjacent faces of a cuboid are p, q and r $unit^2$, respectively. What is its volume ?
SSC MTS 06/09/2023 (3rd Shift)
(a) $p^3q^3r^3$ $unit^3$ (b) $\sqrt{pqr}$ $unit^3$
(c) pqr $unit^3$ (d) $\sqrt[3]{pqr}$ $unit^3$

Q.371. A cylinder has a total surface area of 64π square units, where the height of the cylinder is equal to its radius. If the height is doubled and the radius is halved, then the total surface area of the new cylinder is_____square units.
SSC MTS 08/09/2023 (3rd Shift)
(a) 54π (b) 40π (c) 64π (d) 48π

Q.372. A hollow metal sphere of internal and external radii 5 cm and 6 cm, respectively, is melted into a solid cone of base radius 5.2 cm. What is the height (in cm, rounded off to 1 decimal place) of the cone ?
SSC MTS 11/09/2023 (1st Shift)
(a) 11.8 (b) 12.8 (c) 13.5 (d) 14.5

Q.373. Find the area (in cm^2) of the rhombus, lengths of whose diagonals are, respectively, 7.5 cm and 5.6 cm.
SSC MTS 11/09/2023 (3rd Shift)
(a) 21 (b) 28 (c) 27 (d) 30

Q.374. If a hollow sphere of an external and internal diameters of 6 cm and 4 cm, respectively, is melted into a cone of base diameter 8 cm, then the height of the cone is:
SSC MTS 12/09/2023 (1st Shift)
(a) $4\frac{3}{4}$ cm (b) $3\frac{1}{4}$ cm
(c) $5\frac{1}{4}$ cm (d) $2\frac{3}{4}$ cm

Q.375. A conical tent is set to accommodate 15 persons. Each person must have 5 square metres of space on the ground and 30 cubic metres of air to breathe. What is the height of the cone?
SSC MTS 12/09/2023 (2nd Shift)
(a) 15 m (b) 22 m (c) 13 m (d) 18 m

Q.376. A solid metallic cuboid of length 11 cm, breadth 8 cm and height 6 cm is melted and reshaped to form a cone of height 14 cm. What is the radius of the cone thus formed ?
SSC MTS 13/09/2023 (3rd Shift)
(a) 6 cm (b) 9 cm (c) 7 cm (d) 8 cm

Q.377. The length, breadth and height of

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

a cuboid are in the ratio of 6 : 4 : 3. If the total surface area of the cuboid is 972 cm², what is the length (in cm) of the diagonal of the cuboid ?
SSC MTS 14/09/2023 (1st Shift)
(a) $5\sqrt{65}$ (b) $3\sqrt{61}$ (c) $3\sqrt{65}$ (d) $5\sqrt{61}$

Q.378. A triangle has its sides 5 cm, 12 cm and 13 cm. What will be the area of the triangle formed by joining the mid point of the three sides ?
SSC MTS 14/09/2023 (2nd Shift)
(a) $7\frac{1}{2}$ cm² (b) $19\frac{1}{2}$ cm²
(c) $13\frac{1}{2}$ cm² (d) 15 cm²

Q.379. The height of a right circular cone is 20 cm, and its base diameter is 30 cm. What is the curved surface area and the total surface area of the right circular cone, respectively ?
SSC MTS 14/09/2023 (2nd Shift)
(a) 335π cm² and 525π cm²
(b) 390 cm² and 475π cm²
(c) 450 cm² and 625π cm²
(d) 375π cm² and 600π cm²

SSC CHSL 2023 Tier - 1

Q.380. Aman wants to get his spherical overhead water tank having a diameter of 7 m, painted. If the cost of painting is ₹13 per square metre, find the cost of painting Aman's spherical overhead water tank. (Use $\pi = \frac{22}{7}$)
SSC CHSL 02/08/2023 (2nd Shift)
(a) ₹1,872 (b) ₹1,984
(c) ₹2,002 (d) ₹1,926

Q.381. If the height and slant height of a cone are 21 cm and 29 cm, respectively. Find the volume. (use $\pi = \frac{22}{7}$)
SSC CHSL 02/08/2023 (3rd Shift)
(a) 8800 cm³ (b) 8780 cm³
(c) 8440 cm³ (d) 8080 cm³

Q.382. The perimeter of a parallelogram is 48 cm. If the height of the parallelogram is 6 cm and the length of the adjacent side is 8 cm. find its area.
SSC CHSL 03/08/2023 (1st Shift)
(a) 90 cm^2 (b) 80 cm^2
(c) 84 cm^2 (d) 96 cm^2

Q.383. In an isosceles triangle, if the unequal side is 8 cm and equal side is 5 cm, then the area of the triangle is:
SSC CHSL 03/08/2023 (1st Shift)
(a) 12 cm^2 (b) 25 cm^2
(c) 6 cm^2 (d) 11 cm^2

Q.384. Find the volume of the largest possible sphere circumscribed by a cube of edge 7 cm.
SSC CHSL 03/08/2023 (2nd Shift)
(a) 179.67 cm^3 (b) 169.67 cm^3
(c) 189.67 cm^3 (d) 199.67 cm^3

Q.385. If a map of a city was drawn on a scale of 0.2 cm to a km, what area would represent a country if it has an area of 22500 km²?
SSC CHSL 04/08/2023 (2nd Shift)
(a) 2500 cm² (b) 2250 cm²
(c) 5625 cm² (d) 900 cm²

Q.386. The sides of the three cubes of metal are 15 cm, 18 cm and 25 cm, respectively. Find the side (in cm) of the new cube formed by melting these cubes together
SSC CHSL 04/08/2023 (2nd Shift)
(a) $9\sqrt[3]{388}$ (b) $6\sqrt[3]{388}$ (c) $7\sqrt[3]{388}$ (d) $4\sqrt[3]{388}$

Q.387. A shopkeeper usually makes one big besan laddoo (spherical in shape) with a radius of 9 cm. With the same laddoo, How many besan laddoos of radius 3 cm can be made? (Use $\pi = \frac{22}{7}$)
SSC CHSL 04/08/2023 (3rd Shift)
(a) 9 (b) 18 (c) 36 (d) 27

Q.388. The area of a triangle is half the area of a square. The perimeter of the square is 172 cm. What is the area of the triangle (in cm²) ?
SSC CHSL 04/08/2023 (4th Shift)
(a) 924.5 (b) 1984 (c) 1849 (d) 992

Q.389. A cuboidal water tank is 12 m long, 9 m wide and 7.5 m deep. How many litres of water can it hold?
SSC CHSL 08/08/2023 (1st Shift)
(a) 840000 (b) 805000
(c) 780000 (d) 810000

Q.390. What is the area of a triangular flower bed of a garden whose perimeter is 20 metres and two sides are 5 metres and 6 metres.
SSC CHSL 08/08/2023 (4th Shift)
(a) $10\sqrt{2}\ m^2$ (b) $2\sqrt{10}\ m^2$
(c) $5\sqrt{2}\ m^2$ (d) $4\sqrt{5}\ m^2$

Q.391. The perimeter of a sector of a circle of radius 7.4 cm is 20.6 cm. The area of this sector is:
SSC CHSL 10/08/2023 (3rd Shift)
(a) 42.92 cm^2 (b) 5.8 cm^2
(c) 10.73 cm^2 (d) 21.46 cm^2

Q.392. The perimeter of a minor sector of a circle of radius 5 cm is 15.5 cm. Find the area of the minor sector (use $\pi = \frac{22}{7}$).
SSC CHSL 11/08/2023 (1st Shift)
(a) 17.53 cm² (b) 13.75 cm²
(c) 13.57 cm² (d) 17.35 cm²

Q.393. A copper wire is bent in the form of a square and it encloses an area of 30.25 cm². If the same wire is bent to form a circle, then find the area of the circle. (use $\pi = \frac{22}{7}$).
SSC CHSL 11/08/2023 (2nd Shift)
(a) 38.50 cm² (b) 42.25 cm²
(c) 35 cm² (d) 30.25 cm²

Q.394. A hemispherical bowl is made of 1 cm thick steel. The inside radius of the bowl is 4 cm. The volume of the steel (in cm³) used in making the bowl is:
SSC CHSL 17/08/2023 (2nd Shift)
(a) $40\frac{2}{3}\pi$ (b) $27\frac{1}{3}\pi$
(c) $41\frac{1}{3}\pi$ (d) $35\frac{1}{3}\pi$

Q.395. A rod of 5 cm radius and 52 cm length is converted into a wire of 100 cm length of uniform thickness. The radius of the wire (in cm) is:
SSC CHSL 17/08/2023 (4th Shift)
(a) $\sqrt{13}$ (b) $\sqrt{15}$ (c) $\sqrt{23}$ (d) $\sqrt{17}$

SSC CGL 2023 Tier - 1

Q.396. Ranu carries water to school in a cylindrical flask with diameter 12 cm and height 21 cm. Determine the amount of water that she can carry in the flask.
(Use $\pi = \frac{22}{7}$)
SSC CGL 14/07/2023 (4th shift)
(a) 2372 cm³ (b) 2370 cm³
(c) 2376 cm³ (d) 2374 cm³

Q.397. If the area of a circle is 616 cm² and a chord XY = 10 cm, then find the perpendicular distance from the center of the circle to the chord XY.
SSC CGL 17/07/2023 (1st shift)
(a) $\sqrt{171}$ cm (b) $\sqrt{161}$ cm
(c) $\sqrt{117}$ cm (d) $\sqrt{181}$ cm

Q.398. The area of two triangles is in the ratio 5 : 3 and their heights are in the ratio 5 : 7. Find the ratio of their bases.
SSC CGL 17/07/2023 (1st shift)
(a) 3 : 5 (b) 7 : 3 (c) 7 : 5 (d) 2 : 3

Q.399. If the side of an equilateral triangle is increased by 34%, then by what percentage will its area increase?
SSC CGL 17/07/2023 (2nd shift)
(a) 70.65% (b) 79.56%
(c) 68.25% (d) 75.15%

Q.400. An arc of length 23.1 cm subtends an 18° angle at the centre. What is the area of the circle ?
[Use $\pi = \frac{22}{7}$]

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 17/07/2023 (2nd shift)
(a) 16978.50 cm² (b) 16988.50 cm²
(c) 16878.50 cm² (d) 16798.50 cm²

Q.401. What is the volume of a cube if the perimeter of one face of the cube is 40 cm ?
SSC CGL 17/07/2023 (3rd shift)
(a) 1000 cm³ (b) 820 cm³
(c) 600 cm³ (d) 800 cm³

Q.402. A spherical ball of lead, 3 cm in diameter, is melted and recast into three spherical balls. The diameters of two of these balls are $\frac{3}{2}$ cm and 2cm , respectively. Find the diameter of the third ball.
SSC CGL 17/07/2023 (4th shift)
(a) 2.1 cm (b) 3.3 cm (c) 3 cm (d) 2.5 cm

Q.403. The area of the sector of a circle of radius 12 cm is 32 π cm². Find the length of the corresponding arc of the sector.
SSC CGL 17/07/2023 (4th shift)
(a) $\frac{16}{3}\pi\ cm$ (b) $\frac{13}{3}\pi\ cm$
(c) $\frac{10}{3}\pi\ cm$ (d) $\frac{8}{3}\pi\ cm$

Q.404. The ratio of the length of each equal side and the third side of an isosceles triangle is 3 : 5. If the area of the triangle is $30\sqrt{11}\ cm^2$, then the length of the third side (in cm) is:
SSC CGL 18/07/2023 (2nd shift)
(a) $10\sqrt{6}$ (b) $5\sqrt{6}$ (c) $13\sqrt{6}$ (d) $11\sqrt{6}$

Q.405. A conical tent has a radius of 7 m and a vertical height of 24 m. How many full bags of rice can be emptied in it if the space occupied by the rice in each bag is 2 m³ ?
SSC CGL 19/07/2023 (1st shift)
(a) 566 (b) 616 (c) 716 (d) 650

Q.406. To have a surface area of 9π square units of a ball, what should be the diameter (in units) of the ball?
SSC CGL 19/07/2023 (3rd shift)
(a) 2.5 (b) 2 (c) 1.5 (d) 3

Q.407. A solid cone with curved surface area twice its base area has slant height of $6\sqrt{3}$ cm. Its height is :
SSC CGL 20/07/2023 (2nd shift)
(a) $6\sqrt{2}$ cm (b) 9 cm (c) 6 cm (d) $3\sqrt{6}$ cm

Q.408. The width of a rectangle is 2 m less than its length. If the perimeter of the rectangle is 68 m, then what is the length (in metres) of the rectangle?
SSC CGL 20/07/2023 (4th shift)
(a) 20 (b) 18 (c) 16 (d) 17

Q.409. The length, breadth and height of a cuboid are in the ratio 1 : 2 : 3. The length, breadth and height of the cuboid are increased by 200%, 300% and 300%, respectively. Then compared to the original volume, the increase in the volume of the cuboid will be:
SSC CGL 20/07/2023 (4th shift)
(a) 47 times (b) 26 times
(c) 17 times (d) 15 times

Q.410. The volume of a cuboid is twice that of a cube. If the dimensions of the cuboid are (8 m × 8 m × 16 m), the total surface area of the cube is:
SSC CGL 21/07/2023 (1st shift)
(a) 316 m² (b) 288 m²
(c) 324 m² (d) 384 m²

Q.411. The perimeter of an isosceles triangle is 100 cm. If the base is 36 cm, then find its semi perimeter (in centimetres).
SSC CGL 21/07/2023 (2nd shift)
(a) 64 (b) 60 (c) 45 (d) 50

Q.412. The area of the sector of a circle of radius 28 cm is 112 cm². Find the length of the corresponding arc of the sector.
SSC CGL 21/07/2023 (3rd shift)
(a) 4 cm (b) 8 cm (c) 6 cm (d) 5 cm

Q.413. If the volume of one brick is 0.0014 m³, then how many bricks will be required to construct a wall of length 14 m, breadth 0.125 m and height 5 m?
SSC CGL 21/07/2023 (3rd shift)
(a) 5250 (b) 3250 (c) 6250 (d) 4250

Q.414. If the inner radius of a hemispherical bowl is 5 cm and its thickness is 0.25 cm, then find the volume of the material required in making the bowl. (use π = $\frac{22}{7}$) (Rounded up to two places of decimals).
SSC CGL 21/07/2023 (4th shift)
(a) 34 cm³ (b) 44 cm³
(c) 45.34 cm³ (d) 41.28 cm³

Q.415. A one metre pipe is made with inner diameter equal to outer radius. How much material (in cubic units) is required to make the pipe, if it can hold $\frac{88}{7}$ cubic metres water in it ?
SSC CGL 24/07/2023 (1st shift)
(a) 37.7 (b) 35.5 (c) 33.3 (d) 36.6

Q.416. The ratio of the length to width of a certain rectangle is 3 : 2 and the area is 150 cm². The perimeter of the rectangle (in cm) is :
SSC CGL 24/07/2023 (1st shift)
(a) 20 (b) 30 (c) 50 (d) 40

Q.417. The length of each side of a triangle is 12 cm. What is the length of the circumradius of the triangle?
SSC CGL 24/07/2023 (1st shift)
(a) 8√3 cm (b) 2√3 cm
(c) 6√3 cm (d) 4√3 cm

Q.418. A ball is to be made with inner radius of 2 units and outside radius of 3 units. How much material is required to make the ball ?
SSC CGL 24/07/2023 (4th shift)
(a) $\frac{19}{3}\pi$ (b) 19π (c) $\frac{76}{3}\pi$ (d) π

Q.419. A metallic cube has each of its side of length 12 cm. It is melted and recast into three small cubes. Out of these cubes, two have their sides as 6 cm and 8 cm, respectively. The length of each side of the third cube is:
SSC CGL 25/07/2023 (1st shift)
(a) 7 cm (b) 9 cm (c) 10 cm (d) 5 cm

Q.420. The field is 150 m long and 80 m wide. How many times (rounded off to 1 decimal place) is its perimeter to the length of its diagonal?
SSC CGL 25/07/2023 (1st shift)
(a) 2.3 (b) 2.5 (c) 2.7 (d) 3.1

Q.421. The length, breadth and height of a hall are 10 m, 20 m and 15m respectively. Find the cost of whitewashing the walls of the inside of the hall and ceiling at the rate of ₹10.20/m²
SSC CGL 25/07/2023 (2nd shift)
(a) ₹13,394 (b) ₹11,220
(c) ₹15,320 (d) ₹16,542

Q.422. A cuboid with sides 4, 6 and 8 units is covered with paper. The paper is removed and a square is made from it. What is the side (in units) of the square?
SSC CGL 25/07/2023 (4th shift)
(a) 12.24 (b) 16.62 (c) 14.42 (d) 12.62

Q.423. What is the surface area (in cm²) of a spherical sculpture whose radius is 35 cm ? (Take π = $\frac{22}{7}$)
SSC CGL 26/07/2023 (2nd shift)
(a) 16540 (b) 15700
(c) 15400 (d) 14500

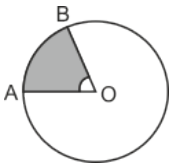
Q.424. A petrol tank is of length 50 m, breadth 25 m, and depth 10 m. How many litres of petrol can be accommodated in the petrol tank when it is completely filled?
SSC CGL 26/07/2023 (2nd shift)
(a) 1,25,00,000 (b) 12,50,000
(c) 1,25,000 (d) 12500

Q.425. In the following figure, the length of arc AB is equal to five times of the radius r of the circle. Find the area of

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

sector AOB ?



SSC CGL 27/07/2023 (1st shift)

(a) $2.5r^2$ (b) $\frac{1}{2}r^2$ (c) $3r^2$ (d) $2r^2$

Q.426. A hemispherical bowl has a radius of 7 cm. It is to be painted from inside as well as outside. Find the cost of painting it at the rate of Rs.40 per 20 cm²? (Take the thickness of the bowl as negligible).

SSC CGL 27/07/2023 (1st shift)

(a) Rs.1,232 (b) Rs.1,125
(c) Rs.1,432 (d) Rs.1,550

Q.427. A circular arc whose radius is 4 cm makes an angle 45° at the centre. Find the perimeter of the sector formed.

(Take π = $\frac{22}{7}$)

SSC CGL 27/07/2023 (3rd shift)

(a) $\frac{78}{7}$ cm (b) $\frac{72}{7}$ cm
(c) $\frac{74}{7}$ cm (d) $\frac{76}{7}$ cm

SSC Selection Post (Phase - XI)

Q.428. If the volume of a cube is given as 12167 cm³, then the surface area of the cube will be:

Graduate Level 27/06/2023 (Shift - 4)

(a) 3475 cm² (b) 4574 cm²
(c) 3174 cm² (d) 5413 cm²

Q.429. What is the side of a cube (in metres) in which an iron rod of maximum length 10 metres can be put ?

Graduate Level 28/06/2023 (Shift - 3)

(a) 5.77 (b) 7.57 (c) 5.57 (d) 7.75

Q.430. The volume of a cylinder is 1650 m³, whereas the surface area of its base is $78\frac{4}{7}$ m² . Find the height of the cylinder.

Graduate Level 30/06/2023 (Shift - 1)

(a) 7.5 m (b) 14 m (c) 21 m (d) 2.1 m

Q.431. Find the length of a diagonal of a cuboid whose dimensions are 12 m, 10 m and 8 m. (up to one decimal point)

Matriculation Level 27/06/2023 (Shift - 1)

(a) 18m (b) 16.5m (c) 17m (d) 17.54m

Q.432. The internal and external diameters of a hollow hemispherical bowl are 6 cm and 10 cm, respectively. If it is melted and recast into a solid cylinder of diameter 14 cm, what is the height of the cylinder in cm?

Matriculation Level 27/06/2023 (Shift - 1)

(a) 1.1 (b) 1.22 (c) 1.33 (d) 1

Q.433. The perimeter of an isosceles right - angled triangle having an area of 200 cm² is:

Matriculation Level 28/06/2023 (Shift - 1)

(a) 68.3 cm (b) 78.2 cm
(c) 70.6 cm (d) 58.6 cm

Q.434. A solid sphere has a surface area of 616 cm². This sphere is now cut into two hemispheres. What is the total surface area of one of the hemispheres?

Matriculation Level 28/06/2023 (Shift - 1)

(a) 440 cm² (b) 462 cm²
(c) 452 cm² (d) 390 cm²

Q.435. The curved surface area of a cylindrical pillar is 528 m² and its volume is 1848 m³. The ratio between its radius and height is _____.

Matriculation Level 30/06/2023 (Shift - 3)

(a) 9 : 10 (b) 7 : 12 (c) 7 : 3 (d) 9 : 5

Q.436. To pack a set of books, Surbhi made a carton that was 48 inches long, 27 inches wide and 30 inches tall. What will be the total surface area (in square feet) of this carton, once it is closed from all sides? [Use 1 foot = 12 inches]

Matriculation Level 30/06/2023 (Shift - 4)

(a) 49.25 (b) 48.25 (c) 48.75 (d) 49.75

SSC CHSL 2022 Tier - 2

Q.437. The length of a rectangular plot is thrice its breadth. If the area of the rectangular plot is 2700 m², then what is the breadth of the rectangular plot?

SSC CHSL Tier II (26/06/2023)

(a) 20 m (b) 12 m (c) 30 m (d) 28 m

SSC MTS 2022 Tier - 1

Q.438. When a wire is bent in the form of a square, then the area enclosed by it is 5929 cm². If wire is bent into the form of a circle, then what will be the area enclosed by the wire?

SSC MTS 02/05/2023 (Afternoon)

(a) 7546 cm² (b) 8542 cm²
(c) 7632 cm² (d) 6954 cm²

Q.439. What will be the area of the semi-circle of perimeter 3.6 meters?

SSC MTS 02/05/2023 (Afternoon)

(a) 1.54 m² (b) 1.76 m²
(c) 1.10 m² (d) 0.77 m²

Q.440. The ratio of the outer and the inner circumference of a circular path is 17 : 15. If path is 40 metres wide, then what is the radius of the inner circle?

SSC MTS 02/05/2023 (Evening)

(a) 280 metres (b) 340 metres
(c) 360 metres (d) 300 metres

Q.441. If the area of a square is 529 cm², then what is the length of its diagonal?

SSC MTS 03/05/2023 (Morning)

(a) 23 cm (b) $26\sqrt{3}$ (c) $23\sqrt{2}$ (d) 46 cm

Q.442. The length of a cuboid is six times of its breadth and the height of a cuboid is four times of its breadth. If the breadth of the cuboid is 3 cm, then what is the total surface area of the cuboid ?

SSC MTS 03/05/2023 (Evening)

(a) 484 cm² (b) 612 cm²
(c) 576 cm² (d) 676 cm²

Q.443. The ratio of radii of a cylinder to a cone is 3 : 1. If their heights are equal, What is the ratio of their volumes?

SSC MTS 03/05/2023 (Evening)

(a) 1 : 3 (b) 27 : 1 (c) 9 : 1 (d) 1 : 9

Q.444. The ratio of the sides of a triangle is 11 : 11 : 4. If the area of triangle is $2\sqrt{117}$ cm² , then what is the length of the equal sides?

SSC MTS 04/05/2023 (Morning)

(a) 3 cm (b) 13 cm (c) 11cm (d) 9 cm

Q.445. The two adjacent sides of a parallelogram are 12 cm and 5 cm respectively. If one of the diagonals is 13 cm long, then what is the area of the parallelogram?

SSC MTS 04/05/2023 (Afternoon)

(a) 60 cm ² (b) 30 cm ²
(c) 75 cm ² (d) 25 cm ²

Q.446. A cuboid whose sides are 8 cm, 27 cm and 64 cm is melted to form a new cube. What is the respective ratio of the total surface area of the cuboid and cube ?

SSC MTS 08/05/2023 (Morning)

(a) 307: 216 (b) 291: 203
(c) 349: 248 (d) 329: 237

Q.447. Find $\frac{1}{21}$th of the volume of a hemisphere whose radius is 4.2 m

SSC MTS 08/05/2023 (Afternoon)

(a) 6.6 m³ (b) 7.3 m³ (c) 8.2 m³ (d) 7.1 m³

Q.448. Two cubes each of edge 9 cm are joined to form a single cuboid. What is the total surface area of the cuboid formed ?

SSC MTS 08/05/2023 (Afternoon)

(a) 775 cm² (b) 810 cm²
(c) 990 cm² (d) 1024 cm²

Q.449. The radius of the base of a conical tent is 8 m and its height is 15 m, what is the cost of the material needed to make it if it costs Rs.54 per π m² ?

SSC MTS 08/05/2023 (Evening)

(a) Rs.6454 (b) Rs.7344

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(c) Rs.8678 (d) Rs.7454

Q.450. The largest possible sphere is carved out of a cube of side 6 cm. What is the volume of the sphere ?
SSC MTS 09/05/2023 (Morning)
(a) $\frac{792}{7}$ cm³ (b) $\frac{144}{7}$ cm³
(c) $\frac{133}{3}$ cm³ (d) $\frac{444}{7}$ cm³

Q.451. Find the area of the rhombus whose diagonals are 16 cm and 20 cm.
SSC MTS 09/05/2023 (Morning)
(a) 110 cm² (b) 150 cm²
(c) 160 cm² (d) 120 cm²

Q.452. Two cubes of iron whose edges are 7 cm and 11 cm are melted and formed into a single cube. Find the volume (in cm³) of the new cube formed.
SSC MTS 09/05/2023 (Afternoon)
(a) 1881 (b) 1674 (c) 1444 (d) 1221

Q.453. Length of a rectangle is 58 meters, while its breadth is 30 meters. What is the total cost of covering it with grass bed if cost is Rs. 20 per m^2 ?
SSC MTS 09/05/2023 (Evening)
(a) Rs. 34800 (b) Rs. 32400
(c) Rs. 28500 (d) Rs. 17400

Q.454. Find the weight of a cylindrical iron container with base radius 12.6 cm and height is 4 m, where the weight of 1 cm³ of iron is 2 grams ?
SSC MTS 10/05/2023 (Morning)
(a) 299.284 kg (b) 199.584 kg
(c) 399.168 kg (d) 499.482 kg

Q.455. Find the area of the triangle whose height is 56 cm and the corresponding base is $\frac{1}{4}$th of the height.
SSC MTS 10/05/2023 (Evening)
(a) 544 cm² (b) 440 cm²
(c) 392 cm² (d) 480 cm²

Q.456. The outer radius of a spherical shell is 13 cm and the thickness of the shell is 3 cm. What is the volume of the metal used for the shell? ($\pi = \frac{22}{7}$)
SSC MTS 11/05/2023 (Morning)
(a) 1197 cm³ (b) 2197 cm³
(c) 3024 cm³ (d) 5016 cm³

Q.457. What will be the approximately volume of sphere with radius 65 cm ?
SSC MTS 11/05/2023 (Afternoon)
(a) 4.5×10^6 cm³ (b) 6×10^6 cm³
(c) 1.15×10^6 cm³ (d) 2×10^6 cm³

Q.458. The lateral area is thrice as big as the base area of a cone. If the diameter of the cone is 1 cm, then what is the total surface area of the cone ?
SSC MTS 11/05/2023 (Evening)
(a) π cm² (b) 3πcm² (c) 2π cm² (d) 4π cm²

Q.459. If the radius of a sphere is $\frac{3}{4}$ of the radius of a hemisphere, then what will be the ratio of the volumes of sphere and hemisphere ?
SSC MTS 12/05/2023 (Morning)
(a) 9:16 (b) 51 : 64 (c) 27 : 32 (d) 18:64

Q.460. The area of the base of a rectangular tank is 720 m² and the volume of water contained in it is 28800 m³. What is the depth of the water ?
SSC MTS 12/05/2023 (Morning)
(a) 30 m (b) 40 m (c) 50 m (d) 60 m

Q.461. Sides of a triangle are 6 cm, 8 cm and 10 cm. What is the area of the triangle ?
SSC MTS 12/05/2023 (Afternoon)
(a) 20 cm² (b) 28 cm²
(c) 24 cm² (d) 16 cm²

Q.462. What is the area of the lateral surface of a right circular cylinder, If the circumference of the base is 22 cm and its height is four times of its radius?
SSC MTS 12/05/2023 (Evening)
(a) 388 cm² (b) 308 cm²
(c) 408 cm² (d) 288 cm²

Q.463. If the heights of two cylinders are in the ratio of 7 : 9 and their diameters are in the ratio of 6 : 7, then what is the ratio of the volumes of the cylinders ?
SSC MTS 15/05/2023 (Afternoon)
(a) 6 : 7 (b) 7 : 9 (c) 5 : 9 (d) 4 : 7

Q.464. If the curved surface area of a solid cylinder is two-fifth of its total surface area, then what is the ratio of its diameter to its height ?
SSC MTS 15/05/2023 (Evening)
(a) 2 : 5 (b) 1 : 2 (c) 2 : 3 (d) 3 : 1

Q.465. Difference between the circumferences of two circles is 4.4 cm and radius of the smaller circle is 1.4 cm. The radius of the larger circle is:
SSC MTS 16/05/2023 (Morning)
(a) 4.1 cm (b) 0.7 cm
(c) 2.1 cm (d) 3.5 cm

Q.466. Nine times the area of a circle is same as the three times the area of a square. What is the ratio of the diameter of the circle and diagonal of the square?
SSC MTS 16/05/2023 (Afternoon)
(a) $\sqrt{2} : \sqrt{3\pi}$ (b) $2 : \sqrt{3\pi}$
(c) $2 : 3\pi$ (d) $\sqrt{5} : \sqrt{7\pi}$

Q.467. How many litre of water can a hemispherical bowl of diameter 21 m hold? (1m³ - 1000 litre)
SSC MTS 16/05/2023 (Afternoon)
(a) 2100000 litre (b) 2425500 litre
(c) 2322500 litre (d) 2250500 litre

Q.468. A solid cylinder having radius of base as 28 cm and height as 24 cm is bisected from its height to get two identical cylinders. What will be the percentage increase in the total surface area ?
SSC MTS 17/05/2023 (Morning)
(a) 61.72 percent (b) 41.92 percent
(c) 53.85 percent (d) 48.64 percent

Q.469. The height and curved surface area of the cylinder are 15 cm and 330 cm². Find the diameter of the cylinder.
SSC MTS 17/05/2023 (Morning)
(a) 2 cm (b) 5 cm (c) 7 cm (d) 6 cm

Q.470. The length, breadth, height of a room are 6 m 40 cm, 4 m 80 cm and 3 m 20 cm respectively. Find the longest tape which can measure the dimensions of the room exactly.
SSC MTS 17/05/2023 (Morning)
(a) 1 m 80 cm (b) 1 m 20 cm
(c) 1 m 60 cm (d) 1 m 40 cm

Q.471. A solid hemisphere of radius 8 cm is melted into N identical cone whose radius is 4 cm and height is 2 cm. Then, what is the value of N ?
SSC MTS 17/05/2023 (Afternoon)
(a) 26 (b) 10 (c) 32 (d) 25

Q.472. The ratio of the outer and the inner circumferences of a circular path is 11 : 7. If path is 20 metres wide, then what is the radius of the inner circle ?
SSC MTS 17/05/2023 (Evening)
(a) 20 metres (b) 55 metres
(c) 65 metres (d) 35 metres

Q.473. The longest side of the obtuse triangle is 7 cm and the other two sides of the triangle are 4 cm and 5 cm. Find the area of the triangle.
SSC MTS 18/05/2023 (Morning)
(a) 1√3 cm² (b) 6√3 cm²
(c) 3√2 cm² (d) 4√6 cm²

Q.474. If the diagonal of a square is 18.4 cm, then the area of that square is:(in cm²)
SSC MTS 18/05/2023 (Evening)
(a) 84.64 (b) 338.56 (c) 324.42 (d) 169.28

Q.475. A cone and a cylinder have same height and the radius of the cone is twice of the radius of the cylinder. What is the ratio of the volume of the cone to that of the cylinder?
SSC MTS 19/05/2023 (Afternoon)
(a) 2 : 5 (b) 4 : 5 (c) 3 : 2 (d) 4 : 3

Q.476. The difference between the length and breadth of a rectangle is 40 metres. If its perimeter is 96 metres, then what will be the area of rectangle?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC MTS 19/05/2023 (Evening)
(a) 254 metre² (b) 110 metre²
(c) 176 metre² (d) 152 metre²

Q.477. A farmer's land is in the shape of a trapezium which has its parallel sides measuring 7.58 yards and 6.42 yards and the distance between the parallel sides is 6.50 yards. The cost of ploughing the land is Rs. 2000 per square yard. What amount have to be spent in order to plough the entire land ?
SSC MTS 13/06/2023 (Morning)
(a) Rs. 85000 (b) Rs. 91000
(c) Rs. 72000 (d) Rs. 102000

Q.478. If the radius of a cylinder is decreased by 12 percent, then by how much percent its height must be increased so that the volume of the cylinder remains same ?
SSC MTS 14/06/2023 (Morning)
(a) 29.13 percent (b) 21.78 percent
(c) 42.56 percent (d) 34.27 percent

Q.479. The radius of a right circular cylinder is 7 cm. Its height is thrice its radius. What is the curved surface area of the cylinder ?
SSC MTS 14/06/2023 (Afternoon)
(a) 724 cm² (b) 666 cm²
(c) 924 cm² (d) 264 cm²

Q.480. The ratio of the sides of a triangle is 3 : 3 : 4. If the area of triangle is $32\sqrt{5}$ cm², then what is the length of the equal sides ?
SSC MTS 14/06/2023 (Evening)
(a) 12 cm (b) 16 cm (c) 10 cm (d) 15 cm

Q.481. The length of a cuboid is 4 cm. If the breadth of the cuboid is four times of its length and height of the cuboid is twice of its length, then what is the lateral surface area of the cuboid?
SSC MTS 15/06/2023 (Afternoon)
(a) 380 cm² (b) 440 cm²
(c) 260 cm² (d) 320 cm²

Q.482. One of the diagonals of a rhombus is 70 percent of the other diagonal. What is the ratio of the area of rhombus to the square of the length of the larger diagonal?
SSC MTS 15/06/2023 (Evening)
(a) 5 : 17 (b) 7 : 20 (c) 6 : 19 (d) 20 : 7

Q.483. If the radius of a cylinder is decreased by 16 percent, then by how much percent its height must be increased, so that the volume of the cylinder remains the same ?
SSC MTS 15/06/2023 (Evening)
(a) 32.96% (b) 41.72%
(c) 45.28% (d) 36.43%

Q.484. The sum of the length and breadth of a cuboid is 16 cm. If the height of the cuboid is $\frac{1}{4}$ of the sum of its length and breadth, then what is the lateral surface area of the cuboid ?
SSC MTS 16/06/2023 (Afternoon)
(a) 128 cm² (b) 196 cm²
(c) 96 cm² (d) 156 cm²

Q.485. The length of a cuboid is 10 cm. If the breadth of the cuboid is half of its length and height of the cuboid is twice of its length, then what is the lateral surface area of the cuboid?
SSC MTS 16/06/2023 (Evening)
(a) 600 cm² (b) 500 cm²
(c) 720 cm² (d) 560 cm²

Q.486. The perimeter of the top of a rectangular table is 56 meter and its area is 192 meter^{2}. What is the length of its diagonal ?
SSC MTS 20/06/2023 (Morning)
(a) 22 metre (b) 20 metre
(c) 16 metre (d) 18 metre

Q.487. If the area of non-spherical portion of a solid hemisphere is 1560 m², then the total surface area of the hemisphere is:
SSC MTS 20/06/2023 (Afternoon)
(a) 6240 m² (b) 4680 m²
(c) 5140 m² (d) 3120 m²

Q.488. The sum of the length and breadth of a cuboid is 40 cm. If the height of the cuboid is $\frac{1}{5}$ of the sum of its length and breadth, then what is the lateral surface area of the cuboid?
SSC MTS 20/06/2023 (Evening)
(a) 580 cm² (b) 320 cm²
(c) 640 cm² (d) 720 cm²

SSC CHSL 2022 Tier - 1

Q.489. If the radius of the sphere is decreased by 10 percent, then volume of the sphere will be decreased by what percentage ?
SSC CHSL 10/03/2023 (1st Shift)
(a) 32.5 percent (b) 30.6 percent
(c) 25.6 percent (d) 27.1 percent

Q.490. Three circles of radius 7 cm are placed in such a way that each circle touches the other two. What will be the area of the portion enclosed by these three circles ?
SSC CHSL 10/03/2023 (3rd Shift)
(a) $49\sqrt{3} - 77\ cm^2$ (b) $40\sqrt{3} - 66\ cm^2$
(c) $50\sqrt{3} - 66\ cm^2$ (d) $55\sqrt{3} - 77\ cm^2$

Q.491. There is a rectangular garden of 240 metres × 80 metres. A path of width 4 metres is build outside the garden along its four sides. What is the area of the path ?
SSC CHSL 10/03/2023 (4th Shift)
(a) 2826 metre² (b) 2542 metre²
(c) 2916 metre² (d) 2624 metre²

Q.492. The sum of the length, breadth, and height of a cuboid box is 20 cm and the total surface area of cuboid is 256 sq . cm. What is the maximum length (in approximate) of a stick that can be placed inside the cuboid box ?
SSC CHSL 13/03/2023 (2nd Shift)
(a) 32 cm (b) 24 cm (c) 16 cm (d) 12 cm

Q.493. X, Y and Z are three equilateral triangles. The sum of the areas of X and Y is equal to the area of Z. If the side lengths of X and Y are 6 cm and 8 cm respectively, then what is the side length of Z ?
SSC CHSL 13/03/2023 (2nd Shift)
(a) 10.5 cm (b) 10 cm (c) 9.5 cm (d) 9 cm

Q.494. An incircle with center O is drawn inside an equilateral triangle ABC and the length of the side is 12 cm. Find the area (in sq .cm) of the triangle which is not in the incircle.
SSC CHSL 13/03/2023 (2nd Shift)
(a) 21.48 (b) 30.64 (c) 37.71 (d) 24.64

Q.495. What is the area of a rhombus whose diagonals are of 8 cm and 13 cm?
SSC CHSL 13/03/2023 (4th Shift)
(a) 52 cm^2 (b) 96 cm^2
(c) 44 cm^2 (d) 84 cm^2

Q.496. If the radius of a sphere is thrice than the radius of a hemisphere, then what will be the respective ratio of their volumes ?
SSC CHSL 14/03/2023 (1st Shift)
(a) 27 : 1 (b) 16 : 1 (c) 54 : 1 (d) 18 : 1

Q.497. The ratio of the volume of the first and second cylinder is 32 : 9 and the ratio of their heights is 8 : 9. If the area of the base of the second cylinder is 616 cm², then what will be the radius of the first cylinder ?
SSC CHSL 14/03/2023 (2nd Shift)
(a) 24 cm (b) 20 cm (c) 28 cm (d) 36 cm

Q.498. Half of the perimeter of a rectangle is 30 cm. If the length of the rectangle is 6 cm more than its breadth, then what is the area of the rectangle?
SSC CHSL 14/03/2023 (4th Shift)
(a) 216 cm^2 (b) 250 cm^2
(c) 185 cm^2 (d) 195 cm^2

Q.499. If the square of product of three sides of the triangle is 1024 units and the area of its circumcircle is 16π, what is

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

the area of the given triangle ?
SSC CHSL 15/03/2023 (1st Shift)
(a) 2 sq . units (b) 3 sq . units
(c) 2.5 sq . units (d) 4 sq . units

Q.500. The breadth of a rectangular floor is $\frac{3}{5}$ of its length. If the area of the floor is 60 $metre^2$, then what is the difference between the length and breadth of the floor ?
SSC CHSL 15/03/2023 (2nd Shift)
(a) 6 m (b) 7.5 m (c) 5 m (d) 4 m

Q.501. A solid cylinder having radius of base as 7 cm and height as 5 cm is bisected from its height to get two identical cylinders. What will be the percentage increase in the total surface area?
SSC CHSL 16/03/2023 (2nd Shift)
(a) 58.33 percent (b) 64.56 percent
(c) 69.44 percent (d) 52.56 percent

Q.502. If in triangle ABC, MN is parallel to BC, and M and N are points on AB and AC respectively. The area of quadrilateral MBCN = 130 cm². If AN: NC = 4:5, then the area of Triangle MAN is:
SSC CHSL 17/03/2023 (1st Shift)
(a) 40 cm² (b) 65 cm²
(c) 32 cm² (d) 45 cm²

Q.503. The circumference of the two circles is 264 m and 308 m respectively. What is the difference between the area of the larger circle and the smaller circle?
SSC CHSL 17/03/2023 (1st Shift)
(a) 2002 m² (b) 2010 m²
(c) 1890 m² (d) 1990 m²

Q.504. If the heights of two cylinders are in the ratio of 2 : 3 and their-radius are in the ratio of 6 : 5, then what is the ratio of the volumes of the cylinders ?
SSC CHSL 17/03/2023 (4th Shift)
(a) 24 : 29 (b) 21 : 31
(c) 24 : 25 (d) 28 : 31

Q.505. The sum of the length and breadth of a cuboid is 4 cm. Length is three times of breadth. If the height of the cuboid is half of the sum of its length and breadth, then what is the total surface area of the cuboid ?
SSC CHSL 20/03/2023 (2nd Shift)
(a) 64 cm² (b) 22 cm^2
(c) 32 cm^2 (d) 30 cm^2

Q.506. The area of a square Is 1156 cm^2 . What is the respective ratio between the length and the breadth of a rectangle whose length is twice the side of the square and whose breadth is 14 cm less than the side of the square?
SSC CHSL 20/03/2023 (4th Shift)
(a) 16 : 7 (b) 19 : 5 (c) 17 : 5 (d) 21 : 19

Q.507. In triangle ABC, AB=20 cm, BC= 16 cm and AC = 12 cm and the radius of circle inscribed in it is 4 cm. Find the area of triangle ABC.
SSC CHSL 21/03/2023 (1st Shift)
(a) 48 cm^2 (b) 72 cm^2
(c) 96 cm^2 (d) 120 cm^2

Q.508. A trapezium plate having two parallel sides of length 15 cm and 9 cm. and distance between them is 6 cm. Copper plating is to be done on the plate at a rate of Rs.3 per square cm. What will be the total cost of copper plating on the upper side of the plate?
SSC CHSL 21/03/2023 (1st Shift)
(a) Rs.432 (b) Rs.216 (c) Rs.72 (d) Rs.108

Q.509. ΔABC is similar to ΔPQR , AB = 4 cm , BC = 8 cm and AC = 10 cm. If QR = 16 cm, then what is the area of ΔPQR?
SSC CHSL 21/03/2023 (2nd Shift)
(a) $2\sqrt{231}$ cm² (b) $4\sqrt{231}$ cm²
(c) $4\sqrt{462}$ cm² (d) $8\sqrt{462}$ cm²

SSC CGL 2022 Tier - 2

Q.510. What is the volume of the largest sphere that can be carved out of a wooden cube of sides 21 cm? ($\pi = \frac{22}{7}$)
SSC CGL Tier II (02/03/2023)
(a) 3851 cm^3 (b) 6858 cm^3
(c) 4851 cm^3 (d) 5821 cm^3

Q.511. A rectangular park is 120 m long and 104 m wide. A 1 - m wide path runs along the boundary of the park, remaining completely inside the park area. Thus, the outside edges of the path run along the boundary wall of the park. The inside edges of the path are marked with a white line of negligible thickness. If it costs ₹2.50 to mark each metre with the white line, then how much would it cost (in ₹) to fully mark the inside edges of the path ?
SSC CGL Tier II (02/03/2023)
(a) 1090 (b) 1080 (c) 1120 (d) 1100

Q.512. What is the total surface area of a pyramid whose base is a square with side 8 cm and height of the pyramid is 3 cm ?
SSC CGL Tier II (03/03/2023)
(a) 169 cm^2 (b) 121 cm^2
(c) 144 cm^2 (d) 184 cm^2

Q.513. The breadth 'b' of a room is twice its height and half of its length. Find the length of the longest diagonal of the room.
SSC CGL Tier II (03/03/2023)
(a) $\frac{\sqrt{20}\,b}{2}$ (b) $\frac{b}{2}$ (c) $\frac{\sqrt{21}\,b}{2}$ (d) $\frac{\sqrt{19}\,b}{2}$

Q.514. A pyramid has an equilateral triangle as its base, of which each side is 8 cm. Its slant edge is 24 cm. The whole surface area of the pyramid (in cm^2) is:
SSC CGL Tier II (06/03/2023)
(a) $(16\sqrt{3} + 24\sqrt{35})$ (b) $(12\sqrt{3} + 24\sqrt{35})$
(c) $(24\sqrt{3} + 36\sqrt{35})$ (d) $(16\sqrt{3} + 48\sqrt{35})$

Q.515. The difference between the length of two parallel sides of a trapezium is 12 cm. The perpendicular distance between these two parallel sides is 60 cm. If the area of the trapezium is 1380 cm^2, then find the length of each of the parallel sides (in cm).
SSC CGL Tier II (06/03/2023)
(a) 27, 15 (b) 31, 19 (c) 29, 17 (d) 24, 12

SSC CGL 2022 Tier - 1

Q.516. How many spherical lead shots each of diameter 8.4 cm can be obtained from a rectangular solid of lead with dimension 88 cm, 63 cm, 42 cm.
(take $\pi = \frac{22}{7}$) ?
SSC CGL 01/12/2022 (1st Shift)
(a) 920 (b) 750 (c) 650 (d) 860

Q.517. A solid metallic sphere of radius 13 cm is melted and recast into a cone having diameter of the base as 13 cm. What is the height (cm) of the cone ?
SSC CGL 01/12/2022 (3rd Shift)
(a) 246 (b) 152 (c) 174 (d) 208

Q.518. Which of the following two will provide more volume ?
I) A cuboid of edges 6 cm,7 cm and 8 cm
II) A cube of edge 7 cm
SSC CGL 02/12/2022 (1st Shift)
(a) Cube will have more volume
(b) Both will have equal volume
(c) Cuboid will have more volume
(d) Cannot be determined

Q.519. A hemispherical bowl made of iron has an inner diameter of 84 cm. Find the cost of tin plating it on the inside at the rate of ₹21 per 100 cm² (take $\pi = \frac{22}{7}$) correct to two places of decimal.
SSC CGL 02/12/2022 (1st Shift)
(a) ₹2,328.48 (b) ₹2,425.48
(c) ₹2,425.60 (d) ₹2,355.48

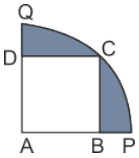
Q.520. The radius of a right circular cylinder is five times of its height. If the height of the cylinder is 3.5 cm, then what is the volume of the cylinder?
SSC CGL 02/12/2022 (3rd Shift)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) 3368.75 cm³ (b) 3872.75 cm³
(c) 3146.75 cm³ (d) 3524.25 cm³

Q.521. In the given figure, a square ABCD is inscribed in a quadrant APCQ . If AB = 16 cm, find the area of the shaded region (take π = 3.14) correct to two places of decimal.



SSC CGL 02/12/2022 (4th Shift)
(a) 155.98cm² (b) 179.68cm²
(c) 163.85cm² (d) 145.92cm²

Q.522. If the volume of a sphere is 24,416.64 cm^3, find its surface area (take π=3.14) correct to two places of decimal.
SSC CGL 03/12/2022 (1st Shift)
(a) 3069.55 cm² (b) 4069.44 cm²
(c) 5069.66 cm² (d) 6069.67 cm²

Q.523. The radius of a right circular cylinder is thrice its height. If the height of the cylinder is 2.1 cm, then what is the volume of the cylinder ?
SSC CGL 03/12/2022 (3rd Shift)
(a) 224.65 cm³ (b) 194.72 cm³
(c) 324.86 cm³ (d) 261.95 cm³

Q.524. A solid copper sphere of radius 9 cm is hammered and moulded into a wire of radius 2 cm. What is the length of this wire ?
SSC CGL 03/12/2022 (3rd Shift)
(a) 224 cm (b) 183 cm
(c) 198 cm (d) 243 cm

Q.525. The length of the side of a cube is 5.6 cm . What is the volume of the largest sphere that can be taken out of the cube ?
SSC CGL 05/12/2022 (1st Shift)
(a) 91.98 cm^3 (b) 99.96 cm^3
(c) 96.98 cm^3 (d) 90.69 cm^3

Q.526. A hollow sphere has an outer radius of 4 cm and inner radius of 1 cm. What is the volume of this hollow sphere?
SSC CGL 05/12/2022 (3rd Shift)
(a) 84π cm³ (b) 68π cm³
(c) 48π cm³ (d) 92π cm³

Q.527. Three cubes of equal volume are joined end to end. Find the surface area of the resulting cuboid if the diagonal of the cube is $6\sqrt{3}\ cm$.
SSC CGL 05/12/2022 (4th Shift)
(a) 509 cm² (b) 504 cm²
(c) 516 cm² (d) 512 cm²

Q.528. A solid hemisphere has radius 21 cm. It is melted to form a cylinder such that the ratio of its curved surace area to total surface area is 2 : 5. What is the radius (in cm) of its base (take π = $\frac{22}{7}$) ?
SSC CGL 06/12/2022 (1st Shift)
(a) 23 (b) 21 (c) 17 (d) 19

Q.529. Calculate the area of a sector of a circle with radius 10 metres and angle of 90 degrees at the centre.
SSC CGL 06/12/2022 (3rd Shift)
(a) 79.3 m² (b) 79.5 m²
(c) 78.5 m² (d) 75 m²

Q.530. The ratio of the outer and the inner circumference of a circular path is 5 : 4. If the path is 50 metres wide, then what is the radius of the inner circle?
SSC CGL 06/12/2022 (3rd Shift)
(a) 250 metres (b) 300 metres
(c) 200 metres (d) 210 metres

Q.531. The diagonal of the square is $8\sqrt{2}$ cm. Find the diagonal of another square whose area is triple that of the first square.
SSC CGL 06/12/2022 (4th Shift)
(a) $8\sqrt{5}$ cm (b) $8\sqrt{3}$ cm
(c) $8\sqrt{2}$ cm (d) $8\sqrt{6}$ cm

Q.532. Steel is used to make a hemispherical bowl that is 0.37 cm thick. The bowl's inner radius is 6 cm. Find the bowl's outer curved surface area (take π = $\frac{22}{7}$).
SSC CGL 07/12/2022 (1st Shift)
(a) 532 cm² (b) 255.0548 cm²
(c) 484 cm² (d) 523.4107 cm²

Q.533. An iron rod with diameter 4 cm and length 12 cm is drawn into a wire of length 12 m of uniform thickness. Determine the thickness of the wire.
SSC CGL 08/12/2022 (2nd Shift)
(a) 0.6 cm (b) 0.7 cm
(c) 0.3 cm (d) 0.4 cm

Q.534. A solid cone of height 42 cm with diameter of its base 42 cm is cut out from a wooden solid sphere of radius 24 cm. Find the percentage of wood wasted correct to two places of decimal.
SSC CGL 09/12/2022 (1st Shift)
(a) 75.56% (b) 56.65%
(c) 66.50% (d) 67.50%

Q.535. The length of the side of a cube is 2.8 cm. What is the volume of the largest sphere that can be taken out of the cube ?
SSC CGL 09/12/2022 (2nd Shift)
(a) 11.50 cm³ (b) 1.15 cm³
(c) 11.55 cm³ (d) 115 cm³

Q.536. The curved surface area of a right circular cone of base radius 21 cm is 594 sq cm. What is the slant height of the cone ?
SSC CGL 09/12/2022 (3rd Shift)
(a) 15 cm (b) 11 cm (c) 9 cm (d) 6 cm

Q.537. The number of solid spheres, each of diameter 6 cm, that could be moulded to form a solid metal cylinder of height 90 cm and diameter 4 cm is:
SSC CGL 09/12/2022 (4th Shift)
(a) 10 (b) 14 (c) 16 (d) 13

Q.538. The radii of the ends of a frustum of a cone 7 cm high are 5 cm and 3 cm. Find its volume correct to one decimal place. (Use π = $\frac{22}{7}$)
SSC CGL 12/12/2022 (2nd Shift)
(a) 345.6 cm³ (b) 359.3 cm³
(c) 379.3 cm³ (d) 369.3 cm³

Q.539. Area of the floor of a cubical room is 64 m². The length of the longest rod that can be kept in the room is:
SSC CGL 12/12/2022 (3rd Shift)
(a) $16\sqrt{3}$ m (b) $4\sqrt{3}$ m
(c) $12\sqrt{3}$ m (d) $8\sqrt{3}$ m

Q.540. A conical vessel, whose internal radius is 20 cm and height is 27 cm, is full of water. If this water is poured into a cylindrical vessel with internal radius 15 cm, what will be the height to which the water rises in it ?
SSC CGL 12/12/2022 (4th Shift)
(a) 16 cm (b) 10 cm
(c) 12 cm (d) 14 cm

Q.541. If the numerical value of twice the curved surface area of a right circular cylinder is equal to the numerical value of its volume, then what is the numerical value of the radius of the base of the cylinder ?
SSC CGL 13/12/2022 (1st Shift)
(a) 2 (b) 3 (c) 5 (d) 4

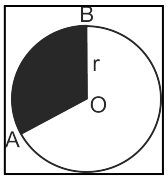
SSC CPO 2022 Tier - 1

Q.542. A field is in the shape of a rectangle of length 90 m and breadth 75 m. In one corner of the field, a pit, which is 18 m long ,15 m broad and 6 m deep, has been dug out. The Earth taken out of it is evenly spread over the remaining part of the field. Find the rise in the level of the field ?
SSC CPO 09/11/2022 (Morning)
(a) 27 cm (b) 25 cm (c) 28 cm (d) 24 cm

Q.543. In the given figure, the length of arc AB is equal to twice the length of radius r of the circle. Find the area of sector OAB in terms of the radius r.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf



SSC CPO 09/11/2022 (Morning)
(a) 3r (b) 2r (c) πr^2 (d) r^2

Q.544. Determine the total surface area of a hemisphere closed at bottom. Radius of the hemisphere is $\sqrt{\frac{25}{\pi}}$ unit.
SSC CPO 09/11/2022 (Morning)
(a) 75 unit^2 (b) 70 unit^2
(c) 60 unit^2 (d) 50 unit^2

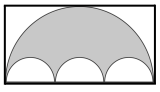
Q.545. Find the perimeter of major sector of a circle of radius 12 metres, whose minor sector subtends an angle of 75° at the centre.
SSC CPO 09/11/2022 (Morning)
(a) 24 + 5π metres (b) 24 + 19π metres
(c) 24 – 5π metres (d) 24 – 19π metres

Q.546. A frustum of a right circular cone, whose height is 18 cm, large base radius is 25 cm, and small base radius is 20 cm, is melted to form a small sphere of diameter 2 cm. How many spheres will be formed ?
SSC CPO 09/11/2022 (Afternoon)
(a) 6287 (b) 6862 (c) 4575 (d) 5857

Q.547. The radius of a hollow sphere is 21 cm. It is cut into two equal halves by a plane passing through its centre. What is 75% of the curved surface area (in cm², rounded off to the nearest tens) of the hemisphere ? (Take π = $\frac{22}{7}$)
SSC CPO 09/11/2022 (Evening)
(a) 4160 (b) 3470 (c) 2080 (d) 2770

Q.548. The total surface area of a solid metallic hemisphere is 462 cm^2 . This is melted and moulded into a right circular cone. If the radius of the base of the cone is the same as that of the hemisphere, then its height is: (use π = $\frac{22}{7}$)
SSC CPO 09/11/2022 (Evening)
(a) 14 cm (b) 7 cm (c) 21 cm (d) 28 cm

Q.549. As shown in the given figure, inside the large semicircle, three semicircles (with equal radii) are drawn so that their diameters all sit on the large semicircle's diameter. What is the ratio between the unshaded and shaded areas?



SSC CPO 09/11/2022 (Evening)
(a) 4 : 3 (b) 1 : 2 (c) 2 : 1 (d) 3 : 4

Q.550. What is the length of the longest pole that can fit itself in a hall 60 feet long, 30 feet broad and 20 feet high?
SSC CPO 10/11/2022 (Morning)
(a) 50 ft. (b) 70 ft. (c) 30 ft. (d) 20 ft.

Q.551. The volume of a wall, six times as hight as its breadth and half as long as its height, is 23958 cm³. What is the breadth of the wall ?
SSC CPO 10/11/2022 (Morning)
(a) 21 cm (b) 15 cm (c) 11 cm (d) 18 cm

Q.552. The curved surface area and circumference at the base of a solid right circular cylinder are 2200 cm² and 110 cm, respectively. Find the height of the cylinder.
SSC CPO 10/11/2022 (Morning)
(a) 24 cm (b) 22 cm (c) 20 cm (d) 18 cm

Q.553. The length of a cold storage is 5 times its breadth, and its height is 8 m. The area of its four walls (including the doors) is 720 m^2. Find the total surface area of cold storage.
SSC CPO 10/11/2022 (Afternoon)
(a) 1290.6 m^2 (b) 1275.3 m^2
(c) 1265.25 m^2 (d) 1282.5 m^2

Q.554. A cylinder of height 8 cm and radius 6 cm is melted and converted into 3 cones of the same radius and height that of cylinder. Determine the total curved surface area of cones.
SSC CPO 10/11/2022 (Evening)
(a) 180π cm^2 (b) 60π cm^2
(c) 144π cm^2 (d) 120π cm^2

Q.555. The heights of two right circular cones are in the ratio 1 : 5 and the perimeter of their bases are in the ratio 5: 3. Find the ratio of their volumes.
SSC CPO 10/11/2022 (Evening)
(a) 8 : 11 (b) 7 : 6 (c) 5 : 9 (d) 3 : 4

Q.556. The area of the sector of a circle is 128 cm^2. If the length of the arc of that sector is 64 cm, then find the radius of the circle.
SSC CPO 10/11/2022 (Evening)
(a) 4 cm (b) 8 cm (c) 2 cm (d) 16 cm

Q.557. A cone-shaped storage tank's height and radius are 9 and 7 feet, respectively. Determine how much liquid the tank can contain. (Take π = 3.14)
SSC CPO 11/11/2022 (Morning)
(a) 471 cubic feet
(b) 450 cubic feet
(c) 435.32 cubic feet
(d) 461.58 cubic feet

Q.558. A hall of 10 m length, 5 m width and 6 m height is to be painted (one side only). Determine the total surface area to be painted. (neglect the area of windows and doors) & (floor area is NOT to be painted)
SSC CPO 11/11/2022 (Morning)
(a) 300 m² (b) 280 m²
(c) 330 m² (d) 230 m²

Q.559. A hemispherical bowl of internal radius 6 cm contains a liquid. This liquid is to be filled into cylindrical shaped small bottles of diameter 2 cm and height 4 cm. How many bottles will be needed to empty the bowl?
SSC CPO 11/11/2022 (Afternoon)
(a) 32 (b) 37 (c) 38 (d) 36

Q.560. The difference between the semi - perimeter and the sides of ΔPQR are 18 cm, 17 cm and 25 cm, respectively. Find the area of the triangle
SSC CPO 11/11/2022 (Evening)
(a) 330√510 cm² (b) 230√510 cm²
(c) 30√510 cm² (d) 130√510 cm²

SSC CGL 2021 Tier - 2

Q.561. The sum of the curved surface area and the total surface area of a solid cylinder is 2068 cm^2. If the radius of its base is 7 cm, then what is the volume of this cylinder ? (use π = $\frac{22}{7}$)
SSC CGL Tier II (08/08/2022)
(a) 2060 cm^3 (b) 2480 cm^3
(c) 3080 cm^3 (d) 2760 cm^3

Q.562. The slant height of a cone is 20 cm. If area of its base is 616 cm^2, then what is the curved surface area of this cone ?
SSC CGL Tier II (08/08/2022)
(a) 960 cm^2 (b) 440 cm^2
(c) 1760 cm^2 (d) 880 cm^2

Q.563. The height of a cylinder is 6 cm more than the radius of its base. If its radius is 14 cm, then what will be volume of this cylinder ? (use π = $\frac{22}{7}$)
SSC CGL Tier II (08/08/2022)
(a) 13560 cm^3 (b) 14340 cm^3
(c) 10440 cm^3 (d) 12320 cm^3

Q.564. ABCD is a quadrilateral. The length of diagonal AC is 24 cm. The sum of perpendiculars drawn from vertex B and D on the diagonal AC is 10 cm. What is the area of the quadrilateral ?
SSC CGL Tier II (08/08/2022)
(a) 240 cm^2 (b) 180 cm^2
(c) 120 cm^2 (d) 90 cm^2

Q.565. The difference between the areas

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

of two concentric circles is 264 cm^2. What is the difference between the square of their radius ? (use $\pi = \frac{22}{7}$)

SSC CGL Tier II (08/08/2022)

(a) 70cm^2 (b) 140 cm^2

(c) 84 cm^2 (d) 64 cm^2

Q.566. Volume of a cone whose radius of a base and height are r and h respectively, is 400 cm^3 . What will be the volume of a cone whose radius of base and height are 2r cm and h cm respectively ?

SSC CGL Tier II (08/08/2022)

(a) 100 cm^3 (b) 1600 cm^3

(c) 1200 cm^3 (d) 800 cm^3

SSC Selection Post (Phase - X)

Q.567. A conical vessel has radius 4 cm and its curved surface area is 20πcm². The volume of conical vessel is:

Graduate Level 02/08/2022 (Shift - 3)

(a) 18πcm³ (b) 12πcm³

(c) 26πcm³ (d) 16πcm³

Q.568. A student wants to know the area of a rhombus, one of whose diagonals is 6 cm. He measures another diagonal as 8 cm. What is the area of the rhombus?

Graduate Level 05/08/2022 (Shift - 3)

(a) 25 cm^2 (b) 20 cm^2

(c) 24 cm^2 (d) 48 cm^2

Q.569. The volumes of two cubes are in the ratio of 8 : 27. If the volume of the larger cube is 513 cm^3more than that of the smaller cube, find the length of each side of the smaller cube.

Higher Secondary 01/08/2022 (Shift - 3)

(a) 27 cm (b) 7 cm (c) 6 cm (d) 16 cm

Q.570. A chord of a circle of radius 21 cm makes a right angle at the center. Find the area of major segment. (take π = $\frac{22}{7}$) closest to nearest integer.

Higher Secondary 03/08/2022 (Shift - 4)

(a) 1360 cm^2 (b) 1436 cm^2

(c) 1260 cm^2 (d) 1160cm^2

SSC MTS 2021 Tier - 1

Q.571. A goat is tied with a 10.5 m-long rope to one corner of a plot which is in the shape of an equilateral triangle each side of which is 16 m long. Find the area that the goat can graze on.

SSC MTS 05/07/2022 (Morning)

(a) 62.25 m² (b) 53.5 m²

(c) 57.75 m² (d) 51.75 m²

Q.572. If the height and the radius of the base of a cone are both doubled, the volume of the cone becomes _____ of its previous volume.

SSC MTS 05/07/2022 (Morning)

(a) 4 times (b) 3 times

(c) 6 times (d) 8 times

Q.573. A smaller circle touches a bigger circle internally and also passes through the centre 'O' of the bigger circle. If the area of the smaller circle is 192 cm^2, the area of the bigger circle (in cm^2) is :

SSC MTS 05/07/2022 (Evening)

(a) 768 (b) 384 (c) 1024 (d) 720

Q.574. The perimeter of a square is equal to the perimeter of a rectangle, and the latter has a width of 12 cm. The area of the square is 400 cm^2. Find the area of the rectangle.

SSC MTS 06/07/2022 (Morning)

(a) 412 cm^2 (b) 394 cm^2

(c) 324 cm^2 (d) 336 cm^2

Q.575. If the total surface area of a sphere of radius r cm is equal to the total surface area of a cube of side s cm, which of the following is true ?

SSC MTS 06/07/2022 (Morning)

(a) r > s (b) r ≥ s (c) r = s (d) r < s

Q.576. The volume of a wall whose height is six times its breadth and length is half its height, is 23958 cm^3. What is the breadth of the wall ?

SSC MTS 06/07/2022 (Afternoon)

(a) 21 cm (b) 15 cm (c) 11 cm (d) 18 cm

Q.577. A goldsmith uses 110 cm^3 of gold to make a wire 1 mm in diameter. He will use this wire to make gold chains of equal lengths. If each chain requires 56 cm length of wire, then how many gold chains can he make? [use π = $\frac{22}{7}$]

SSC MTS 07/07/2022 (Morning)

(a) 320 (b) 250 (c) 160 (d) 210

Q.578. The measures of the outer dimensions of a closed metal box are given as 15 cm × 18 cm × 8 cm. The thickness of the metal is 1.5 cm. What will be the volume of the metal required to make the box ?

SSC MTS 07/07/2022 (Evening)

(a) 1680 cm^3 (b) 950 cm^3

(c) 1440 cm^3 (d) 1260 cm^3

Q.579. The length of a side of an equilateral triangle is 120 cm less than its perimeter. What is the area of the equilateral triangle?

SSC MTS 07/07/2022 (Evening)

(a) 1800$\sqrt{3}$ cm^2 (b) 900$\sqrt{3}$ cm^2

(c) 450$\sqrt{3}$ cm^2 (d) 1200$\sqrt{3}$ cm^2

Q.580. The volume of a cuboid is 3300 cm^3. The sum of the length and the breadth of the cuboid is 37 cm. If the difference between the length and the breadth of the cuboid is 13 cm, then what is the height of the cuboid?

SSC MTS 08/07/2022 (Morning)

(a) 18 cm (b) 11 cm (c) 14 cm (d) 16 cm

Q.581. The length and the breadth of a rectangular cardboard are 40 cm and 35 cm, respectively. If the biggest possible square is cut out from this cardboard, what is the area of the remaining part of the cardboard ?

SSC MTS 08/07/2022 (Afternoon)

(a) 175 cm^2 (b) 275 cm^2

(c) 425 cm^2 (d) 325 cm^2

Q.582. The diagonal of a rectangle is 12 cm long and it is twice as long as one of the sides of the rectangle. Find area of the rectangle ?

SSC MTS 08/07/2022 (Evening)

(a) 25 $\sqrt{3}$ cm^2 (b) 30 $\sqrt{3}$ cm^2

(c) 36 $\sqrt{3}$ cm^2 (d) 42 $\sqrt{3}$ cm^2

Q.583. A solid sphere whose radius is 21 cm is melted and recast into a regular pyramid of square base. If the height of the pyramid is 66 cm, then what is the length of each side of the base of the pyramid ? [use π = $\frac{22}{7}$].

SSC MTS 08/07/2022 (Evening)

(a) 68 cm (b) 85 cm (c) 42 cm (d) 48 cm

Q.584. the total surface area of a closed cube is 128 cm^2more than the area of a square. If the length of each side of the cube is 8 cm, then what is the length of each side of the square?

SSC MTS 11/07/2022 (Morning)

(a) 16 cm (b) 12 cm (c) 18 cm (d) 9 cm

Q.585. In a camp, there are tents of the same shape and size. Each tent is cylindrical up to a height of 4 m and conical above it. The diameters of the bases of the cylinder and the cone are both 10.5 m and the slant height of the conical part is 10 m. If a total of 3861 m² canvas is used in making all the tents, then how many tents are there in the camp ? [use π = $\frac{22}{7}$]

SSC MTS 11/07/2022 (Evening)

(a) 11 (b) 7 (c) 19 (d) 13

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.586. A rectangular LCD has an area of 480 cm^2 and a perimeter of 92 cm. If the size of the LCD is defined in term of length of the diagonal, then what is the size of the LCD?
SSC MTS 12/07/2022 (Evening)
(a) 34 cm (b) 39 cm (c) 31 cm (d) 35 cm

Q.587. If the circumference of a circle is equal to the perimeter of a square and the radius of the given circle is positive, then which of the following options is correct ?
SSC MTS 12/07/2022 (Evening)
(a) Area of the circle > Area of the square
(b) Area of the circle ≥ Area of the square
(c) Area of the circle < Area of the square
(d) Area of the circle = Area of the square

Q.588. If the length of one side of a rectangle is twice that of the other side, and its perimeter is 54 cm, then what is the length of the longer side of this rectangle ?
SSC MTS 13/07/2022 (Evening)
(a) 14 cm (b) 9 cm (c) 27 cm (d) 18 cm

Q.589. A person uses a rectangular metallic sheet of 45 m × 30 m for making an open box. From each corner of the sheet he cut offs a square. If the length of one side of each of the squares is 10 m, then what will be the volume of the box (in m^3) ?
SSC MTS 13/07/2022 (Evening)
(a) 5000 (b) 4500 (c) 7000 (d) 2500

Q.590. The length of the longest diagonal that can be placed in a closed cube is $50\sqrt{3}$ cm. What is the total surface area of this cube ?
SSC MTS 14/07/2022 (Evening)
(a) 15000 cm^2 (b) 10000 cm^2
(c) 12000 cm^2 (d) 6000 cm^2

Q.591. The larger diagonal of a rhombus is 150% of its smaller diagonal, and its area is 432 cm^2. Find the length (in cm) of the side of the rhombus ?
SSC MTS 14/07/2022 (Evening)
(a) $8\sqrt{13}$ (b) $4\sqrt{13}$ (c) $6\sqrt{13}$ (d) $2\sqrt{13}$

Q.592. The length of each side of a rhombus is 10 cm. If the length of one of its diagonals is 16 cm,then what is the area of the rhombus?
SSC MTS 15/07/2022 (Evening)
(a) 108 cm^2 (b) 112 cm^2
(c) 128 cm^2 (d) 96 cm^2

Q.593. Two cubes, each having a total surface area of 150cm^2, are joined together to form a cuboid. Find the total surface area of the resulting cuboid.
SSC MTS 18/07/2022 (Afternoon)
(a) 225 (b) 250 (c) 275 (d) 300

Q.594. The circumference of a circle is equal to the perimeter of an equilateral triangle. If the radius of the circle is 84 cm, then what will be the length of each side of the equilateral triangle ?
[use π = $\frac{22}{7}$]
SSC MTS 19/07/2022 (Afternoon)
(a) 192 cm (b) 176 cm
(c) 172 cm (d) 184 cm

Q.595. The height of a cylinder is 3 cm more than the radius of its base. If the height is 10 cm, then what is the volume of this cylinder ? [use π = $\frac{22}{7}$]
SSC MTS 20/07/2022 (Morning)
(a) 1540 cm^3 (b) 1860 cm^3
(c) 2160 cm^3 (d) 1240 cm^3

Q.596. What is the radius of a circular field whose area is equal to the sum of the area of three smaller circular fields of radii 8 m, 9 m and 12 m respectively?
SSC MTS 20/07/2022 (Morning)
(a) 20 m (b) 21 m (c) 29 m (d) 17 m

Q.597. A toy is formed by placing a solid circular cone on a solid hemisphere and the radius of the common base of the cone and the hemisphere is 15 cm, If the volume of the toy is 2850πcm^3, then find the total surface area of that toy.
SSC MTS 20/07/2022 (Morning)
(a) 815π cm^2 (b) 755π cm^2
(c) 705π cm^2 (d) 685π cm^2

Q.598. A large solid cube is melted and cast into 'N' small solid spheres, each of radius 3 cm , and 'N+2' small solid cuboids, Each of dimensions 4 cm × 4cm × 6.5cm. If the length of each side of the large solid cube is 12 cm, then find the value of 'N' [use π = $\frac{22}{7}$]
SSC MTS 20/07/2022 (Afternoon)
(a) 8 (b) 5 (c) 7 (d) 6

Q.599. The height of a trapezium is 68 cm and the sum of its parallel sides is 75 cm. If the area of the trapezium is $\frac{6}{17}$ times of the area of a square, then the length of the diagonal of the square is:
(take $\sqrt{2}$ = 1.41)
SSC MTS 21/07/2022 (Morning)
(a) 127.39 cm (b) 183.49 cm
(c) 119.85 cm (d) 102.39 cm

Q.600. Find the total surface area of a closed hemisphere whose diameter is 7 cm. [Use π = $\frac{22}{7}$]
SSC MTS 21/07/2022 (Evening)
(a) 77 cm^2 (b) 154 cm^2
(c) 110 cm^2 (d) 115.5 cm^2

Q.601. The ratio of the length to the width of a rectangle is 3:2. If the length of this rectangle is increased by 25% and its width is kept constant, then the area of the rectangle increases by 24 m^2. What is the width of this rectangle?
SSC MTS 22/07/2022 (Morning)
(a) 12 m (b) 10 m (c) 8 m (d) 15 m

Q.602. If the ratio of an external angle and an internal angle of a regular polygon is 1 : 5, then what is the number of sides in the polygon ?
SSC MTS 22/07/2022 (Afternoon)
(a) 24 (b) 22 (c) 12 (d) 30

Q.603. The area of a square is 1296 cm^2 and the radius of a circle is $\frac{7}{6}$ of the length of a side of the square. What is the ratio of the perimeter of the square and the circumference of the circle ?
(use π = $\frac{22}{7}$)
SSC MTS 25/07/2022 (Morning)
(a) 13:11 (b) 8:11 (c) 6:11 (d) 3:7

Q.604. The length, the breadths, and the volumes of two cuboids are in the ratios of 4 : 5, 3 : 4 and 2 : 3 respectively. What is the ratio of their heights ?
SSC MTS 25/07/2022 (Afternoon)
(a) 3 : 5 (b) 10 : 9 (c) 8 : 15 (d) 2 : 3

Q.605. The breadth of a rectangle is $\frac{4}{5}$ of the radius of a circle. The radius of the circle is $\frac{1}{5}$ of the side of a square, whose area is 625 cm^2. What is the area of the rectangle if the length of rectangle is 20 cm ?
SSC MTS 25/07/2022 (Afternoon)
(a) 150 cm^2 (b) 60 cm^2
(c) 100 cm^2 (d) 80 cm^2

Q.606. The diameter of a circle is $\frac{7}{4}$ times of the base of a triangle, and the height of the triangle is 14 cm. If the area of the triangle is 56cm^2, then what is the circumference (in m) of the circle - (use π = $\frac{22}{7}$)
SSC MTS 26/07/2022 (Morning)
(a) 0.44 m (b) 2.46 m
(c) 0.48 m (d) 1.74 m

Q.607. A square of side p is taken. A rectangle is cut out from this square

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

such that the length of one side of the rectangle is equal to half of the length of one side of the square and the length of another side of the rectangle is equal to $\frac{1}{3}$ of the length of the first side of the rectangle. What is the area of the portion of the square that remained after the rectangle is cut out?
SSC MTS 26/07/2022 (Afternoon)
(a) $\frac{7}{8}p^2$ (b) $\frac{3}{4}p^2$ (c) $\frac{11}{12}p^2$ (d) $\frac{15}{16}p^2$

Q.608. The length of a rope, by which a calf is tied, is decreased from 9 m to 5 m . Find the decrease in the area that can be grazed by the calf.[use π = $\frac{22}{7}$]
SSC MTS 26/07/2022 (Evening)
(a) 112 m^2 (b) 154 m^2
(c) 122 m^2 (d) 176 m^2

SSC CHSL 2021 Tier - 1

Q.609. A pillar 11 m in radius is 21 m high. How much material(in m^3) was used to construct it? (Use π = $\frac{22}{7}$)
SSC CHSL 24/05/2022 (Morning)
(a) 7996 (b) 7886 (c) 7989 (d) 7986

Q.610. A sphere passes through the eight corners of a cube of side 14 cm. Find the volume (in cm^3) of the sphere.
(π = $\frac{22}{7}$)
SSC CHSL 25/05/2022 (Morning)
(a) $4312\sqrt{3}$ (b) $4012\sqrt{3}$
(c) $4312\sqrt{2}$ (d) $4012\sqrt{2}$

Q.611. A rectangular water tank is 1.5 m high, 3 m long and 3.5 m wide. How much water (in litres) can it hold?
SSC CHSL 25/05/2022 (Evening)
(a) 13520 (b) 14510 (c) 15750 (d) 11780

Q.612. What is the volume of the largest right circular cone that can be cut out from a cube whose edge is 10 cm ?
SSC CHSL 26/05/2022 (Morning)
(a) $\frac{250\pi}{3}$ (b) $\frac{351\pi}{3}$ (c) $\frac{145\pi}{3}$ (d) $\frac{150\pi}{3}$

Q.613. 15 identical solid spherical balls of radius 5 cm are melted to form a single sphere. In this process, 35% of the mass is wasted. What is the radius (in cm) of the single sphere that is now formed? [Use π = 22/7, and give your answer correct to two decimal places.]
SSC CHSL 26/05/2022 (Evening)
(a) 12.68 (b) 16.68 (c) 10.68 (d) 34.68

Q.614. As air is pumped into a spherical balloon, its radius increases from 7 cm to 14 cm. Find the ratio of volume of the balloon's in both circumstances.
SSC CHSL 27/05/2022 (Morning)
(a) 2 : 5 (b) 1 : 9 (c) 1 : 8 (d) 3 : 7

Q.615. A solid right-circular cylinder, whose radius of the base is 15 cm and height is 12 cm, is melted and moulded into the solid right - circular cone, whose radius of the base is 24 cm. What will be the height of this cone?
SSC CHSL 27/05/2022 (Evening)
(a) 14.0625 cm (b) 14.0675 cm
(c) 14.6025 cm (d) 14.0525 cm

Q.616. A solid toy is in the shape which is a combination of a cylinder, cone and a hemispherical bowl. The cylinder contributes to 50% of the total volume of the toy, the cone contributes to 20% of the volume. Find the ratio of the contribution (in terms of volume) of the cone, cylinder and hemisphere.
SSC CHSL 30/05/2022 (Afternoon)
(a) 2 : 3 : 5 (b) 5 : 2 : 3
(c) 2 : 5 : 3 (d) 4 : 5 : 3

Q.617. What is the volume (cm^3)of a right circular cylinder whose curved surface area is 12π cm^2 and the circumference of its base is 4π cm ?
SSC CHSL 30/05/2022 (Evening)
(a) 48π (b) 36π (c) 12π (d) 24π

Q.618. The sum of the length, breadth and depth of a cuboid is 23 cm, and its diagonal is $5\sqrt{7}$ cm. Its total surface area (cm^2) is:
SSC CHSL 31/05/2022 (Morning)
(a) 144 (b) 354 (c) 188 (d) 111

Q.619. A cone-shaped temple top has slant height of 10 m and radius of base is 11 m. Find the total cost for painting its curved surface area at the rate of ₹7/m^2.
SSC CHSL 31/05/2022 (Afternoon)
(a) ₹2440 (b) ₹2040
(c) ₹2420 (d) ₹2240

Q.620. The area of a triangle is 96 cm^2 and the length of one of its sides is 24 cm. What is the length of the perpendicular drawn to this side of the triangle from the opposite vertex?
SSC CHSL 01/06/2022 (Morning)
(a) 16 cm (b) 8 cm (c) 4 cm (d) 12 cm

Q.621. Find the volume(in cm^3) of the cuboid, if its length is twice more than its breadth and its breadth is 8 cm, which is twice its height.
SSC CHSL 01/06/2022 (Afternoon)
(a) 768 (b) 769 (c) 767 (d) 766

Q.622. If the length of a cuboid is 20 m, breadth is 5 m and height is 4 m, then find the length of diagonal of the cuboid.
SSC CHSL 01/06/2022(Evening)
(a) 12 m (b) 21 m (c) 18 m (d) 24 m

Q.623. The radius of a hemispherical bowl is given as 7 cm. What is the capacity(cm^3). of the bowl ? [π = $\frac{22}{7}$]
SSC CHSL 02/06/2022(Afternoon)
(a) $718\frac{2}{3}$ (b) $812\frac{1}{3}$ (c) $618\frac{1}{3}$ (d) $518\frac{2}{3}$

Q.624. The length of each side of a regular hexagon is 10 cm. What is the area (cm^2).of the hexagon ?
SSC CHSL 02/06/2022(Evening)
(a)$156\sqrt{3}$ (b)$144\sqrt{3}$ (c) $148\sqrt{3}$ (d) $150\sqrt{3}$

Q.625. The area of a square is $9m^2$ + 12m + 4. Find the measure of the side of the square.
SSC CHSL 02/06/2022(Evening)
(a) 3m + 2 (b) 3m + 4
(c) $3m^2$ + 2 (d) $3m^2$ + 2m

Q.626. The area of a square is $4x^2 - 12x + 9$, which of the following will be the side of the square?
SSC CHSL 03/06/2022 (Afternoon)
(a) (2x + 3) (b) (2x - 3)
(c) (3x - 2) (d) (3x + 2)

Q.627. If the areas of three adjacent faces of a cuboidal box are 729 cm^2, 529 cm^2 and 289 cm^2, respectively, then find the volume of the box.
SSC CHSL 03/06/2022 (Evening)
(a) 10557 cm^3 (b) 10560 cm^3
(c) 10555 cm^3 (d) 10551 cm^3

Q.628. The diameter of the base and the slant height of a right circular cone are 10 cm and 16cm, respectively. Find its total surface area(cm^2). [Use π = $\frac{22}{7}$]
SSC CHSL 06/06/2022 (Morning)
(a) $\frac{5720}{7}$ (b) $\frac{720}{7}$ (c) 330 (d) $\frac{1760}{7}$

Q.629. The diagonal of a rhombus is 8 cm and its area is 48 cm^2, then the length of each side of the rhombus is:
SSC CHSL 06/06/2022 (Afternoon)
(a) $\sqrt{13}$ (b) $2\sqrt{13}$ (c) $6\sqrt{13}$ (d) $5\sqrt{13}$

Q.630. The total surface area of a solid cylinder whose radius is r cm and height is $\frac{r}{2}$ cm (in cm^2) is :
SSC CHSL 07/06/2022 (Morning)
(a) $3\pi\frac{r^2}{2}$ (b) $4\pi r^2$ (c) $3\pi r^2$ (d) $\pi\frac{r^3}{2}$

Q.631. The base of a hemispherical bowl

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

has a circumference of 132 cm. Find the capacity of the bowl [Use π = $\frac{22}{7}$]
SSC CHSL 07/06/2022 (Afternoon)
(a) 18240 cm^3 (b) 19404 cm^3
(c) 19708 cm^3 (d) 16540 cm^3

Q.632. Find the volume of the cylinder circumscribing a sphere with a diameter of 14 cm. [Use π = $\frac{22}{7}$]
SSC CHSL 07/06/2022 (Evening)
(a) 2156 cm^3 (b) 2158 cm^3
(c) 2155 cm^3 (d) 2157 cm^3

Q.633. The surface area of a spherical volleyball is 100π cm^2. Find the volume of air enclosed in the ball.
SSC CHSL 08/06/2022 (Morning)
(a) $\frac{400}{3}$ π (b) $\frac{350}{3}$ π
(c) $\frac{500}{3}$ π (d) $\frac{200}{3}$ π

Q.634. Find the length of diagonal (m) of a cuboid 13 m long,7 m broad and 3 m high.
SSC CHSL 08/06/2022 (Evening)
(a) $\sqrt{207}$ (b) $\sqrt{232}$ (c) $\sqrt{327}$ (d) $\sqrt{227}$

Q.635. The radius of a roller is 14 cm and its length 20cm. It takes 235 complete revolutions to move once over to level a playground. Find the area of the playground.(Use π = $\frac{22}{7}$)
SSC CHSL 09/06/2022 (Afternoon)
(a) 4136 cm^2 (b) 4136 × 10^3 cm^2
(c) 41360 cm^2 (d) 4136 × 10^2 cm^2

Q.636. The length of the hypotenuse of a right-angled triangle is 37 cm and the length of one of its other two sides is 12 cm. What is the area of the triangle in cm^2?
SSC CHSL 09/06/2022 (Evening)
(a) 222 (b) 204 (c) 216 (d) 210

Q.637. The area of quadrilateral is 336 m^2 and the perpendiculars drawn to one diagonal from the opposite vertices are 16 m and 12 m long. Find the length of this diagonal.
SSC CHSL 10/06/2022 (Morning)
(a) 28 cm (b) 26 cm (c) 21 cm (d) 24 cm

Q.638. How many spherical balls of radius 5 cm can be made by melting a spherical clay ball having a radius of 15 cm ?
SSC CHSL 10/06/2022 (Afternoon)
(a) 18 (b) 3 (c) 9 (d) 27

Q.639. What is the height of a solid right circular cylinder whose radius is 3 cm and total surface area is 60 π cm^2?
SSC CHSL 10/06/2022 (Evening)
(a) 3 cm (b) 5 cm (c) 7 cm (d) 9 cm

SSC CGL 2021 Tier - 1

Q.640. A solid cube of side 8 cm is dropped into a rectangular container of length 16cm, breadth 8 cm and height 15 cm which is partly filled with water. If the cube is completely submerged, then the rise of water level (in cm) is :
SSC CGL 11/04/2022 (Morning)
(a) 2 (b) 6 (c) 5 (d) 4

Q.641. A solid cube of side 8 cm is dropped into a rectangular container of length 16cm, breadth 8 cm and height 15cm which is partly filled with water. If the cube is completely submerged, then the rise of water level (in cm) is :
SSC CGL 11/04/2022(Morning)
(a) 2 (b) 6 (c) 5 (d) 4

Q.642. What is the difference in the volume (in cm^3) of a sphere of radius 7 cm and that of a cone of a radius 7 cm and height of 10 cm? [Use π = $\frac{22}{7}$]
SSC CGL 12/04/2022 (Morning)
(a) 205 (b) 704 (c) 924 (d) 1078

Q.643. If the length of a diagonal of a square is (a + b), then the area of the square is:
SSC CGL 13/04/2022 (Morning)
(a) $a^2 + b^2$ (b) $\frac{1}{2}(a^2 + b^2)$ + ab
(c) $a^2 + b^2$ + 2ab (d) $\frac{1}{2}(a^2 + b^2)$

Q.644. Let $x\ cm^2$ be the surface area and $y\ cm^3$ be the volume of a sphere such that y = 14x. What is the radius (in cm) of the sphere ?
SSC CGL 13/04/2022 (Evening)
(a) 102 (b) 42 (c) 51 (d) 68

Q.645. A hemispherical depression of diameter 4 cm is cut out from each face of a cubical block of sides 10 cm. Find the surface area of the remaining solid (in cm^2) (Use π = $\frac{22}{7}$)
SSC CGL 18/04/2022 (Morning)
(a) 900$\frac{4}{7}$ (b) 112$\frac{4}{7}$
(c) 675$\frac{3}{7}$ (d) 713$\frac{1}{7}$

Q.646. The area of a cardboard(in cm²) needed to make a closed box of size 20 cm × 10 cm × 8 cm will be:
SSC CGL 18/04/2022 (Evening)
(a) 880 (b) 690 (c) 750 (d) 960

Q.647. From the body of a solid cube of edge 7 cm, a solid sphere is removed. The volume of the remaining solid was found to be 163$\frac{1}{3}$ cm^3. What is the diameter (in cm) of the sphere?
(Use π = $\frac{22}{7}$)
SSC CGL 19/04/2022 (Morning)
(a) 10 (b) 7 (c) 5 (d) 8

Q.648. The length of a wire (in cm) of 0.1mm radius that can be drawn from melting a solid copper sphere of a diameter 6 cm is:
SSC CGL 19/04/2022 (Evening)
(a) 250000 (b) 360000
(c) 440000 (d) 810000

Q.649. The inner circumference of a circular path enclosed between two concentric circles is 264m. The uniform width of the circular path is 3m. What is the area (in m^2 ,to the nearest whole number) of the path ?.(Use π = $\frac{22}{7}$)
SSC CGL 20/04/2022 (Morning)
(a) 696 (b) 756 (c) 820 (d) 948

Q.650. The total surface area of a right pyramid , with base as a square of side 8 cm , is 208 cm^2. What is the slant height (in cm) of the pyramid?
SSC CGL 20/04/2022 (Afternoon)
(a) 7 (b) 10 (c) 9 (d) 8

Q.651. A 22.5 m high tent is the shape of a frustum of a cone surmounted by a hemisphere. If the diameter of the upper and the lower circular end of the frustum are 21 m and 39 m respectively, then find the areas of the cloth (in m^2) used to make the tent (ignoring the wastage).
(Use π = $\frac{22}{7}$)
SSC CGL 21/04/2022(Evening)
(a) 787$\frac{2}{7}$ (b) 2107$\frac{2}{7}$
(c) 1635$\frac{6}{7}$ (d) 2800$\frac{2}{7}$

SSC CGL 2020 Tier - 2

Q.652. A solid metallic cuboid of dimensions 12 cm × 54 cm × 72 cm is melted and converted into 8 cubes of the same size. What is the sum of the lateral surface areas (in cm^2) of 2 such cubes ?
SSC CGL Tier II (29/01/2022)
(a) 2592 (b) 2268 (c) 3888 (d) 1944

Q.653. The radius of a spherical balloon is inflated from 3.5 cm to 4.9 cm by pushing air into it. What is the percentage increase in the volume of the

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

original balloon ?
SSC CGL Tier II (29/01/2022)
(a) 74.4% (b) 174.4% (c) 73.6% (d) 173.6%

Q.654. The radius of the base of a cylindrical tank is 4 m. If three times the sum of the areas of its two circular faces is twice the area of its curved surface, then the capacity (in kilolitres) of the tank is:
SSC CGL Tier II (29/01/2022)
(a) 54π (b) 108π (c) 96π (d) 144π

Q.655. The slant height and radius of a right circular cone are in the ratio 29 : 20. If its volume is 4838.4 π cm^3, then its radius is:
SSC CGL Tier II (29/01/2022)
(a) 20 cm (b) 28 cm (c) 24 cm (d) 25 cm

Q.656. The areas of three adjacent faces of a cuboidal solid block of wax are 216 cm², 96 cm² and 144 cm². It is melted and 8 cubes of the same size are formed from it. What is the lateral surface area (in cm^2) of 3 such cubes?
SSC CGL Tier II (03/02/2022)
(a) 648 (b) 432 (c) 576 (d) 288

Q.657. A well with inner radius 3 m, is dug 6 m deep. The soil taken out of it has been spread evenly all around it to a width of 2 m to form an embankment. The height (in m) of the embankment is:
SSC CGL Tier II (03/02/2022)
(a) $4\frac{1}{2}$ (b) $4\frac{1}{4}$ (c) $3\frac{1}{4}$ (d) $3\frac{3}{8}$

Q.658. A solid metallic sphere of radius 4 cm is melted and recast into spheres of 2 cm each. What is the ratio of the surface area of the original sphere to the sum of surface areas of the spheres, so formed?
SSC CGL Tier II (03/02/2022)
(a) 2 : 1 (b) 2 : 3 (c) 1 : 2 (d) 1 : 4

Q.659. A cylindrical tube, open at both ends, is made of a metal sheet which is 0.5 cm thick. Its outer radius is 4 cm and length is 2 m. How much metal (in cm^3) has been used in making the tube ?
SSC CGL Tier II (03/02/2022)
(a) 800π (b) 450π (c) 750π (d) 550π

Q.660. The base of a right prism is a triangle whose sides are 8 cm, 15 cm and 17 cm, and its lateral surface area is 480 cm^2. What is the volume (in cm^3) of the prism?
SSC CGL Tier II (03/02/2022)
(a) 540 (b) 600 (c) 720 (d) 640

Q.661. The curved surface area of a right circular cone is 2310 cm^2 and its radius is 21 cm. If its radius is increased by 100% and height is reduced by 50%, then its capacity (in litres) will be correct to one decimal place) .(Use π = $\frac{22}{7}$)
SSC CGL Tier II (03/02/2022)
(a) 27.8 (b) 28.2 (c) 26.7 (d) 25.9

SSC MTS 2020 Tier - 1

Q.662. The area of a square is S and that of the square formed by joining the mid points of the given square is A. Then the value of $\frac{A}{S}$ is equal to:
SSC MTS 05/10/2021 (Morning)
(a) 0.25 (b) 0.5 (c) 0.125 (d) 1.25

Q.663. A container in the shape of a right circular cone, whose radius and depth are equal, gets completely filled by 128000 spherical droplets, each of diameter 2mm. What is the radius (in cm) of the container?
SSC MTS 05/10/2021 (Morning)
(a) 6 (b) 4 (c) 8 (d) 2

Q.664. The total surface area of a solid right circular cylinder of height 13 cm, is 880 cm^2. Its volume (in cm^3) is 11k.The value of k is:(Use π = $\frac{22}{7}$)
SSC MTS 05/10/2021(Afternoon)
(a) 208 (b) 182 (c) 104 (d) 91

Q.665. The area of a parallelogram ABCD is 300 cm^2. The distance between AB and CD is 20cm and the distance between BC and AD is 30cm. What is the perimeter (in cm) of the parallelogram?
SSC MTS 05/10/2021 (Evening)
(a) 60 (b) 50 (c) 40 (d) 100

Q.666. The radii of the circular ends of a frustum of a cone are 20 cm and 13 cm and its height is 12 cm. What is the capacity (in litres) of the frustum(correct to one decimal place)? (Use π = $\frac{22}{7}$)
SSC MTS 06/10/ 2021 (Morning)
(a) 10.4 (b) 11.2 (c) 10.8 (d) 11.4

Q.667. If the width of the path around a square field is 4.5 m and the area of the path is 252 m^2, then the length of the side of the field is:
SSC MTS 06/10/ 2021 (Morning)
(a) 9.5 m (b) 9 m (c) 8 m (d) 8.5 m

Q.668. A solid metal cube of edge 12 cm is immersed completely in water in a cylindrical vessel whose radius is 20 cm and height is 32 cm, and the water in the vessel is up to a height of 15 cm. The height(in cm) by which the water will rise in the vessel is (correct to one decimal place):
SSC MTS 06/10/2021 (Evening)
(a) 0.9 (b) 1.4 (c) 1.2 (d) 1.1

Q.669. From each of the four corners of a rectangular sheet of dimensions 48 cm × 27 cm, a square of side 3.5 cm is cut off and a box is made. The volume of the box is:
SSC MTS 07/10/2021 (Morning)
(a) 2880 (b) 2780 (c) 2870 (d) 2860

Q.670. The internal dimensions of a rectangular closed wooden box are 30 cm , 18cm and 23cm,. What space (in cm^3) will it occupy, if the wood used is 1cm thick?
SSC MTS 08/10/2021 (Morning)
(a) 12420 (b) 16000 (c) 14136 (d) 9408

Q.671. A solid metallic cylinder with a base radius of 3 cm and a height of 120 cm is melted and recast into a sphere of radius r cm. What is the value of r if there is a 10% metal loss in the conversion?
SSC MTS 08/10/2021 (Afternoon)
(a) 9 (b) 8 (c) 13.5 (d) 12

Q.672. The difference between the areas of two concentric circles is 88 cm^2. If the radius of the inner circle is 6 cm then the area (in cm^2) of the larger circle is closest to: (Use π = $\frac{22}{7}$)
SSC MTS 08/10/2021 (Afternoon)
(a) 196 (b) 201 (c) 197 (d) 198

Q.673. A rectangular plot is 420 m long and 84 m wide. It is surrounded by semi-circular flower beds along all its sides. The area of the entire plot (in hectares) is x. The value of x (correct to one decimal place) is: (Use π = $\frac{22}{7}$)
SSC MTS 08/10/2021 (Evening)
(a) 19.1 (b) 18.7 (c) 17.9 (d) 19.4

Q.674. From a wooden cubical block of side 10 cm, a sphere of radius 4.2 cm is carved out. How much wood is wasted in the process (Use π = $\frac{22}{7}$)
SSC MTS 11/10/2021(Morning)
(a) 476.2 cm^3 (b) 689.536 cm^3
(c) 310.464 cm^3 (d) 523.8 cm^3

Q.675. A typist uses a paper of size 32 cm× 20 cm. He leaves a margin of 2 cm each on all the sides. If he leaves a margin of 1 cm only on all the sides. then what is the percentage of the increase in the area available for typing (correct to 2 decimal places)?
SSC MTS 11/10/2021 (Morning)
(a) 20.54% (b) 82.69%
(c) 17.04% (d) 79.46%

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.676. A rectangular water reservoir contains 126 kilolitres of water. The depth of the reservoir is 3.5 m and its length measures 8m. What is the width of the reservoir?
SSC MTS 11/10/2021 (Afternoon)
(a) 4.5 m (b) 4.2 m (c) 4 m (d) 5 m

Q.677. A hall is 18 m long and 12 m broad. If the sum of the areas of the floor and the ceiling is equal to the sum of the areas of the four walls, the volume (in m^3) of the hall is:
SSC MTS 12/10/2021 (Morning)
(a) 1175.5 (b) 1876.2
(c) 1555.2 (d) 1376.4

Q.678. A wooden piece in the shape of a cuboid is divided into five equal parts by cutting it with four cuts perpendicular to its length, and it turns out that each piece is a cube of volume 27 cm^3. What is the total surface area (in cm^2) of the cuboid?
SSC MTS 12/10/2021 (Afternoon)
(a) 150 (b) 174 (c) 216 (d) 198

Q.679. The material of a sphere of radius r is melted and recast into a hollow cylindrical shell of thickness *a* and outer radius *b*. What is its length assuming that no material is lost in recasting?
SSC MTS 12/10/2021 (Afternoon)
(a) $\frac{4r^3}{3a(2a-b)}$ (b) $\frac{4r^3}{3a(b+a)(b-a)}$
(c) $\frac{4r^3}{3a(b-a)}$ (d) $\frac{4r^3}{3a(2b-a)}$

Q.680. The radius of the base of a cone and also that of a hemisphere each is 14 cm. Also, the volumes of these two solids are equal. The curved surface area of the cone is:
(Take π = $\frac{22}{7}$)
SSC MTS 12/10/2021 (Evening)
(a) $614\sqrt{5}$ (b) $626\sqrt{5}$ (c) $616\sqrt{5}$ (d) $516\sqrt{5}$

Q.681. A boy walked along two adjacent sides of a rectangular field. If he had walked along the diagonal, then he would have saved a distance equal to one-fourth of the larger side.The ratio of the larger to the smaller side is:
SSC MTS 13/10/2021 (Morning)
(a) 7 : 24 (b) 11 : 18 (c) 24 : 7 (d) 18 : 11

Q.682. The length of a rectangle is three-fifth of the radius of a circle. The radius of the circle is equal to the side of a square whose area is 6400 m^2. Find the area (in m^2) of the rectangle, if the breadth is 20 m is:
SSC MTS 13/10/2021 (Morning)
(a) 1200 (b) 480 (c) 960 (d) 1000

Q.683. Kamala has three cylindrical containers, each with radius 20 cm that she wants to fill with grain. If her bag of grain contains 100 kg of grain, and she fills all three containers to a height of 70 cm, how much grain will be left in the bag. If 1 kg grain occupies 3000 cm^3 space ? (Use π = $\frac{22}{7}$)
SSC MTS 13/10/2021 (Afternoon)
(a) 88 kg (b) 50 kg (c) 58 kg (d) 12 kg

Q.684. The radius of a spherical balloon increases from 6 cm to 10 cm when more air is pumped into it. The ratio of the surface area of the original balloon and the inflated balloon is:
SSC MTS 13/10/2021 (Afternoon)
(a) 4 : 5 (b) 27 : 125 (c) 3 : 5 (d) 9 : 25

Q.685. The radius of a cylinder is reduced to 50% of its actual radius. If its volume remains the same as before, then its height becomes k times the original height. The value of k is:
SSC MTS 14/10/2021 (Evening)
(a) 2 (b) 16 (c) 8 (d) 4

Q.686. The length and breadth of a rectangle are 35 cm and 12 cm, respectively. What will be the circumference of the circle that inscribes this rectangle ? (π = $\frac{22}{7}$)
SSC MTS 14/10/2021 (Evening)
(a) $115\frac{3}{7}$ cm (b) $117\frac{1}{7}$ cm
(c) $114\frac{4}{7}$ cm (d) $116\frac{2}{7}$ cm

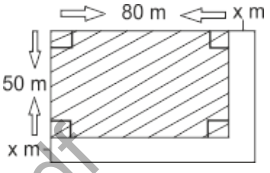
Q.687. Four solid cubes, each of volume 1728 cm^3,are kept in two rows having two cubes in each row. They form a rectangular solid with a square base. The total surface area (in cm^2) of the resulting solid is:
SSC MTS 18/10/2021 (Afternoon)
(a) 1440 (b) 2304 (c) 576 (d) 1152

Q.688. A right circular cone is inscribed in a cube of side 14 cm occupying the maximum space possible. What is the ratio of the volume of the cube to the volume of the cone ? (π = $\frac{22}{7}$)
SSC MTS 18/10/2021 (Afternoon)
(a) 81 : 22 (b) 11 : 42
(c) 42 : 11 (d) 22 : 81

Q.689. Three circles, each having radius equal to 4 cm, are drawn with the vertices of an equilateral triangle as the centres. If the length of each side of the triangle is equal to 8 cm, then what is the area (in cm^2) of the portion of the triangle that is NOT covered by the sectors of the circles ?
SSC MTS 18/10/2021 (Evening)
(a) 16 ($2\sqrt{3}$ − π) (b) 8 ($2\sqrt{3}$ − π)
(c) 8 ($2\sqrt{3} - \frac{\pi}{2}$) (d) 16 ($2\sqrt{3} - \frac{\pi}{2}$)

Q.690. Three cubes each having volume 1728 cm^3 are placed one above the other. What is the total surface area of the resulting solid?
SSC MTS 20/10/2021 (Morning)
(a) 2304 (b) 2592 (c) 2160 (d) 2016

Q.691. In the given figure, the area of the unshaded region is 35% of the area of the shaded region. What is the value of x



SSC MTS 20/10/2021 (Morning)
(a) 20 (b) 15 (c) 10 (d) 5

Q.692. The sum of the height and radius of the base of a solid right circular cylinder is 46 cm. If the total surface area of the solid cylinder is 6072 cm^2, what is the volume (in cm^3) of the cylinder ?
SSC MTS 20/10/2021 (Evening)
(a) 11025 π (b) 3030 π
(c) 11020 π (d) 3036 π

Q.693. A solid right circular cone is cut into two parts by a plane parallel to its base and at a point one-third vertically below its vertex. What is the ratio of the volume of the smaller cone to that of the whole cone ?
SSC MTS 20/10/2021 (Evening)
(a) $\frac{1}{9}$ (b) $\frac{1}{8}$ (c) $\frac{1}{27}$ (d) $\frac{1}{3}$

Q.694. A horse racecourse is in the form of an annular ring whose outer and inner circumferences are 748 m and 396 m, respectively. The width (in m) of the racecourse is: (π = $\frac{22}{7}$)
SSC MTS 22/10/2021 (Morning)
(a) 176 (b) 88 (c) 56 (d) 28

Q.695. A hall is 18 m long and 12 m broad. If the area of the floor is equal to the sum of the areas of the four walls, the volume (in m^3) of the hall is:
SSC MTS 22/10/2021 (Evening)
(a) 876.2 (b) 777.6 (c) 576.4 (d) 675.5

Q.696. The area of a triangular field with sides 60 m, 175 m and 185 m is equal to that of a rectangular park whose sides are in the ratio of 21 : 10. The perimeter (in m) of the park is:

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC MTS 26/10/2021 (Afternoon)
(a) 341 (b) 403 (c) 372 (d) 310

Q.697. A circular wire of diameter 56 cm is folded in the shape of a rectangle whose sides are in the ratio 7 : 4. The area enclosed by the rectangle is:
SSC MTS 26/10/2021 (Evening)
(a) 1842 (b) 1792 (c) 1684 (d) 1782

Q.698. A solid metallic toy has a hemispherical base with radius 3.5 cm surmounted by a cone. If the height of the cone is the same as the radius of its base, then the volume of metal used in cm^3
SSC MTS 27/10/2021 (Morning)
(a) $89\frac{2}{3}$ (b) $144\frac{3}{4}$ (c) $134\frac{3}{4}$ (d) $179\frac{2}{3}$

Q.699. A bucket in the shape of the frustum of a cone has its top and bottom radii as 20 cm and 10 cm, respectively. The depth of the bucket is 24 cm. The capacity of the bucket (in cm^3) is :
($\pi = \frac{22}{7}$)
SSC MTS 02/11/2021 (Morning)
(a) 8800 cm^3 (b) 13200 cm^3
(c) 17000 cm^3 (d) 17600 cm^3

Q.700. A rectangle of dimension 10 cm and 5 cm is placed adjacent to another rectangle of the same size to draw an L shape figure. Find the perimeter of the shape so formed.
SSC MTS 02/11/2021 (Morning)
(a) 100 (b) 40 (c) 50 (d) 60

Q.701. The total surface area of a hemisphere is nearly equal to that of an equilateral triangle. The side of the triangle is how many times (approximately) of the radius of the hemisphere?
SSC MTS 02/11/2021 (Evening)
(a) $(\frac{8\pi}{\sqrt{3}})^{0.5}$ (b) $(\frac{4\pi}{3})^{0.5}$
(c) $(2\pi\sqrt{3})^{0.5}$ (d) $(4\pi\sqrt{3})^{0.5}$

Q.702. When a rectangle is divided into three equal parts, each of them turns out to be a square of 16 cm^2 What is the perimeter (in cm) of the rectangle?
SSC MTS 02/11/2021 (Evening)
(a) 64 (b) 16 (c) 32 (d) 48

Q.703. The area (in cm^2) of a sector of a circle of radius 2 cm is $\frac{4\pi}{5}$. What is the central angle (in degrees) of the sector?
SSC MTS 02/11/2021 (Evening)
(a) 60 (b) 75 (c) 36 (d) 72

SSC CGL 2020 Tier - 1

Q.704. A heap of wheat is in the form of a cone whose base diameter is 8.4 m and height is 1.75 m. The heap is to be covered by canvas. What is the area (in m^2) of the canvas required ? ($\pi = \frac{22}{7}$)
SSC CGL 16/08/2021 (Afternoon)
(a) 60.06 (b) 115.05 (c) 63.6 (d) 115.5

Q.705. The area of the square shaped field is 1764 m². The breadth of a rectangular park is 1/3rd the side of the square field and its length is two times its breadth. What is the cost (in Rs.) of leveling the park at Rs.15 per m² ?
SSC CGL 16/08/2021 (Evening)
(a) 4200 (b) 4290 (c) 5880 (d) 4320

Q.706. The volume of a wall whose height is 10 times its width and whose length is 8 times its height, is 51.2 m³. What is the cost (in Rs.) of painting the wall on one side at the rate of Rs.100/m² ?
SSC CGL 20/08/2021 (Afternoon)
(a) 12750 (b) 12500 (c) 12800 (d) 12250

Q.707. A square has the perimeter equal to the circumference of a circle having radius 7 cm. What is the ratio of the area of the circle to the area of the square?
SSC CGL 23/08/2021 (Afternoon)
(a) 7 : 2 (b) 14 : 11 (c) 7 : 11 (d) 121 : 44

Q.708. The area of the circular path enclosed by two concentric circles is 3080 m^2. If the difference between the radius of the outer edge and that of the inner edge of the circular path is 10m, what is the sum (in m) of the two radii?
SSC CGL 23/08/2021 (Afternoon)
(a) 70 (b) 112 (c) 98 (d) 84

SSC CHSL 2020 Tier - 1

Q.709. One diagonal of a rhombus is $8\sqrt{3}\ cm$. If the other diagonal is equal to its side, then the area of rhombus is:
SSC CHSL 12/04/2021 (Morning)
(a) $12\sqrt{3}$ (b) $24\sqrt{3}$ (c) $16\sqrt{3}$ (d) $32\sqrt{3}$

Q.710. What is the perimeter of a right-angled triangle whose sides (maki- - ng 90°) are $20\sqrt{3}\ cm$ and $15\sqrt{3}\ cm$?
SSC CHSL 13/04/2021 (Morning)
(a) $60\sqrt{3}$ (b) $55\sqrt{3}$ (c) $65\sqrt{3}$ (d) $50\sqrt{3}$

Q.711. The perimeter of an isosceles triangle is 91 cm and its base is $1\frac{1}{4}$ times each of its equal sides. What is the length of its base ? (in cm)
SSC CHSL 16/04/2021 (Morning)
(a) 35 (b) 20 (c) 25 (d) 28

Q.712. The lengths of three sides of a triangle are in the ratio 3:4:5. Among three sides, the difference between the largest side and the smallest side of this triangle is 3.6 cm. The area of this triangle is:
SSC CHSL 16/04/2021 (Evening)
(a) 19.44 (b) 32.4 (c) 21.75 (d) 15.64

Q.713. One - quarter of a circular pizza of diameter 28 cm was removed from the whole pizza. What is the perimeter (in cm) of the remaining pizza? ($\pi = \frac{22}{7}$)
SSC CHSL 04/08/2021 (Morning)
(a) 88 (b) 94 (c) 80 (d) 66

Q.714. From a rectangle sheet of dimensions 32cm × 18 cm, a square of side 3 cm is cut from the four corners of the sheet and a box is made. The volume of the box is:
SSC CHSL 05/08/2021 (Afternoon)
(a) 946 (b) 936 (c) 1305 (d) 1300

Q.715. How many spherical bullets, each bullet being 7 cm in diameter, can be made out of a cube of lead whose edge measures 77 cm? ($\pi = \frac{22}{7}$)
SSC CHSL 05/08/2021 (Evening)
(a) 1452 (b) 4521 (c) 2451 (d) 2541

Q.716. The base of a triangle is equal to the perimeter of a square whose diagonal is $7\sqrt{2}$cm and its height is equal to the side of a square whose area is 169 cm^2. The area(in cm^2) of the triangle is :
SSC CHSL 06/08/2021 (Afternoon)
(a) 182 (b) 175 (c) 156 (d) 130

Q.717. The perimeter of a rectangle is 86 cm. The measures of its area and breadth are in the ratio of 9 : 1, respectively. The breadth of the rectangle is:
SSC CHSL 11/08/2021 (Evening)
(a) 32 cm (b) 34 cm (c) 36 cm (d) 30 cm

Q.718. The square of the diagonal of a cube is 2175 cm^2. What is the total surface area (in cm^2) of the cube?
SSC CHSL 12/08/2021 (Afternoon)
(a) 4305 (b) 4272 (c) 4530 (d) 4350

SSC CPO 2020 Tier - 1

Q.719. The sides of a triangle are 24cm, 26cm and 10cm. At each of its vertices, circles of radius 4.2 cm are drawn. What is the area (in cm^2) of the triangle, excluding the portion covered by the sectors of the circle ?
SSC CPO 23/11/2020 (Morning)
(a) 27.72 (b) 120 (c) 105.86 (d) 92.28

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.720. A 9 cm solid metallic cube and a solid metallic cuboid having dimensions 5 cm, 13cm, 31cm are melted and recast into a single cube. What is the total surface area(in cm^2) of the new cube?
SSC CPO 23/11/2020 (Evening)
(a) 2744 (b) 1362 (c) 865 (d) 1176

Q.721. A rectangular lawn whose length is twice of its breadth is extended by having four semi-circular portions on its sides. What is the total cost (in Rs.) of levelling the entire lawn at the rate of Rs.100 per square metre if the smaller side of the rectangular lawn is 12 m :
SSC CPO 23/11/2020 (Evening)
(a) 85,320 (b) 86,540
(c) 78,650 (d) 97,625

Q.722. A 9 cm solid metallic cube and a solid metallic cuboid having dimensions 5 cm, 13cm, 31cm are melted and recast into a single cube. How much (in Rs.) is the cost to polish the new cube at the rate of Rs.10 per cm^2
SSC CPO 24/11/2020 (Morning)
(a) 13,620 (b) 11,760 (c) 8,650 (d) 27,440

Q.723. A hexagon is $1944\sqrt{3}m^2$. What will be the cost (in Rs) of fencing it at the rate of Rs.11.50 per metre?
SSC CPO 24/11/2020 (Morning)
(a) 2,256 (b) 2,785 (c) 3,200 (d) 2,484

Q.724. The base of a triangle is equal to the perimeter of a square whose diagonal is $6\sqrt{2}$cm , and its height is equal to the side of a square whose area is 144 cm^2. The area of the triangle (in m^2)
SSC CPO 24/11/2020 (Evening)
(a) 144 (b) 216 (c) 288 (d) 72

Q.725. The perimeter of a square is half the perimeter of a rectangle. The perimeter of the square is 40m. If its breadth is two-thirds of its length, then what is the area of the rectangle ?
SSC CPO 25/11/2020 (Morning)
(a) 321 (b) 196 (c) 400 (d) 384

Answer Key :-

1.(b)	2.(c)	3.(d)	4.(b)
5.(b)	6.(a)	7.(d)	8.(d)
9.(b)	10.(c)	11.(c)	12.(a)
13.(b)	14.(d)	15.(d)	16.(a)
17.(d)	18.(b)	19.(b)	20.(b)
21.(a)	22.(c)	23.(c)	24.(b)
25.(d)	26.(a)	27.(d)	28.(a)
29.(a)	30.(a)	31.(c)	32.(c)
33.(b)	34.(b)	35.(c)	36.(d)
37.(b)	38.(c)	39.(a)	40.(b)
41.(c)	42.(d)	43.(b)	44.(d)
45.(a)	46.(a)	47.(d)	48.(d)
49.(b)	50.(c)	51.(c)	52.(a)
53.(d)	54.(c)	55.(a)	56.(c)
57.(b)	58.(c)	59.(d)	60.(c)
61.(b)	62.(c)	63.(c)	64.(d)
65.(b)	66.(d)	67.(b)	68.(d)
69.(d)	70.(a)	71.(c)	72.(d)
73.(b)	74.(d)	75.(d)	76.(c)
77.(a)	78.(a)	79.(d)	80.(c)
81.(b)	82.(b)	83.(b)	84.(c)
85.(a)	86.(c)	87.(d)	88.(a)
89.(a)	90.(a)	91.(d)	92.(a)
93.(d)	94.(c)	95.(a)	96.(b)
97.(b)	98.(b)	99.(a)	100.(c)
101.(d)	102.(a)	103.(c)	104.(b)
105.(d)	106.(c)	107.(a)	108.(c)
109.(b)	110.(c)	111.(c)	112.(c)
113.(b)	114.(a)	115.(b)	116.(d)
117.(b)	118.(d)	119.(a)	120.(b)
121.(b)	122.(a)	123.(a)	124.(a)
125.(b)	126.(a)	127.(d)	128.(b)
129.(a)	130.(b)	131.(a)	132.(b)
133.(b)	134.(c)	135.(b)	136.(c)
137.(c)	138.(c)	139.(b)	140.(b)
141.(d)	142.(b)	143.(b)	144.(a)
145.(a)	146.(a)	147.(a)	148.(b)
149.(b)	150.(c)	151.(d)	152.(b)
153.(b)	154.(d)	155.(b)	156.(d)
157.(a)	158.(b)	159.(d)	160.(b)
161.(d)	162.(b)	163.(b)	164.(b)
165.(b)	166.(c)	167.(a)	168.(a)
169.(d)	170.(d)	171.(c)	172.(b)
173.(a)	174.(b)	175.(b)	176.(c)
177.(d)	178.(a)	179.(a)	180.(a)
181.(d)	182.(d)	183.(d)	184.(c)
185.(c)	186.(b)	187.(d)	188.(d)
189.(b)	190.(a)	191.(d)	192.(b)
193.(c)	194.(b)	195.(b)	196.(d)
197.(c)	198.(d)	199.(b)	200.(b)
201.(a)	202.(d)	203.(b)	204.(b)
205.(b)	206.(d)	207.(b)	208.(c)
209.(a)	210.(b)	211.(d)	212.(b)
213.(d)	214.(a)	215.(d)	216.(d)
217.(c)	218.(a)	219.(b)	220.(c)
221.(c)	222.(c)	223.(c)	224.(b)
225.(c)	226.(d)	227.(b)	228.(b)
229.(c)	230.(a)	231.(a)	232.(b)
233.(d)	234.(a)	235.(c)	236.(b)
237.(a)	238.(c)	239.(a)	240.(d)
241.(b)	242.(d)	243.(d)	244.(b)
245.(c)	246.(a)	247.(b)	248.(a)
249.(b)	250.(c)	251.(c)	252.(a)
253.(c)	254.(a)	255.(b)	256.(a)
257.(d)	258.(b)	259.(b)	260.(a)
261.(a)	262.(d)	263.(d)	264.(c)
265.(b)	266.(d)	267.(d)	268.(d)
269.(a)	270.(c)	271.(b)	272.(d)
273.(d)	274.(c)	275.(c)	276.(c)
277.(c)	278.(c)	279.(c)	280.(b)
281.(a)	282.(b)	283.(b)	284.(b)
285.(a)	286.(d)	287.(a)	288.(c)
289.(b)	290.(d)	291.(d)	292.(c)
293.(a)	294.(d)	295.(b)	296.(d)
297.(b)	298.(a)	299.(d)	300.(a)
301.(b)	302.(b)	303.(a)	304.(d)
305.(c)	306.(c)	307.(d)	308.(d)
309.(c)	310.(c)	311.(a)	312.(c)
313.(c)	314.(b)	315.(a)	316.(d)
317.(a)	318.(b)	319.(b)	320.(c)
321.(a)	322.(a)	323.(d)	324.(a)
325.(c)	326.(c)	327.(c)	328.(b)
329.(c)	330.(b)	331.(a)	332.(a)
333.(d)	334.(b)	335.(d)	336.(c)
337.(d)	338.(b)	339.(c)	340.(b)
341.(b)	342.(b)	343.(d)	344.(d)
345.(c)	346.(a)	347.(b)	348.(c)
349.(a)	350.(b)	351.(d)	352.(c)
353.(a)	354.(c)	355.(d)	356.(d)
357.(d)	358.(d)	359.(d)	360.(c)
361.(c)	362.(b)	363.(c)	364.(b)
365.(c)	366.(c)	367.(c)	368.(c)
369.(a)	370.(b)	371.(b)	372.(c)
373.(a)	374.(a)	375.(d)	376.(a)
377.(b)	378.(a)	379.(d)	380.(c)
381.(a)	382.(d)	383.(a)	384.(a)
385.(d)	386.(d)	387.(d)	388.(a)
389.(d)	390.(a)	391.(d)	392.(b)
393.(a)	394.(a)	395.(a)	396.(c)
397.(a)	398.(b)	399.(b)	400.(a)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

401.(a)	402.(d)	403.(a)	404.(a)
405.(b)	406.(d)	407.(b)	408.(b)
409.(a)	410.(d)	411.(d)	412.(b)
413.(c)	414.(d)	415.(a)	416.(c)
417.(d)	418.(c)	419.(c)	420.(c)
421.(b)	422.(c)	423.(c)	424.(a)
425.(a)	426.(a)	427.(a)	428.(c)
429.(a)	430.(c)	431.(d)	432.(c)
433.(a)	434.(b)	435.(b)	436.(a)
437.(c)	438.(a)	439.(d)	440.(d)
441.(c)	442.(b)	443.(b)	444.(c)
445.(a)	446.(a)	447.(b)	448.(b)
449.(b)	450.(a)	451.(c)	452.(b)
453.(a)	454.(c)	455.(c)	456.(d)
457.(c)	458.(a)	459.(c)	460.(b)
461.(c)	462.(b)	463.(d)	464.(d)
465.(c)	466.(a)	467.(b)	468.(c)
469.(c)	470.(c)	471.(c)	472.(d)
473.(d)	474.(d)	475.(d)	476.(c)
477.(b)	478.(a)	479.(c)	480.(a)
481.(d)	482.(b)	483.(b)	484.(a)
485.(a)	486.(b)	487.(b)	488.(c)
489.(d)	490.(a)	491.(d)	492.(d)
493.(b)	494.(d)	495.(a)	496.(c)
497.(c)	498.(a)	499.(a)	500.(d)
501.(a)	502.(c)	503.(a)	504.(c)
505.(b)	506.(c)	507.(c)	508.(b)
509.(b)	510.(c)	511.(d)	512.(c)
513.(c)	514.(d)	515.(c)	516.(b)
517.(d)	518.(a)	519.(a)	520.(a)
521.(d)	522.(b)	523.(d)	524.(d)
525.(a)	526.(a)	527.(b)	528.(b)
529.(c)	530.(c)	531.(d)	532.(b)
533.(d)	534.(c)	535.(a)	536.(c)
537.(a)	538.(b)	539.(d)	540.(a)
541.(d)	542.(b)	543.(d)	544.(a)
545.(b)	546.(b)	547.(c)	548.(a)
549.(b)	550.(b)	551.(c)	552.(c)
553.(d)	554.(a)	555.(c)	556.(a)
557.(d)	558.(d)	559.(d)	560.(c)
561.(c)	562.(d)	563.(d)	564.(c)
565.(c)	566.(b)	567.(d)	568.(c)
569.(c)	570.(c)	571.(c)	572.(d)
573.(a)	574.(d)	575.(d)	576.(c)
577.(b)	578.(d)	579.(b)	580.(b)
581.(a)	582.(c)	583.(c)	584.(a)

585.(d)	586.(a)	587.(a)	588.(d)
589.(d)	590.(a)	591.(c)	592.(d)
593.(b)	594.(b)	595.(a)	596.(d)
597.(c)	598.(c)	599.(c)	600.(d)
601.(c)	602.(c)	603.(c)	604.(b)
605.(d)	606.(a)	607.(c)	608.(d)
609.(d)	610.(a)	611.(c)	612.(a)
613.(c)	614.(c)	615.(a)	616.(c)
617.(c)	618.(b)	619.(c)	620.(b)
621.(a)	622.(b)	623.(a)	624.(d)
625.(a)	626.(b)	627.(a)	628.(c)
629.(b)	630.(c)	631.(b)	632.(a)
633.(c)	634.(d)	635.(d)	636.(d)
637.(d)	638.(d)	639.(c)	640.(d)
641.(d)	642.(c)	643.(b)	644.(b)
645.(c)	646.(a)	647.(b)	648.(b)
649.(c)	650.(c)	651.(b)	652.(a)
653.(b)	654.(c)	655.(c)	656.(b)
657.(d)	658.(c)	659.(c)	660.(c)
661.(d)	662.(b)	663.(c)	664.(b)
665.(b)	666.(a)	667.(a)	668.(b)
669.(c)	670.(b)	671.(a)	672.(b)
673.(c)	674.(b)	675.(a)	676.(a)
677.(c)	678.(d)	679.(d)	680.(c)
681.(c)	682.(c)	683.(d)	684.(d)
685.(d)	686.(d)	687.(b)	688.(c)
689.(b)	690.(d)	691.(c)	692.(a)
693.(c)	694.(c)	695.(b)	696.(d)
697.(b)	698.(c)	699.(d)	700.(c)
701.(d)	702.(c)	703.(d)	704.(a)
705.(c)	706.(c)	707.(b)	708.(c)
709.(d)	710.(a)	711.(a)	712.(a)
713.(b)	714.(b)	715.(d)	716.(a)
717.(b)	718.(d)	719.(d)	720.(d)
721.(a)	722.(b)	723.(d)	724.(a)
725.(d)			

Solutions :-

Sol.1.(b) Let the arc length be l

According to the question,

$l = \frac{2\pi r}{2} \Rightarrow l = \pi r$

We know that,

$\Rightarrow$ Area of a circle $= \frac{1}{2} \times r \times l$

$\Rightarrow \pi r^2 \times \frac{\theta}{360°} = \frac{1}{2} \times r \times \pi r$

$\Rightarrow \theta = \frac{360°}{2} = 180°$

Sol.2.(c) Area of circle $= \frac{\theta}{360} \times \pi r^2$

$= 209 \Rightarrow \frac{\theta}{360} = \frac{209}{\pi r^2}$

And perimeter of sector

$= \frac{\theta}{360} \times 2\pi r + 2r = 63 \Rightarrow \frac{\theta}{360}$

$= \frac{63 - 2r}{2\pi r}$

On equating both:

$\frac{209}{\pi r^2} = \frac{63 - 2r}{2\pi r} \Rightarrow \frac{209}{r} = \frac{63 - 2r}{2}$

$418 = 63r - 2r^2 \Rightarrow 2r^2 - 63r + 418 = 0$

$2r^2 - 44r - 19r + 418 = 0$

$2r(r - 22r) - 19(r - 22) = 0$

$(r - 22)(2r - 19) \Rightarrow r = 22$ or $\frac{19}{2}$

Now

perimeter of sector $= \frac{\theta}{360} \times 2\pi r + 2r$

$63 = \frac{\theta}{360} \times 2 \times \frac{22}{7} \times 22 + 44$

$\Rightarrow \theta = 49.5°$

Sol.3.(d) Area of square $= (side)^2$

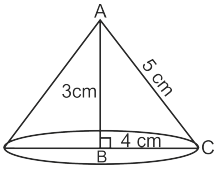
$= 16x^2 + 40x + 25 = (4x + 5)^2$

$\Rightarrow$ Side of square $= (4x + 5)$

$\Rightarrow$ Perimeter of square $= 4 \times (4x + 5)$

$= 2(8x + 10)$

Sol.4.(b)



Volume of the cone $= \frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \pi \times 4 \times 4 \times 3 = 16\pi \text{ cm}^3$

Sol.5.(b)

Perimeter of sector $= 2r + \frac{\theta}{360} \times 2\pi r$

$\Rightarrow 2r + \frac{\theta}{360} \times 2\pi r = \frac{64}{3}$

$\Rightarrow 2r + \frac{1}{6} \times 2 \times \frac{22}{7} \times r = \frac{64}{3}$

$\Rightarrow 42r + 22r = 64 \times 7$

$\Rightarrow 64r = 64 \times 7 \Rightarrow r = 7$

Now,

$2r + l = \frac{64}{3}$ (given)

$\Rightarrow 2 \times 7 + l = \frac{64}{3} \Rightarrow l = \frac{64}{3} - 14 = \frac{22}{3}$

Hence, area of sector $= \frac{1}{2} lr$

$= \frac{1}{2} \times \frac{22}{3} \times 7 = \frac{77}{3}\ cm^2$

Sol.6.(a)

New length of cuboid $= \frac{20}{2} = 10$ cm

New breadth of cuboid $= \frac{12}{2} = 6$ cm

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

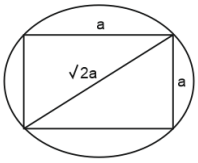
New height of cuboid = $\frac{10}{2}$ = 5 cm

TSA of all the pieces

= 8 × 2(10 × 6 + 6 × 5 + 5 × 10)

= 8 × 2(60 + 30 + 50) = 2240 cm^2

Sol.7.(d) As we know, Rectangle with the largest area cut out of the circle is square.



Area of circle = π × 5^2 = 25π square units

Diameter of circle = 5 × 2 = 10 units

Diagonal of square = $\sqrt{2}$a = 10

⇒ a = $\frac{10}{\sqrt{2}}$ = $5\sqrt{2}$ unit

Area of square = $(5\sqrt{2})^2$ = 50 square units

Area of remaining portion = Area of circle - Area of square

25π - 50 = 25(π - 2) square units

Sol.8.(d) According to the question,

CSA of the cylinder = $2\pi rh$

$2\pi rh \times \frac{350}{100} = 2\pi RH$

h : H = 6 : 7 (where radii ratio are, 3 : 1)

Volume of the cylinder = $\pi r^2 h$

Small cylinder volume = $\pi(1)^2 \times 6$

Big cylinder volume = $\pi(3)^2 \times 7$

required% = $\frac{\pi(1)^2 \times 6}{\pi(3)^2 \times 7}$ × 100 = 9.52%

Sol.9.(b)

Outer area of hemispherical bowl = 2π $(R)^2$ = 2π $(8)^2$ = 128π cm^2

Inner area of hemispherical bowl = 2π $(r)^2$

= 2π $(6)^2$ = 72π cm^2

Ring area of the top = π(R^2 - r^2)

= π(64 - 36) = 28π cm^2

Total area to polished

= 128π + 72π + 28π = 228π cm^2

Hence, cost to polish the bowl = 228π

= 228 × 50 = Rs. 11400

Sol.10.(c) Option 'c' is false

Length of an arc = $\frac{\theta}{360°}$ × 2πr

Sol.11.(c) Sum of the area of similar triangles = 706.5 × 2 = 1413 m²

$\frac{1st\ triangle's\ perimeter}{2nd\ triangle's\ perimeter}$

= $\frac{side\ of\ 1st\ triangle}{side\ of\ 2nd\ triangle}$ = $\frac{6}{11}$

$\frac{area\ of\ 1st\ triangle}{area\ of\ 2nd\ triangle}$

= $(\frac{side\ of\ 1st\ triangle}{side\ of\ 2nd\ triangle})^2 = (\frac{6}{11})^2 = \frac{36}{121}$

Sum of both triangles area = 36 + 121

= 157 units ⇒ 157 units = 1413 m²

Area of 1st triangle (36 units)

= $\frac{1413}{157}$ × 36 = 324 m²

Area of 2nd triangle (121 units)

= $\frac{1413}{157}$ × 121 = 1089 m²

Required value = $(1089 - 324) \times \frac{1}{5}$

= 153 m²

Sol.12.(a) Area of remaining area = area of square - 2 × area of semicircle

According to the question,

42 = $(2r)^2$ - 2 × $\frac{1}{2}$ × π × $(r)^2$

42 = $4r^2$ - $\frac{22}{7}$ × $(r)^2$

42 = r^2 (4 - $\frac{22}{7}$) ⇒ 42 = r^2 ($\frac{6}{7}$)

r^2 = 42 × $\frac{7}{6}$ = 49 ⇒ r = 7

So, diameter of each circle ($2r$) = 14 cm

Sol.13.(b) Let the radius of larger and smaller spheres $2x$ and $\frac{x}{2}$ respectively.

1st condition :- Volume of larger spheres = 125 × volume of identical spheres

$\frac{4}{3}\pi R_1^3 = 125 \times \frac{4}{3}\pi r_1^3$

$(2x)^3 = 125 \times r_1^3 \Rightarrow r_1^3 = \frac{(2x)^3}{125}$

2nd condition : -

Volume of smaller spheres = 27 × volume of identical spheres

$\frac{4}{3}\pi(R_2^3) = 27 \times \frac{4}{3}\pi r_2^3$

$\frac{4}{3}\pi(\frac{x}{2})^3 = 27 \times \frac{4}{3}\pi r_2^3 \Rightarrow r_2^3 = \frac{(\frac{x}{2})^3}{27}$

Ratio of of the volume = $\frac{(2x)^3}{125} : \frac{(\frac{x}{2})^3}{27}$

= $\frac{(2x)^3}{125} : \frac{(x)^3}{27 \times 8}$ = 1728 : 125

According to question

$\frac{1}{m} = \frac{1728}{125}$

Hence the value of m = $\frac{125}{1728}$

Alternate method :

$\frac{\frac{volume\ of\ larger\ sphere}{125}}{\frac{volume\ of\ smaller\ sphere}{27}} = \frac{1}{m}$

$\frac{\frac{\frac{4}{3}\pi \times (2)^3}{125}}{\frac{\frac{4}{3}\pi \times (\frac{1}{2})^3}{27}} = \frac{1}{m}$

$\Rightarrow \frac{(2)^3 \times 27}{(\frac{1}{2})^3 \times 125} = \frac{1}{m}$

$\Rightarrow \frac{8 \times 27 \times 8}{125} = \frac{1}{m} \Rightarrow m = \frac{125}{1728}$

Sol.14.(d)

Case 1: When the sheet of paper is rolled along its length to form a cylinder, then the circumference of the base of the cylinder = length of the rectangular sheet height of the cylinder = breadth of the rectangular sheet.

Let radius = r and height = h = 36 cm

Circumference of base = 60 cm

$2\pi r$ = 60 cm ⇒ $r = \frac{30}{\pi}$ cm

Volume of the cylinder formed (V_1)

= $\pi r^2 h = \pi \times \frac{30}{\pi} \times \frac{30}{\pi} \times 36$..... (i) .

Case 2: When the sheet of paper is rolled along its breadth to form a cylinder, then the circumference of the base of the cylinder = the breadth of the rectangular sheet height of the cylinder = length of the rectangular sheet.

Let radius = R and height = H = 60 cm

Circumference of base = 36 cm

$2\pi R$ = 36 cm ⇒ R = $\frac{18}{\pi}$ cm

Volume of the cylinder formed (V_2)

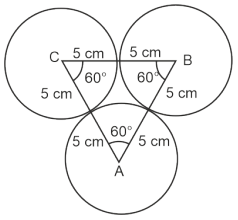
= $\pi R^2 H = \pi \times \frac{18}{\pi} \times \frac{18}{\pi} \times 60$ .....(ii)

Now,

$V_1 : V_2 = \pi \times \frac{30}{\pi} \times \frac{30}{\pi} \times 36 : \pi \times \frac{18}{\pi} \times \frac{18}{\pi} \times 60 \Rightarrow V_1 : V_2 = 5 : 3$

Thus, the ratio of the volumes of the two cylinders so formed is 5 : 3.

Sol.15.(d)



Center distance between circle = side of triangle = 2 × 5 = 10 cm

Since all sides are of 10 cm so, ΔABC is an equilateral triangle

Area subtended between three circle = area of triangle - 3 × area of sector

= $\frac{\sqrt{3}}{4} \times 10 \times 10 - 3 \times \frac{\theta}{360°} \times \pi r^2$

= $25\sqrt{3} - 3 \times \frac{60°}{360°} \times \pi \times 5 \times 5$

= $25\sqrt{3} - \frac{\pi}{2} \times 25 = 25(\sqrt{3} - \frac{\pi}{2})$

Sol.16.(a)

Circumference of Larger gear (C_1) = $2\pi R$

= $2 \times \frac{22}{7} \times \frac{21}{2}$

Circumference of smaller gear (C_2) = $2\pi r$

= $2 \times \frac{22}{7} \times \frac{15}{2}$

$C_1 : C_2$ = 7 : 5

Ratio → Larger : Smaller

Circumference → 7 : 5

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Revolution → 5 : 7
7 unit = 105 revolution
5 unit = $\frac{105}{7} \times 5 = 75$
Hence, larger gear has 75 revolutions.

Sol.17.(d) Volume of cylinder = $\pi r^2 h$
$= \frac{22}{7} \times 7 \times 7 \times 12 = 1848\ cm^3$
Let the two new recast cones volume be x and $2x$
So,
$\Rightarrow 3x = 1848$
$\Rightarrow x = 616\ cm^3$ and $2x = 1232\ cm^3$
According to question,
$$\Rightarrow \frac{616}{1232} = \frac{\frac{1}{3}\pi r_1^2 h}{\frac{1}{3}\pi r_2^2 h}$$
$$\Rightarrow \frac{616}{1232} = \frac{\frac{1}{3}\pi r_1^2 \times 12}{\frac{1}{3}\pi r_2^2 \times 12}$$
$$\Rightarrow \frac{r_1^2}{r_2^2} = \frac{1}{2} \Rightarrow r_1 : r_2 = 1 : \sqrt{2}$$
Now, $\Rightarrow \pi r_1^2 : \pi r_2^2 = 1 : 2$
Required percentage = $\frac{2-1}{2} \times 100$
= 50%

Sol.18.(b) Volume of cubes = $8^3 + 10^3 + 12^3 = 512 + 1000 + 1728 = 3240 cm^3$
Remaining volume of cube
$= 3240 - 496 = 2744\ cm^3$
$a^3 = 2744 \Rightarrow a = 14$ cm
Area of whole surface of the newly formed cube $(6a^2)$
$= 6 \times 14 \times 14 = 1176\ cm^2$

Sol.19.(b)
Semiperimeter = $\frac{2(x+y)}{2} = x + y = 12$
Area of rectangle = 28
xy = 28
Now, $(x + y)^2 = x^2 + y^2 + (xy + xy)$
$(x + y)^2 - xy = x^2 + y^2 + xy$
$12^2 - 28 = x^2 + y^2 + xy$
$116 = x^2 + y^2 + xy$
Again, $(x + y)^2 = x^2 + y^2 + (3xy - xy)$
$(x + y)^2 - 3xy = x^2 + y^2 - xy$
$12^2 - 28 \times 3 = x^2 + y^2 - xy$
$60 = x^2 + y^2 - xy$
then, $x^4 + x^2y^2 + y^4 = (x^2 + y^2 + xy)(x^2 + y^2 - xy) = 116 \times 60 = 6960$

Sol.20.(b) Lateral surface area = 120 cm^2
Lateral surface area of prism = perimeter of base × height
120 = 3 × 4 × height ⇒ Height = 10 cm
Now,
volume of prism = area of base × height
$= \frac{\sqrt{3}}{4} \times 4 \times 4 \times 10 = 40\sqrt{3}\ cm^3$

Sol.21.(a) According to the question,
Let the number of ice pieces be n
Volume of spherical ice pieces × n
= volume of cylindrical container
$\frac{4}{3} \times \frac{22}{7} \times 3^3 \times n = \frac{22}{7} \times 9^2 \times 40$
n = 90

Sol.22.(c) According to the question,
Volume of hemispherical container
= volume of cylindrical bottles
Let the number of bottles = x
$\frac{2}{3}\pi r^3 = \pi r^2 h \times x$
$= \frac{2}{3} \times 18 \times 18 \times 18 = 3 \times 3 \times 6 \times x$
(Number of bottles) $x = 72$

Sol.23.(c) H.C.F of 90 and 126 = 18
Largest possible side of the tiles
= 18 feet
Area of tiles = 18 × 18 = 324 feet^2

Sol.24.(b)
Volume of frustum = $\frac{\pi H}{3}(R^2 + r^2 + Rr)$
$= \frac{22 \times 45}{7 \times 3}(28^2 + 7^2 + 28 \times 7)$
$= \frac{22 \times 45}{7 \times 3} \times 1029 = 48510$
Now,
Volume of cylinder = Volume of frustum
$\frac{22}{7} \times 3x \times 3x \times 5x = 48510$
$x^3 = 343 \Rightarrow x = 7$
So, curved surface area of cylinder
= 2πrh
$= 2 \times \frac{22}{7} \times 21 \times 35 = 4620\ cm^2$

Sol.25.(d) Area of square = Base^2
Area of rhombus = Base^2 × $\sin\theta$(θ=angle between the sides)
The ratio of area of the square to the area of rhombus = $\frac{1}{\sin 45} = \sqrt{2} : 1$

Sol.26.(a) Volume of the wood Required
= (Total volume – inner volume)
(10 × 8 × 6) – [(10 – 1) × (8 – 1) × (6 –1)]
= 480 – 315 = 165 cm^3

Sol.27.(d) According to the question,
Weight ∝ (density × volume)
Volume = $k \times \frac{weight}{density}$

Ratio	- 1st cube	:	2nd cube
Density -	27	:	16
Weight -	4	:	1

Volume - $\frac{4}{27} : \frac{1}{16} \rightarrow 64 : 27$
Side = $\sqrt[3]{64} : \sqrt[3]{27} \rightarrow 4 : 3$

Sol.28.(a) According to the question,
weight = radii^2 × thickness
Ratio of weight = 4 : 1
Ratio of thickness = 16 : 9
Ratio of their radii = $\sqrt{\frac{4}{16}} : \sqrt{\frac{1}{9}}$
$= \frac{2}{4} : \frac{1}{3} = 3 : 2$

Sol.29.(a) Circumference of dome (2πr)
= 154 cm ⇒ $r = 154 \times \frac{7}{44} = 24.5$ cm
Curved surface area of hemispherical dome = $2 \times \frac{22}{7} \times 24.5 \times 24.5$
Required cost = $\frac{2 \times 22 \times 24.5 \times 24.5}{7 \times 100} \times 4$
$= \frac{2 \times 22 \times 3.5 \times 24.5}{25} = 150.92$ ₹

Sol.30.(a) Area of sector = $\frac{\theta}{360°} \times \pi r^2$
$616\ cm^2 = \frac{10°}{360°} \times \frac{22}{7} \times r^2$
$r^2 = \frac{616 \times 36 \times 7}{22} = 28 \times 36 \times 7$
$r = 84$ cm

Sol.31.(c) Volume of cone
$= \frac{1}{3} \times \frac{22}{7} \times \frac{7}{4} \times \frac{7}{4} \times \frac{7}{2}$
$= \frac{11 \times 7 \times 7}{3 \times 16} = \frac{539}{48} = 11.23\ cm^3$

Sol.32.(c)
Total surface area of cylinder = 2πr(h + r)
$6336 = 2 \times \frac{22}{7} \times r \times 42$
$r = \frac{6336}{22 \times 12} = 24$ m
Curved surface area of cylinder = 2πrh
$= 2 \times \frac{22}{7} \times 24 \times 18 = 2715.43\ m^2$

Sol.33.(b)
Let the side of cubes is $3x, 4x, 5x$
Side of newly formed cube = $\frac{diagonal}{\sqrt{3}}$
Side of newly formed cube = $\frac{18\sqrt{3}}{\sqrt{3}} = 18$
Equating the volume of cubes :-
$(3x)^3 + (4x)^3 + (5x)^3 = 18 \times 18 \times 18$
$x^3 = \frac{18 \times 18 \times 18}{216} = 27 \Rightarrow x = 3$
Sides are :- 9, 12 and 15

Sol.34.(b)
Perimeter of equilateral angle triangle= 3a
Area of equilateral angle triangle = $\frac{\sqrt{3}}{4} a^2$
According to question , a = $\sqrt[4]{\frac{16}{3}}$
Therefore, required area = $\frac{\sqrt{3}}{4} \times (\sqrt[4]{\frac{16}{3}})^2$
$= \frac{\sqrt{3}}{4} \times \frac{4}{\sqrt{3}} = 1\ unit^2$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.35.(c)

Curved surface area of hemisphere = $2\pi r^2$

Cost for green colour =

3 × (2 × 3.14 × 4 × 4) = 301.44 Rs.

Cost for red colour

= $3 \times (2 \times 3.14 \times 4 \times 4)$ = 301.44 Rs.

Area of two bases = $\pi r^2 + \pi r^2 = 2\pi r^2$

= $(2 \times 3.14 \times 4 \times 4)$ = 100.48

The cost of painting with blue

= 2×100.48 = 200.96 Rs.

Total cost = 301.44 + 301.44 + 200.96

= 803.84 Rs.

Sol.36.(d)

Total surface area of cube = $(6a^2)$

= $6 \times 5^2 = 150\ cm^2$

Increased area = $6 \times 5\ cm^2 - 6 \times 1\ cm^2$

= $24\ cm^2$

Total increased surface area = 150 + 24

= $174\ cm^2$

Sol.37.(b)

Volume of Prism = Area of Base × Height

Volume of Pyramid

= $\frac{1}{3}$ × Area of Base × Height

Required ratio

⇒ Volume of Prism : Volume of Pyramid

= 3 : 1

Sol.38.(c) ATQ, CSA of cone = total area of rectangular cloth

$\frac{22}{7} \times \frac{14}{2} \times 9 = 2 \times$ (length of cloth)

⇒ $198 = 2 \times l \Rightarrow l = \frac{198}{2}$ = 99 m

Sol.39.(a) Angle covered in 45 minutes by minute hand = $\frac{360}{60} \times 45 = 270°$

Required area = $\frac{270°}{360°} \times \frac{22}{7} \times 20 \times 20$

= $\frac{6600}{7}\ cm^2$

Sol.40.(b) External radius (R) = 10 cm

Internal radius (r) = 9 cm and

length (h) = 12 cm

Total surface area of hollow cylinder pipe

= $2\pi(R + r)\{h + R - r\}$

= $2 \times \frac{22}{7} \times 19 \times 13$

= $\frac{44 \times 247}{7}$ = 1552.57 cm^2

Sol.41.(c) Let the length of rectangle is 'l' and breadth of rectangle is 'b'

Area of rectangle = length × breadth = l × b

$(Area\ of\ rectangle) = (lb)$ .....e.q .(1)

According to question,

$(Area\ of\ resulting\ square)$

= (l - 4) × (b + 2) .....e.q .(2)

Side of square are equal, so

l - 4 = b + 2 ⇒ l - b = 6 .....e.q .(3)

Equating e.q .(1) and e.q .(2), we get

(lb) = lb + 2l - 4b - 8

l - 2b = 4 .....e.q .(4)

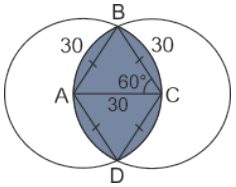
From e.q .(3) and e.q .(4), we get

b = 2, l = 8

So, Perimeter of the original rectangle

= 2(8 + 2) = 20cm

Sol.42.(d)



Area of sector ACB = $\frac{60°}{360°} \times \pi r^2 = \frac{900\pi}{6}$

Area of sector BAC = $\frac{60°}{360°} \times \pi r^2 = \frac{900\pi}{6}$

Area of equilateral triangle ABC

= $\frac{\sqrt{3}}{4} r^2 = \frac{900\sqrt{3}}{4}$

Upper shaded region = area of sector ACB + area of sector BAC - area of equilateral ΔABC

Area of total shaded region

= 2 × area of upper half shaded region

Required shaded area

= $2 \times \{\frac{900\pi}{6} + \frac{900\pi}{6} - \frac{900\sqrt{3}}{4}\}$

= $2 \times \{\frac{1800\pi}{6} - \frac{900\sqrt{3}}{4}\}$

= $(600\pi - 450\sqrt{3})\ cm^2$

Short Trick:-

Area of shaded region = $r^2(\frac{2}{3}\pi - \frac{\sqrt{3}}{2})$

Area = $900(\frac{2}{3}\pi - \frac{\sqrt{3}}{2})$

= $(600\pi - 450\sqrt{3})\ cm^2$

Sol.43.(b) Let side of the rhombus be 'a'

Perimeter of rhombus = 4a = 4P ⇒ a = P

As we know that,

$D1^2 + D2^2 = 4a^2$, $D_1 + D_2 = L$

Then, $D_1D_2 = \frac{L^2 - 4a^2}{2}$

Area of Rhombus = $\frac{1}{2} \times D_1 \times D_2$

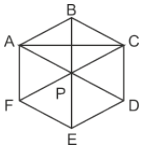
= $\frac{1}{2} \times \frac{L^2 - 4a^2}{2} = \frac{1}{4} \times (L^2 - 4P^2)$

Sol.44.(d) Volume of water flowing through the canal in 30 min

= $\frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times (18 \times \frac{5}{18}) \times (30 \times 60)$

= 3,46,500 m^3

Sol.45.(a) According to the question,



As ABCDEF is a regular hexagon,

Area of ❒ABCP = $2 \times \frac{\sqrt{3}}{4} \times (side)^2$

= $2 \times \frac{\sqrt{3}}{4} \times 36^2 = 648\sqrt{3}\ cm^2$

So, area of ΔABC = $\frac{1}{2}$ × Area of ❒ABCP

= $\frac{1}{2} \times 648\sqrt{3} = 324\sqrt{3}\ cm^2$

Sol.46.(a)

Volume of frustum = $\frac{1}{3}\pi h\ (R^2 + r^2 + Rr)$

= $\frac{1}{3}\pi \times 6\ (5^2 + 3^2 + 15)$

= $2\pi\ (25 + 9 + 15) = 98\pi\ cm^3$

Sol.47. (d) Let a = b = 2 units

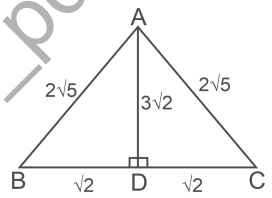
BC = $\sqrt{a^2 + b^2} = 2\sqrt{2}$ units

AB = $\sqrt{(2a)^2 + b^2} = 2\sqrt{5}$ units

AC = $\sqrt{a^2 + (2b)^2} = 2\sqrt{5}$ units

It becomes an isosceles triangle as below.

AD = $\sqrt{(2\sqrt{5})^2 - (\sqrt{2})^2} = 3\sqrt{2}$ units

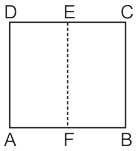


Area of triangle

= $\frac{1}{2} \times 2\sqrt{2} \times 3\sqrt{2}$ = 6 sq units

In option (d), $\frac{3}{2}ab = \frac{3}{2} \times 2 \times 2 = 6$

Sol.48.(d)



Let the side of square = a

AB = BC = CD = DA = EF = a

Perimeter of rectangle ADEF + Perimeter of rectangle BCEF = 39 + 39 = 78

AB + BC + CD + DA + EF + EF = 78

6a = 78 cm ⇒ a = 13 cm

Perimeter of Square = 4a = 52 cm

Sol.49.(b) Circumference of a circle = aπ

2πr = aπ ⇒ 2r = a

Area = bπ ⇒ πr² = bπ ⇒ b = r²

a : b = 2r : r² or 2 : r

4 : 5 = 2 : r ⇒ r = 2.5 cm

Sol.50.(c) 65 m, 72 m and 97 m are triplets of a right - angled triangle.

So area of triangular park

= $\frac{1}{2} \times 65 \times 72 = 2340$

Let sides of the rectangle be 5x and 13x .

Area of rectangle = $65x^2$

ATQ, $65x^2 = 2340$ ⇒ x = 6

Perimeter of rectangle = 2 (5x + 13x)

= 36x = 216 m

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.51.(c) Radius of bicycle = 0.42 m
Distance travelled in 25 seconds
$= 2\pi r \times 40 \Rightarrow 2 \times \frac{22}{7} \times 0.42 \times 40$
= 105.6 m
Speed of bicycle (in m/s) = $\frac{105.6}{25}$
= 4.224
Speed of bicycle (in kmph) = $4.224 \times \frac{18}{5}$
= 15.2

Sol.52.(a) Area of the square = a^2 = 169.
So, a = 13 , Perimeter = 4a = 4 × 13 = 52
Circumference of the circle = 2πr = 52
$r = \frac{7}{44} \times 52 = \frac{91}{11}$
Area = $\pi r^2 = \frac{22}{7} \times \frac{91}{11} \times \frac{91}{11}$
$= \frac{2366}{11} = 215.09 \approx 215\ cm^2$

Sol.53.(d) Slant height of the cone
= radius of the sector And $\frac{\theta}{360} \times$ perimeter of the circle
= perimeter of the base of the cone
Let the radius of cone = r
$\frac{120}{360} \times 2 \times \pi \times 10.5 = 2 \times \pi \times r$
⇒ r = 3.5
Height of the cone = $\sqrt{l^2 - r^2}$
$= \sqrt{(10.5)^2 - (3.5)^2} = 7\sqrt{2}$
Volume of the cone
$= \frac{1}{3} \times \pi \times 3.5 \times 3.5 \times 7\sqrt{2}$
$= \frac{343\sqrt{2}}{12}\pi\ cm^3$

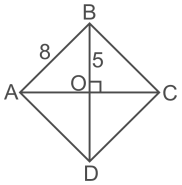
Sol.54.(c) 20, 21 and 29 are triplet pairs, clearly a given triangle is a right angle triangle.
Area of the triangle = $\frac{1}{2} \times 20 \times 21$
$= 210\ cm^2$
Volume of the prism = Base Area × Height
⇒ 7560 = 210 × Height ⇒ Height = 36
Lateral surface area of the prism
= Base perimeter × Height
$= (20 + 21 + 29) \times 36 = 2520\ cm^2$

Sol.55.(a) Let the original radius be r.
According to the question
$4\pi(r + 4)^2 = 4\pi r^2 + 464\pi$
$\Rightarrow r^2 + 16 + 8r = r^2 + 116 \Rightarrow r = 12.5$
Volume of the sphere = $\frac{4}{3}\pi r^3$
$= \frac{4}{3} \times 12.5 \times 12.5 \times 12.5 \times \pi$
$= \frac{15625}{6}\pi cm^3$

Sol.56.(c)
Volume of prism = base area × height
$1731.6 = \frac{1}{2} \times (15 + 11) \times 9 \times$ height
⇒ height = 14.8

Sol.57.(b) Let n be the number of turns.
Total length of the ribbon = number of turns × circumference of the base of cylinder l = n × c ⇒ n = $\frac{l}{c}$

Sol.58.(c)



BO = $\frac{BD}{2} = \frac{10}{2} = 5$
AO = $\frac{AC}{2} = \frac{2\sqrt{x}}{2} = \sqrt{x}$
Now, $AB^2 = AO^2 + BO^2$
$8^2 = (\sqrt{x})^2 + 5^2 \Rightarrow x = 39$
$\sqrt{x + 10} \Rightarrow \sqrt{39 + 10} = 7$ cm

Sol.59.(d) Perimeter of rhombus
$= 2\sqrt{d_1^2 + d_2^2} = 2\sqrt{14^2 + 48^2} = 100$ cm

Sol.60.(c) Circumference of the circle(C)
$= 2\pi r \Rightarrow r = \frac{C}{2\pi}$
Area of the sector (A) = $\frac{60}{360} \times \pi \times r^2$
$= \frac{1}{6} \times \pi \times (\frac{C}{2\pi})^2 \Rightarrow \frac{c^2}{24\pi}$

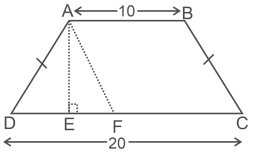
Sol.61.(b) Let the length of the perpendicular and base of the right angle triangle is a cm.
⇒ Hypotenuse of the triangle = $a\sqrt{2}$
Area of Δ formed on hypotenuse(H)
$= \frac{\sqrt{3}}{4} \times (a\sqrt{2})^2 = \frac{\sqrt{3}a^2}{2}$
Area of Δ formed on perpendicular(A)
$= \frac{\sqrt{3}a^2}{4} \Rightarrow \frac{A}{H} = \frac{\frac{\sqrt{3}a^2}{4}}{\frac{\sqrt{3}a^2}{2}} = \frac{1}{2}$

Sol.62.(c) Since it is an equilateral triangle. Each side will be formed of 4 sticks and its length will be 4 units.
Area of the equilateral triangle = $\frac{\sqrt{3}}{4}a^2$
$= \frac{\sqrt{3}}{4} \times 4 \times 4 = 4\sqrt{3}$

Sol.63.(c) % age change in the area
$= (-11) + 11 + \frac{(-11) \times (11)}{100} = -1.21\%$.
Here, - ve sign indicates that the area is decreasing.

Sol.64.(d) Let AB = a cm
AC = a + 10 ⇒ BC = 2a - 2
According to the question
a + a + 10 + 2a - 2 = 32 ⇒ 4a = 24
a = AB = 6 cm
AC = 6 + 10 = 16 cm
BC = 2(6) - 2 = 10 cm
Clearly AB is the smallest side.

Sol.65.(b)

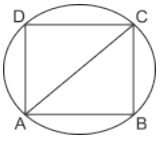


Let ABCD be the given trapezium. And AE be its height.
Area of trapezium = $\frac{1}{2} \times$ (CD + AB) AE
$180 = \frac{1}{2} \times (20 + 10)$ AE
AE = 12 cm Draw AF || BC
⇒ AB = FC = 10 cm and AF = BC
⇒ DF = DC - FC = 20 - 10 = 10 cm
In ΔADF ⇒ AF = AD ....(AD = BC, given)
DE = EF = $\frac{DF}{2}$ = 5 cm
.....(Perpendicular drawn on the base of an isosceles triangle)
$AF^2 = AE^2 + EF^2$, AF = $\sqrt{AE^2 + EF^2}$
$= \sqrt{12^2 + 5^2} = 13$
Hence AD = BC = 13cm

Sol.66.(d)
Let the breadth of the rectangle = b
Length of the rectangle (l) = b + 20
Perimeter of the rectangle = 2(b + b +20)
= 4(b + 10)
According to the question
4(b + 10) × 53 = 21200
b + 10 = 100 ⇒ b = 90 m
l = 90 + 20 = 110 m
Area of the rectangle = 90 × 110 = 9900 m^2

Sol.67.(b) Let the sides of the rectangle are 7x and 4x.
Perimeter of rectangle = 2(7x + 4x) = 22x
Perimeter of circle = $2\pi r \Rightarrow 2 \times \frac{22}{7} \times 31.5$
According to the question
$22x = 2 \times \frac{22}{7} \times 31.5 \Rightarrow x = 9$
Smaller side of rectangle = 4x
= 4 × 9 = 36 cm

Sol.68.(d)



Let the sides be 4 units and 3 units.
According to the question
2(4 unit + 3 unit) = 56
1 unit = 4 cm, 4 unit = 16 cm, 3 unit = 12 cm
Diagonal of Rectangle= Diameter of circle
$= \sqrt{AB^2 + BC^2} = \sqrt{16^2 + 12^2} = 20$ cm

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Radius of the circle = $\frac{20}{2}$ = 10 cm

Area of circle = $\pi r^2 = \pi 10^2 = 100\pi$

Sol.69.(d)
Curved Surface area of cylinder = $2\pi rh$
Volume of cylinder = $\pi r^2 h$
According to the question
$2\pi rh = 132$.....(1), $\pi r^2 h = 528$.....(2)
Dividing eq 2 by eq 1, r = 8 cm
Put r = 8 in eq (1)
$2\pi rh = 132$
$2 \times \frac{22}{7} \times 8 \times h = 132 \Rightarrow h = 2\frac{5}{8}$ m

Sol.70.(a) Area of Hexagon = $6 \times \frac{\sqrt{3}}{4}a^2$

Here, $6 \times \frac{\sqrt{3}}{4}a^2 = 2400\sqrt{3}$,

$a^2 = 1600$, a = 40
Perimeter of the hexagonal field = 6a
6 × 40 = 240 metre
Required cost of fencing = 240 × 18.5
= Rs. 4440

Sol.71.(c) One of the sides of newly formed cuboid = 6 × 2 = 12 cm
Other two sides will be 2 cm.
Surface area of cuboid = $2(lb + bh + hl)$
$= 2(12 \times 2 + 2 \times 2 + 2 \times 12) = 104\ cm^2$

Sol.72.(d) 40% = $\frac{2}{5}$

		Old	:	New
Radius	→	5	:	3
Volume($\propto r^3$)	→	125	:	27

Let the volumes are 125 unit and 27 unit
Required % = $\frac{125 - 27}{125} \times 100$ = 78.4%

Sol.73.(b) Area of triangular field with side x m = $\frac{\sqrt{3}}{4}x^2$
Area of other triangular field
$= \sqrt{s(s-a)(s-b)(s-c)}$
Where s = $\frac{a+b+c}{2}$
$\Rightarrow \frac{50+70+80}{2}$ = 100 m
Area of field =
$\sqrt{100(100-50)(100-70)(100-80)}$
$= \sqrt{100 \times 50 \times 30 \times 20} = 1000\sqrt{3}m^2$
According to question, $\frac{\sqrt{3}}{4}x^2 = 1000\sqrt{3}$
$x^2 = 4000 \Rightarrow x = 63.25\ m^2$

Sol.74.(d) Area of Sector = $\frac{\theta}{360°} \times \pi r^2$
$= \frac{150}{360} \times \frac{22}{7} \times 21^2 = 577.5\ cm^2$

Sol.75.(d) Area of circle is $\propto r^2$.
⇒ Area of three circles will be 4^2, 5^2, 7^2
Desired Ratio = $(5^2 - 4^2) : (7^2 - 5^2)$
= 9 : 24 = 3 : 8

Sol.76.(c)
Volume of a cylinder = $\pi(R^2 - r^2)h$
Where R = external radius
r = internal radius
h = height or length of the cylinder
Volume = $\frac{22}{7} \times (2.5^2 - 1.5^2) \times 756$
= 22 × (2.5 + 1.5)(2.5 - 1.5) × 108
= 9504 cm^3
Total Weight of pipe = Volume of pipe × density of metal
= 9504 × 7.5 = 71280 g or 71.28 kg

Sol.77.(a)
Volume of a cylinder = $\pi(R^2 - r^2)h$
Where R = external radius
r = internal radius
h = height or length of the cylinder
$7480 = \frac{22}{7} \times (9^2 - r^2) \times 140$
$17 = 81 - r^2 \Rightarrow r^2 = 64 \Rightarrow r = 8$ cm
Thickness = 9 - 8 = 1 cm

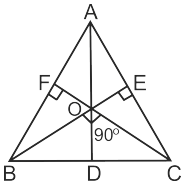
Sol.78.(a) Volume of cuboid = $\sqrt{a \times b \times c}$
Here a, b and c are the area of three faces
$= \sqrt{32 \times 24 \times 48} = 192\ cm^3$

Sol.79.(d) We know that
Inradius = $\frac{area}{semiperimeter}$
$3 = \frac{15}{semiperimeter} \Rightarrow$ Semiperimeter = 5
Perimeter = 2 × 5 = 10 cm

Sol.80.(c) Required area of sheet = Total surface area of rectangular tank - Area of circular opening
$= 2 \times (80 + 48 + 60) - \pi \times 1^2$
$= 376 - 3.1 = 372.9\ m^2$

Sol.81.(b) Let side of bigger cube = R
$R^3 = 13824 \Rightarrow R = \sqrt[3]{13824} = 24$
Let side of smaller cubes = r
$13824 = 8 \times r^3 \Rightarrow 1728 = r^3 \Rightarrow 12 = r$
Required ratio = $(6 \times 24^2) : (3 \times 6 \times 12^2)$
= 4 : 3

Sol.82.(b)



ΔOBC, OB = OC = x ⇒ BC = 2
$x^2 + x^2 = 2^2 \Rightarrow x^2 = 2 \Rightarrow x = \sqrt{2}$
In ΔOBD, BD = 1 ⇒ OB = $\sqrt{2}$
OD = $\sqrt{(\sqrt{2})^2 - 1^2} = 1$
Now, AO = 2 × OD ⇒ 2 × 1 = 2
AD = AO + OD = 3
Area of ΔABC = $\frac{1}{2} \times 3 \times 2 = 3\ cm^2$

Sol.83.(b) Volume of cubical box
$= 30 \times 30 \times 30 = 27000\ cm^3$
Required rise in water level
$= \frac{27000}{60 \times 30}$ = 15 cm

Sol.84.(c)

		Old	:	New
Length	→	10	:	13
Breadth	→	5	:	4
Area	→	50	:	52

52 - 50 = 2 unit = 100 ⇒ 1 unit = 50
New area = 52 × 50 = 2600 cm^2

Sol.85.(a) Required Cost
$= \frac{11 \times 6 \times 100}{60} \times 112.50$ = 12,375

Sol.86.(c) Remaining area
= 119 × 18 - 17× 6 = 2040
Volume of sand = 17 × 6 × 3 = 306
Required height
$= \frac{306 \times 100 \times 100 \times 100}{2040 \times 100 \times 100}$ = 15 cm

Sol.87.(d) Total area to be painted
= 40 × 30 + 2(40 × 2.2 + 30 × 2.2) = 1508
Total cost = 1508 × 25 = 37700

Sol.88.(a) Since, the height of the triangle formed will be half of the diagonal of the square.
Therefore,
Height = $\frac{3\sqrt{2}}{2} = \frac{3}{\sqrt{2}}$m

Sol.89.(a) ATQ,
$\frac{3\sqrt{3}}{2} \times a^2 = 108\sqrt{3} \Rightarrow a = 6\sqrt{2}$
∴ Perimeter = 6 × $6\sqrt{2}$ = $36\sqrt{2}$ cm

Sol.90.(a) Volume = (12 - 4) × (12- 4) × 2
= 8 × 8 × 2 = 128 cu.cm

Sol.91.(d) Given, in a right angle triangle
Hypotenuse = 25, Base = 24
Then, Height = 7
∴ Area = $\frac{1}{2} \times 24 \times 7 = 84$ cm²

Sol.92.(a)
Longest pole = $\sqrt{16^2 + 8^2 + 11^2} = 21$m

Sol.93.(d) $\frac{\sqrt{3}}{2}$ a = $10\sqrt{3}$ ⇒ a = 20
Area = $\frac{\sqrt{3}}{4}a^2$
$= \frac{\sqrt{3}}{4} \times 20 \times 20 = 100\sqrt{3}\ cm^2$

Sol.94.(c)
Required time = $\frac{66 \times 35 \times 3}{\frac{22}{7} \times \frac{35}{200} \times \frac{35}{200} \times 8}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

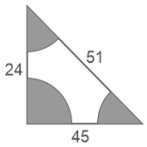
= 9000 sec = 2.5 h

Sol.95.(a)
In the given solid figures. Cuboid has the maximum no. of vertex i.e. 8.

Sol.96.(b)
Area = $20 \times (7.5 + 8.6) = 322\ cm^2$

Sol.97.(b) Since the chessboard is composed of 64 squares of side 2cm and the border is of thickness 2 cm.
Therefore, the length of each side of chessboard = 2 × 8 + 4 = 20
So, the perimeter = 4 × 20 = 80 cm

Sol.98.(b) Given triangle is a right angled triangle:



Area of triangle = $\frac{1}{2} \times 24 \times 45 = 540$
Area of all sectors of the circle covering the triangle = $\frac{180}{360} \times \frac{22}{7} \times 10.5 \times 10.5$
$= 173.25$
Therefore, Area of triangle excluding the portion covered = 540 - 173.25
= 366.75 sq .cm

Sol.99.(a) Old : New
Radius → 2^2 : 5^2
Height → 5 : 4
Volume → 20 : 100
Required % = $\frac{100-20}{20} \times 100$ = 400%

Sol.100.(c) Given: Surface area of cube $(6a^2) = 1728\ cm^2$ So, a = $12\sqrt{2}$cm
Volume of cube $(a^3) = (12\sqrt{2})^3$
= $3456\sqrt{2}\ cm^3$

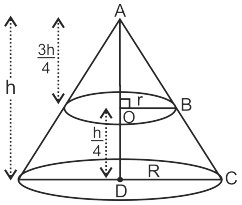
Sol.101.(d) Radius = $\frac{8}{\pi}$, Volume = 448
Volume of cylinder $(\pi r^2 h)$ = 448
⇒ $\pi \times \frac{8}{\pi} \times \frac{8}{\pi} \times h = 448$
⇒ h = $\frac{448 \times 22}{64 \times 7}$ ⇒ h = 22 cm

Sol.102.(a)
Ratio → $Sphere_1 : Sphere_2$
Volume → $\frac{4}{3}\pi(4)^3 : \frac{4}{3}\pi(5)^3$
64 : 125

Sol.103.(c) Volume of toy = Volume of hemisphere + volume of cylinder + volume of cone
= $\frac{2}{3}\pi r^3 + \pi r^2 h + \frac{1}{3}\pi r^2 h$
= $\pi r^2 [\frac{2}{3}r + h + \frac{1}{3}h]$
= $\frac{22}{7} \times 4.2 \times 4.2 [\frac{2}{3} \times 4.2 + 7 + \frac{7}{3}]$
= $22 \times 0.6 \times 4.2 \times \frac{36.4}{3}$ = $672.672\ cm^3$

Sol.104.(b)
Area of regular hexagon = $\frac{3\sqrt{3}}{2}a^2$
According to the question,
$\frac{3\sqrt{3}}{2}a^2 = 2048\sqrt{3} \Rightarrow a^2 = \frac{4096}{3}$
$a = \sqrt{\frac{4096}{3}} = \frac{64}{\sqrt{3}} = \frac{64}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$
= $\frac{64\sqrt{3}}{3}\ cm^2$

Sol.105.(d)
CSA of a cone = $\pi R l = \pi R\sqrt{R^2 + h^2}$
According to question,
Height of small cone = h - $\frac{h}{4} = \frac{3h}{4}$



ΔAOB ~ ΔADC by AAA rule
⇒ $\frac{r}{R} = \frac{\frac{3h}{4}}{h}$ ⇒ r = $\frac{3R}{4}$
CSA of a small cone = $\pi r l_1$
= $\pi r\sqrt{r^2 + (\frac{3h}{4})^2}$
= $\pi \times \frac{3R}{4} \times \sqrt{(\frac{3R}{4})^2 + (\frac{3h}{4})^2}$
= $\pi \times \frac{3R}{4} \times \frac{3}{4}\sqrt{R^2 + h^2}$
Now,
CSA of frustum = $\pi(R + r)l_2$
= $\pi \times (R + \frac{3R}{4})$
$\times \sqrt{(R - \frac{3R}{4})^2 + (\frac{h}{4})^2}$
= $\pi \times \frac{7R}{4}\sqrt{\frac{R^2 + h^2}{16}}$
= $\pi \times \frac{7R}{16} \times \sqrt{R^2 + h^2}$
So,
Required ratio → $\pi \times \frac{3R}{4} \times \frac{3}{4}\sqrt{R^2 + h^2}$
: $\pi \times \frac{7R}{16} \times \sqrt{R^2 + h^2}$ or 9 : 7

Sol.106.(c) Volume of cuboid
= 5.5 × 5 × 3.5 = 96.25 cm^3
Volume of each gold coins = $\pi r^2 h$
= $\frac{22}{7} \times (0.875)^2 \times \frac{2}{10}$ = 0.48125 cm^3
Hence, no. of gold coins = $\frac{96.25}{0.48125}$
= 200

Sol.107.(a) Total surface area of the tank = total surface area of cylinder - area of circular cut
= $2\pi r(h + R) - \pi r^2$
= $2\pi \times 5(10 + 5) - \pi (o.5)^2$
= $2\pi \times 75 - 0.25\pi = 150\pi - \frac{\pi}{4} = \frac{599\pi}{4}\ m^2$

Sol.108.(c) TSA of a cylinder = 2πr(h +r)
= $2 \times \frac{22}{7} \times 3.5\ (8 + 3.5)$
= 22 × 11.5 = 253 cm^2
According to question,
⇒ 5 cm^2 = ₹40
⇒ 253 cm^2 = $\frac{40}{5} \times 253$ = ₹ 2024

Sol.109.(b) Given,
⇒ $2\pi r$ = 264cm ⇒ r = $\frac{264 \times 7}{44}$ = 42cm
Given Bowl is half -full of beverage
∴ Volume of half -full beverage hemispherical bowl = $\frac{\frac{2}{3}\pi r^3}{2}$
Now, radius of hemispherical glasses = 3cm
According to question ,
⇒ N × volume of hemispherical glasses = Volume of half -full beverage hemispherical bowl
⇒ N = $\frac{\frac{\frac{2}{3}\pi r^3}{2}}{\frac{2}{3}\pi r^3} = \frac{21 \times 42 \times 42}{3 \times 3 \times 3}$ = 1372

Sol.110.(c) Given radius = 14cm
Area of circle = πr^2
= $\frac{22}{7} \times 14 \times 14 = 616 cm^2$
Diagonal of square ($\sqrt{2}$a) = diameter
⇒ $\sqrt{2}$a = 28 ⇒ a = $14\sqrt{2}$cm
Area of Square = $14\sqrt{2} \times 14\sqrt{2}$ = 14 × 14 × 2 = $392 cm^2$
Area of remaining portion = 616 - 392
= $224 cm^2$

Sol.111.(c) Volume of the hemisphere
= $\frac{2}{3}\pi r^3 \Rightarrow 486\pi = \frac{2}{3}\pi r^3$
⇒ 243 × 3 = r^3 ⇒ r^3 = 729 ⇒ r = 9 cm
According to question,
⇒ Radius (r) = 9 × 3 = 27 cm
CSA of a hemisphere = $2\pi r^2$
= 2 × π × 27 × 27 = 1458π cm^2

Sol.112.(c) Given , internal radius of hemispherical bowl = 15cm
Diameter and height of cylindrical shaped bottles = 5cm and 6cm
Number of bottles required to empty the bowl

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{Volume\ of\ hemispherical\ bowl}{volume\ of\ cylindrical\ shape\ bottles}$

$= \frac{\frac{2}{3}\pi r^3}{\pi r^2 h} = \frac{\frac{2}{3} \times 15 \times 15 \times 15}{\frac{5}{2} \times \frac{5}{2} \times 6} = 60$

Sol.113.(b) Volume of cone = $\frac{1}{3}\pi r^2 h$

$= \frac{1}{3}\pi \times (7)^2 \times 18 = 294\pi$ cm³

Volume of hollow sphere

$= \frac{2}{3}\pi(R^3 - r^3) = \frac{2}{3}\pi[R^3 - (20)^3]$

According to the question,

$\frac{2}{3}\pi[R^3 - (20)^3] = 294\pi$

$R^3 - (20)^3 = 441$

$R^3 = 441 + 8000 \Rightarrow R = \sqrt[3]{8441}$ cm³

Sol.114.(a) Volume of a spherical item = Volume of a shape

$\Rightarrow \frac{4}{3}\pi r^3 = \frac{1}{3}\pi r^2 H + \pi r^2 h$

$\Rightarrow \frac{4}{3} \times \frac{21}{2} \times \frac{21}{2} \times \frac{21}{2} = \frac{1}{3} \times \frac{21}{2} \times \frac{21}{2}$

$\times H + \frac{21}{2} \times \frac{21}{2} \times 7 \Rightarrow \frac{4}{3} \times \frac{21}{2} = \frac{H}{3} + 7$

$\Rightarrow 14 = \frac{H}{3} + 7 \Rightarrow H = 21$ cm

Hence, the height of the cone is 21 cm

Sol.115.(b)

Each diagonal of hexagon = 2 × side(a)

So, $a = \frac{12}{2} = 6$ cm

Now, are of hexagon = $\frac{3\sqrt{3}}{2}a^2$

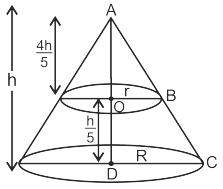
$= \frac{3\sqrt{3}}{2} \times (6)^2 = 54\sqrt{3}$ cm²

Sol.116.(d)

CSA of a cone = $\pi R l = \pi R\sqrt{R^2 + h^2}$

According to question,

Height of small cone = $h - \frac{h}{5} = \frac{4h}{5}$



ΔAOB ~ ΔADC by AAA rule

$\Rightarrow \frac{r}{R} = \frac{\frac{4h}{5}}{h}$

$\Rightarrow$ small cone radius (r) = $\frac{4R}{5}$

TSA of a small cone = CSA of smaller cone + base area of smaller cone

$\Rightarrow \pi r l_1 + \pi r^2 = \pi \times \frac{4R}{5} \times [\frac{4R}{5} + \sqrt{(\frac{4R}{5})^2 + (\frac{4h}{5})^2}] = \pi \times \frac{16R}{25}[R + \sqrt{R^2 + h^2}]$

Now, CSA of frustum = $\pi(R + r)l_2$

$= \pi \times (R + \frac{4R}{5}) \times \sqrt{(R - \frac{4R}{5})^2 + (\frac{h}{5})^2}$

$= \pi \times \frac{9R}{5}\sqrt{\frac{R^2 + h^2}{25}} = \pi \times \frac{9R}{25} \times \sqrt{R^2 + h^2}$

So, Required ratio = $\pi \times \frac{9R}{25} \times \sqrt{R^2 + h^2}$

$: \pi \times \frac{16R}{25}\left[R + \sqrt{R^2 + h^2}\right]$

$= \pi \times \frac{9R}{25} \times L : \pi \times \frac{16R}{25}[R + L]$

= 9L : 16(R + L)

Sol.117.(b) Given , Radius : Height = 8 : 15

Slant height = $\sqrt{r^2 + h^2} = \sqrt{8^2 + 15^2}$

$= \sqrt{289} = 17$cm

Sol.118.(d)

Case 1 :- along the length 28 cm

Circumference of the circle = 2πr = 28 cm

$\Rightarrow r = \frac{28}{2\pi} = \frac{14}{\pi}$ and height = 16 cm

Volume of cylinder = $\pi r^2 h = \pi(\frac{14}{\pi})^2 \times 16$

$= \frac{3136}{\pi}$ cm³

Case 2 :- along the breadth 16 cm

Circumference of the circle = 2πR = 16 cm

$\Rightarrow 16 = 2\pi R \Rightarrow r = \frac{16}{2\pi} = \frac{8}{\pi}$ and height(h) = 28 cm

Volume of cylinder = $\pi R^2 h = \pi(\frac{8}{\pi})^2 \times 28$

$= \frac{1792}{\pi}$ cm³

The ratio of the larger volume to the smaller volume $= \frac{\frac{3136}{\pi}}{\frac{1792}{\pi}} = \frac{3136}{1792} = \frac{7}{4}$

Hence, Required percentage

$= \frac{7}{4} \times 100 = 175\%$

Sol.119.(a)

1 person occupy the space = 5 m²

12 person occupy the space = 12 × 5 = 60 m²

Then,

$\Rightarrow$ Area of the circle = πr^2

$\Rightarrow 60 = \pi r^2$ .....(i)

1 person breadth the air = 20 m³

12 person breadth the air = 12 × 20 = 240 m³

Then,

$\Rightarrow$ Volume of the cone = $\frac{1}{3}\pi r^2 h$

$\Rightarrow 240 = \frac{1}{3} \times 60 \times h$ [from eq . (i)]

$\Rightarrow$ h = 12 m

Sol.120.(b) Length of capsule = 15 mm

Height of cylindrical part = $15 - (\frac{6}{2})$

= 12 mm

Now, surface area of capsule = T.S.A of cylinder + T.S.A of sphere - $2\pi r^2$

$= (2\pi r^2 + 2\pi r h) + 4\pi r^2 - 2\pi r^2$

$= 2\pi r h + 4\pi r^2$

$= 2\pi r(h + 2r) = 2 \times \frac{22}{7} \times 3 \times (3 + 12)$

$= \frac{12 \times 15 \times 11}{7} \approx 283$ mm²

Hence, surface area of capsule ≈ 283 mm²

Sol.121.(b)

Total surface area of hemisphere = $3\pi r^2$

According to the question,

$3\pi r^2 = 7392$

$r^2 = 7392 \times \frac{7}{22} \times \frac{1}{3} = 784$

Radius (r) = $\sqrt{784} = 28$

$\frac{1}{4}th$ of the hemispherical container is empty

So, total volume of oil container

$= \frac{3}{4} \times \frac{2}{3}\pi r^3 = \frac{3}{4} \times \frac{2}{3} \times \frac{22}{7} \times (28)^3$ cm³

Now, oil is to be transferred in small hemispherical bottles

Then, volume per bottle = $\frac{2}{3}\pi r^3$

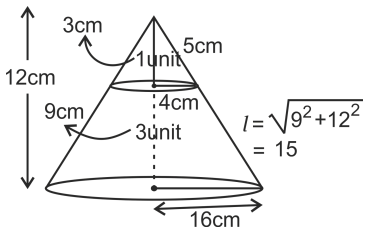
$= \frac{2}{3} \times \frac{22}{7} \times (6.3)^3$ cm³

Hence, required no. of bottles

$= \frac{\frac{3}{4} \times \frac{2}{3} \times \frac{22}{7} \times (28)^3}{\frac{2}{3} \times \frac{22}{7} \times (6.3)^3} = \frac{\frac{3}{4} \times (28)^3}{(6.3)^3}$

$= \frac{3 \times 7 \times 28 \times 28}{6.3 \times 6.3 \times 6.3} = \frac{16464}{250} \approx 66$

Sol.122.(a)



Given, radius (R) = 16 cm, height = 12 cm and ratio of height of solid =1 : 3

According to question,

Height of small cone = h_1

$= \frac{1}{4} \times H = \frac{1}{4} \times 12 = 3$ cm

Height of frustum = $h_2 = \frac{1}{4} \times H$

$= \frac{3}{4} \times 12 = 9$ cm

The section is parallel to the base, so the ratio of the radii will be equal to the ratio of the heights.

radius of small cone (r) = $\frac{h_1}{H} \times R$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{3}{12} \times 16 = 4$ cm

Slant height of small cone (l_1)

$= \sqrt{(r_1)^2 + (h_1)^2} = \sqrt{(4)^2 + (3)^2} = 5$ cm

From the question -

$l_1 : l_2 = 1:3 \Rightarrow 5 : l_2 = 1:3 \Rightarrow l_2 = 15$ cm

Thus

Slant height of the larger frustum (l_2)

= 15 cm

TSA of small cone = $\pi r_1 l_1 + \pi r_1^2$

$= \pi(4 \times 5) + \pi (4)^2 = 20\pi + 16\pi = 36\pi$

Total surface area of the larger frustum

$= \pi l_2(R + r) + \pi (R^2 + r^2)$

$= \pi \times 15 \times (20) + \pi (4^2 + 16^2)$

$= 300\pi + 272\pi = 572\pi$

Hence, Required ratio $= \frac{36\pi}{572\pi} = 9 : 143$

Sol.123.(a)

Radius(r) = 24 cm , height(h) = 7 cm

As, (7 , 24 , 25) are triplet

Then, slant height (l) = 25 cm

Area of remaining solid = C.S.A of cylinder + area of base + C.S.A. of cone

$= 2\pi rh + \pi r^2 + \pi rl$

$= \pi r (2h + r + l)$

$= \pi \times 24 (2 \times 7 + 24 + 25)$

$= \pi \times 24 \times 63 = 1512\pi\ cm^2$

Sol.124.(a)

Let side of one square = x cm

Side of another square = x + 3

According to question

$\Rightarrow x^2 + (x + 3)^2 = 225$

$\Rightarrow x^2 + x^2 + 9 + 6x = 225$

$\Rightarrow 2x^2 + 6x - 216 = 0 \Rightarrow x^2 + 3x - 108 = 0$

$\Rightarrow x^2 + 12x - 9x - 108 = 0$

$\Rightarrow x(x + 12) - 9(x + 12) = 0$

$\Rightarrow (x - 9)(x + 12) = 0$

$x = 9, -12$

∴ Sides of two square are = 9 and 12

Hence sum of the perimeter of both the square are = 4 × 9 + 4 × 12 = 84 cm

Sol.125.(b) CSA of a hemisphere = $2\pi r^2$

$308 = 2 \times \frac{22}{7} \times r^2$

$r^2 = \frac{308 \times 7}{2 \times 22} = 49 \Rightarrow r = 7$ cm

Volume of the hemisphere $= \frac{2}{3}\pi r^3$

$= \frac{2}{3} \times \frac{22}{7} \times 7 \times 7 \times 7 = 718.66$ cm³

Now,

1 cm³ = 8.7 gm

718.66 cm³ = 718.66 × 8.7 = 6252.342 gm ≈ 6252.4 gm

Sol.126.(a) Diagonal of a square who made mid point a square = $\sqrt{2}$ × side

$\Rightarrow a = \sqrt{2} \times \text{side} \Rightarrow \text{side} = \frac{a}{\sqrt{2}}$

Area of a square $= (\frac{a}{\sqrt{2}})^2 = \frac{a^2}{2}$

According to question,

Remaining area $= a^2 - \frac{a^2}{2}$

$= \frac{2a^2 - a^2}{2} = \frac{a^2}{2}$

Sol.127.(d) External radius (R) = 2.7 cm

Internal radius $(r) = 2.7 - \frac{3}{10} = 2.4$ cm

Now, Volume of pipe $= \pi(R^2 - r^2)h$

$= \frac{22}{7} \times \{(2.7)^2 - (2.4)^2\} \times 420$

$= \frac{22}{7} \times \{7.29 - 5.76\} \times 420$

$= 22 \times 1.53 \times 60 = 2019.6$ cm³

Given, 1 cm³ = 25 gram

So, 2019.6 cm³ = 25 × 2019.6

= 50490 gm = 50.49 kg

Sol.128.(b) Volume of solid sphere

$(\frac{4}{3}\pi r^3)$ = Volume of cylindrical pipe

$(\pi r^2 h) \Rightarrow \frac{4}{3} \times 15 \times 15 \times 15 = (6^2 - 4^2)h$

$\Rightarrow h = \frac{\frac{4}{3} \times 15 \times 15 \times 15}{20}$

= 225cm or 2.25m

Sol.129.(a) According to question,

$\Rightarrow r + l = h^2 \Rightarrow r + l = 9^2 = 81$ .....(i)

$\Rightarrow r - l = 1$ .....(ii)

On solving equation (i) and (ii), we get

r = 41 cm and l = 40 cm

TSA of cone = $\pi r(r + l)$

$= \frac{22}{7} \times 41 (41 + 40) = \frac{22 \times 41 \times 81}{7}$

$= \frac{73062}{7} = 10437.43$ cm²

Sol.130.(b) TSA of cylinder = $2\pi r(h + r)$

$= 2\pi \times 10 (30 + 10) = 800\pi$ cm²

According to question,

TSA of larger piece of a cylinder

$= 800\pi \times \frac{70}{100} = 560\pi$ cm²

$\Rightarrow 2\pi r(h_1 + r) = 560\pi$

$\Rightarrow 2\pi \times 10 \times (h_1 + 10) = 560\pi$

$\Rightarrow (h_1 + 10) = 28 \Rightarrow h_1 = 18$ cm

Height(h_2) of smaller cylinder = 30 - 18

= 12 cm

Now,

Volume of sphere =Volume of smaller piece of cylinder

$\frac{4}{3}\pi R^3 = \pi r^2 h_2 \Rightarrow \frac{4}{3} \times R^3 = 10 \times 10 \times 12$

$R^3 = 900 \Rightarrow R = \sqrt[3]{900}$ cm

Sol.131.(a)

For the largest right circular cone Length of cone = height of cube = 6 unit

Diameter of cone = side length of cone = 6 unit

Radius of cone $= \frac{6}{2} = 3$ unit

Now, volume of cone $= \frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \pi \times (3)^2 \times 6 = 18\pi$ units³

Sol.132.(b) Internal Volume of the large cylindrical vessel $(V_L) = \pi r_1^2 h_1$

$= \pi \times 10 \times 10 \times 14 = 1400\pi\ cm^3$

Internal Volume of small cylindrical vessel $(V_S) = \pi r_2^2 h_2$

$= \pi \times 5 \times 5 \times 7 = 175\pi\ cm^3$

Unfilled volume of big vessel after transferring 6 times = 1400π - 6 × 175π

$= 1400\pi - 1050\pi = 350\pi\ cm^3$

Now,

Unfilled volume of big vessel = $350\pi\ cm^3$

$\pi r_3^2 h_3 = 350\pi\ cm^3 \Rightarrow h_3 = \frac{350}{10 \times 10} = 3.5$ cm

Sol.133.(b) Inner radius$(r) = \frac{12}{2} = 6$ cm

Outer radius(R) = 6 + 2 = 8 cm

Length (h) = 35 cm

T.S.A. of cylindrical tube = C.S.A of inner part + C.S.A of outer part + area of rings

Now,

C.S.A of inner part + C.S.A of outer part :-

$= 2\pi h(R + r) = 2 \times \frac{22}{7} \times 35 \times (8 + 6)$

= **3080 cm²**

For area of two ring :-

$2 \times \pi(R^2 - r^2) = 2 \times \frac{22}{7} \times [(8)^2 - (6)^2]$

$= 2 \times \frac{22}{7} \times [64 - 36]$ = **176 cm²**

Hence, required area = 3080 + 176

= 3256 cm²

Sol.134.(c)

Perimeter of rhombus $(4a)$ = 160

Side of rhombus(a) = 40 cm

Now, $a^2 = (\frac{d_1}{2})^2 + (\frac{d_2}{2})^2$

$(40)^2 = (\frac{d_1}{2})^2 + (\frac{50}{2})^2$

$1600 = (\frac{d_1}{2})^2 + 625 \Rightarrow (\frac{d_1}{2})^2 = 975$

$d_1 = \sqrt{975 \times 4} = \sqrt{3900} = 10\sqrt{39}$ cm

Area of rhombus $= \frac{1}{2} \times d_1 \times d_2$

$= \frac{1}{2} \times 10\sqrt{39} \times 50 = 250\sqrt{39}$ cm²

Sol.135.(b) According to question,

$\Rightarrow \sqrt{2}a_1 : \sqrt{2}a_2 = 5 : 6 \Rightarrow a_1 : a_2 = 5 : 6$

Now,

$\Rightarrow a_1^2 : a_2^2 = 25 : 36$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.136.(c)

Given , radius of circle(R) = $\frac{(l+r)}{2}$

According to question ,

Total surface area of icecream cone with lid = area of circle

$\Rightarrow \pi r^2 + \pi rl = \pi r^2$

$\Rightarrow \pi r(r+l) = \pi \times (\frac{(l+r)}{2})^2$

$\Rightarrow 4r^2 + 4rl = l^2 + r^2 + 2lr$

$\Rightarrow 4r^2 - r^2 - l^2 + 4rl - 2lr = 0$

$\Rightarrow 3r^2 - l^2 + 2rl = 0$ -------(i)

Now, (R) = $\frac{(l+r)}{2}$

l = 2R - r -------(ii)

Putting the value of l in equation (i)

$3r^2 - (2R - r)^2 + 2r(2R - r) = 0$

$3r^2 - 4R^2 - r^2 + 4Rr + 4rR - 2r^2) = 0$

$8Rr - 4R^2 = 0$

$8Rr = 4R^2$

$8r = 4R \Rightarrow R : r = 2 : 1$

Now, l = 2R - r $\Rightarrow l = 2 \times 2 - 1 = 3$

Hence, required ratio = $l : R$ = 3 : 2

Sol.137.(c) Volume of hemisphere

$= \frac{2}{3}\pi r^3 = (\frac{2}{3} \times \pi \times 15 \times 15 \times 15)\ cm^3$

Water displaced out =

$(\frac{2}{5} \times \frac{2}{3} \times \pi \times 15 \times 15 \times 15)\ cm^3$

Volume of lead shot = $\frac{4}{3}\pi r^3$

$= (\frac{4}{3}\pi \times 0.75 \times 0.75 \times 0.75)cm^3$

No of lead shots drop in the hemisphere

$= \frac{\frac{2}{5} \times \frac{2}{3} \times \pi \times 15 \times 15 \times 15}{\frac{4}{3}\pi \times 0.75 \times 0.75 \times 0.75} = 1600$

Sol.138.(c) Volume of the cone = $\frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \frac{22}{7} \times \frac{13.2}{2} \times \frac{13.2}{2} \times 14$

$= 11 \times 4.4 \times 13.2 = 638.88\ cm^3$

According to question,

$\Rightarrow$ Number of bags = $\frac{638.88}{29.4}$

$= 21.73 \approx 22$

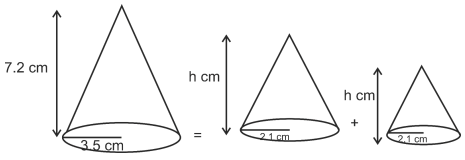
Sol.139.(b) For the largest right circular cone that cut out from a cube

Diameter of cone = edge of the cube

= 8.4 cm

So, Radius of cone = $\frac{8.4}{2}$ = 4.2 cm

Sol.140.(b) Volume of cone = $\frac{1}{3}\pi r^2 h$



$\frac{1}{3} \times \pi \times 3.5 \times 3.5 \times 7.2$

$= 2 \times (\frac{1}{3} \times \pi \times 2.1 \times 2.1 \times h)$

$3.5 \times 3.5 \times 7.2 = 2 \times (2.1 \times 2.1 \times h)$

$h = \frac{3.5 \times 3.5 \times 7.2}{2 \times 2.1 \times 2.1}$ = 10 cm

Sol.141.(d) Side = radius ... (given)

$\frac{Perimeter\ of\ square}{Perimeter\ of\ circle} = \frac{7}{11}$

$\frac{area\ of\ square}{area\ of\ circle} = \frac{side^2}{\pi r^2} = \frac{1}{\frac{22}{7}} = \frac{7}{22}$

Hence, required ratio = 7 : 22

Sol.142.(b) Area to be painted = external C.S.A. + Internal C.S.A. + area of ring

$= 2\pi R^2 + 2\pi r^2 + \pi(R^2 - r^2)$

$= 2 \times \frac{22}{7}[(14)^2 + (13.3)^2) + \frac{22}{7}$

$[(14)^2 - (13.3)^2)$

$= 2 \times \frac{22}{7}[(196 + 176.89) + \frac{22}{7}$ [196 - 176.89]

$= 2 \times \frac{22}{7} \times 372.89 + \frac{22}{7} \times 19.11$

$= 44 \times 53.27 + 22 \times 2.73$

$= 2343.88 + 60.06 = 2403.94$

Cost of painting

$= 2403.94 \times 3.75 = 9014.775 \approx 9015$

Sol.143.(b)

$\frac{curved\ surface\ area\ of\ cylinder_1}{curved\ surface\ area\ of\ cylinder_2}$

$= \frac{2\pi RH}{2\pi rh} = \frac{2 \times 5}{3 \times 4} = \frac{5}{6}$

Required ratio = 5 : 6

Sol.144.(a) Outer radius (R) = 9 units

Volume of hollow hemispherical steel bowl = $\frac{686}{3}\pi\ unit^3 \Rightarrow \frac{2}{3}\pi r^3 = \frac{686}{3}\pi\ unit^3$

$r^3 = 343\ unit^3$

Internal radius (r) = 7 unit

Steel used = $\frac{2}{3}\pi(R^3 - r^3)$

$= \frac{2}{3}\pi(9^3 - 7^3) = \frac{2}{3}\pi(729 - 343)$

$= \frac{2}{3}\pi \times 386 = \frac{772}{3}\pi\ unit^3$

Sol.145.(a) Radius of balloon = 8 feet

Volume of spherical balloon = $\frac{4}{3}\pi r^3$

$= \frac{4}{3} \times 3.14 \times 512$

Time taken for balloon to empty

$= \frac{Volume\ of\ spherical\ balloon}{Rate\ of\ leak}$

$= \frac{\frac{4}{3} \times 3.14 \times 512}{24} = \frac{12.56 \times 64}{9}$

$= \frac{803.84}{8} = 89.31 \approx 89$ minutes

Sol.146.(a) Volume of hemisphere

= $N \times$ volume of cone

$\frac{2}{3}\pi R^3 = N \times \frac{1}{3}\pi r^2 h$

$\frac{2}{3} \times 12^3 = N \times \frac{1}{3} \times 6^2 \times 8$

$2 \times 144 \times 12 = N \times 36 \times 8$

$N = \frac{144}{12} = 12$

Sol.147.(a) Let the height of the two cone be h_1 and h_2,

According to the question,

$\Rightarrow \frac{\frac{1}{3}\pi r_1^2 h_1}{\frac{1}{3}\pi r_2^2 h_2} = \frac{3}{5} \Rightarrow \frac{4 \times h_1}{25 \times h_2} = \frac{3}{5}$

$\Rightarrow \frac{h_1}{h_2} = \frac{75}{20} = \frac{15}{4} \Rightarrow h_1 : h_2 = 15 : 4$

Sol.148.(b) Volume of cylinder = $\pi r^2 h$

$\Rightarrow \frac{22}{7} \times (8)^2 \times 14 = 2816\ cm^3$

Sol.149.(b) Area of sector = $\frac{1}{2} \times l \times r$

$= \frac{1}{2} \times 11 \times 15.75 = 86.625\ cm^2$

Sol.150.(c) Area of isosceles right angle triangle = $(\frac{hypotenuse(H)}{2})^2$

$\Rightarrow (\frac{H}{2})^2 = 50 \Rightarrow H^2 = 200 \Rightarrow H = 10\sqrt{2}$ unit

Sol.151.(d)

Perimeter of sector = 2r + $\frac{\theta}{360} \times 2\pi r$

$\Rightarrow 2 \times 10 + \frac{30}{360} \times 2 \times 3.14 \times 10$

$\Rightarrow 20 + \frac{1}{12} \times 62.8$

$\Rightarrow 20 + \frac{1}{12} \times 62.8 = 25.2$ (approx)

Sol.152.(b) Volume of cone = $\frac{1}{3}\pi r^2 h$

$1232 = \frac{1}{3} \times \frac{22}{7} \times r^2 \times 24$

$1232 = \frac{176}{7}r^2 \Rightarrow r^2 = \frac{1232 \times 7}{176}$

$= r^2 = 49 \Rightarrow r = 7$ cm

Slant height = $\sqrt{7^2 + 24^2} = \sqrt{625}$ = 25 cm

TSA of cone = $\pi r(r + l)$

$= \frac{22}{7} \times 7(7 + 25) = 22 \times 32 = 704\ cm^2$

Sol.153.(b) If a cylinder is formed by rolling the paper along its breadth, breadth becomes perimeter of base and length is equivalent to height.

$\Rightarrow 2\pi r = 22 \Rightarrow r = \frac{7}{2} = 3.5$

And h = 50

Volume of cylinder = $\pi r^2 h$

$= \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 50 = 1925$ cm³

Sol.154.(d) Length = 495 cm

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Width = 1665 cm
Now, finding HCF of (495 and 1665)
$\frac{1665}{495}$ = 3 (remainder = 180)
$\frac{495}{180}$ = 2 (remainder = 135)
$\frac{180}{135}$ = 1 (remainder = 45)
$\frac{135}{45}$ = 3 (remainder = 0)
HCF (495 , 1665) = 45
So, dimension of per required tile
= 45 × 45 cm^2
Area of the courtyard = 495 × 1665 cm^2
Hence, required tiles = $\frac{495 \times 1665}{45 \times 45}$
= 11 × 37 = 407

Sol.155.(b)
Area of circular track = $\pi(R_2^2 - R_1^2)$
$\Rightarrow \pi[(28)^2 - (25)^2] = \frac{22}{7}$ [784 - 625]
$= \frac{22}{7}[159]$
Now, cost of levelling the track
$= 28 \times \frac{22}{7}[159] = 4 \times 22 \times 159$ = ₹13992

Sol.156.(d) Side of equilateral triangle (a)
$= \frac{36}{3}$ = 12 unit
Area of equilateral triangle = $\frac{\sqrt{3}}{4}a^2$
$\Rightarrow \frac{\sqrt{3}}{4} \times (12)^2 = 36\sqrt{3}$ $unit^2$

Sol.157.(a) Ratio of the sides of two similar triangles = $\sqrt{25} : \sqrt{144}$ = 5 : 12

Sol.158.(b) Dimension of largest cube = HCF of (50, 150, 175) = 25
Required no = $\frac{volume\ of\ cuboid}{volume\ of\ cube}$
$= \frac{50 \times 150 \times 175}{25 \times 25 \times 25} = 84$

Sol.159.(d) lateral surface area of cylinder = 2 π r h = 1760
$= 2 \times \frac{22}{7} \times r \times 20 = 1760 \Rightarrow r = 14$
volume of cylinder = $\frac{22}{7} \times 14 \times 14 \times 20$
= 12320 cm^3

Sol.160.(b) Ratio of curved surface area
$= \frac{2\pi RH}{2\pi rh} = \frac{2\pi 4 \times 5}{2\pi 5 \times 7} = \frac{4}{7}$

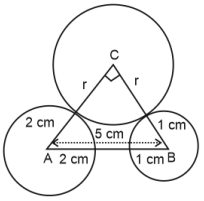
Sol.161.(d) Given height = 8m
Circumference of the base of a conical tent = 2πr =32 πm ∴ r = 16m
Slant height $l = \sqrt{r^2 + h^2} = \sqrt{25 + 64}$
$= \sqrt{320} = 8\sqrt{5}$m
Now, curved surface area(πrl)
$= \pi \times 16 \times 8\sqrt{5} = 128\sqrt{5}$ πm²

Sol.162.(b) Length of arc = $\frac{\theta}{360} \times 2\pi r$
$= \frac{30}{360} \times 2 \times 3.14 \times 12$ = 6.28cm
Perimeter of the sector = 6.28 + 12 + 12 = 30.28cm

Sol.163.(b) Remaining perimeter of pizza
$= 2\pi r \times \frac{270°}{360°} + 2r$
$= 2 \times \frac{22}{7} \times 21 \times \frac{3}{4} + 2 \times 21$
= 99 + 42 = 141 cm

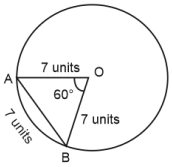
Sol.164.(b)
Let the height of conical water tank be h
Volume of a cone = $\frac{1}{3}\pi r^2 h$
$46200 = \frac{1}{3} \times \frac{22}{7} \times 70 \times 70 \times h$
$h = \frac{46200 \times 7 \times 3}{22 \times 70 \times 70}$ = 9 m

Sol.165.(b)



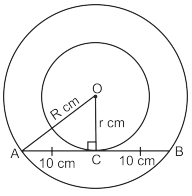
In ΔACB,
By using pythagoras theorem,
$AC^2 + BC^2 = AB^2$
$(r + 2)^2 + (r + 1)^2 = 5^2$
$r^2 + 4 + 4r + r^2 + 1 + 2r = 25$
$2r^2 + 6r - 20 = 0 \Rightarrow r^2 + 3r - 10 = 0$
$r^2 + 5r - 2r - 10 = 0 \Rightarrow r(r + 5) - 2(r + 5) = 0$
(r + 5)(r - 2) = 0
Radius can not be negative so r = 2 cm

Sol.166.(c) According to the question,



Arc length of smaller portion
$= 2\pi r \times \frac{60°}{360°} = 2\pi \times 7 \times \frac{1}{6} = \frac{7}{3}\pi$ units

Sol.167.(a)



In the right angled Δ OCA
$R^2 = (10)^2 + r^2 \Rightarrow R^2 - r^2 = 100$
Area of annular portion = π(R^2 - r^2)
= 100π cm^2

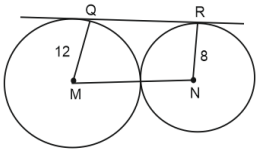
Sol.168.(a) According to the question,
Radius = 4 unit
Diameter (2r) = height (h) = 8 unit
Volume of cylinder = $\pi r^2 h$
$\Rightarrow \pi(4)^2 8 = 128\pi$

Sol.169.(d) For minute hand
$\Rightarrow$ 60 minute = 2π ⇒ 1 minute = $\frac{2\pi}{60}$
$\Rightarrow$ 25 minute = $\frac{2\pi}{60} \times 25 = \frac{5\pi}{6}$

Sol.170.(d)
Area of sector = $\pi r^2 \times \frac{angle\ (\theta)}{360°}$
$\Rightarrow 16\pi = \pi \times 8 \times 8 \times \frac{angle\ (\theta)}{360°}$
$\Rightarrow \frac{360°}{4} = \theta \Rightarrow$ Angle(θ) = 90°

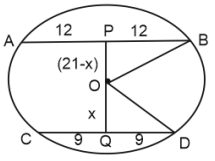
Sol.171.(c) Circumference of circle = 2πr
$\Rightarrow 44 = 2 \times \frac{22}{7} \times r \Rightarrow r = 7$ cm
Now,
Volume of cylinder = $\pi r^2 h$
$= \frac{22}{7} \times 7 \times 7 \times 25 = 3850$ cm^3
1000 cm^3 = 1 litre
1 cm^3 = $\frac{1}{1000}$ litre
3850 cm^3 = $\frac{3850}{1000}$ = 3.85 litres

Sol.172.(b)



Length of QR = $\sqrt{d^2 - (12 - 8)^2}$
$= \sqrt{256 - 16} = \sqrt{240} = 4\sqrt{15}$ cm

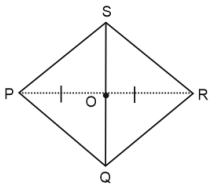
Sol.173.(a)



Here , OB = OD = radius
$\Rightarrow 12^2 + (21 - x)^2 = 9^2 + x^2$
$\Rightarrow 144 + 441 + x^2 - 42x = 81 + x^2$
$\Rightarrow 144 + 441 - 81 = 42x$
$\Rightarrow 504 = 42x \Rightarrow x = 12$
Now in ΔODQ
OD = $\sqrt{81 + 144} = \sqrt{225} = 15$
So, radius of the circle = 15 cm

Sol.174.(b) Diagonal of a cube = $\sqrt{3}$a
$= \sqrt{3} \times 70 = 70\sqrt{3}$ cm

Sol.175.(b)



Search on TG: @apna_pdf

Search on Telegram @apna_pdf

As OP = OR , So with the help of diagram we can say that , ∠SOQ = 180°

Sol.176.(c) Height and diameter of a cylinder are 12 cm and 28cm
Total surface area of cylinder = 2πr(r + h)
= $2 \times \frac{22}{7} \times 14\ (14 + 12) = 88 \times 26$
Curved Surface area of cylinder = $2\pi rh$
= $2 \times \frac{22}{7} \times 14 \times 12 = 88 \times 12$
The ratio of the total surface area to the curved surface area = 88 × 26 : 88 × 12
= 13 : 6

Sol.177.(d)
Perimeter of the sector = $2\pi r \times \frac{\theta}{360°} + 2r$
= $2 \times 3.14 \times 14 \times \frac{15°}{360°} + 2 \times 14$
= $\frac{3.14 \times 7}{6} + 28 = 3.66 + 28 = 31.66$ cm

Sol.178.(a) Let breadth of the rectangular garden = x m
Length of the rectangular garden
= (x + 6) m
Perimeter of rectangular garden [2(l + b)]
= 48 m
⇒ 2 (x + 6 + x) = 48 ⇒ 2x + 6 = 24
⇒ 2x = 18 ⇒ x = 9m
Length = 15 m and breadth = 9 m
Area of rectangular garden = l × b
= 15 × 9 = 135 m^2

Sol.179.(a)
Volume of each cube = 512 cm^3
∴ Side of cube = $\sqrt[3]{512}$ = 8 cm
Now by joining three cube , length of the cuboid = 8 +8 + 8 = 24 cm
Breadth = 8 cm and height = 8 cm
∴ Surface area = 2 $(lb + bh + hl)$
= 2 (24 × 8 + 8 × 8 +8 × 24)
= 2 (192 + 64 + 192) = 896 cm^2

Sol.180.(a) Given : radius(r) = 9 cm and slant height(l) = 49 cm
Curved surface area of a cone = πrl
= $\frac{22}{7} \times 9 \times 49 = 1386$ cm^2

Sol.181.(d)
Area of parallelogram = Base × Height
⇒ 26 × 18 = 468cm^2

Sol.182.(d) Base radius = 10.5cm
Curved surface area of cylinder ($2\pi rh$)
= 792 cm^2
h = $\frac{792 \times 7 \times 10}{2 \times 22 \times 105}$ = 12 cm
volume of the cylinder = $\pi r^2 h$
= $\frac{22}{7} \times 10.5 \times 10.5 \times 12 = 4158$ cm^3

Sol.183.(d) given, (a + b) = 9 and ab = 18
We know that,
(a - b) = $\sqrt{(a + b)^2 - 4ab}$
= $\sqrt{(9)^2 - 4 \times 18} = \sqrt{81 - 72} = \sqrt{9} = 3$
then,
(a + b) = 9 .....(i)
(a - b) = 3 .... (ii)
On solving equation (i) and (ii), we get
a = 6 and b = 3
Now,
$a^2 - ab + b^2 = 6^2 - 6 \times 3 + 3^2$
= 36 - 18 + 9 = 27

Sol.184.(c) Area of sector of a circle = π $r^2 \times \frac{\theta}{360°}$ ⇒ 462 = $\frac{22}{7} \times r^2 \times \frac{120°}{360°}$
⇒ $r^2 = 462 \times \frac{7}{22} \times 3 = 21 \times 21$
⇒ r = 21 cm

Sol.185.(c)
Total surface area of cube = $6a^2$
⇒ 1152 = $6a^2$ ⇒ a^2 = 192 ⇒ a = $8\sqrt{3}$ cm

Sol.186.(b)
Surface area of four walls = 2h(l + b)
= 2 × 5 (15 + 9) = 10 (24) = 240 m^2
So,
The number of cans = $\frac{240}{40}$ = 6

Sol.187.(d) Volume of a right circular cylindrical box ($\pi R^2 h$) = 600cm^3
⇒ $\frac{22}{7} \times 30 \times 30 \times h = 600$
⇒ h = $\frac{600 \times 7}{22 \times 30 \times 30} = \frac{7}{33}$ = 0.21cm

Sol.188.(d) According to question ,
⇒ $\pi R^2 = \pi r_1^2 + \pi r_2^2$
⇒ $R^2 = (8^2 + 15^2)$ ⇒ R = 17cm
∴ Perimeter of circle = 2 × π × 17 = 34π cm

Sol.189.(b)
Length : breadth : height = 3 : 2 : 1
Breadth (2 unit) = 12 cm
Length (3 unit) = 18 cm
Height (1 unit) = 6 cm
Volume = 18 × 12 × 6 = 1296 cm^3

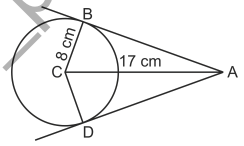
Sol.190.(a) Circumference of base of cylinder = 154 cm
$2\pi r = 154$
$2 \times \frac{22}{7} \times r = 154 \Rightarrow r = \frac{49}{2}$
Volume of cylindrical vessel = $\pi r^2 h$
= $\frac{22}{7} \times \frac{49}{2} \times \frac{49}{2} \times \frac{49}{10}$
= $11 \times 7 \times \frac{49}{2} \times \frac{49}{10} = 9243.5$ cm^3
In litres = $9243.5 \times \frac{1}{1000}$ = 9.244 litres

Sol.191.(d) 1 l = 1000 cm^3
Volume of water level dropped = $\pi r^2 h$
$616 \times 1000 = \frac{22}{7} \times 14 \times 14 \times h$
$h = \frac{616000}{22 \times 14 \times 2}$ = 1000 cm = 10 m

Sol.192.(b) Circumference of bigger circle = $2\pi r_1 + 2\pi r_2$
$2\pi R = 2\pi(r_1 + r_2)$
R = 12 + 16 = 28 cm
Radius of bigger circle = 28 cm
then diameter = 56 cm

Sol.193.(c) Volume of earth taken out
= $\pi r^2 h = \frac{22}{7} \times 14 \times 14 \times 23$
= 22 × 28 × 23 = 14168 cm^3

Sol.194.(b) T.S.A. of cone = curved surface area + area of base
= 550 + πr^2 = 550 + $\frac{22}{7} \times 7 \times 7$
= 550 + 154 = 704 cm^2

Sol.195.(b)


In ΔABC
∠ABC = 90° ... (radius ⊥ tangent)
hence,
$AB = \sqrt{AC^2 - BC^2} = \sqrt{17^2 - 8^2}$
= $\sqrt{289 - 64} = \sqrt{225}$ = 15 cm
Area of $\Delta ABC = \frac{1}{2}$ × base × height
= $\frac{1}{2}$ × AB × BC = $\frac{1}{2} \times 15 \times 8 = 60$ cm^2
Area of quadrilateral ABCD
= 2 × Area of ΔABC = 2 × 60 = 120 cm^2

Sol.196.(d) Length of sector = 96π
$\frac{\theta}{360^\circ} \times 2\pi r = 96\pi \Rightarrow \frac{80^\circ}{360^\circ} \times 2 \times r = 96$
$r = \frac{96 \times 36}{16} = 6 \times 36 = 216$ unit

Sol.197.(c)
Radius of the sphere = $\frac{14}{2}$ = 7 cm
Volume of the sphere = $\frac{4}{3}\pi r^3$
= $\frac{4}{3} \times \frac{22}{7} \times (7)^3 = 1437\frac{1}{3}$ cm^3

Sol.198.(d) According to the question,
Let radius and height of cylinder be $3x$ and $7x$ respectively,
⇒ $\frac{CSA\ of\ cylinder}{Volume\ of\ cylinder} = \frac{2\pi rh}{\pi r^2 h}$
⇒ $\frac{2}{3} = \frac{2 \times \pi \times 3x \times 7x}{\pi \times 3x \times 3x \times 7x}$ ⇒ x = 1 unit
So, radius of cylinder = $3x$ = 3 cm and height = $7x$ = 7 cm
Now,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Total surface area of cylinder
$= 2\pi r(r + h) = 2\pi \times 3(3 + 7) = 60\pi$ cm²

Sol.199.(b) Ratio of surface area of two spheres $= 4\pi r_1^2 : 4\pi r_2^2 = r_1^2 : r_2^2$

Given: $\frac{r_1^2}{r_2^2} = \frac{25}{36} \Rightarrow \frac{r_1}{r_2} = \frac{5}{6}$

Now, ratio of their volumes

$= \frac{4}{3}\pi r_1^3 : \frac{4}{3}\pi r_2^3 = r_1^3 : r_2^3 = \frac{5^3}{6^3} = \frac{125}{216}$

Sol.200.(b) Let the length, breadth and height of cuboid be l, b and h respectively,
Let sides of cuboid be $3x$, $4x$ and $5x$ respectively
Then, Surface area of cuboid
$= 2(lb + bh + hl)$
$= 2(12x^2 + 20x^2 + 15x^2) = 2\,(47x^2) = 94x^2$
Now, surface area of cube with side 6 cm
$= 6 \times (6\ unit)^2 = 216\ unit^2$
Now, according to the question,
$94x^2 = 216\ unit^2$

$x^2 = \frac{216}{94} \Rightarrow x = \sqrt{\frac{216}{94}} \approx \frac{14.69}{9.69}$
$= 1.51599$
Volume of cuboid $(lbh) = 3x \times 4x \times 5x$
$= 60x^3 = 60 \times (1.51599)^3 \approx 210\ unit^3$

Sol.201.(a) Area of the playground = 700 × CSA of cylinder $= 700 \times 2\pi rh$
$= 700 \times 2 \times \frac{22}{7} \times 49 \times 200$
$= 4312 \times 10^4$ cm²

Sol.202.(d)
Curved surface area of the cone $= \pi rl$
$2200 = \frac{22}{7} \times 28 \times l$
(slant height) $l = 25$ cm

Sol.203.(b) Ratio of surface area and volume of cube $= 6a^2 : a^3$
$= 6(3)^2 : (3)^3 = 2 : 1$

Sol.204.(b)
Surface area of sphere $= 4\pi r^2$
$4\pi r^2 = 2464 \Rightarrow 4 \times \frac{22}{7} \times r^2 = 2464$
$r^2 = 2464 \times \frac{7}{22} \times \frac{1}{4} = 196$
$r = \sqrt{196} = 14$ cm
Now, volume of sphere $= \frac{4}{3}\pi r^3$
$= \frac{4}{3} \times \frac{22}{7} \times (14)^3 = 11498\frac{2}{3}$ cm³

Sol.205.(b) By checking options one by one option (b) satisfied
I.e. (12 : 16 : 20) = (3 : 4 : 5)
3 , 4 and 5 are the pythagorean triplet so, triangle having side 12 cm, 16 cm and 20 cm is right angled triangle.

Sol.206.(d) volume of sphere $= \frac{4}{3}\pi r^3$
$= \frac{4}{3} \times \frac{22}{7} \times (r)^3 = 38.808$ cm³
$(r)^3 = \frac{38.808 \times 3 \times 7}{22 \times 4}$
$= \frac{11 \times 8 \times 0.441 \times 3 \times 7}{11 \times 2 \times 4} = 9.261$ cm³
$r = \sqrt[3]{9.261} = \sqrt[3]{\frac{9261}{1000}} = \frac{21}{10} = 2.1$ cm
Hence, diameter of spherical ball $(2r)$
= 4.2 cm

Sol.207.(b) Length of arc $(l) = \frac{\theta}{360^\circ} 2\pi r$
$= \frac{45^\circ}{360^\circ} \times 2 \times \pi \times 4$
$= \frac{1}{8} \times 2 \times \pi \times 4 = \pi$ unit
Now, perimeter of minor sector = 2r + l
$= 2 \times 4 + \pi = (8 + \pi)$ unit

Sol.208.(c) Curved surface area of hemisphere $= 2\pi r^2 = 2 \times \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2}$
$= 3 \times 11 \times 21 = 693cm^2$

Sol.209.(a)
Capacity of cylinder = 8316 cm³
$\pi r^2 h = 8316 \Rightarrow \frac{22}{7} \times 21 \times 21 \times h = 8316$
$h = 8316 \times \frac{7}{22 \times 21 \times 21} = 6$ cm

Sol.210.(b) 72.9% $= \frac{729}{1000}$
$\frac{final\ volume\ of\ cube\ (a_1^3)}{initial\ volume\ of\ cube\ (a^3)} = \frac{729}{1000}$
$\frac{a_1}{a} = \frac{9}{10}$
Hence, required % $= \frac{1}{10} \times 100 = 10\%$

Sol.211.(d)
Total surface area of hemisphere $= 3\pi r^2$
$\Rightarrow 3 \times 3.14 \times (6.2)^2 = 362.10$ cm²

Sol.212.(b) Required % $= 5 + 5 + \frac{5 \times 5}{100}$
$= 10 + 0.25 = 10.25\%$

Sol.213.(d) Required bricks
$= \frac{(10 \times 100) \times 22.5 \times (6 \times 100)}{25 \times 12 \times 9}$
$= 40 \times 2.5 \times 50 = 5000$

Sol.214.(a) Weight of the empty box
= [(60 × 40 × 20) - (58 × 38 × 18)] × 50
= [48000 - 39672] × 50 = [8328] × 50
= 416400 gm
Weight of the empty box $= \frac{416400}{1000}$
= 416.4 kg

Sol.215.(d)
Volume of the hemisphere $= \frac{2}{3}\pi r^3$
Volume of the hemisphere
$= \frac{2}{3} \times \frac{22}{7} \times 21 \times 21 \times 21$
Volume of the hemisphere = 19404 cm³

Sol.216.(d) Difference between TSA and CSA of cylinder $= 2\pi r(h + r) - 2\pi rh$
$= 2\pi r[h + r - h] = 2\pi r^2$
Required difference $(2\pi r^2)$
$= 2 \times \frac{22}{7} \times 14 \times 14 = 1232$ cm²

Sol.217.(c) To find the maximum possible area of a triangle with a perimeter of 36 units, we assume it's an equilateral triangle.
Perimeter = 3a = 36, a = 12 units
Area of the equilateral triangle
$= \frac{\sqrt{3}}{4} side^2 = \frac{\sqrt{3}}{4} \times 12 \times 12$
$= 36\sqrt{3}$ square units

Sol.218.(a) TSA of the sphere $= 4\pi r^2$
Required cost
$= 4 \times \pi \times 5 \times 5 \times \frac{80}{\pi} =$ ₹ 8000

Sol.219.(b)
3, 4, 5 are triplet of right angle triangle so, Length of the perpendicular
$= \frac{p \times b}{h} = \frac{3 \times 4}{5} = 2.4$ cm

Sol.220.(c) Volume of the cylinder $= \pi r^2 h$
$= \frac{22}{7} \times (6x)^2(7x) = 792$
$x^3 = \frac{792 \times 7}{22 \times 36 \times 7} = 1$ so x = 1
So, the radius and height of the cylinder will be 6 and 7
Now, according to the question,
CSA of the cylinder $= 2\pi rh$
$= 2 \times \frac{22}{7} \times 6 \times 7 = 264$ cm²

Sol.221.(c) Required number of boxes
$= \frac{2160}{6 \times 10 \times 12} = 3$

Sol.222.(c) Volume of the cone $= \frac{1}{3}\pi r^2 h$
Required ratio $= 6^2 \times 5 : 5^2 \times 3 = 12 : 5$

Sol.223.(c) Volume of sphere $= \frac{4}{3}\pi r^3$

Ratio -	before :	after
Radius -	1 :	2
Volume -	$(1)^3$:	$(2)^3$
=	1 :	8

We can clearly see that the volume will be 8 times of the previous volume.

Sol.224.(b) CSA of the cylinder $= 2\pi rh$
$88 = 2 \times \frac{22}{7} \times r \times 14 \Rightarrow r = 1$ cm

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

TSA of cylinder = $2\pi r(h + r)$

= $2 \times \frac{22}{7} \times 1(14 + 1) = \frac{660}{7}$ cm²

Sol.225.(c)
Area of the rectangle = length × breadth
3600 = 45 × breadth
Breadth = 80 m
Perimeter of the rectangular field
= 2(length + breadth) = 2(45 + 80)
= 250 m

Sol.226.(d)
TSA of cuboid = 2(lb + bh + hl)
108 = 2(6 × 3 + 3h + 6h) ⇒ 54 = 18 + 9h

h = $\frac{54 - 18}{9}$ = 4 m

Sol.227.(b) Area of sector = $\frac{\theta}{360}\pi r^2$

= $\frac{45}{360} \times 3.14 \times (4)^2 = \frac{1}{8} \times 3.14 \times 16$

= 6.28 cm^2

Sol.228.(b)

Volume of right circular cone = $\frac{1}{3}\pi r^2 h$

According to the question,
Volume of right circular cone

= $\frac{1}{3} \times \frac{22}{7} \times 10.5 \times 10.5 \times 24$ = 2772 cm³

Sol.229.(c)

Effective rate for 2 year = $x + y + \frac{x \times y}{100}$

Effective rate for 2 year

= 12 + 12 + $\frac{12 \times 12}{100}$ = 24 + 1.44 = 25.44

Net change in volume

= 25.44 + 12 + $\frac{25.44 \times 12}{100}$

= 37.44 + 3.0528 = 40.49 %

Sol.230.(a) Let radius of cylinder = r
Then according to question,
Height of cylinder = 12r

And , radius of each spherical ball = $\frac{r}{3}$

Volume of cylindrical iron rod =
x × volume of each spherical balls

$\pi r^2 h = x \times \frac{4}{3}\pi r^3$

$\pi r^2 \times 12r = x \times \frac{4}{3}\pi(\frac{r}{3})^3$

$12r^3 = x \times \frac{4}{3} \times \frac{r^3}{27}$

$x = \frac{12 \times 3 \times 27}{4}$ = 243

Hence, number of spherical ball (x) = 243

Sol.231.(a)

Area of triangle = $\frac{1}{2}$ × base × height

18 = $\frac{1}{2}$ × 6 × height ⇒ Height = 6 cm

Sol.232.(b) Let the sides of the rectangular box be 3x, 5x and 8x
TSA of cuboid = 2(lb + bh + hl)

632 = 2(15x^2 + 40x^2 + 24x^2)

⇒ 316 = 79x^2 ⇒ x^2 = 4, x = 2

So the sides of the rectangular box will be 6, 10 and 16
Volume of cuboid = lbh
= 6 × 10 × 16 = 960 cm³

Sol.233.(d)
Volume of 3 cubes = volume of new cube
Let the sides of new cubes be n

Volume of cube = a^3

$6^3 + 8^3 + 10^3 = n^3$

216 + 512 + 1000 = n^3

n^3 = 1728, n = 12 cm

TSA of new cube = 6a^2
= 6 × 12 × 12 = 864 cm²

Sol.234.(a) CSA of the cylinder = 2πrh

352 = 2 × $\frac{22}{7}$ × 7 × h ⇒ h = 8 cm

TSA of the cylinder = 2πr(h + r)

= 2 × $\frac{22}{7}$ × 7(8 + 7) = 44 × 15 = 660 cm²

Sol.235.(c) 25% = $\frac{1}{4}$

TSA of the sphere = $4\pi r^2$

Radius - 4 : 5

TSA of the sphere - $(4)^2$: $(5)^2$
= 16 : 25

increase % = $\frac{25 - 16}{16}$ × 100 = 56.25%

Sol.236.(b) CSA of the cylinder = $2\pi rh$

= 2 × $\frac{22}{7}$ × 3 × 14 = 264 cm²

Sol.237.(a)

Total surface area of hemisphere = $3\pi r^2$

= 3 × $\frac{22}{7}$ × $(14)^2$ = 1848 cm²

Sol.238.(c) Volume of cylinder = $\pi r^2 h$

= $\frac{22}{7}$ × 2.1 × 2.1 × 6.3 = 87.318 m³

Now, 1m³ = 1000 litre
Hence, capacity of water tank
= 87.318 × 1000 = 87318 litre

Sol.239.(a) Total surface area of cylinder
= $2\pi r(r + h)$

= 2 × $\frac{22}{7}$ × 7 × (7 + 9) = 704 cm²

Sol.240.(d)

Length of the arc = $\frac{\theta}{360}$ × $2\pi r$

5.5 = $\frac{30}{360}$ × 2 × $\frac{22}{7}$ × r

r = $\frac{42 \times 5.5}{22}$ = 10.5 cm

Sol.241.(b) TSA of the cylinder

= $2\pi r(h + r)$ = 2 × $\frac{22}{7}$ × 15(27 + 15)

= 2 × 22 × 15 × 6 = 3960 cm²

Sol.242.(d) Volume of sphere = $\frac{4}{3}\pi r^3$

Volume of 3 small spheres = volume of 1 big sphere

$\frac{4}{3}\pi[(3)^3 + (4)^3 + (5)^3] = \frac{4}{3}\pi(R)^3$

27 + 64 + 125 = $(R)^3$ ⇒ 216 = $(6)^3$ = $(R)^3$
R = 6 cm

Sol.243.(d) CSA of the cylinder = $2\pi rh$
TSA of the cylinder = $2\pi r(h + r)$
Required ratio = $2\pi r(10)$: $2\pi r(10 + 30)$
= 10 : 40
= 1 : 4

Sol.244.(b) Given : the ratio of cuboid dimensions = 3 : 4 : 5
Let length(l) = 3x, breadth(b) = 4x and height(h) = 5x
According to question,
Volume of cube = l × b × h

⇒ 3x × 4x × 5x = 1620 ⇒ 60x^3 = 1620

⇒ x^3 = 27 ⇒ x = 3 units
Total surface area of cuboid

= 2(lb + bh + hl) = 2(12x^2 + 20x^2 + 15x^2)

= 2 × 47x^2 = 2 × 47 × 9 = 846 m^2

Sol.245.(c) Total surface area of cylinder

= $2\pi r^2$ + 2πrh

⇒ 628 = 2 × $\frac{22}{7}$ × 5 × 5 + 2πrh

⇒ 2πrh = 628 - $\frac{1100}{7}$

⇒ 2πrh = 628 - 157.14

⇒ 2πrh = 470.86 m² or 470.8 m²

So, curved surface area of a cylinder be 470.8 m²

Sol.246.(a) Given : diameter of sphere = 28 cm then radius = 14 cm

Surface area of sphere = $4\pi r^2$

⇒ Surface area of sphere

= 4 × $\frac{22}{7}$ × 14 × 14 = 2464 cm^2

Now,
Cost of painting the ball
= 2464 × ₹2 = ₹4928

Sol.247.(b) 9 cm = $\frac{9}{100}$ m

4 mm = $\frac{4}{1000}$ m

Volume of sphere = volume of cylindrical wire

$\frac{4}{3}\pi r^3 = \pi r^2 h \Rightarrow \frac{4}{3} \times \frac{9}{100} \times \frac{9}{100} \times \frac{9}{100}$

= $\frac{4}{1000} \times \frac{4}{1000}$ × h ⇒ h = 60.75 m

Sol.248.(a)
Let the height of the triangle = 3x

And the base is = 3x × $\frac{2}{3}$ = 2x

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Area of the triangle = $\frac{1}{2}$ × base × height

363 = $\frac{1}{2}$ × 3x × 2x ⇒ 121 = x^2, x = 11

Height of the triangle (3x) = 33 cm

Sol.249.(b)

Total Surface area of cube = $6a^2$

Ratio -	initial	:	new
Side -	a	:	3a
TSA -	a^2	:	$9a^2$

Required % = $\frac{9a^2 - a^2}{a^2}$ × 100 = 800%

Sol.250.(c) Total surface area of cuboid = 2(lb + bh + hl)

2600 = 2(30 × 20 + 20 × h + h × 30)

⇒ 2600 = 2(600 + 50h)

⇒ 2600 = 1200 + 100h

100h = 1400 ⇒ height (h) = 14 cm

Sol.251.(c) According to question,

⇒ $\frac{Area\ of\ \Delta ABC}{Area\ of\ \Delta PQR} = \frac{AB^2}{PQ^2}$

⇒ $\frac{490}{640} = \frac{21^2}{PQ^2}$ ⇒ $\frac{49}{64} = \frac{21^2}{PQ^2}$

Taking square root both side,

⇒ $\frac{7}{8} = \frac{21}{PQ}$ ⇒ PQ = 24 cm

Sol.252.(a) Given:

radius = $\frac{35}{2}$ cm and length = 100 cm

Surface area of a roller

= 2 × $\frac{22}{7}$ × $\frac{35}{2}$ × 100 = 11000 cm²

1 revolution of roller = surface area of a roller

200 revolution = 11000 × 200

= 2200000 cm^2 = 220 m^2

Hence, Area of the playground = 220 m^2

Sol.253.(c)

Perimeter of rectangle = 2(l + b)

70 = 2(l + b) ⇒ l + b = 35……(i)

Diagonal of the rectangle = $\sqrt{l^2 + b^2}$

25 = $\sqrt{l^2 + b^2}$ ⇒ $l^2 + b^2$ = 625……(ii)

Now,

l + b = 35

(on square both sides)

$(l + b)^2$ = 1225 ⇒ $l^2 + b^2$ + 2lb = 1225

625 + 2lb = 1225 (from e.q .(i))

lb = $\frac{1225 - 625}{2}$ = 300

Area of rectangle = lb

Hence, the are of the rectangle is 300 cm^2

Sol.254.(a) Volume of sphere = $\frac{4}{3}\pi r^3$

Let the small number of spheres = n

Volume of big sphere = n × volume of small spheres

$\frac{4}{3}\pi R^3 = n \times \frac{4}{3}\pi r^3$

⇒ $(8)^3$ = n × $(2)^3$ ⇒ n = 64

Sol.255.(b) Surface area of sphere = $4\pi r^2$

According to the question,

$4\pi(r + 3.5)^2 - 4\pi(r)^2$ = 550

$4\pi\,[(r + 3.5)^2 - r^2]$ = 550

$[(r + 3.5)^2 - r^2]$ = 550 × $\frac{7}{22 \times 4}$

(2r + 3.5) × 3.5 = 43.75 ⇒ 2r + 3.5 = 12.5

2r = 9 ⇒ radius (r) = 4.5 cm

Sol.256.(a) According to the question,

$a^2 = \frac{1}{2}\pi r^2$ ⇒ $a^2 = \frac{1}{2}\pi \times (2\sqrt{2})^2 = 4\pi$

$a = \sqrt{4\pi} = 2\sqrt{\pi}$

Perimeter of square (4a) = $8\sqrt{\pi}$ cm

Sol.257.(d) Volume of cuboid (lbh)

= 36 cm × 22 cm × 12 cm

Volume of each cube = 6 × 6 × 6

So, required number of cubes

= $\frac{36 \times 22 \times 12}{6 \times 6 \times 6}$ = 44

Sol.258.(b) Area of isosceles right angle triangle = $(\frac{hypotenuse}{2})^2$

16 = $(\frac{hypotenuse}{2})^2$ ⇒ Hypotenuse = 8 m

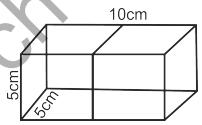
Sol.259.(b) Area of sphere = $4\pi r^2$

= 4 × $\frac{22}{7}$ × 14 × 14 = 2464 cm^2

Cost of painting a ball

= 2464 × 5 = ₹12,320

Sol.260.(a)



Length of cuboid (l) = (5 + 5)cm = 10 cm

Breadth of cuboid (b) = 5 cm

Height of cuboid (h) = 5 cm

Surface area of cuboid = 2(lb + bh + hl)

= 2 × (10 × 5 + 5 × 5 + 5 × 10)

= 2 (50 + 25 + 50) = 250 cm^2

Sol.261.(a) Let breadth of park be x m

Length = (x + 15) m

Perimeter of rectangular park

= 2[(x + 15) + (x)] = 4x + 30

According to question,

4x + 30 = 110 ⇒ x = 20

Length of rectangular park

= x + 15 = 35 m

Sol.262.(d)

Lateral surface area of cube = $4a^2$

$4a^2$ = 144 ⇒ a = 6 cm

Volume of cube (a^3) = 6^3 = 216 cm^3

Sol.263.(d) Surface area of cuboid

= 2(lb + bh + hl) = 2(5 + 15 + 27) = 94 cm^2

Sol.264.(c) Cylindrical tank is closed

So, total surface area cylindrical tank

= $2\pi r(r + h)$

= 2 × $\frac{22}{7}$ × 1.5 (1.5 + 3) = 42.42 m^2

Hence, required metal sheet used

= 42.42 m^2

Sol.265.(b)

Sides ratio = $\sqrt[3]{1} : \sqrt[3]{125}$ = 1 : 5

Surface area of cube = $6a^2$

Required ratio = 6 × $(1)^2$: 6 × $(5)^2$ = 1 : 25

Sol.266.(d)

Height of the cone = $\sqrt{(10)^2 - (6)^2}$

= $\sqrt{100 - 36} = \sqrt{64}$ = 8 cm

Volume of the cone = $\frac{1}{3}\pi r^2 h$

= $\frac{1}{3}$ × π × 6 × 6 × 8 = 96π cm^3

Sol.267.(d) Volume of Sphere = $\frac{4}{3}\pi r^3$

According to the question,

n × $\frac{4}{3}\pi(1)^3 = \frac{4}{3}\pi(9)^3$

Required number of balls (n)

= $\frac{729}{1}$ = 729

Sol.268.(d)

As we know, 1 litre = 1000 cm^3

Then, 10 litres = 10000 cm^3

Let the height be15x

Breadth of cuboidal water purifier

= $\frac{1}{5}$ × 15x = 3x

Length of cuboidal water purifier

= $\frac{1}{3}$(3x + 15x) = 6x

Now, volume of cuboidal water purifier

= 3x × 6x × 15x = 270x^3 ⇒ 10000 = 270x^3

$\frac{1000}{27} = x^3$ ⇒ $x = \frac{10}{3}$

So, the height of cuboidal water purifier

= 15 × $\frac{10}{3}$ = 50 cm

Sol.269.(a)

Total surface area of cube = $6a^2$

Required ratio = 6 × $(2)^2$: 6 × $(4)^2$ = 1 : 4

Sol.270.(c)

Curved surface area of cone = $\pi r l$

According to the question,

π × 4 × l = 20π

Slant height (l) = 5 cm

Height of cone(h) = $\sqrt{l^2 - r^2}$

= $\sqrt{(5)^2 - (4)^2} = \sqrt{9}$ = 3 cm

Now, volume of cone = $\frac{1}{3}\pi r^2 h$

⇒ $\frac{1}{3}$ × π × $(4)^2$ × 3 = 16π cm^3

Sol.271.(b) Let the radius of outer circle

Search on TG: @apna_pdf

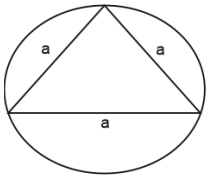
Search on Telegram @apna_pdf

be R and inner circle be r.
According to the question,
$2\pi R : 2\pi r = 7 : 6 \Rightarrow R : r = 7 : 6$
Difference (7 - 6) = 1 unit
1 unit = 45 m
Hence, radius of inner circle (6 unit)
= 45 × 6 = 270 m

Sol.272.(d)
Let the no. of smaller cube be n
Surface area of larger cube = $6a_1^2 = 54$
$a_1^2 = 9 \Rightarrow a_1 = 3$ cm
Surface area of smaller cube
$= 6a_2^2 = \frac{8}{12} \Rightarrow a_2^2 = \frac{8}{12 \times 6} = \frac{1}{9}$
$\Rightarrow a_2 = \frac{1}{3}$
Volume of larger cube = n × volume of smaller cube
$a_1^3 = n \times a_2^3 \Rightarrow 3^3 = n \times \frac{1}{3^3}$
$27 = \frac{n}{27} \Rightarrow n = 729$

Sol.273.(d) Length of cuboid = 60 cm
Breadth of cuboid = $60 \times \frac{1}{2} = 30$ cm
Height of cuboid = $\frac{1}{3} \times 30 = 10$ cm
TSA of cardboard box = 2(lb + bh + hl)
= 2(60 × 30 + 30 × 10 + 10 × 60)
= 2(1800 + 300 + 600) = 2 × 2700
= 5400 cm^2

Sol.274.(c)



Circumradius (R) = $\frac{a}{\sqrt{3}}$, Radius(r) = r
Given that, $\frac{a}{\sqrt{3}} = r \Rightarrow a = \sqrt{3}r$ unit

Sol.275.(c)
Area of rhombus = side × height
70 = side × 5 ⇒ Side = $\frac{70}{5} = 14$ cm
So, the perimeter of rhombus
= 14 × 4 = 56 cm

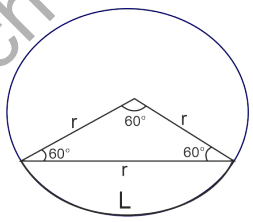
Sol.276.(c)
Median of equilateral triangle = $\frac{\sqrt{3}}{2}a$
Perimeter of equilateral triangle = 3a
Required ratio = $3a : \frac{\sqrt{3}}{2} \times 3a = 2 : \sqrt{3}$

Sol.277.(c)
Inner radius of bowl = $\frac{4}{2} = 2$ cm
Outer radius of bowl = 2 + 0.5 = 2.5 cm
Required volume of silver used in making the bowl = $\frac{2}{3}\pi(R^3 - r^3)$
$= \frac{2}{3} \times 3.14 \times [(2.5)^3 - (2)^3]$
$= \frac{2}{3} \times 3.14 \times 7.625 = \frac{47.885}{3}$
$= 15.96\ cm^3$

Sol.278.(c)
Length = $4x$, Breadth = $3x$, Height = $2x$
Volume = 12288 ⇒ $l \times b \times h = 12288$
$4x \times 3x \times 2x = 12288$
$24x^3 = 12288 \Rightarrow x^3 = 512 \Rightarrow x = 8$
Hence,
Length = $4x = 4 \times 8 = 32$ m
Breadth = $3x = 3 \times 8 = 24$ m
Height = $2x = 2 \times 8 = 16$ m
Total surface area of box = $2(lb + bh + hl)$
$= 2(4x \times 3x + 3x \times 2x + 2x \times 4x)$
$= 2(12x^2 + 6x^2 + 8x^2) = 2(26x^2)$
$= 52 \times 8^2 = 52 \times 64 = 3328\ m^2$
Total cost of polishing = 2 × 3328
= 6656 paise or Rs. 66.56

Sol.279.(c) Let no. of person be x
Perimeter of brim of hemispherical bowl
$= 2\pi r = 88 \Rightarrow 2 \times \frac{22}{7} \times r = 88 \Rightarrow \frac{44}{7}r = 88$
$r = \frac{88 \times 7}{44} = 14$ cm
Volume of hemispherical bowl = x × Volume of hemispherical glass
$\frac{2}{3} \times \pi \times 14^3 = x \times \frac{2}{3} \times \pi \times (\frac{7}{2})^3$
$2744 = \frac{343}{8}x \Rightarrow x = \frac{2744 \times 8}{343} = 64$

Sol.280.(b)



Length of the arc(L) = $\frac{\theta}{360°} \times 2\pi r$
$= \frac{60°}{360°} \times 2 \times \frac{22}{7} \times 21 = 22$ units

Sol.281.(a) Area of parallelogram
= Base(b) × Height(h)
According to the question,
b = 2h ⇒ 338 = 2h × h
$\Rightarrow 338 = 2h^2 \Rightarrow h^2 = 169 \Rightarrow h = 13$ cm

Sol.282.(b) TSA of cone = πR(L+ R)
$= \frac{\pi r}{4}(4l + \frac{r}{4})$
$= \frac{\pi r}{4} \times 4(l + \frac{r}{16}) = \pi r(l + \frac{r}{16})$

Sol.283.(b) CSA of conical tent = $\pi r l$
Let the required length of cloth be x m
Slant height of tent (l) = $\sqrt{r^2 + h^2}$
$= \sqrt{(21)^2 + (28)^2} = \sqrt{1225} = 35$ m
Area of cloth = CSA of conical tent
$5 \times x = \frac{22}{7} \times 21 \times 35 \Rightarrow 5x = 2310$
$x = \frac{2310}{5} = 462$ m

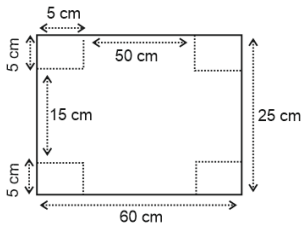
Sol.284.(b)
Volume of cube = 4 × volume of cuboid
$a^3 = 4 \times 32 \times 8 \times 4 = 4096 \Rightarrow a = 16$
Now, $\frac{TSA\ of\ cube}{TSA\ of\ cuboid}$
$= \frac{6 \times 16 \times 16}{2(32 \times 8 + 8 \times 4 + 32 \times 4)}$
$= \frac{6 \times 16 \times 16}{832} = \frac{24}{13} = 24 : 13$

Sol.285.(a)
Radius of copper sphere = $\frac{12}{2} = 6$ cm
Radius of wire = $\frac{4}{2} = 2$ mm = $\frac{2}{10}$
= 0.2 cm
volume of sphere = volume of wire
$\frac{4}{3}\pi \times 6^3 = \pi \times 0.2^2 \times h$
$288 = 0.04h \Rightarrow h = \frac{288}{0.04} = 7200$ cm

Sol.286.(d) Length of the largest possible rod which can be placed in cubical room = $\sqrt{3}a \Rightarrow 42\sqrt{3} = \sqrt{3}a \Rightarrow a = 42$ m
Required TSA of sphere
$= 4 \times \frac{22}{7} \times (\frac{42}{2})^2 = 5544\ m^2$

Sol.287.(a) circumference of circle
$= 2 \times \frac{22}{7} \times r \Rightarrow 88 = \frac{44}{7}r$
$r = \frac{88 \times 7}{44} = 14$ cm
Area of a minor sector = $\frac{1}{2} \times lr$
(l = minor arc length)
$= \frac{1}{2} \times 22 \times 14 = 154\ cm^2$

Sol.288.(c)



Length of box = 50 cm
Breadth of box = 15 cm
Height of box = 5 cm
Volume of box = $l \times b \times h = 50 \times 15 \times 5$
$= 3750\ cm^3$

Sol.289.(b)
Volume of cylindrical shell = $\pi(R^2 - r^2)h$
$= \frac{22}{7} \times (7^2 - 4^2) \times 42$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

= 22 × (49 - 16) × 6

= 22 × 33 × 6 = 4356 cm^3

Sol.290.(d)

Volume of laddoo of radius 5 cm = $\frac{4}{3}\pi R^3$

Volume of laddoo of radius 2.5 cm

= $\frac{4}{3}\pi r^3$

No. of laddoos created = $\frac{\frac{4}{3}\pi R^3}{\frac{4}{3}\pi r^3}$

= $\frac{5 \times 5 \times 5}{2.5 \times 2.5 \times 2.5}$ = 8 laddoos

Sol.291.(d) T.S.A. of spherical vessel

= $4\pi r^2$ = 4 × $\frac{22}{7}$ × 7 × 7 = 616 cm^2

Cost per square centimeter

= $\frac{total\ cost}{T.S.A}$ = $\frac{21,560}{616}$ = 35 Rs.

Sol.292.(c) $\frac{Volume\ of\ cone}{Volume\ of\ cylinder}$

= $\frac{\frac{1}{3}\pi r^2 h}{\pi R^2 H}$ = $\frac{\frac{1}{3} \times 5 \times 5 \times 6}{2.5 \times 2.5 \times 3}$ = $\frac{8}{3}$ = 8 : 3

Sol.293.(a) C.S.A. of cylinder = 2200

$2\pi rh$ = 2200

2 × $\frac{22}{7}$ × 7 × h = 2200

⇒ h = $\frac{2200}{44}$ = 50 cm

T.S.A. of cylinder = $2\pi r(h + r)$

= 2 × $\frac{22}{7}$ × 7 (50 + 7) = 44 × 57

= 2508 cm^2

Sol.294.(d) Let R be external radius and r be internal radius of a hollow sphere and radius of a cone be r_1

According to question,

Volume of cone = volume of hollow cylinder

$\frac{1}{3}\pi r_1^2 h$ = $\frac{4}{3}\pi(R^3 - r^3)$

$5^2 \times h = 4\ (5^3 - 3^3)$

$25 \times h = 4 \times 98$

h = $\frac{4 \times 98}{25}$ = 15.68 cm

Sol.295.(b)

Surface area of spherical box = 528 cm²

$4\pi r^2$ = 528 cm²

4 × $\frac{22}{7}$ × r^2 = 528 cm²

r^2 = $\frac{528 \times 7}{4 \times 22}$ = 42 ⇒ r = $\sqrt{42}$

Hence, radius = $\sqrt{42}$ cm

Sol.296.(d) Area of trapezium =

$\frac{1}{2}$ × sum of parallel sides × height

⇒ 1188 = $\frac{1}{2}$× sum of parallel sides × 18

sum of parallel sides = 132 cm

Sol.297.(b) Circumference of circular base of cone = 30π ft.

$2\pi r$ = 30π ft. ⇒ r = 15 ft.

Height (h) of cone = 20 ft.

Slant height of cone (l) = $\sqrt{r^2 + h^2}$

Slant height of cone (l) = $\sqrt{225 + 400}$ = 25 ft.

Area of canvas needed = π × 15 × 25 = 375π sq .ft.

Sol.298.(a) Volume of cone = 150 π

$\frac{1}{3}$× π × r^2 × 18 = 150 π

r^2 = 25 ⇒ r = 5

Slant height (l) = $\sqrt{h^2 + r^2}$ = $\sqrt{18^2 + 5^2}$

= $\sqrt{324 + 25}$ = $\sqrt{349}$ = 18.68 cm

Sol.299.(d) If both playgrounds are similar then their dimension must be in proportion.

First playground = $\frac{length}{breadth}$ = $\frac{224}{160}$ = $\frac{7}{5}$

By checking option one by one we find that option (d) does not have the same ratio of length and breadth as the first playground.

Sol.300.(a) Volume of storage tank

= $\frac{1}{3}\pi r^2 h$ = $\frac{1}{3}$ × $\frac{22}{7}$× 7 × 7 × 9

= 21 × 22 = 462 cubic ft.

Sol.301.(b)

Ratio → length : breadth : height

2 : 1

2 : 1

Final → 4 : 2 : 1

Volume (8 m^3) = 1728 m^3

1 m^3 = $\frac{1728}{8}$ = 216 ⇒ 1 unit = 6

Length (4 m) = 6 × 4 = 24 m

Sol.302.(b) Number of candles

= $\frac{volume\ of\ cuboidal\ solid}{volume\ of\ cylindrical\ candle}$

= $\frac{70 \times 44 \times 20}{\frac{22}{7} \times 7 \times 7 \times 20}$ = 20

Sol.303.(a) Lateral surface area = πrl

13.2 = $\frac{22}{7}$× r × 4.2

13.2 = 22 × r × 0.6 ⇒ r = $\frac{13.2}{13.2}$ = 1 unit

Sol.304.(d) Area of triangle = inradius × semiperimeter

= 8 × $\frac{125}{2}$ = 500 cm^2

Sol.305.(c) Volume of metal ball

= volume of (27 identical dice + a ball)

$\frac{4}{3}\pi R^3$ = 27 × $side^3$ + $\frac{4}{3}\pi r^3$

$\frac{4}{3}\pi R^3$ - $\frac{4}{3}\pi r^3$ = 27 × $side^3$

$\frac{4}{3}$ × $\frac{22}{7}$ (27 - 1) = 27×$side^3$

$\frac{4}{3}$ × $\frac{22}{7}$ × 26 = 27×$side^3$

$side^3$ = $\frac{2288}{21 \times 27}$ ⇒$side^3$ = 4.035 (approx)

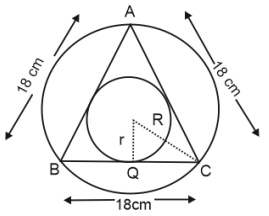
Side = 1.6 units (approx)

Sol.306.(c) $l : h$ **= 4 : 3**

C.S.A. of cone = $4\sqrt{7}\pi$

πrl = $4\sqrt{7}\pi$ ⇒ r × 4 = $4\sqrt{7}$ ⇒ r = $\sqrt{7}$ unit

Sol.307.(d)



Area of equilateral triangle = $\frac{\sqrt{3}}{4}$ × a^2

= $\frac{\sqrt{3}}{4}$ × 18 × 18 = $81\sqrt{3}$ cm^2

Relation between area of circumcircle, equilateral triangle and incircle

Circumcircle : equilateral triangle : incircle = 4π : $3\sqrt{3}$: π

Area of circumcircle - area of incircle

= 4π - π = 3π ⇒ $3\sqrt{3}$ unit = $81\sqrt{3}$ cm^2

1 unit = 27 cm^2

3π unit = $\frac{27}{1}$ × 3 × $\frac{22}{7}$ = $254\frac{4}{7}$ cm^2

Sol.308.(d) Area of circle = 256π cm^2

πr^2 = 256π ⇒ r = 16 cm

Diameter = 2 × r = 2 × 16 = 32 cm

Diameter is the longest chord,

Hence length of longest chord = 32 cm

Sol.309.(c) Perimeter of one face of cube (4a) = 40 ⇒ a = 10

Volume of cube = a^3 = 10^3 = 1000 cm^3

Sol.310.(c) Area of triangle = $\frac{1}{2}$ × 15^2 × sin 30° = $\frac{225}{2}$ × $\frac{1}{2}$ = $\frac{225}{4}$ = 56.25 cm^2

Sol.311.(a) Radius of cone = $\frac{14}{2}$ = 7 cm

LSA of cone (πrl) = 550

⇒ $\frac{22}{7}$ × 7 × l = 550 ⇒ 22 l = 550

⇒ l = $\frac{550}{22}$ = 25

Height of the cone

= $\sqrt{25^2 - 7^2}$ = $\sqrt{576}$ = 24 cm

Sol.312.(c)

Volume of hemisphere = $\frac{2}{3}$ π r^3

⇒ V = $\frac{2}{3}$ × π × $(9)^3$ ⇒ V = 486 π cm^3

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.313.(c) Given,
Height of cylinder = 9 cm
the base area = 25πcm²
$\Rightarrow \pi r^2$ = 25πcm² ⇒ r = 5 cm
Now,
Total Surface Area = 2πrh + 2 π r^2
TSA of cylinder
$= 2 \times \frac{22}{7} \times 5 \times 9 + 2 \times \frac{22}{7} \times 25$
$= 2 \times \frac{22}{7} \times 5\ (9 + 5)$
$= 2 \times \frac{22}{7} \times 5 \times 14 = 440$ cm²

Sol.314.(b) Let height of the first cone = 3h
And height of the second cone = h
Radius of first cone = r
And radius of the second cone = 2r
Total volume(V) = volume of first cone + volume of second cone
$\Rightarrow V = \frac{1}{3}\pi r^2\, 3h + \frac{1}{3}\pi\, 4r^2\, h$
$\Rightarrow 100 = \frac{1}{3}\pi\,(r^2.\ 3h + 4r^2\, h)$
$\Rightarrow 100 = \frac{1}{3}\pi\,(7r^2\, h) \Rightarrow r^2\, h = \frac{300}{7\pi}$
Now,
Difference between the volume of cones
$= \frac{1}{3}\pi\,(4\, r^2\,.\, h - r^2.3h)$
$\Rightarrow V = \frac{1}{3}\pi\,(r^2\, h) \Rightarrow V = \frac{1}{3}\pi\,.\,\frac{300}{7\pi}$
$= \frac{100}{7} = 14.28 \approx 14.3\ unit^3$

Sol.315.(a)
Surface area of cube = 5400 square units
$\Rightarrow 6a^2 = 5400 \Rightarrow a^2 = 900 \Rightarrow$ a = 30 unit
Volume of cube = a^3 = 27000 Unit³
Now, New side = 30 + 5 = 35 unit
New Volume of cube
= 35 × 35 × 35 = 42875 Unit³
Increment in volume = $\frac{42875 - 27000}{27000} \times$
$100 = \frac{15875}{27000} \times 100 = 58.79 \approx 59$ %

Sol.316.(d) Let radius = r cm
⇒ Surface Area of sphere = $4\pi r^2\ cm^2$
New radius = r + 2 cm
New surface area of sphere
$= 4\pi(r + 2)^2\ cm^2$
According to question,
$4\pi\,(r + 2)^2 - 4\pi r^2 = 704$
$\Rightarrow 4 \times \frac{22}{7}(r^2 + 4 + 4r - r^2) = 704$
⇒ 4 + 4r = 56 ⇒ 4r = 52 ⇒ r = 13 cm

Sol.317.(a)
$10\% = \frac{1}{10}$, $20\% = \frac{1}{5}$, $40\% = \frac{2}{5}$

	Original		New
Length	10	:	9
Breadth	5	:	4
Height	5	:	7
Volume	250	:	252

Change in volume = $\frac{252 - 250}{250} \times 100$
$= \frac{200}{250} = 0.8\%$ increase

Sol.318.(b) Radius of cone = $\frac{14}{2}$ = 7 m
Volume of cone
$= \frac{1}{3} \times \frac{22}{7} \times 7^2 \times 12 = 616\ m^3$
Required time taken to fill the cone
$= \frac{616}{2} \times 20 = 6160$ sec

Sol.319.(b) Volume of a cuboid = 2 × Volume of a cube
12 × 16 × 18 = 2 × Volume of a cube
3,456 = 2 × Volume of a cube
Volume of a cube = 1728
$a^3 = 1728 \Rightarrow$ a = 12
TSA of cube = $6a^2 = 6 \times 12^2$ = 864 cm²

Sol.320.(c) ATQ,
h = 4r
$\frac{CSA\ of\ cylinder}{Base\ area\ of\ cylinder}$
$= \frac{2\pi rh}{\pi r^2} = \frac{2\pi r \times 4r}{\pi r^2} = \frac{8}{1}$
So, the curved surface area is 8 times its base area.

Sol.321.(a) According to the question,
Lateral surface area of cylinder = 2πrh
3862.2 = 2 × 3.14 × r × 15
3862.2 = 94.2r ⇒ r = 41 cm
Volume of cylinder = πr^2h
$= 3.14 \times 41^2 \times 15 = 79{,}175.1\ cm^3$

Sol.322.(a) L = 2B and H = $\frac{1}{2}$B
Volume of cubical shaped cold storage = L × B × H
$\Rightarrow 216 = 2B \times B \times \frac{1}{2}B = B^3 \Rightarrow$ B = 6 m
Then, L = 2 × 6 = 12 m, H = $\frac{1}{2} \times 6$ = 3 m
So, the dimensions are 12 m × 6 m × 3 m

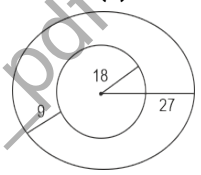
Sol.323.(d) Volume of cylinder = πr^2h
CSA of cylinder = 2πrh
Let x be multiplied to obtain volume of cylinder
According to the question,
$2\pi rh \times x = \pi r^2 h \Rightarrow x = \frac{\pi r^2 h}{2\pi rh} = \frac{r}{2}$

Sol.324.(a) Required no of cubes
$= \frac{volume\ of\ cuboid}{volume\ of\ cube}$
$= \frac{500 \times 200 \times 500}{50 \times 50 \times 50} = 400$

Sol.325.(c) Perpendicular = $\sqrt{17^2 - 15^2}$
$= \sqrt{289 - 225} = \sqrt{64} = 8$ cm
Area of right angle triangle
$= \frac{1}{2} \times 8 \times 15 = 60\ cm^2$

Sol.326.(c)
Let length of rectangle = l meter
Breadth of rectangle = b meter
According to question,
$\frac{l+6}{b+6} = \frac{4}{3} \Rightarrow 3l - 4b = 6$ ---------- (i)
And
$\frac{l-6}{b-6} = \frac{2}{1} \Rightarrow l - 2b = -6$ ---------- (ii)
On solving equations (i) and (ii) we get,
l = 18 meter , b = 12 meter

Sol.327.(c) Increment in area of circle
$= 7 + 7 + \frac{7 \times 7}{100} = 14.49$ %

Sol.328.(b)


Area of the closed figure
$= \pi(27)^2 - \pi(18)^2$
⇒ Area = π (729 - 324) = 405 π cm^2

Sol.329.(c) Required area of hemisphere
$= 2\pi r^2 + 2\pi r^2 \Rightarrow A = 4\pi r^2$
$\Rightarrow A = 4 \times \frac{22}{7} \times 21 \times 21 = 5544$
Hence, cost of painting
= 5544 × 0.05 = 277.2 Rs.

Sol.330.(b)
Area of a regular pentagon = $5 \times \frac{\sqrt{3}}{4} a^2$
$\Rightarrow 3920\sqrt{3} = 5 \times \frac{\sqrt{3}}{4} \times a^2$
$\Rightarrow a^2 = 3136 \Rightarrow$ a = 56 cm

Sol.331.(a) Given,
Base (b) = 3H, Height (h) = H
Area of parallelogram = 1020 cm²
⇒ b × h = 1020 ⇒ 3 H × H = 1020
⇒ H² = 340 ⇒ H = $2\sqrt{85}$ cm

Sol.332.(a) According to the question,
Surface area of sphere = Surface area of cube
$\Rightarrow 4\pi r^2 = 6a^2 \Rightarrow 2\pi r^2 = 3a^2$
Take square root both side,
$\Rightarrow \sqrt{2\pi}\, r = \sqrt{3}\, a$ .....(i)
Volume of sphere = $\frac{4}{3}\pi r^3$
Volume of cube = a^3
Required ratio
$= \frac{\frac{4}{3}\pi r^3}{a^3} = \frac{\frac{4}{3}\pi r^3}{\left(\frac{\sqrt{2\pi}\, r}{\sqrt{3}}\right)^3}$ [from eq . (i)]

Search on TG: @apna_pdf

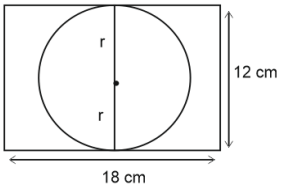
Search on Telegram @apna_pdf

$= \frac{\sqrt{6}}{\sqrt{\pi}}$

Sol.333.(d)
Surface area of a sphere = 2464 cm²
$\Rightarrow 4\pi r^2 = 2464 \Rightarrow 4 \times \frac{22}{7} r^2 = 2464$
$\Rightarrow r^2 = 196 \Rightarrow r = 14$ cm
Hence ,
Volume = $\frac{4}{3}\pi r^3$
$= \frac{4}{3} \times \frac{22}{7} \times 14 \times 14 \times 14$
= 11498.67 cm³

Sol.334.(b)
As we know, $(\frac{D_1}{2})^2 + (\frac{D_2}{2})^2 = side^2$
$12^2 + (\frac{D_2}{2})^2 = 13^2 \Rightarrow (\frac{D_2}{2})^2$
$= \sqrt{13^2 - 12^2} = 5 \Rightarrow D_2 = 5 \times 2 = 10$ cm
Now, Area of rhombus = $\frac{1}{2} \times D_1 \times D_2$
$= \frac{1}{2} \times 24 \times 10 = 120\ cm^2$

Sol.335.(d)



Maximum radius (r) = $\frac{12}{2}$ = 6 cm
Area of circle = $\pi r^2 = \pi \times 6^2 = 36\pi\ cm^2$

Sol.336.(c) LSA of cube = $4a^2$
TSA of cube = $6a^2$
ATQ, $6a^2 - 4a^2 = 2a^2 = 2 \times 11^2 = 242\ cm^2$

Sol.337.(d) Volume of cone = $\frac{1}{3}\pi r^2 h$
Volume of cone $\propto r^2 h$
(As $\frac{1}{3}\pi$ is constant)
According to the question,
Volume of cone = $Radius^2$ × Height

Original →	100	=	5^2	×	4
New →	108	=	6^2	×	3

% Change in volume
$= \frac{108 - 100}{100} \times 100 = 8\%$

Sol.338.(b)
Let the width of rectangular garden be x
Then, length = $(x + 8)$ cm
Perimeter of garden = 42 × 2 = 84 cm
$2(x + x + 8) = 84$
$2(2x + 8) = 84 \Rightarrow 2x + 8 = 42$
$x + 4 = 21 \Rightarrow x = 17$
So, the area of rectangular garden
$= 17 \times 25 = 425 cm^2$

Sol.339.(c) Volume of cube = 64 cm^3
$a^3 = 64 \Rightarrow a = 4$
TSA of cube = $6a^2 = 6 \times 4^2 = 96\ cm^2$

Sol.340.(b)
Before : After
Ratio of radius = 10 : 13
∴ Ratio of volume = $(10)^3 : (13)^3$
= 1000 : 2197
% increase in volume
$= \frac{2197 - 1000}{1000} \times 100 = 119.7\%$

Sol.341.(b)
Diameter = 21 cm, Radius = $\frac{21}{2}$ cm
Volume of hemispherical bowl = $\frac{2}{3}\pi r^3$
$= \frac{2}{3} \times \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2} \times \frac{21}{2}$
$= 2425.5\ cm^3$

Sol.342.(b) Before : After

Radius →	4^2	:	5^2
Height →	4	:	5
Volume →	64	:	125

% increase in volume = $\frac{125 - 64}{64} \times 100$
= 95.31%

Sol.343.(d) Volume of cube = a^3
$a^3 = 512$ cubic unit
∴ side of cube $(a) = 8$ unit
Now, surface area of cube = $6 \times a^2$
$= 6 \times 8 \times 8 = 384$ square unit

Sol.344.(d)
Let the total number of packed box = x
∵volume of big box = volume of small box × x
$160 \times 90 \times 60 = 6 \times 5 \times 4 \times x$
$\therefore x = 7200$
Hence no. of packed box = 7200

Sol.345.(c)
Let the length = 6x, width = 3x ,height =2x
ATQ,
2(LB + BH + HL) = 1800
$2(6x \times 3x + 3x \times 2x + 2x \times 6x) = 1800$
$2 \times 36x^2 = 1800 \Rightarrow x^2 = 25 \Rightarrow x = 5$
Now, volume of cuboid = L × B × H = 6x ×
= 3x × 2x = $36x^3 = 36 \times 5^3 = 4500$

Sol.346.(a)
Let the no of small cubes be n
ATQ,
Volume of solid cube = Volume of new cube formed
48 × 48 × 48 = n × 64
$n = \frac{48 \times 48 \times 48}{64} = 1728$

Sol.347.(b) T.S.A. of cylinder = $2\pi r(h + r)$
$\frac{18,425}{25} = 2 \times \frac{22}{7} \times r(30 + r)$
$\frac{737 \times 7}{11} = 4 \times r(30 + r)$
$469 = 4r^2 + 120r$
$4r^2 + 120r - 469 = 0$
$4r^2 + 134r - 14r - 469 = 0$
$2r(2r + 67) - 7(2r + 67) = 0$
$(2r + 67)(2r - 7) = 0$
$r = -\frac{67}{2}$ or $r = \frac{7}{2}$ m
Radius cannot be negative
therefore ,radius $(r) = \frac{7}{2}$
Volume of cylinder = $\pi r^2 h$
$= \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 30$
Volume of cylinder = 1155 m^3

Sol.348.(c) According to the question,
T.S.A of hemisphere - C.S.A of hemisphere
$3\pi r^2 - 2\pi r^2 = \pi r^2 = 4\pi\ cm^2$

Sol.349.(a) According to the question,
C.S.A of cone = πrl
Required cost = $\frac{22}{7} \times 21 \times 25 \times 1.5$
= 2475 Rs

Sol.350.(b)
Let the number of hemisphere = n
Volume of sphere = n × volume of hemisphere
$\frac{4}{3}\pi \times 12 \times 12 \times 12 = n \times \frac{2}{3}\pi \times 4 \times 4 \times 4$
$n = 54$

Sol.351.(d) Given, Perimeter of rhombus = 52 cm and diagonal $(D1)$ = 10 cm
Then, side of the rhombus = 13 cm
Now, $D1^2 + D2^2 = 4side^2$
$D2^2 = 676 - 100 \Rightarrow D2 = 24\ cm$
Now, area of rhombus
$= \frac{1}{2} \times D1 \times D2 = \frac{1}{2} \times 10 \times 24 = 120\ cm^2$

Sol.352.(c) side of square base = b
slant height = s
height of pyramid = h
base area of pyramid $(b)^2 = \frac{3}{8} \times 1536$
$= 576\ m^2$
side of square base(b) = 24 m
T.S.A. of square based pyramid
$= (b)^2 + 2 \times b \times s$
$1536 = 576 + 2 \times 24 \times s$
Slant height $(s) = \frac{1536 - 576}{48}$
$= \frac{960}{48} = 20$ m
Height of pyramid $(h) = \sqrt{s^2 - (\frac{b}{2})^2}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \sqrt{400 - 144} = \sqrt{256} = 16$ m

Volume of pyramid = $(b)^2 \times \frac{h}{3}$

$= 24 \times 24 \times \frac{16}{3} = 3072\ m^3$

Sol.353.(a)

Volume of sphere = $\frac{4}{3} \times \pi \times (radius)^3$

when diameter is reduced to half then new radius will also reduced to half of the former sphere

Therefore ,

Volume of new sphere

$= \frac{4}{3} \times \pi \times (\frac{radius}{2})^3$

$= \frac{1}{8} \times \frac{4}{3} \times \pi \times (radius)^3$

= reduced by $\frac{1}{8}$ of the former volume

Sol.354.(c) According to the question,

Volume of cone = $\frac{1}{3}\pi r^2 h$

Volume of 1st cone : volume of 2nd cone

$\frac{1}{3}\pi \times 5^2 \times 7 : \frac{1}{3}\pi \times (\frac{21}{2})^2 \times 5$

$25 \times 7 : \frac{441}{4} \times 5 \Rightarrow 20 : 63$

Sol.355.(d)

Diagonal of rectangle = $\sqrt{4^2 + 3^2} = 5$

According to the question,

Diagonal of rectangle = diameter of hemisphere = 5

So, radius = 2.5 cm

Now, total surface area of hemisphere

$= 3\pi \times 2.5 \times 2.5 = \frac{75\pi}{4}$

Sol.356.(d) Let the height and radius of the right circular cone = 12x and 5x

Volume of a cone = $\frac{1}{3}\Pi r^2 h$

$314 = \frac{1}{3} \times 3.14 \times 25x^2 \times 12x$

$x^3 = \frac{314 \times 100 \times 3}{314 \times 25 \times 12} = 1 \Rightarrow x = 1$

Hence, Slant height = $\sqrt{(12x)^2 + (5x)^2}$

$= \sqrt{144 + 25} = 13$ cm

Sol.357.(d)

Given, diagonal of square = $24\sqrt{2}$

Then, side of the square = 24 cm

Lateral surface area of square pyramid

= 2 × side × slant height

$= 2 \times 24 \times l = 624 \Rightarrow l = 13\ cm$

Now, height of pyramid = $\sqrt{13^2 - (\frac{24}{2})^2}$

= 5 cm

So, volume of pyramid

$= \frac{1}{3} \times side^2 \times height$

$= \frac{1}{3} \times 24^2 \times 5 = 960\ cm^3$

Sol.358.(d) According to the question,

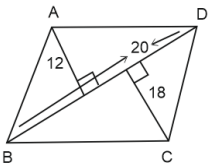
Volume of cylinder = Volume of sphere

$\pi r^2 h = \frac{4}{3}\pi r^3 \Rightarrow 12 \times 12 \times h$

$= \frac{4}{3} \times 9 \times 9 \times 9 \Rightarrow h = \frac{4 \times 9 \times 9 \times 9}{3 \times 12 \times 12}$

h = 6.75 cm

Sol.359.(d)



According to the question,

Area of quadrilateral ABCD

$= \frac{1}{2} \times 20 \times 12 + \frac{1}{2} \times 20 \times 18 = 300\ m^2$

Sol.360.(c)

Ratio	- ball P	:	ball Q
Diameter -	8	:	2
Radius -	4	:	1

Required ratio = $4^3 : 1^3 = 64 : 1$

Sol.361.(c) Given,Slant height (l) = 29 cm

Height (h) = 20 cm

Radius (r) = $\sqrt{(29)^2 - (20)^2}$

$= \sqrt{841 - 400} = \sqrt{441} = 21$ cm

According to question,

$\frac{T.S.A.\ of\ cone}{Volume\ of\ cone}$

$= \frac{\pi r(l + r)}{\frac{1}{3}\pi r^2 h} = \frac{(l + r)}{\frac{1}{3}rh}$

$\frac{T.S.A.\ of\ cone}{Volume\ of\ cone} = \frac{(29 + 21)}{\frac{1}{3} \times 21 \times 20}$

$= \frac{50}{140} = 5 : 14$

Sol.362.(b) Given, Radius (R) = 3 cm

Radius of each hemispherical ball after recasting (r) = 1.5 cm

Number of recasted balls = $\frac{\frac{4}{3}\pi R^3}{\frac{2}{3}\pi r^3}$

$= \frac{2 \times (3)^3}{(1.5)^3} = 2 \times (\frac{3}{1.5})^3 = 2 \times 8 = 16$

Sol.363.(c) According to the question,

Volume of hollow cylinder = $\pi(R^2 - r^2)h$

$= \frac{22}{7} \times (10 + 7)(10 - 7) \times 49 = 7854\ cm^3$

Sol.364.(b)

Volume of sphere = volume of wire

$\frac{4}{3}\pi r^3 = \pi r^2 h$

$\frac{4}{3} \times 3 \times 3 \times 3 = 0.2 \times 0.2 \times h$

h = 900 cm or 9 m

Sol.365.(c) Number of small cubes n

$= \frac{8 \times 6 \times 6}{0.5 \times 0.5 \times 0.5} = 2304$

Sol.366.(c) Let radius and height of the cone = $3x$ and $4x$

Slant height(l) = $\sqrt{(3x)^2 + (4x)^2}$

$= \sqrt{25x^2} = 5x$

According to the question,

Volume of the cone = $\frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times 3.14 \times 9x^2 \times 4x = 301.44$

$= 12x^3 \times 3.14 = 301.44$

$= x^3 = \frac{301.44}{12 \times 3.14} = 8 \Rightarrow x = 2$

Slant height ($5x$) = 5 × 2 = 10 cm

Sol.367.(c) According to the question,

1 liter = 1000 cm^3

50 liter = 50,000 cm^3

50 liter = $50{,}000 \times \frac{1}{1000000} = 0.05\ m^3$

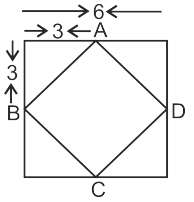
Required time = $\frac{120}{0.05}$

= 2400 min. or 40 hours

Sol.368.(c) according to the question,

Area of the square = $side^2$

36 = $side^2$, side = 6



Length of AB = $\sqrt{3^2 + 3^2} = \sqrt{18}$

Area of square ABCD = $(\sqrt{18})^2$

= 18 square units

Sol.369.(a) Both the median and the altitude are the same in equilateral triangle.

(height) Median of equilateral triangle

$= \frac{\sqrt{3}}{2}a = \frac{\sqrt{3}}{2}a = 6\sqrt{3} \Rightarrow a = 12$ cm

So, area of equilateral triangle = $\frac{\sqrt{3}}{4}a^2$

$= \frac{\sqrt{3}}{4} \times 12 \times 12 = 36\sqrt{3}$ cm²

Sol.370.(b) Volume of cuboid When areas of three adjacent faces of a cuboid are given = $\sqrt{pqr}\ unit^3$

Sol.371.(b)

Total surface area of cylinder = $2\pi r(h + r)$

$2\pi r(h + r) = 64\pi$

$2\pi r \times 2r = 64\pi$ (given r = h)

$4\pi r^2 = 64\pi \Rightarrow r = 4$, (h = 4)

Now, R = 2, H = 8

Total surface area of cylinder

$= 2\pi \times 2(8 + 2) = 40\pi$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.372.(c) According to the question,
Volume of hollow metal sphere = volume of solid cone

$\frac{4}{3} \times \pi \times (6^3 - 5^3) = \frac{1}{3} \times \pi \times (5.2)^2 \times h$

$h = \frac{4 \times 91}{5.2 \times 5.2} \approx 13.5$

Sol.373.(a) Area of rhombus

$= \frac{1}{2} \times d_1 \times d_2 = \frac{1}{2} \times 7.5 \times 5.6 = 21$ cm²

Sol.374.(a) According to the question,
Volume of hollow sphere = volume of cone

$\frac{4}{3}\pi(R^3 - r^3) = \frac{1}{3}\pi r^2 h$

$4(3^3 - 2^3) = 4^2 h \Rightarrow 4 \times 19 = 16h$

(height) h = $4\frac{3}{4}$ cm

Sol.375.(d)

Total area of ground(πr^2) =15 × 5 = 75 m^2

Volume of the cone = $\frac{1}{3}\pi r^2 h$

According to the question,

$\frac{1}{3}\pi r^2 h = 30 \times 15 \Rightarrow \frac{1}{3} \times 75 \times h = 30 \times 15$

Height of cone (h) = 18 m

Sol.376.(a)
Volume of cuboid = Volume of cone

$11 \times 8 \times 6 = \frac{1}{3} \times \frac{22}{7} \times r^2 \times 14$

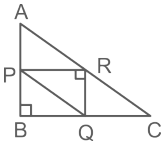
$r^2 = 36 \Rightarrow r = 6$ cm

Sol.377.(b)
Let length, breadth and height of cuboid be $6x$, $4x$ and $3x$ respectively
Total surface area of the cuboid
$= 2(lb + bh + hl)$
$2(6x \times 4x + 4x \times 3x + 3x \times 6x) = 972$
$108x^2 = 972$, $x = 3$
then, length, breadth and height = 18 cm, 12 cm and 9 cm
Diagonal of the cuboid

$= \sqrt{(18)^2 + (12)^2 + (9)^2}$

$= \sqrt{549} = 3\sqrt{61}$ cm

Sol.378.(a) (5, 12, 13) is a triplate so the triangle will be a right angle triangle.



triangle made by the mid point of the sides ABC triangle will be also right angle triangle

And the area of ΔPRQ will be $\frac{1}{4}$ of the area of ΔABC.

So the area of ΔPRQ = $\frac{1}{4} \times \frac{1}{2} \times 5 \times 12$

$= 7\frac{1}{2}$ cm²

Sol.379.(d) C.S.A of cone = πrl
T.S.A of cone = πr(l + r)

slant height (l) = $\sqrt{h^2 + r^2}$

l = $\sqrt{20^2 + 15^2}$ = 25 cm
C.S.A of cone = π × 15 × 25 = 375π cm²
T.S.A of cone = π ×15(25 + 15) = 600π cm²

Sol.380.(c) Surface area of spherical water tank = $4\pi r^2$

$= 4 \times \frac{22}{7} \times 3.5 \times 3.5 \Rightarrow 88 \times .5 \times 3.5$

$= 44 \times 3.5 = 154\ m^2$

Required cost = 154 × 13 = 2002 Rs.

Sol.381.(a)
Pythagoras triplets :- (20, 21, 29)
Radius of cone = 20 cm

Volume of cone = $\frac{1}{3} \times \pi r^2 h$

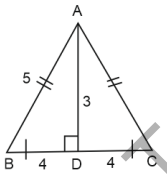
$= \frac{1}{3} \times \frac{22}{7} \times 20 \times 20 \times 21$

$= 400 \times 22 = 8800\ cm^3$

Sol.382.(d)
Perimeter of parallelogram = 2(l + b)
= 48 cm ⇒ b = 24 – 8 = 16 cm

Area = base × height = 16 × 6 = 96 cm^2

Sol.383.(a)



Pythagoras triplets : (3, 4, 5)
AD = 3 cm

Area of triangle = $\frac{1}{2} \times 8 \times 3 = 12\ cm^2$

Sol.384.(a) Radius of sphere = 3.5 cm

Volume = $\frac{4}{3}\pi r^3$

$= \frac{4}{3} \times \frac{22}{7} \times 3.5 \times 3.5 \times 3.5$

$= \frac{4}{3} \times 22 \times 0.5 \times 3.5 \times 3.5$

$= \frac{44}{3} \times 12.25 = 179.67\ cm^3$

Sol.385.(d) 0.2 cm refers to 1 km
1cm refers to 5 km

$1cm^2$ refers to 25 km^2

Now, 22500 km^2 = $\frac{1}{25} \times 22500 = 900\ cm^2$

Sol.386.(d)

Total volume = $(15)^3 + (18)^3 + (25)^3$
Side of newly formed cube

$= \sqrt[3]{(15)^3 + (18)^3 + (25)^3}$

$= \sqrt[3]{3375 + 5832 + 15625}$

$= \sqrt[3]{24832} = \sqrt[3]{64 \times 388} = 4\sqrt[3]{388}$

Sol.387.(d)

$\frac{4}{3} \times \pi \times (9)^3 = x \times \frac{4}{3} \times \pi \times (3)^3$

⇒ x = 27 laddoos

Sol.388.(a)

Side of square = $\frac{172}{4}$ = 43 cm

Area of triangle = $\frac{43 \times 43}{2} = 924.5\ cm^2$

Sol.389.(d) $1m^3$ = 1000 litre
Volume of cuboid = 12 × 9 × 7.5
= 810m^3 = 810000 litre

Sol.390.(a)
Third side = 20 – (5 + 6) = 9 meter
Semiperimeter = 10

Area = $\sqrt{10 \times (10 - 5)(10 - 6)(10 - 9)}$

$= \sqrt{10 \times (5) \times (4) \times (1)} = 10\sqrt{2}\ m^2$

Sol.391.(d) Length of arc = $\frac{\theta}{360°} \times 2\pi r$

= 20.6 – 2 ×7.4 = 5.8 cm

Area of sector = $\frac{\theta}{360°} \times \pi r^2$

$= (\frac{\theta}{360°} \times 2\pi r) \times \frac{r}{2} = 5.8 \times \frac{7.4}{2}$

$= 21.46\ cm^2$

Sol.392.(b)
Length of arc = 15.5 – (2 × 5) = 5.5 cm

Area of sector = length of arc × $\frac{radius}{2}$

$= 5.5 \times \frac{5}{2} = 13.75\ cm^2$

Sol.393.(a)
Side of the square = $\sqrt{30.25}$ = 5.5 cm
Circumference of circle = 4 × 5.5 = 22 cm

Radius of circle = $22 \times \frac{7}{2 \times 22}$ = 3.5 cm

Area of circle = $\frac{22}{7} \times 3.5 \times 3.5 = 38.5\ cm^2$

Sol.394.(a) Inner radius of hemispherical bowl = 4 cm
So, outer radius = (4 + 1) = 5 cm
Volume of hemispherical bowl

$= \frac{2}{3} \times \pi \times (5^3 - 4^3) = \frac{122}{3}\pi = 40\frac{2}{3}\pi$

Sol.395.(a) Volume of cylinder = $\pi r^2 h$
According to the question,

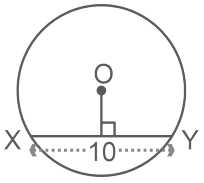
$\pi \times 5^2 \times 52 = \pi \times r^2 \times 100 \Rightarrow r^2 = 13$

Radius of the wire (r) = $\sqrt{13}$

Sol.396.(c)
Volume of the cylindrical flask = $\pi r^2 h$

$= \frac{22}{7} \times 6 \times 6 \times 21 = 2376\ cm^3$

Sol.397.(a)



Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Area of the circle = πr^2

616 = $\frac{22}{7} \times r^2 \Rightarrow r$ = 14 cm

Required distance =$\sqrt{14^2 - 5^2}$= $\sqrt{171}$ cm

Sol.398.(b) Area of the triangles

= $\frac{1}{2}$ × base × height

According to the question,

$\frac{5}{3} = \frac{5 \times base_1}{7 \times base_2}$ ⇒ Required ratio = 7 : 3

Sol.399.(b)

Area of equilateral triangle = $\frac{\sqrt{3}}{4}a^2$

According to question,

Net % increase in area

= 34 + 34 + $\frac{34 \times 34}{100}$ = 79.56 %

Sol.400.(a) Angle Subtended by arc

(in radian) = $\frac{Length\ of\ arc}{Radius}$

According to question,

$\frac{\pi}{10} = \frac{23.1}{Radius}$

⇒ radius = $\frac{231 \times 7}{22}$ = 73.5 cm

Required area of Circle = πr^2

= $\frac{22}{7}$ × 73.5 × 73.5 = 16978.5 cm^2

Sol.401.(a)

Perimeter of one face of cube = $4a$

According to the question,

$4a = 40 \Rightarrow a$ = 10 cm

Volume of cube (a^3) = 10^3 = 1000cm^3

Sol.402.(d) According to the question,

Volume of the ball = $\frac{4}{3}\pi r^3$

1 big ball volume = 3 small balls volume

$\frac{4}{3}\pi \times (\frac{3}{2})^3 = \frac{4}{3}\pi\{(\frac{3}{4})^3 + (1)^3 + (r_3)^3\}$

$(\frac{27}{8}) = \{\frac{27}{64} + 1 + (r_3)^3\}$

$(r_3)^3 = \frac{27}{8} - \frac{91}{64} = \frac{125}{64} \Rightarrow r_3 = \frac{5}{4}$ = 1.25

Diameter of the 3rd ball = 1.25 × 2 = 2.5 cm

Sol.403.(a)

Area of the sector = $(\frac{\theta}{360})\pi r^2$

$32\pi = (\frac{\theta}{360})\pi \times 12 \times 12$

$\theta = \frac{32 \times 360}{12 \times 12}$ = 80°

Length of the arc = $2\pi r(\frac{\theta}{360})$

= $2\pi \times 12(\frac{80}{360}) = \frac{16}{3}\pi$ cm

Sol.404.(a) Area of isosceles triangle

= $\frac{b}{4} \times \sqrt{4a^2 - b^2}$

where, b is an unequal side and a is equal sides.

$30\sqrt{11}\ cm^2 = \frac{5x}{4} \times \sqrt{4 \times 9x^2 - 25x^2}$

$30\sqrt{11}\ cm^2 = \frac{5 \times x^2}{4} \times \sqrt{11}$

$30\ cm^2 = \frac{5 \times x^2}{4} \Rightarrow x = \sqrt{24} = 2\sqrt{6}$

Length of unequal side ($5x$) = $10\sqrt{6}$ cm

Sol.405.(b)

Volume of conical tent = $\frac{1}{3}\pi r^2 h$

Volume = $\frac{1}{3} \times \frac{22}{7} \times 7 \times 7 \times 24$

= 22 × 7 × 8 = 22 × 56 = 1232 m^3

Let, n number of full bags of rice emptied in space = 1232 m^3 = n × 2 m^3

n = $\frac{1232}{2}$ = 616 bags

Sol.406.(d) Surface area of sphere = $4\pi r^2$

According to the question,

$4\pi r^2 = 9\pi \Rightarrow r = \frac{3}{2}$

diameter (2r) = 3 cm

Sol.407.(b)

Curved surface area of cone = $\pi r l$

Area of base = πr^2

According to question, $\pi r l = 2 \times \pi r^2$

= $\pi r \times 6\sqrt{3} = 2 \times \pi r^2 \Rightarrow$ r = $3\sqrt{3}$ cm

By using pythagoras theorem,

Height of cone=$\sqrt{(6\sqrt{3})^2 - (3\sqrt{3})^2}$ = 9 cm

Sol.408.(b)

2(L + B) = 68 ⇒ (L + B) = 34 ....e.q .(1)

(L − B) = 2 ....e.q .(2)

On solving e.q .(1) and e.q .(2) , we get the length of the rectangle (L) = 18

Sol.409.(a)

Initial Ratio = Length : Breadth : Height

= 1 : 2 : 3

Initial volume = 1 × 2 × 3 = 6 $unit^3$

Final Ratio = Length : Breadth : Height

= 1×300% : 2×400% : 3×400%

= 3 : 8 : 12

Final volume = 3 × 8 × 12 = 288 $unit^3$

Required increase in volume = $\frac{288 - 6}{6}$

= 47 times

Sol.410.(d) According to the question,

$l \times b \times h = 2 \times a^3$

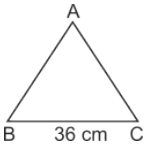
= 8 × 8 × 16 = 2 × a^3

a^3 = 512 ⇒ a = 8 cm

Now, total surface area of the cube = $6a^2$

= 6 × 8 × 8 = 384 m^2

Sol.411.(d)



Now, semi-perimeter of the triangle

= $\frac{100}{2}$ = 50 cm

Sol.412.(b) Area of sector = $\frac{\theta}{360°} \times \pi r^2$

112 = $\frac{\theta}{360°} \times \frac{22}{7} \times 28 \times 28$

$\theta = \frac{360}{22}$ (in degree)

$\theta = \frac{360}{22} \times \frac{22}{7 \times 180}$ (in radian)

By Using formula :-

$\theta(in\ radian) = \frac{length\ of\ arc}{radius}$

Length of arc = $\frac{360}{22} \times \frac{22}{7 \times 180} \times 28$

= 8 cm

Sol.413.(c)

Volume of wall= 14 × 0.125 × 5 = 8.75 m^3

Required no. of bricks = $\frac{8.75}{0.0014}$

= 6250 bricks

Sol.414.(d)

Inner radius of the bowl = 5 cm

Outer radius of the bowl = 5.25 cm

Required Volume of the hemisphere

= $\frac{2}{3} \times \pi(r_2^3 - r_1^3)$

= $\frac{2}{3} \times \frac{22}{7} \times \{(5.25)^3 - (5)^3\}$

= $\frac{2}{3} \times \frac{22}{7} \times 19.70$ = 41.28 cm^3

Sol.415.(a) Let the inner radius of pipe be 'r' and outer radius of pipe be 'R'.

Volume of pipe= $\pi r^2 h \Rightarrow \frac{88}{7} = \frac{22}{7} \times r^2 \times 1$

Inner radius = 2 m and outer radius = 4m

Therefore, Required quantity of material

= $\pi R^2 h - \pi r^2 h$

= $\frac{22}{7} \times 4 \times 4 \times 1 - \frac{88}{7}$ = 37.7 m^3

Sol.416.(c) Let the length and width of rectangle be $3x$ and $2x$.

According to question,

$3x \times 2x = 150 \Rightarrow x = 5$

Require perimeter = 2(length + width)

= 2[(3 × 5) + (2 × 5)] = 50 cm

Sol.417.(d) Circumradius of equilateral triangle= $\frac{a}{\sqrt{3}} = \frac{12}{\sqrt{3}} = 4\sqrt{3}$ cm

Short trick :-

Ratio ⇒ side : circumradius = 6 : $2\sqrt{3}$

Here,

6 units = 12 cm ⇒ $2\sqrt{3}$ units = $4\sqrt{3}$ cm

Sol.418.(c) Volume of Sphere = $\frac{4}{3}\pi r^3$

Let inner radius be r and outer radius be R.

According to question,

Required material = $\frac{4}{3}\pi R^3 - \frac{4}{3}\pi r^3$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{4}{3}\pi(3^3 - 2^3) = \frac{76}{3}\pi$

Sol.419.(c)
Equating the volumes of the cubes :-
$12 \times 12 \times 12 = 6 \times 6 \times 6 + 8 \times 8 \times 8 + x^3$
$1728 = 216 + 512 + x^3$
$x^3 = 1728 - 728 = 1000 \Rightarrow x = 10$ cm

Sol.420.(c)
Pythagoras triplets :- 150, 80, 170
Length of its diagonal = 170 cm
Perimeter = 2(150 + 80) = 460
Now, $\frac{460}{170} = 2.7$ times

Sol.421.(b)
Required area = $2(bh + hl) + lb$
$= 2(20\times15 + 15 \times 10) + 10 \times 20 = 1100\ m^2$
So, cost of whitewashing the walls of the inside of the hall and ceiling =
1100 × 10.20 = ₹11,220

Sol.422.(c) Total surface area of cuboid = Area of square
$2(lb + bh + hl) = side^2$
$2(4 \times 6 + 6 \times 8 + 8 \times 4) = side^2$
$2 \times 104 = side^2$
$side = \sqrt{208} = 14.42$ units

Sol.423.(c) Given, radius = 35 cm
Surface area of sphere = $4\pi r^2$
$= 4 \times \frac{22}{7} \times 35 \times 35 = 15400\ cm^2$

Sol.424.(a) 1 m^3 = 1000 liters
Volume of the tank = lbh
$= 50 \times 25 \times 10 = 12500\ m^3$
the capacity of the petrol tank
= 12500 × 1000 = 1,25,00,000 liters.

Sol.425.(a) $l = r\theta$
$5r = r\theta \Rightarrow \theta = 5^c = 5 \times \frac{180°}{\pi}$
Area of sector AOB = $\frac{\theta}{360°} \times \pi r^2$
$= \frac{5 \times 180°}{360° \times \pi} \times \pi \times r^2 = 2.5r^2$

Sol.426.(a) CSA of hemispherical bowl inside as well as outside = $4\pi r^2$
$= 4 \times \frac{22}{7} \times 7^2 = 616 cm^2$
Cost of painting the hemispherical bowl
$= 616 \times \frac{40}{20} =$ ₹1232

Sol.427.(a)
Perimeter of arc = $\frac{\theta}{360°} \times 2\pi r + 2r$
$= \frac{45}{360°} \times 8 \times \frac{22}{7} + 8$
$= \frac{22 + 56}{7} = \frac{78}{7}$ cm

Sol.428.(c) Volume of cube = $(Side)^3$
Side = $\sqrt[3]{12167} = 23$ cm
Surface area of cube = $6 \times (Side)^2$
$= 6 \times 529 = 3174\ cm^2$

Sol.429.(a) Diagonal of cube = $side\sqrt{3}$
$10 = side\sqrt{3} \Rightarrow$ Side = $\frac{10}{\sqrt{3}} = 5.77$ m

Sol.430.(c) Volume of cylinder = area of base × height
Height = $\frac{1650 \times 7}{550} = 21$ m

Sol.431.(d)
Diagonal of cuboid = $\sqrt{l^2 + b^2 + h^2}$
$= \sqrt{144 + 100 + 64} = \sqrt{308} = 17.54$ m

Sol.432.(c) Equating the volumes :-
Volume of hollow hemisphere = Volume of cylinder
$\frac{2}{3}\pi(R^3 - r^3) = \pi \times 7 \times 7 \times H$
$\frac{2}{3}(5^3 - 3^3) = 7 \times 7 \times H$
$H = \frac{2 \times (125 - 27)}{7 \times 7 \times 3} = \frac{4}{3} = 1.33$ cm

Sol.433.(a)
Area of triangle = $\frac{1}{2} \times base \times Height$
As we know, the base and height of an isosceles right angle triangle are equal.
According to question,
$200 = \frac{1}{2} \times a \times a \Rightarrow a = 20$ cm
By using pythagoras theorem,
Hypotenuse = $20\sqrt{2}$ cm
Perimeter of isosceles right-angle triangle = $20\sqrt{2} + 40 = 68.3$ cm

Sol.434.(b) Surface area of sphere = $4\pi r^2$
According to question,
$616 = 4 \times \frac{22}{7} \times r^2 \Rightarrow r^2 = 49 \Rightarrow r = 7$ cm
Now, total surface area of hemisphere
$= 3\pi r^2 = 3 \times \frac{22}{7} \times 7 \times 7 = 462\ cm^2$

Sol.435.(b)
$\frac{\pi r^2 h}{2\pi r h} = \frac{1848}{528} \Rightarrow r = \frac{2 \times 7}{2} = 7$ m
Now, $2\pi r h = 528\ m^2$
$h = \frac{528 \times 7}{2 \times 22 \times 7} = 12$ m
Required ratio = 7 : 12

Sol.436.(a) Total surface area of Cuboid
= 2(lb + bh + lh)
= 2{(48 × 27) + (27 × 30) + (30 × 48)}
= 2{1296 + 810 + 1440} = 7092 sq . inch
$= \frac{7092}{12 \times 12} = 49.25$ sq . foot

Sol.437.(c) Let, the breadth of rectangle be x metre, then length be $3x$ metre.
Area = $x \times 3x = 3x^2$
$3x^2 = 2700\ m^2 \Rightarrow$ breadth (x) = 30 metre

Sol.438.(a) Area of square ($side^2$) = 5929
Side = 77
Perimeter of square = perimeter of circle
$4 \times 77 = 2\pi r \Rightarrow 2 \times \frac{22}{7} \times r = 308 \Rightarrow r = 49$
Area of the circle = (πr^2)
$= \frac{22}{7} \times 49 \times 49 = 7546\ cm^2$

Sol.439.(d)
Perimeter of the semi-circle = $\pi r + 2r$
$3.6 = r(\frac{22}{7} + 2)$
$3.6 = r(\frac{36}{7}) \Rightarrow r = \frac{7}{10}$
Area of semi-circle = $\frac{1}{2}\pi r^2$
$\frac{1}{2} \times \frac{22}{7} \times \frac{7}{10} \times \frac{7}{10} = 0.77\ m^2$

Sol.440.(d) Let, inner radius and outer radius be r_2 and r_1 respectively .
According to the question,
$\frac{2\pi r_1}{2\pi r_2} = \frac{17}{15} \Rightarrow \frac{r_1}{r_2} = \frac{17}{15} \Rightarrow r_1 = \frac{17}{15} r_2$
Now, $r_1 - r_2 = 40 \Rightarrow \frac{17}{15} r_2 - r_2 = 40$
$r_2 = 300$ and $r_1 = 340$
Radius of inner circle (r_2) = 300 m

Sol.441.(c) Area of the square = ($side^2$)
529 = ($side^2$) ⇒ Side = 23
Diagonal of the square
= side$\sqrt{2} = 23\sqrt{2}$ cm

Sol.442.(b) Let length of cuboid be l, breadth be b and height be h
According to the question,
Breadth of cuboid = 3cm
$l = 6b = 6 \times 3 = 18$ cm
And, $h = 4b = 4 \times 3 = 12$cm
Hence,
total surface area of cuboid
$= 2(lb + bh + hl)$
$= 2(18 \times 3 + 3 \times 12 + 12 \times 18) = 612\ cm^2$

Sol.443.(b) Ratio of the radius of cylinder and cone = 3 : 1
Volume of cylinder = $\pi r^2 h$
Volume of cone = $\frac{1}{3}\pi r^2 h$
According to the question,
$\pi(3r)^2 h : \frac{1}{3}\pi(r)^2 h = 9 : \frac{1}{3} = 27 : 1$

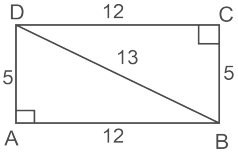
Sol.444.(c) Area of scalene triangle
$= \sqrt{s(s - a)(s - b)(s - c)}$
Semiperimeter (s) = $\frac{11 + 11 + 4}{2} = 13$
$\sqrt{13(13 - 11)(13 - 11)(13 - 4)}$

Search on TG : @apna_pdf

Search on Telegram @apna_pdf

$= \sqrt{13 \times 2 \times 2 \times 9} = 6\sqrt{13}$ unit
According to the question,
$6\sqrt{13}$ unit = $2\sqrt{117}\ cm^2 \Rightarrow 1$ unit = 1
Required side = 11 cm

Sol.445.(a) Triplate = 5, 12, 13



So, the area of the parallelogram
$= 2\left(\frac{1}{2} \times 12 \times 5\right) = 60\ cm^2$

Sol.446.(a) Volume of cuboid = l × b × h
Volume of cube = $side^3$
Volume of cuboid = volume of cube
$8 \times 27 \times 64 = side^3$
Side = 2 × 3 × 4 = 24 cm
TSA of cuboid = 2(lb + bh + hl)
TSA of cube = $6side^2$
Required ratio
$= 2(8 \times 27 + 27 \times 64 + 64 \times 8) : 6 \times 24^2$
$= 2(216 + 1728 + 512) : 6 \times 576$
$= 2 \times 2456 : 6 \times 576 = 307 : 216$

Sol.447.(b)
Volume of hemisphere = $\frac{2}{3}\pi r^3$
$= \frac{2}{3} \times \frac{22}{7} \times 4.2 \times 4.2 \times 4.2 = 155.232\ m^3$
Now,
$\frac{1}{21}th$ of volume = $\frac{155.232}{21} = 7.3\ m^3$

Sol.448.(b) After joining two cubes each of edge 9 cm to form cuboid
Length of cuboid(l) = 18cm,
width (b) = 9cm and height (h) = 9 cm
Then, Total surface area of cuboid
$= 2(lb + bh + hl)$
$= 2(18 \times 9 + 9 \times 9 + 9 \times 18) = 810cm^2$

Sol.449.(b) CSA of cone = πrl
Slant height of the cone (l) = $\sqrt{r^2 + h^2}$
$l = \sqrt{8^2 + 15^2} = \sqrt{64 + 225} = 17$
Required cost = $\frac{\pi \times 8 \times 17 \times 54}{\pi}$ = ₹ 7344

Sol.450.(a) For largest possible sphere, diameter = side of cube
Radius of sphere = $\frac{6}{2}$ = 3 cm
Volume of the sphere = $\frac{4}{3}\pi r^3$
$= \frac{4}{3} \times \frac{22}{7} \times 3 \times 3 \times 3 = \frac{792}{7}\ cm^3$

Sol.451.(c)
Formula used :- area of rhombus
$= \frac{1}{2} \times first\ diagonal \times second\ diagonal$
According to the question,
Area of rhombus = $\frac{1}{2} \times 16 \times 20 = 160\ cm^2$

Sol.452.(b) Volume of cube = $side^3$
Volume of 2 small cube = volume of 1 big cube
$7^3 + 11^3$ = volume of 1 big cube
volume of 1 big cube = 343 + 1331
= 1674 cm³

Sol.453.(a)
Area of rectangle = 58 × 30 = 1740 m^2
Required cost = 1740 × 20 = ₹34800

Sol.454.(c) Volume of the cylinder = $\pi r^2 h$
$= \frac{22}{7} \times \frac{126}{10} \times \frac{126}{10} \times 400$ cm³
= 199584 cm³ ⇒ 1 cm³ = 2 grams
199584 cm³ = $\frac{2}{1} \times 199584 \times \frac{1}{1000}$
= 399.168 kg

Sol.455.(c) According to the question,
Base = $56 \times \frac{1}{4}$ = 14 cm
Area of the triangle = $\frac{1}{2}$ × base × height
$= \frac{1}{2} \times 14 \times 56 = 392$ cm²

Sol.456.(d)
Outer radius of spherical shell (R) = 13cm
Inner radius (r) = 13 – 3 = 10cm
Volume of the spherical sell = $\frac{4}{3}\pi(R^3 - r^3)$
Required volume = $\frac{4}{3} \times \frac{22}{7} \times (13^3 - 10^3)$
$= \frac{4}{3} \times \frac{22}{7} \times 1197 = 5016$ cm³

Sol.457.(c) According to question,
Volume of sphere = $\frac{4}{3}\pi r^3$
$= \frac{4}{3} \times \frac{22}{7} \times (65)^3 = 1150809.52$
$= 1.15 \times 10^6$ cm³

Sol.458.(a)
$\frac{C.S.A\ of\ cone}{base\ area\ of\ cone} = \frac{\pi rl}{\pi r^2} = \frac{l}{r}$
According to the question,
$\frac{l}{r} = \frac{3}{1}; \frac{l}{\frac{1}{2}} = \frac{3}{1} \Rightarrow l = \frac{3}{2}$
T.S.A of cone = $\pi r(l + r)$
$= \pi \times \frac{1}{2}\left(\frac{3}{2} + \frac{1}{2}\right) = \pi$ cm²

Sol.459.(c) Let radius of sphere = R
According to the question, $R = \frac{3}{4}$ r
Ratio of volumes
$= \frac{4}{3} \times \pi \times \left(\frac{3}{4}r\right)^3 : \frac{2}{3} \times \pi \times (r)^3$
$\Rightarrow 2 \times \frac{27}{64} : 1 = 27 : 32$

Sol.460.(b) According to the question,
$720 \times h = 28800$
Depth of the water (h) = $\frac{28800}{720}$
= 40 meters.

Sol.461.(c)
From the given sides of triangle
= (6, 8, 10)
$6^2 + 8^2 = 10^2 \Rightarrow 100 = 100$
So, the given triangle is a right angled triangle.
Therefore, Area of triangle
$= \frac{1}{2} \times base \times height = \frac{6 \times 8}{2}$ = 24 cm²

Sol.462.(b) According to the question, circumference of the base of the cylinder = $2\pi r$
$22 = 2 \times \frac{22}{7} \times r \Rightarrow r = 3.5$ cm
Height = 3.5 × 4 = 14 cm
C.S.A of cylinder = $2\pi rh$
$2 \times \frac{22}{7} \times 3.5 \times 14 = 308$ cm²

Sol.463.(d) Volume of Cylinder = $\pi r^2 h$
According to question,
Required ratio = $\frac{\pi r_1^2 h_1}{\pi r_2^2 h_2}$
$= \frac{\pi \times \frac{6}{2} \times \frac{6}{2} \times 7}{\pi \times \frac{7}{2} \times \frac{7}{2} \times 9} = \frac{4}{7}$

Sol.464.(d) According to the question,
$2\pi rh = \frac{2}{5} \times 2\pi r(r + h)$
$3h = 2r \Rightarrow \frac{r}{h} = \frac{3}{2}$
Hence, ratio of diameter to height
= 3 × 2 : 2 = 3 : 1

Sol.465.(c)
circumferences of circles = $2\pi r$
Let the radius of larger circle be R.
According to question,
$\left(2 \times \frac{22}{7} \times R\right) - \left(2 \times \frac{22}{7} \times 1.4\right) = 4.4$
$\left(2 \times \frac{22}{7} \times R\right) = 13.2 \Rightarrow R = 2.1$ cm

Sol.466.(a) According to the question,
$9 \times \pi r^2 = 3 \times side^2 \Rightarrow \frac{r^2}{side^2} = \frac{1}{3 \times \pi}$
$\frac{r}{side} = \sqrt{\frac{1}{3 \times \pi}} = \frac{1}{\sqrt{3\pi}}$
Diameter of the circle = 2r = 2 × 1 = 2
Diagonal of the square = $\sqrt{2}$ side
$= \sqrt{2} \times \sqrt{3\pi}$
Required ratio = $2 : \sqrt{2} \times \sqrt{3\pi} = \sqrt{2} : \sqrt{3\pi}$

Sol.467.(b)
Volume of hemispherical bowl = $\frac{2}{3}\pi r^3$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\frac{2}{3} \times \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2} \times \frac{21}{2}$ = 2425.5 m³
1m³ = 1000 liter
2425.5 m³ = 2425500 liter

Sol.468.(c) Total Surface area of Cylinder
$= 2\pi r(r + h) = 2 \times \frac{22}{7} \times 28\ (28 + 24)$
= 9152
Total Surface area of bisected cylinder
$= 2\{2\pi r\ (r + \frac{h}{2})\}$
$= 2 \times 2 \times \frac{22}{7} \times 28\ (28 + \frac{24}{2})\}$ = 14080
Required% = $\frac{14080-9152}{9152} \times 100$ = 53.85%

Sol.469.(c)
Curved surface area of Cylinder = $2\pi rh$
$330 = 2 \times \frac{22}{7} \times r \times 15$
r = $\frac{330 \times 7}{2 \times 15 \times 22}$ = 3.5 cm
Required Diameter = 7 cm

Sol.470.(c) According to question,
Length, Breadth and Height of room
= 640 cm, 480 cm and 320 cm
HCF(640, 480, 320) = 160 cm
So, Required length of tape = 1 m 60 cm

Sol.471.(c) According to the question,
Volume of hemisphere = $\frac{2}{3}\pi r^3$
Volume of cone = $\frac{1}{3}\pi r^2 h$
N number of cone = $\frac{Volume\ of\ hemisphere}{volume\ of\ cone}$
$= \frac{\frac{2}{3}\pi r^3}{\frac{1}{3}\pi r^2 h} \Rightarrow \frac{2 \times 8 \times 8 \times 8}{4 \times 4 \times 2}$ = 32

Sol.472.(d) According to the question ,
$\frac{2\pi R}{2\pi r} = \frac{11}{7} \Rightarrow \frac{R}{r} = \frac{11}{7}$
Now, width of path (11 − 7) unit
= 20 meter ⇒ 1 unit = 5 meter
Radius of inner circle (r) = 7 × 5 = 35 meter

Sol.473.(d) S = $\frac{a+b+c}{2}$ and Area of triangle = $\sqrt{S(S-a)(S-b)(S-c)}$
According to question,
S = $\frac{7+4+5}{2}$ = 8
Area of triangle = $\sqrt{8(8-7)(8-4)(8-5)}$
$= \sqrt{8 \times 1 \times 4 \times 3} = \sqrt{96} = 4\sqrt{6}$ cm²

Sol.474.(d) Area of square = $\frac{(diagonal)^2}{2}$
$= \frac{(18.4)^2}{2} = \frac{338.56}{2}$ = 169.28 cm^2

Sol.475.(d) Volume of cylinder = $\pi r^2 h$
Volume of cone = $\frac{1}{3}\pi r^2 h$
Let the Radius of cylinder = x
And the radius of cone = $2x$
According to the question,
$\frac{1}{3}\pi r^2 h : \pi r^2 h = \frac{1}{3} \times 2x \times 2x : x \times x$
Required ratio = 4 : 3

Sol.476.(c) According to the question,
$l - b = 40$
Now, perimeter of rectangle$2(l + b)$ = 96
$l + b = 48$
Then l = 44 and b = 4
Area of rectangle = 44 × 4 = 176 m^2

Sol.477.(b)
Area of Trapezium = $\frac{(a+b)}{2} \times h$
According to question,
Area of Trapezium
$= \frac{7.58 + 6.42}{2} \times 6.50$ = 45.5 square yard
Required price = 45.5 × 2000 = Rs. 91000

Sol.478.(a) According to question,
$\pi r^2 H = \pi\ (\frac{88r}{100})^2 h$
r × r × H = $\frac{22r}{25} \times \frac{22r}{25} \times h \Rightarrow \frac{H}{h} = \frac{484}{625}$
Required % = $\frac{(625-484)}{484} \times 100$ = 29.13%

Sol.479.(c) According to the question,
Height = 7 × 3 = 21 cm
CSA of cylinder = $2\pi rh$
$= 2 \times \frac{22}{7} \times 7 \times 21$ = 924 cm²

Sol.480.(a) Semiperimeter of triangle (s)
$= \frac{3x + 3x + 4x}{2} = 5x$
Now, area of triangle
$= \sqrt{5x(5x-3x)(5x-3x)(5x-4x)}$
$= \sqrt{5x(2x)(2x)(x)} = 2\sqrt{5}\ x^2$
According to the question,
$2\sqrt{5}\ x^2 = 32\sqrt{5} \Rightarrow x$ = 4 cm
Length of equal sides ($3x$) = 12 cm

Sol.481.(d) Length = 4cm
ATQ
Breadth = 16cm , Height = 8cm
Lateral surface area of cuboid
= 2(length + breadth)height
= 2(4 + 16) × 8 = 2(20) × 8 = 320 cm²

Sol.482.(b)
Let length of longer Diagonal be 10 unit
Then, the length of the smaller diagonal is 7 units.
Area of Rhombus= $\frac{product\ of\ Diagonals}{2}$
$= \frac{7 \times 10}{2}$ = 35
square of the length of larger diagonal
= 100
According to question,
Required Ratio = $\frac{35}{100}$ = 7 : 20

Sol.483.(b) According to question

	initial :	final
Radius →	$(25)^2$:	$(21)^2$
Height →	h_1 :	h_2
Volume →	625 h_1 :	441h_2

According to question ,
volume remains same
Volume is directly proportional to height-
Increase in height:-
$\frac{625-441}{441} \times 100$ = 41.72%

Sol.484.(a) According to the question,
Height of the cuboid = 16 × $\frac{1}{4}$ = 4 cm
CSA of cuboid
= 2 (length + breadth) × height
= 2 (16) × 4 = 128 cm²

Sol.485.(a) According to question,
Length, breadth and height of Cuboid
= 10 cm , 5 cm and 20 cm respectively
lateral surface area of the cuboid
= 2(length + breadth) × height
= 2(10 + 5) × 20 = 600 cm²

Sol.486.(b) Perimeter of rectangle
= 2(length + breadth)
56 = 2(l + b) ⇒ (l + b) = 28 m
Area of rectangle = l × b ⇒ l × b = 192
(l + b) = 28 m (squaring both sides)
$l^2 + b^2 + 2 \times 192 = 784 \Rightarrow l^2 + b^2 = 400$
Diagonal of the rectangle = $\sqrt{l^2 + b^2}$
Diagonal of the rectangle = $\sqrt{400}$
= 20 meter

Sol.487.(b) According to the question,
Area of circle = $\pi r^2 \Rightarrow \pi \times r^2$ = 1560
total surface area of the hemisphere
= $3\pi r^2 \Rightarrow 3 \times 1560$ = 4680 m²

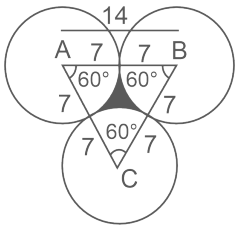
Sol.488.(c) According to the question,
Height of the cuboid = 40 × $\frac{1}{5}$ = 8
Lateral Surface area of cuboid
= 2(l + b)h ⇒ 2(40) × 8 = 640 cm²

Sol.489.(d)
Volume of the sphere = $\frac{4}{3}\pi r^3$
After decreasing the radius of sphere by 10% then volume of the sphere
$= \frac{4}{3}\pi(\frac{9}{10}r)^3 = \frac{4}{3}\pi(\frac{729}{1000}r^3)$
Therefore, decrement in the volume
$= \frac{r^3 - (\frac{729}{1000}r^3)}{r^3} \times 100$
$= \frac{271r^3}{1000r^3} \times 100 \Rightarrow 27.1$ %

Search on TG : @apna_pdf

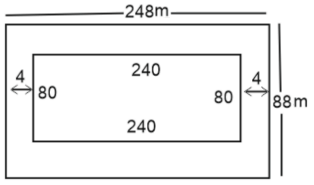
Search on Telegram @apna_pdf

Sol.490.(a)



Side of the equilateral triangle(2r)= 14cm
So, area of the equilateral triangle
$= \frac{\sqrt{3}}{4} \times 14 \times 14 = 49\sqrt{3}\ cm^2$
Now, the area of the each sector
$= 3 \times \frac{60°}{360°} \times \pi r^2$
$= 3 \times \frac{1}{6} \times \frac{22}{7} \times 7 \times 7 = 77\ cm^2$
Therefore, area of the portion enclosed by three circle = (area of equilateral triangle - area of all three sector)
$\Rightarrow (49\sqrt{3} - 77) cm^2$

Sol.491.(d)

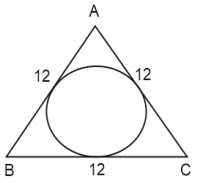


Area of the path = (248 × 88 - 240 × 80)
= (21824 - 19200) m^2 = 2624 m^2

Sol.492.(d) According to the question,
$l + b + h$ = 20cm
Total Surface area of the cuboid
$= 2(lb + bh + hl) = 256\ cm^2$
Now, $(l + b + h)^2 = (l)^2 + (b)^2 + (h)^2 + 2(lb + bh + hl)$
$\Rightarrow (l)^2 + (b)^2 + (h)^2 = 400 - 256$
$= 144\ cm^2$
Maximum Length of stick that can be placed inside the cuboid box
$= \sqrt{(l)^2 + (b)^2 + (h)^2} \Rightarrow \sqrt{144} = 12$ cm

Sol.493.(b) Let side of third triangle (z) = a
According to the question,
Area of the triangle → X + Y = Z
$\frac{\sqrt{3}}{4} \times (6)^2 + \frac{\sqrt{3}}{4} \times (8)^2 = \frac{\sqrt{3}}{4} \times (a)^2$
$(a)^2 = (6)^2 + (8)^2 \Rightarrow$ a = 10 cm

Sol.494.(d)



Inradius = $\frac{side}{2\sqrt{3}}$
Side of the equilateral triangle
= inradius × $2\sqrt{3}$
inradius = $\frac{12}{2\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = 2\sqrt{3}$
Area of the equilateral triangle $\frac{\sqrt{3}}{4} \times a^2$
$= \frac{\sqrt{3}}{4} \times 144 = 36 \times 1.732 = 62.35\ sq.cm$
Area of the incircle = πr^2
$= \frac{22}{7} \times (2\sqrt{3})^2 = 37.71\ sq.cm$
Therefore, area of the triangle which is not in the incircle(shaded region)
= (62.35 - 37.71) = 24.64 $sq.cm$

Sol.495.(a) Area of the rhombus = $\frac{1}{2} \times first\ diagonal \times second\ diagonal$
$= \frac{1}{2} \times 8 \times 13 = 52\ cm^2$

Sol.496.(c)
Volume of the sphere = $\frac{4}{3}\pi(R)^3$
Volume of the hemisphere = $\frac{2}{3}\pi(r)^3$
According to the question,
Required ratio → $\frac{4}{3}\pi(R)^3 : \frac{2}{3}\pi(r)^3$
$\frac{4}{3}\pi(3r)^3 : \frac{2}{3}\pi(r)^3 \Rightarrow 54 : 1$

Sol.497.(c) Let, the radius of the 1st cylinder be 'R' and radius of the smaller cylinder be 'r'.
Ratio →1st cylinder : 2nd cylinder
Volume → 32 : 9
Height → 8 : 9
According to the question,
Area of base of 2nd Cylinder (πr^2)
$= 616\ cm^2 \Rightarrow r = \sqrt{616 \times \frac{7}{22}}$ = 14 cm.
Now,
$\frac{Volume\ of\ 1st\ Cylinder\ (\pi R^2 H)}{Volume\ of\ 2nd\ Cylinder\ (\pi r^2 h)} = \frac{32}{9}$
$\frac{\pi r^2 (8)}{\pi \times 196 \times (9)} = \frac{32}{9}$
$r^2 = 784 \Rightarrow r = 28$ cm

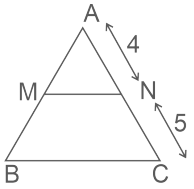
Sol.498.(a) $\frac{2(l+b)}{2}$ = 30 cm
(l + b) = 30 cm
According to question;
l = (6 + x) and b = x
(6 + x) + x = 30 cm ⇒ x = 12
l = (6 + 12) = 18 cm and b = 12 cm
Area of rectangle = l × b = 18 × 12= 216 cm^2
Alternate method :
Formula : Perimeter of rectangle
= 2 (l + b) ⇒ $\frac{2(l+b)}{2}$ = 30 cm
(l + b) = 30 cm.....eq(1)
(l - b) = 6 cm .....eq(2)
Solving the eq(1) and eq(2), we get,
l = 18 cm , and b = 12 cm ,
Area of rectangle = l × b = 18 × 12
= 216 cm^2

Sol.499.(a) $(a \times b \times c)^2$ = 1024 units
a × b × c = 32
Area of its circumcircle = 16π
$\pi R^2 = 16\pi \Rightarrow R = 4$
circumradius(R) = $\frac{abc}{4 \times area\ of\ \Delta}$
4 = $\frac{32}{4 \times area\ of\ \Delta}$
Area of given triangle = 2 sq . units

Sol.500.(d)
Let the length of the rectangle = 5x
Breadth = 3x
Area of rectangle = length × breadth
60 = 5x × 3x ⇒ x → 2
Now,
Length = 5x → 10m , Breadth = 3x → 6m
Difference between length and breadth
⇒10 − 6 → 4 m

Sol.501.(a) Total surface area of cylinder
$2\pi r(h + r) = 2 \times \frac{22}{7} \times 7(5+7) = 528\ cm^2$
When Cylinder is bisected from its height , then Increased area → $2 \times (\pi r^2)$
$= 2 \times \frac{22}{7} \times 7 \times 7 = 308\ cm^2$
Required % increase
$= \frac{308}{528} \times 100 \approx 58.33\%$
Alternate method :
After cutting the cylinder in two identical cylinder the total increase in the surface area will be $2\pi r^2$
% increase in the surface area
$= \frac{2\pi r^2}{2\pi r(h+r)} \times 100 \Rightarrow \frac{r}{(r+h)} \times 100$
$= \frac{7}{(5+7)} \times 100 = 58.33\%$

Sol.502.(c)



Area of ΔAMN = $(4)^2 \Rightarrow$ 16 units
Area of ΔABC = $(9)^2 \Rightarrow$ 81 units
Area of quadrilateral MBCN = Area of Δ ABC − Area of ΔAMN
81 − 16 ⇒ 65 units
65 units = 130 cm²
Area of ΔAMN (16 units) = 32cm²

Sol.503.(a)
Circumference of circle=2πr(Small circle)
2πr = 264 m ⇒ r = 42 m
(Big circle) ⇒ 2πR = 308 m, R = 49 m
Area of circle = πr^2
Difference between bigger and smaller

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

circle's area = $\pi(49^2 - 42^2) \rightarrow 2002$ m²

Sol.504.(c) Ratio of their heights → 2 : 3
Ratio of their radius → 6 : 5

$\frac{Volume_1}{Volume_2} = \frac{\pi \times 6 \times 6 \times 2}{\pi \times 5 \times 5 \times 3} = \frac{24}{25}$

Sol.505.(b) Length + breadth = 4 cm
Length = 3 cm, Breadth = 1cm

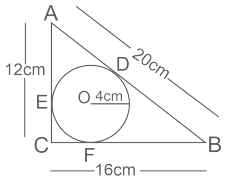
Height = $\frac{4}{2}$ = 2 cm

T.S.A cuboid = 2(length × breadth + breadth × height + height × length)
= 2(3 × 1 + 1 × 2 + 2 × 3) = 22cm²

Sol.506.(c) Area of square = $side^2$

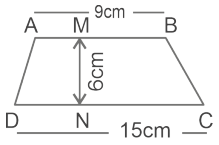
1156 = $side^2$, side = 34 cm
So the length of rectangle = 34 × 2
= 68 cm
Breadth of rectangle = 34 − 14 = 20 cm
Ratio of length and breadth of rectangle = 68 : 20 ⇒ 17 : 5

Sol.507.(c)



Area of ΔABC = $\frac{16 \times 12}{2}$ = 96 cm^2

Sol.508.(b)



Area of Trapezium = $\frac{1}{2}$ × (AB + CD) ×MN

= $\frac{1}{2}$ × (9 + 15) × 6 = 72 cm^2

Total cost of copper plating
= 72 × 3 = Rs. 216

Sol.509.(b) According to the question,
Semiperimeter of the ΔABC,

s = $\frac{22}{2}$ = 11cm

Then, Area of triangle ΔABC
⇒$\sqrt{11\ (7)(3)(1)}$ = $\sqrt{231}$ cm^2
∵ ΔABC ~ ΔPQR

Therefore, $\frac{ar(\Delta PQR)}{ar(\Delta ABC)} = \frac{(QR)^2}{(BC)^2}$

= $\frac{ar(\Delta PQR)}{\sqrt{231}} = \frac{256}{64}$

= $ar(\Delta PQR)$ = $4\sqrt{231}$ cm²

Sol.510.(c) Length of each side of the cube = 21 cm

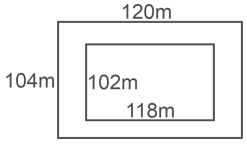
Radius of sphere = $\frac{21}{2}$cm

Volume of sphere = $\frac{4}{3}\pi r^3$

= $\frac{4}{3} \times \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2} \times \frac{21}{2}$

= 4851 cm^3

Sol.511.(d)



Required perimeter for marking
= $2(l + b)$ = 2 (102 + 118) = 440 metre
Total price = 440 × 2.5 = 1100 Rs.

Sol.512.(c)

TSA of Pyramid = Area of Base + ($\frac{1}{2}$ × Perimeter of Base × Slant height)

Slant Height $(l) = \sqrt{r^2 + h^2}$

$l = \sqrt{9 + 16} = \sqrt{25}$ = 5 cm

TSA of Pyramid = 64 + ($\frac{1}{2}$ × 32 × 5)

= 144 cm^2.

Sol.513.(c) Longest diagonal in a room

= $\sqrt{l^2 + b^2 + h^2}$
According to Question,

Breadth = $\frac{Length}{2}$ and

Breadth = 2 × height

Now, Diagonal = $\sqrt{(2b)^2 + (b)^2 + (\frac{b}{2})^2}$

= $\sqrt{\frac{16b^2 + 4b^2 + b^2}{4}} = \frac{\sqrt{21}\,b}{2}$

Sol.514.(d) LSA = $\frac{1}{2}$ × Perimeter of Base × Slant height
TSA of pyramid = LSA + Area of Base

$(Edge)^2 = (Slant\ height)^2 + (\frac{Side}{2})^2$

$(24)^2 = (Slant\ height)^2 + (\frac{8}{2})^2$

⇒ Slant height = $4\sqrt{35}$ cm

LSA = $48\sqrt{35}$ cm

TSA = $16\sqrt{3}$ + $48\sqrt{35}$ cm^2

Sol.515.(c) Let the parallel sides of trapezium be a and b cm .

Area of Trapezium = $\frac{1}{2}$ × Sum of two parallel sides × height

1380 = $\frac{1}{2}$ × (a + b) × 60

a + b = 46 and a − b = 12
On Solving these equations , we get
a = 29 cm and b = 17 cm.

Sol.516.(b) Volume of rectangular leads = n × volume of spherical lead

L × B × H = n × $\frac{4}{3}$ × π × r^3

88 × 63 × 42 = n × $\frac{4}{3}$ × $\frac{22}{7}$ × 4.2^3

n = $\frac{63 \times 10 \times 21}{4.2 \times 4.2}$ = 750

Sol.517.(d) If any 3D figure cast into another 3D figure always equate their Volume .
Volume of sphere = Volume of Cone

$\frac{4}{3}\pi r_1^3 = \frac{1}{3}\pi r_2^2 h$

$\frac{4}{3} \times (13)^3 = \frac{1}{3} \times (\frac{13}{2})^2 h$

h = $\frac{4 \times 13 \times 13 \times 13 \times 3 \times 2 \times 2}{3 \times 13 \times 13}$ = 208 cm

Sol.518.(a)
Statement 1 :- volume of cuboid
= $Length \times Breadth \times height$
= 6 × 7 × 8 = 336 cm^3
Statement 2 :- volume of cube
= $(Side)^3$ = $(7)^3$ = 343 cm^3
Clearly, the cube has more volume

Sol.519.(a) Curved surface area of hemisphere = $2\pi r^2$

C.S.A. = 2 × $\frac{22}{7}$ × 42 × 42 = 11088 cm^2

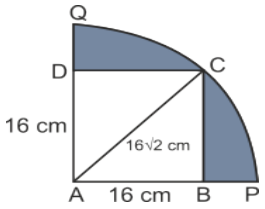
Cost of tin painting = 11088 cm^2 × $\frac{21}{100}$

= 2328.48 Rs.

Sol.520.(a)
Height of the cylinder = 3.5 cm
Then radius of the cylinder = 17.5 cm
Volume of cylinder = $\pi r^2 h$

= $\frac{22}{7}$ × $(17.5)^2$ × 3.5 = 3368.75 cm^3

Sol.521.(d)



Area of square = $(Side)^2$ = 16^2 = 256 cm^2
Diagonal of square = $\sqrt{2} \times Side$=$16\sqrt{2}$ cm
Here , diagonal of square is the radius for the quadrant ,

So, area of the quadrant = $\frac{1}{4} \times \pi r^2$

= $\frac{1}{4} \times 3.14 \times 16\sqrt{2} \times 16\sqrt{2}$ = 401.92 cm^2

Now, Area of shaded portion
= Area of quadrant - area of square
= 401.92cm^2 - 256 cm^2 = 145.92 cm^2

Sol.522.(b) Volume of sphere = $\frac{4}{3} \times \pi r^3$

Now, 24416.64 = $\frac{4}{3} \times 3.14 \times r^3$

r^3 = $\frac{7776 \times 3}{4}$ = 5832 ⇒ r = 18 cm

Now, surface area of sphere = $4\pi r^2$
= 4 × 3.14 × 18 × 18 = 4069.44 cm^2

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.523.(d) Height = 2.1 cm
According to question, radius = 6.3 cm
Volume of cylinder = $\pi r^2 h$
$= \frac{22}{7} \times 6.3 \times 6.3 \times 2.1 = 261.95\ cm^3$

Sol.524.(d) If any solid object cast into another solid object always equates their Volume .
Volume of sphere = Volume of cylinder
$\frac{4}{3}\pi r_1^3 = \pi r_2^2 h$
$\frac{4}{3} \times \frac{22}{7} \times 9^3 = \frac{22}{7} \times 2^2 \times h$
h = $\frac{729}{3}$ = 243 cm

Sol.525.(a) Side of given cube = 5.6 cm.
For largest sphere to be inscribed in the cube,
diameter of sphere should be equal to edge length of cube,
⇒ 2 × radius = 5.6cm ⇒ radius (r) = 2.8
Volume of the sphere = $\frac{4}{3}\pi r^3$
$= \frac{4}{3}\pi(2.8)^3 = 91.98\ cm^3$

Sol.526.(a) Volume of hollow sphere
$= \frac{4}{3}\pi\left(R^3 - r^3\right) = \frac{4}{3}\pi\left(4^3 - 1^3\right) = 84\pi\ cm^3$

Sol.527.(b) Diagonal of cube = $side\sqrt{3}$
Side of cube = 6 cm.
Three cube of equal volume are joined end to end , then a cuboid in formed , having length=18 cm , breadth = 6 cm and height = 6 cm
Now, Surface area of cuboid
$= 2(lb + bh + hl)$
Surface area of cuboid
$= 2(108 + 36 + 108) = 504\ cm^2$

Sol.528.(b) When a 3D figure is cast into another 3D figure , then their volume is equal . According to the Question ,
$\frac{C.S.A.\ of\ cylinder}{T.S.A.\ of\ cylinder} = \frac{2}{5}$
$\frac{2\pi rh}{2\pi r(h+r)} = \frac{2}{5}$
$\frac{h}{(h+r)} = \frac{2}{5}$ ⇒ r = 3x
Let height is 2x then radius be 3x
Again, Volume of solid hemisphere
= volume of cylinder = $\frac{2}{3}\pi R^3 = \pi r^2 h$
$\frac{2}{3} \times 21 \times 21 \times 21 = 9x^2 \times 2x$
$x^3 = \frac{2 \times 7 \times 21 \times 21}{9 \times 2}$ ⇒ x = 7,
then radius = 3x = 3 × 7 = 21 cm

Sol.529.(c) Area of sector = $\frac{\theta}{360°} \times \pi r^2$
Area = $\frac{90°}{360°} \times 3.14 \times 10^2 = 78.5\ m^2$

Sol.530.(c) Circumference of circle = $2\pi r$
Ratio of circumference of circle is directly proportional to ratio of radius of circle. R : r = 5 : 4
Width of path
= (outer radius - inner radius) = 1 unit
According to question, 1 unit = 50 m
Then, Inner radius (r) = 200 m

Sol.531.(d)
Diagonal of the first square = $8\sqrt{2}$
Side of the first square = $\frac{8\sqrt{2}}{\sqrt{2}} = 8\ cm$
Area of the square = 8 × 8 = 64 cm^2
Area of the new square = 64 × 3= 192cm^2
Side of the new square = $\sqrt{192} = 8\sqrt{3}$ cm
Diagonal of the new square
$= 8\sqrt{3} \times \sqrt{2} = 8\sqrt{6}\ cm$

Sol.532.(b) Given, inner radius = 6 cm, thickness = 0.37 cm
Outer radius = 6 + 0.37 = 6.37 cm
Outside curved surface area = $2\pi R^2$
$= 2 \times \frac{22}{7} \times 6.37 \times 6.37 = 255.0548\ cm^2$

Sol.533.(d) Given, diameter of the rod = 4 cm, radius = 2 cm and height = 12 cm
Volume of cylinder = $\pi R^2 h$
= 2 × 2 × 12 × π = 48π
Now, new length = 12m = 1200 cm
$\pi r^2 \times 1200 = 48\pi$
$r = \sqrt{\frac{48}{1200}} = 0.2$ cm
So, the thickness of the wire is 0.4 cm

Sol.534.(c) Volume of cone
$= \frac{1}{3}\pi \times (\frac{42}{2})^2 \times 42 = 6174\pi$
Volume of sphere
$= \frac{4}{3}\pi \times (24)^3 = 18{,}432\pi$
The amount of wood wasted
= 18,432π - 6174π = 12,258π
Required % of wood wasted
$= \frac{12{,}258\pi}{18{,}432\pi} \times 100 = 66.50\%$

Sol.535.(a) diameter the largest sphere that can be taken out from cube will be 2.8cm
Volume of sphere = $\frac{4}{3} \times \frac{22}{7} \times (\frac{2.8}{2})^3$
$= \frac{34.496}{3} \approx 11.50\ cm^3$

Sol.536.(c) CSA of cone = πrl
$594 = \frac{22}{7} \times 21 \times l$
594 = 66 × l ⇒ l = $\frac{594}{66}$ = 9 cm

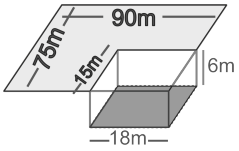
Sol.537.(a)
Let number of solid sphere be 'n'
$n \times \frac{4}{3}\pi \times (\frac{6}{2})^3 = \pi \times (\frac{4}{2})^2 \times 90$
$n \times \frac{4}{3}\pi \times 27 = \pi \times 4 \times 90$
n × 36π = 360π ⇒ n = $\frac{360}{36}$ = 10

Sol.538.(b) Volume of a frustum
$= \frac{1}{3} \times \pi \times h(R^2 + r^2 + R \times r)$
$= \frac{1}{3} \times \frac{22}{7} \times 7\ (5^2 + 3^2 + 5 \times 3)$
$= \frac{22}{3}(25 + 9 + 15)$
$= \frac{22 \times 49}{3} = \frac{1078}{3} = 359.3\ cm^3$

Sol.539.(d)
Let a be the edge of the cubical room.
ATQ, Area of the floor = a^2 = 64 ⇒ a = 8 m
So,
length of the longest rod =$\sqrt{3} \times 8 = 8\sqrt{3}$ m

Sol.540.(a)
Let the height of water raised be h
ATQ,
(Volume of conical vessel) = (Volume of cylindrical vessel)
$\frac{1}{3}\pi \times 20 \times 20 \times 27 = \pi \times 15 \times 15 \times h$
3600 = 225h ⇒ h = $\frac{3600}{225}$ = 16 cm

Sol.541.(d) CSA of cylinder = 2πRH
Volume of cylinder = $\pi R^2 H$
ATQ,
2 × 2πRH = $\pi R^2 H$, ⇒ R = 4
So, radius of cylinder = 4 unit

Sol.542.(b)


Let the rise in the level of the field be h
The area of field = 90 × 75 = 6750 m^2
Area of pit = 18 × 15 = 270 m^2
Area of the remaining part of the field
= 6750 - 270 = 6480 m^2
ATQ, Volume of earth taken out = Volume of earth spread over remaining part of field 270 × 6 = 6480 × h⇒ 1620 = 6480 h
h = $\frac{1620}{6480} = \frac{1}{4}$m = 25cm

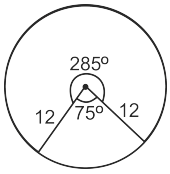
Sol.543.(d) Area of sector OAB
$= \frac{length\ of\ arc \times radius}{2} = \frac{2r \times r}{2} = r^2$

Sol.544.(a) TSA of hemisphere = $3\pi r^2$
$= 3\pi \times \frac{25}{\pi} = 75\ unit^2$

Sol.545.(b)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf



Perimeter of major sector

$= \frac{285°}{360°} \times 2\pi \times 12 + 12 \times 2 = (19\pi + 24)$m

Sol.546.(b)
Let the no of sphere formed be N
Volume of frustum = N × Volume of sphere

$\frac{1}{3}\pi(R^2 + r^2 + Rr)h_1 = N \times \frac{4}{3}\pi \times R_1^3$

$(25^2 + 20^2 + 500)18 = 4N$

$(625 + 400 + 500)18 = 4N$

$1525 \times 18 = 4N \Rightarrow N = \frac{1525 \times 18}{4} = 6862$

Sol.547.(c) C.S.A of hemisphere = $2\pi R^2$

75% of CSA of hemisphere = $\frac{3}{4} \times 2 \times \frac{22}{7} \times 21 \times 21 = 2079 \approx 2080 cm^2$

Sol.548.(a) TSA of hemisphere = $3\pi r^2$,

$462 = 3 \times \frac{22}{7} \times r^2$

$r^2 = \frac{462 \times 7}{66} = 49 \Rightarrow r = 7$ cm

Volume of hemisphere = Volume of cone

$\frac{2}{3}\pi \times 7^3 = \frac{1}{3}\pi \times 7^2 \times h$

$686 = 49h \Rightarrow h = \frac{686}{49} = 14$ cm

Sol.549.(b) Let the radius of each of the smaller semicircle be r
Then, the diameter of larger semicircle = 6r
The area of larger semicircle

$= \frac{\pi}{2} \times \left(\frac{6r}{2}\right)^2 = 4.5\pi r^2$

The area of unshaded region

$= 3 \times \frac{1}{2}\pi \times r^2 = 1.5\pi r^2$

The required ratio = $1.5\pi r^2 : \pi r^2(4.5 - 1.5)$

$= 1.5\pi r^2 : 3\pi r^2 = 1 : 2$

Sol.550.(b) Length of the longest pole

$= \sqrt{60^2 + 30^2 + 20^2}$

$= \sqrt{3600 + 900 + 400} = \sqrt{4900} = 70$ feet

Sol.551.(c) Let the breadth of wall be x
Then, height of wall = 6x
And length of wall = 3x
ATQ,

$3x \times x \times 6x = 23958 \Rightarrow 18x^3 = 23958$

$x^3 = \frac{23958}{18} = 1331 \Rightarrow x = 11$ cm

Sol.552.(c)
CSA of cylinder = 2πrh = 2200 ------ (1)
Circumference at the base of cylinder = 2πr = 110 ------ (2)

Dividing eqn(1) and (2) we have :

$h = \frac{2200}{110} = 20$ cm

Sol.553.(d)
Let the breadth of a cold storage be x
Then, length of the cold storage = 5x
The area of four walls = 2(l+b)×h

$720 = 2(5x + x) \times 8$

$45 = 6x \Rightarrow x = \frac{45}{6} = 7.5$m

Now,

$2lb = 2 \times 5x \times x = 10x^2 = 10 \times 7.5^2 = 562.5$

TSA of cold storage = 2(l + b) × h + 2lb

$= 720 + 562.5 = 1282.5 m^2$

Sol.554.(a) ATQ, r = 6 cm, h = 8 cm
Slant height of cone

$= \sqrt{6^2 + 8^2} = \sqrt{100} = 10$ cm

Total CSA of cones

$= 3 \times \pi \times 6 \times 10 = 180\pi\ cm^2$

Sol.555.(c) ATQ,

$\frac{2\pi R_1}{2\pi R_2} = \frac{5}{3} \Rightarrow \frac{R_1}{R_2} = \frac{5}{3}$

So, $\frac{volume\ of\ cone1}{volume\ of\ cone2} = \frac{\frac{1}{3}\pi R_1^2 h_1}{\frac{1}{3}\pi R_2^2 h_2}$

$= \frac{5^2 \times 1}{3^2 \times 5} = \frac{25}{45} = \frac{5}{9}$

Sol.556.(a) The area of sector

$= \frac{length\ of\ arc \times radius}{2} \Rightarrow 128 \times 2 = 64r$

$\Rightarrow 256 = 64r \Rightarrow r = \frac{256}{64} = 4$ cm

Sol.557.(d)
Volume of cone-shaped storage

$= \frac{1}{3} \times 3.14 \times 7^2 \times 9 = 461.58$ cubic feet

Sol.558.(d) TSA of hall to be painted

$= 2(l + b) \times h + l \times b$

$= 2(10 + 5) \times 6 + 10 \times 5 = 2 \times 15 \times 6 + 50$

$= 180 + 50 = 230\ m^2$

Sol.559.(d) Volume of hemispherical bowl = volume of cylindrical bottles

$\frac{2}{3}\pi R^3 = n \times \pi r^2 h$

Required number of bottles

$= \frac{2 \times 6 \times 6 \times 6}{3 \times 1 \times 1 \times 4} = 36\ bottles$

Sol.560.(c)
Given, s - a = 18, s - b = 17 and s - c = 25

$S = \frac{a + b + c}{2} \Rightarrow a + b + c = 2s$

Now, s - a + s - b + s - c = 60

$3s - (a + b + c) = 60$

$3s - 2s = 60 \Rightarrow s = 60$

So, area of the triangle

$= \sqrt{s(s - a)(s - b)(s - c)}$

$= \sqrt{60 \times 18 \times 17 \times 25} = 30\sqrt{510}$ cm²

Sol.561.(c)
CSA + TSA of cylinder = 2068 cm^2

$2\pi rh + (2\pi rh + 2\pi r^2) = 2068$

$2\pi r(2h + r) = 2068$

$2 \times \frac{22}{7} \times 7(2h + 7) = 2068$

$2h + 7 = \frac{2068}{44} = 47$

$2h = 40 \Rightarrow h = 20$ cm

So, the volume of cylinder

$= \frac{22}{7} \times 7^2 \times 20 = 3080\ cm^3$

Sol.562.(d) Slant height l = 20 cm
According to the question,
Area of base of cone = 616 cm^2

$\pi r^2 = 616 \Rightarrow \frac{22}{7} \times r^2 = 616$

$r^2 = 196 \Rightarrow r = 14$ cm

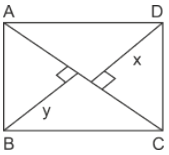
So, CSA of cone = $\pi r l$

$= \frac{22}{7} \times 14 \times 20 = 880\ cm^2$

Sol.563.(d) Given that, r = 14 cm
According to the question,
Height h = r + 6 = 14 + 6 = 20 cm
So, volume of cylinder = $\pi r^2 h$

$= \frac{22}{7} \times 14^2 \times 20 = 12320\ cm^3$

Sol.564.(c) Let the length of the perpendicular drawn from point D to AC and point B to AC be x and y respectively.
According to the question ,



So, area of quadrilateral
= Area of ΔABC + Area of ΔADC

$= \frac{1}{2} \times AC \times y + \frac{1}{2} \times AC \times x$

$= \frac{1}{2} \times AC \times (x + y)$

$= \frac{1}{2} \times 24 \times (10) = 120\ cm^2$

Sol.565.(c) Let the radius of the inner and outer circle be r and R respectively.
According to the question,
Difference between the areas of two concentric circles = 264 cm^2

$\pi R^2 - \pi r^2 = 264 \Rightarrow \pi(R^2 - r^2) = 264$

$\frac{22}{7} \times (R^2 - r^2) = 264$

$R^2 - r^2 = 84\ cm^2$

So, option (c) is the correct answer.

Sol.566.(b) According to the question,
Volume of cone = 400 cm^3
Volume of cone with radius r and height

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

h = $\frac{1}{3}\pi r^2 h$ = 400

$\frac{1}{3} \times \frac{22}{7} \times r^2 h$ = 400 ⇒ $r^2 h$ = $\frac{4200}{11}$

Volume of cone with radius 2r and height

h = $\frac{1}{3}\pi(2r)^2 h$ = $\frac{4}{3}\pi r^2 h$

= $\frac{4}{3} \times \frac{22}{7} \times \frac{4200}{11}$ = 1600 cm^3

Sol.567.(d)

Given, radius of the cone = 4 cm,

C.S.A of cone = π rl

$\pi r\ l = 20\pi \Rightarrow l = \frac{20}{4} = 5\ cm$

Now, height of the cone = $\sqrt{(l)^2 - (r)^2}$

= $\sqrt{25 - 16} = 3cm$

Volume of the conical vessel = $\frac{1}{3}\pi r^2 h$

= $\frac{1}{3} \times \pi \times 4 \times 4 \times 3$ =16π cm^3

Sol.568.(c) Area of rhombus = $\frac{1}{2} \times d_1 \times d_2$

= $\frac{1}{2}$ × 6 × 8 = 24 cm^2

Sol.569.(c) Volume of a cube = a^3

Where a = side of a cube

$\frac{Side\ of\ smaller\ cube}{Side\ of\ larger\ cube}$ =

$\sqrt[3]{\frac{Volume\ of\ smaller\ cube}{volume\ of\ larger\ cube}}$

$\frac{Side\ of\ smaller\ cube}{Side\ of\ larger\ cube} = \sqrt[3]{\frac{8}{27}} = \frac{2}{3}$

Then , side of smaller cube = 2x

and side of larger cube = 3x

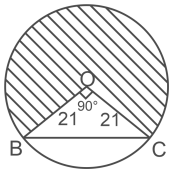
According to question,

$27x^3 - 8x^3 = 513cm^3 \Rightarrow 19x^3 = 513$

$x^3 = 27 \Rightarrow x = 3$

So, Side of smaller cube = 2 × 3 = 6cm

Sol.570.(c)



Area of minor sector(OBC)

= $\frac{90}{360} \times \frac{22}{7}$ × 21 × 21 = 346.5 cm^2

Area of △BOC

= $\frac{1}{2}$ × 21 × 21 × $\sin 90^0$ = 220.5 cm^2

Area of minor segment

= 346.5 - 220.5 = 126 cm^2

Now , area of major segment = area of circle - area of minor segment

= $\frac{22}{7} \times 21^2$ - 126 = 1386 - 126 = 1260 cm^2

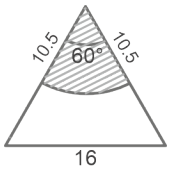
Short Trick:- Area of major segment :- area of major sector + area of triangle

Required area :- $\frac{270}{360} \times \frac{22}{7}$ × 21 × 21 + $\frac{1}{2}$ × 21 × 21 × $\sin 90^0$

Required area :- $\frac{21}{2}(99 + 21)$

= 60 × 21 = 1260 cm^2

Sol.571.(c) As it is given that plot is in the shape of an equilateral triangle then, the grazed area is part of circle of radius 10.5m. so, angle is 60°



Hence, required area

= $\frac{60°}{360°} \times \frac{22}{7}$ × 10.5 × 10.5

= $\frac{2425.5}{42}$ = 57.75 m^2

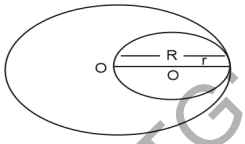
Sol.572.(d) Let the radius and height of the cone be r and h respectively.

ATQ,

$\frac{New\ volume}{Original\ volume} = \frac{\frac{1}{3}\pi \times 4r^2 \times 2h}{\frac{1}{3}\pi \times r^2 \times h}$ = 8

So, the volume of the cone becomes 8 times its previous volume.

Sol.573.(a)



Area of the smaller circle = 192

πr^2 = 192 ⇒ π × $(\frac{R}{2})^2$ = 192

πR^2 = 192 × 4 = 768

So, area of the bigger circle = 768 cm^2

Sol.574.(d) Let the length of the rectangle be L cm and the side of the square be a cm.

Area of square = 400 cm^2

a^2 = 400 ⇒ a = 20 cm

ATQ,Perimeter of square = perimeter of rectangle

4a = 2(L + 12) ⇒ 4 × 20 = 2(L + 12)

40 = L + 12 ⇒ L = 40 - 12 = 28

So, the area of rectangle

= 28 × 12 = 336 cm^2

Sol.575.(d) ATQ,

TSA of Sphere = TSA of cube

$4\pi r^2 = 6s^2 \Rightarrow 4 \times \frac{22}{7} \times r^2 = 6s^2$

$\frac{r^2}{s^2} = \frac{6 \times 7}{4 \times 22} = \frac{42}{88} = \frac{21}{44}$

So, we can see that r < s

Sol.576.(c) The ratio of length, breadth and height of the wall = 3 : 1 : 6,

Let the length, breadth and height of the wall be 3x, x and 6x respectively

ATQ,

The volume of wall = 23958

6x × 3x × x = 23958

$18x^3$ = 23958 ⇒ $x^3 = \frac{23958}{18}$ = 1331

x = $\sqrt[3]{1331}$ = 11 cm

Sol.577.(b)

Diameter of a wire = 1 mm = 0.1 cm

Radius of a wire = $\frac{0.1}{2}$ = 0.05 cm

Let the no of gold chain required be n

ATQ,

Volume of wire × n = Volume of gold

$\frac{22}{7}$ × 0.05 × 0.05 × 56 × n = 110

n = $\frac{110 \times 7}{22 \times 0.05 \times 0.05 \times 56}$ = 250

Sol.578.(d) The outer dimensions of a closed metal box is 15 cm, 18 cm, 8 cm

Thickness of the metal = 1.5 cm

So, the inner dimension of the metal box-

= 15 - 1.5 × 2 = 15 - 3 = 12cm,

= 18 - 1.5 × 2= 18 - 3 = 15 cm,

= 8 - 1.5 × 2 = 8 - 3 = 5 cm.

So, the required volume of the metal

= 15 × 18 × 8 - (12 × 15 × 5)

= 2160 - 900 = 1260 cm^3

Sol.579.(b)

Perimeter of an equilateral triangle = 3a

Length of equilateral triangle = a

ATQ,

3a - a = 120 ⇒ 2a = 120 ⇒ a = 60 cm

So, the area of equilateral triangle -

= $\frac{\sqrt{3}}{4}$ × 60 × 60 = 900$\sqrt{3}$ cm^2

Sol.580.(b) It is given that,

L + B = 37 — (1), L - B = 13 — (2)

Adding eqn. (1) and (2), we have :

L = $\frac{37 + 13}{2} = \frac{50}{2}$ = 25 cm, B = 12 cm

ATQ, Volume of cuboid = 25 × 12 × H

3300 = 300H ⇒ H = $\frac{3300}{300}$ = 11 cm

Sol.581.(a) Area of the rectangle -

= 40 × 35 = 1400 cm²

We can cut the biggest square by taking side of breadth of rectangle

Breadth of rectangle = 35cm

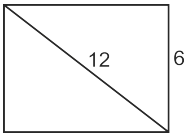
Then area of the square -

= 35 × 35 =1225 cm²

Area of remaining part-

= 1400 - 1225 = 175 cm²

Sol.582.(c) In rectangle



Another side = $\sqrt{12^2 - 6^2} = \sqrt{144 - 36}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \sqrt{108} = 6\sqrt{3}$

Area of rectangle = l × b = $6\sqrt{3} \times 6 = 36\sqrt{3}$

Sol.583.(c) Sphere is melted and recast into pyramid

Then the volume of sphere = volume of pyramid

$\frac{4}{3}\pi r^3 = \frac{1}{3} \times$ (area of base) × height

Let side of pyramid having square base = a

$4 \times \frac{22}{7} \times 21^3 = a^2 \times 66$

{ area of square = $(\text{side})^2$}

$a^2 = 4 \times \frac{22}{66 \times 7} \times 21 \times 21 \times 21$

$a^2 = 4 \times 21 \times 21$

Therefore, $a = \sqrt{21 \times 21 \times 4} = 42$cm

Sol.584.(a) According to the question,

The total surface area of cube having 8 cm side = area of a square +128 cm²

Let side of square is, X

$6 \times 8 \times 8 = X^2 + 128 \Rightarrow X^2 + 128 = 384$

$X^2 = 256 \Rightarrow X = \sqrt{256} \Rightarrow 16$ cm

Sol.585.(d) According to the question, height of cylinder = 4 m

Radius of cone and cylinder(r) = $\frac{10.5}{2}$ m

And slant height of cone (l) = 10 m

Canvas used for all tents = 3861 cm²

Let number of tents = N,

$= N \times 3861 = N \times [\pi r(l + 2h)] = 3861$

$= N \times [\frac{22}{7} \times \frac{10.5}{2} (10 + 8)] = 3861$

$= N \times \frac{22}{7} \times \frac{10.5}{2} \times 18 = 3861 \Rightarrow N = 13$

Sol.586.(a)

Area of a rectangle = l × b = 480

Perimeter of rectangle =2(l + b) = 92

l + b = 46 = 30 + 16

l × b = 480 = 30 × 16

So clearly length is 30 cm and breadth is- 16 cm

Now diagonal of a rectangle

$= \sqrt{l^2 + b^2} = \sqrt{30 \times 30 + 16 \times 16}$

$= \sqrt{1156} = 34$ cm

Sol.587.(a) According to question,

Circumference of circle = perimeter of square,

$\Rightarrow 2\pi r = 4a \Rightarrow r = \frac{2a}{\pi}$

Area of circle = πr^2

$= \pi \times (\frac{2a}{\pi})^2 = \frac{4a^2}{\pi} = \frac{14}{11} \times a^2$

Area of square = a^2

Hence, we can see that the area of a circle is more than the area of a square.

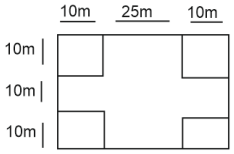
Sol.588.(d) If length is 2x then breath is x

Perimeter of rectangle = 2(l + b) = 54

$2(2x + x) = 54 \Rightarrow x = 9$

Length = 2x = 2 × 9 = 18 cm

Sol.589.(d)



When the 4 square shaped cuts are made in rectangular sheet then

Length = 25m, Breadth = 10m,

Height = 10m

Volume - = l × b × h = 25m × 10m × 10m

$= 2500\ m^3$

Sol.590.(a) Side of the cube $= \frac{50\sqrt{3}}{\sqrt{3}} = 50$

Total surface area of cube = $6\ side^2$

$= 6 \times 50 \times 50 = 15000\ cm^2$

Sol.591.(c) Let the smaller diagonal be x and larger diagonal be $= \frac{150}{100}x \Rightarrow \frac{3}{2}x$

$432 = \frac{1}{2} \times \frac{3}{2}x^2$

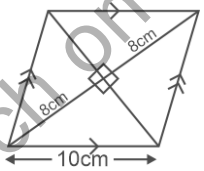
$x = \sqrt{\frac{432 \times 4}{3}} = 24$ cm

So, $d_1 = 24$ cm and $d_2 = 36$ cm

Side of the rhombus

$= \sqrt{12^2 + 18^2} = 6\sqrt{13}$

Sol.592.(d)

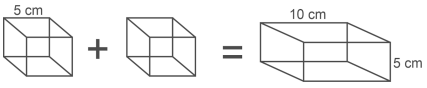


$D_2 = 2 \times 6 = 12$ cm

Area of rhombus $= \frac{1}{2} \times 16 \times 12 = 96cm^2$

Sol.593.(b) T.S.A of cube ($6side^2$) = 150

side = 5 cm



Now,

T.S.A of cuboid = 2(10 × 5 + 5 ×5 +10 × 5)

$= 2(50 + 50 + 25) = 250\ cm^2$

Sol.594.(b) According to the question,

Radius of circle = 84cm

Circumference of circle = perimeter of an equilateral triangle.

$2\pi r = 3 \times a$ (let side of triangle = a)

$2 \times \frac{22}{7} \times 84 = 3 \times a$

$3 \times a = 2 \times 22 \times 12$

$a = 2 \times 22 \times 4 = 176$ cm

Sol.595.(a) Height of a cylinder = 10 cm

According to the question,

radius = 10 - 3 = 7cm

So, volume of cylinder = $\pi r^2 h$

$\frac{22}{7} \times 7 \times 7 \times 10 \Rightarrow 22 \times 7 \times 10 = 1540\ cm^3$

Sol.596.(d) Area of large field = area of three smaller field

$\Rightarrow \pi R^2 = \pi 8^2 + \pi 9^2 + \pi 12^2$

$\Rightarrow \pi R^2 = \pi(8^2 + 9^2 + 12^2)$

$\Rightarrow R^2 = 64 + 81 + 144$

$\Rightarrow Radius\ (R) = \sqrt{289} \Rightarrow 17$m

Sol.597.(c)

Radius of common base r = 15 cm

Volume of toy = $\frac{2}{3}\pi r^3 + \frac{1}{3}\pi r^2 h$

$\Rightarrow 2850\pi = \frac{1}{3}\pi r^2 (2r + h)$

$\Rightarrow \frac{1}{3} \times 15 \times 15 \times (30 + h) = 2850$

$\Rightarrow (30 + h) = 38 \Rightarrow h = 8$

Hence , by Pythagoras

L(Slant Height) = $\sqrt{15^2 + 8^2} = 17$cm

Therefore,

Surface area of toy = $2\pi r^2 + \pi r l$

$\Rightarrow \pi r(2r + l) \Rightarrow \pi \times 15 \times (30 + 17) = 705\pi$ cm²

Sol.598.(c) According to the question,

Side of the large cube = 12cm

Radius of small spheres= 3cm

So ⇒ 12 × 12 × 12

$= N \times \frac{4}{3}\pi r^3 + (N + 2)\ 4 \times 4 \times 6.5$

$= N \times \frac{4}{3}\pi r^3 + (N + 2)\ 4 \times 4 \times 6.5 = 1728$

$= N \times \frac{4}{3} \times \frac{22}{7} \times 3 \times 3 \times 3 + 104N + 208$

$= 1728$

$N\ [\frac{792}{7} + 104] = 1728 - 208$

$N\ [\frac{792 + 728}{7}] = 1520$

$N\ [\frac{1520}{7}] = 1520 \Rightarrow N = 7$

Sol.599.(c) Area of trapezium

$= \frac{1}{2}(68 \times 75) = 2550\ cm^2$

Area of square $= \frac{2550 \times 17}{6} = 7225\ cm^2$

Side of square $= \sqrt{7225} = 85$ cm

Diagonal of square $= \sqrt{2} \times 85 = 119.85$ cm

Sol.600.(d) D = 2R = 7cm

Hence , R = 3.5 cm

Total surface area = $3\pi R^2$

$3 \times \frac{22}{7} \times 3.5 \times 3.5 = 115.5$ cm²

Sol.601.(c) Let the length and width of the rectangle be $3x$, $2x$

Area of rectangle = $6x^2$

According to question,

Now, $(\frac{125}{100} \times 3x) \times 2x - 6x^2 = 24$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\frac{15}{2}x^2 - 6x^2 = 24 \Rightarrow x = \sqrt{\frac{24 \times 2}{3}} = 4$

Width of the rectangle = 8 m

Sol.602.(c) ratio of an external angle and an internal angle = 1 : 5

As per question,

x + 5x = 180 ⇒ x = 30

Number of sides = $\frac{360}{30}$ = 12

Sol.603.(c) Area of a square = 1296

a^2 = 1296 ⇒ a = 36

Perimeter of square = 4a = 4 × 36 = 144

Radius = 36 × $\frac{7}{6}$ = 42

Circumference of circle -

= 2 × $\frac{22}{7}$ × 42 = 264

Required ratio = 144 : 264 = 6 : 11

Sol.604.(b) According to question,

$\frac{2}{3} = \frac{4 \times 3 \times H1}{5 \times 4 \times H2}$ ⇒ $H_1 : H_2$ = 10 : 9

Sol.605.(d)

Let breadth of the rectangle = 4x

Radius of the circle = 5x

Side of the square = 25x

Area = 625 ⇒ $(25x)^2$ = 625 ⇒ x = 1

So,

breadth of the rectangle = 4x = 4

Length = 20

= Area of rectangle = 4 × 20 = 80 cm^2

Sol.606.(a)

Let the diameter of circle = 7x

Base of triangle = 4x

Area of the triangle = $\frac{1}{2}$ × b × h

= 56 = $\frac{1}{2}$ × 4x × 14 ⇒ x = 2

Diameter = 7x = 14 cm ⇒ Radius = 7 cm

Circumference of circle -

= 2 × $\frac{22}{7}$ × 7 = 44 cm or 0.44 m

Sol.607.(c)

Given length of side of square = p

So, length of rectangle = $\frac{p}{2}$

Breadth of rectangle = $\frac{p}{6}$

Now, required area = area of square - area of rectangle = $p^2 - \frac{p^2}{12} = \frac{11p^2}{12}$

Sol.608.(d) Desired area

= $\frac{22}{7}$ × [$(9)^2 - (5)^2$] = 176 m^2

Sol.609.(d)

Since, Pillar is cylindrical in shape.

So, to reach the required answer we have to find the volume of the cylinder.

Volume of cylinder (pillar) = $\pi r^2 h$

= $\frac{22}{7}$ × 11 × 11 × 21 = 7986 m^3

Sol.610.(a) Diagonal of cube = diameter of sphere = $14\sqrt{3}$ cm

Radius of sphere = $\frac{14\sqrt{3}}{2}$ = $7\sqrt{3}$ cm

Volume of Sphere = $\frac{4}{3}$ × $\frac{22}{7}$ × $7\sqrt{3}$ × $7\sqrt{3}$ × $7\sqrt{3}$ = $4312\sqrt{3}$ cm^3

Sol.611.(c) 1 m^3 = 1000 litre

Volume of tank = 1.5 × 3 × 3.5 × 1000

= 15750 litre.

Sol.612.(a) Edge of cube = 10 cm

Height of the largest cone = Edge of the cone = 10 cm

Radius of the largest cone = $\frac{10}{2}$ = 5 cm

Volume of the largest cone

= $\frac{1}{3}$ × π × 5 × 5 × 10 = $\frac{250\pi}{3}$ cm^3

Sol.613.(c) Volume of 15 spherical ball

= 15 × $\frac{4}{3}$ × π × 5^3 = 2500π cm^3

Since 35% of the mass wasted ,

So the volume of sphere

= 2500π × $\frac{65}{100}$ = 1625π cm^3

Let the radius of new formed sphere = r

Volume of big Sphere = volume of new formed sphere ⇒1625π = $\frac{4}{3}$ × π × r^3

$r^3 = \frac{1625 \times 3}{4} = \frac{4875}{4}$

r = $\sqrt[3]{1218.75}$ = 10.68 cm

Sol.614.(c)

Volume of sphere = r^3 ($\frac{4}{3}$π is constant)

Original Volume 343 = 7^3

New Volume 2744 = 14^3

Required ratio = 343 : 2744 = 1 : 8

Sol.615.(a)

Volume of cylinder = Volume of cone

π × 15^2 × 12 = $\frac{1}{3}$ × π × 24^2 × H

H = $\frac{225 \times 36}{576} = \frac{8100}{576}$ = 14.0625 cm

Sol.616.(c) According to the question,

Percentage contribution of hemisphere in total volume of toy = 100 - (50 + 20)

= 100 - 70 = 30%

So, required ratio = 20 : 50 : 30 = 2 : 5 : 3

Sol.617.(c) Circumference of the base of cylinder = 2πr

⇒ 4π = 2πr ⇒ r = 2 cm

CSA of cylinder = 2πrh ,

12π = 2× π × 2 × h ⇒ h = $\frac{12}{4}$ = 3 cm

Volume of cylinder = π × 2 × 2 × 3 =12π cm^3

Sol.618.(b) $L + B + H$ = 23 cm (Given)

Length of the diagonal of cuboid

= $\sqrt{L^2 + B^2 + H^2}$

⇒ $5\sqrt{7} = \sqrt{L^2 + B^2 + H^2}$

⇒ 175 = $L^2 + B^2 + H^2$

⇒ $(L + B + H)^2 = L^2 + B^2 + H^2 + 2(LB + BH + HL)$

⇒ 23^2 = 175 + 2 $(LB + BH + HL)$

⇒ 529 = 175 + 2 $(LB + BH + HL)$

⇒ 354 = 2 $(LB + BH + HL)$

So, TSA of cuboid = 354 cm^2

Sol.619.(c)

CSA of cone-shaped temple = πrl

= $\frac{22}{7}$ × 11 × 10 = $\frac{2420}{7}$ m^2

Total cost for painting its CSA

= 7 × $\frac{2420}{7}$ = 2420 Rs.

Sol.620.(b)

Let the base of the triangle = 24cm

Area of Δ = $\frac{1}{2}$ × 24 × height

96 = 12 × height ⇒ H = $\frac{96}{12}$ = 8 cm

Sol.621.(a) According to the question,

Length = Breadth + 2(Breadth)

= 8 + 2(8) = 8 + 16 = 24 cm

Breadth = 2(Height)

8 = 2(Height), Height = 4 cm

Volume of cuboid = Length × Breadth × Height = 24 × 8 × 4 = 768 cm^3

Sol.622.(b)

Diagonal of cuboid = $\sqrt{l^2 + b^2 + h^2}$

= $\sqrt{20^2 + 5^2 + 4^2} = \sqrt{441}$ = 21 m

Sol.623.(a) Volume of Hemisphere

= $\frac{2}{3}$ × $\frac{22}{7}$ × 7 × 7 × 7

= $\frac{2156}{3}$ = $718\frac{2}{3}$ cm^3

Sol.624.(d) Length of each side of hexagon = 10 cm

Area of Hexagon = 6 × area of equilateral triangle

Area of Hexagon = 6 × $\frac{\sqrt{3}}{4}$ × 10 × 10

= $\frac{600\sqrt{3}}{4}$ = $150\sqrt{3}$ cm^2

Sol.625.(a)

Area of square = $9m^2$ + 12m + 4

= $(3m)^2$ + 2 × 3m × 2 + 2^2 ⇒ $(3m + 2)^2$

Side of square = $\sqrt{(3m + 2)^2}$ = 3m + 2

Sol.626.(b) Area of square = $4x^2 - 12x + 9$

= $(2x)^2 - 2 \times 2x \times 3 + 3^2 = (2x - 3)^2$

Side of the square = $\sqrt{(2x - 3)^2}$ = 2x - 3

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.627.(a) L × B = 729 cm^2, B × H = 529 cm^2, H × L = 289 cm^2

$L^2 \times B^2 \times H^2$ = 729 × 529 × 289

L × B × H = $\sqrt{729 \times 529 \times 289}$

= 27 × 23 × 17 = 10557 cm^3

Sol.628.(c) TSA of cone = πr (r + l)

= $\frac{22}{7} \times \frac{10}{2}$ ($\frac{10}{2}$ + 16)

= $\frac{22}{7}$ × 5 × 21 = 330 cm^2

Sol.629.(b)

Diagonal of rhombus(D_1) = 8cm

Area of rhombus = $\frac{1}{2}$ × 8 × D_2

48 = 4 × D_2 ⇒ D_2 = $\frac{48}{4}$ = 12 cm

Now, side of rhombus

= $\sqrt{(\frac{8}{2})^2 + (\frac{12}{2})^2}$ = $\sqrt{16 + 36}$

= $\sqrt{52}$ = 2$\sqrt{13}$ cm

Sol.630.(c) TSA of cylinder = 2πr (r + h)

= 2πr (r + $\frac{r}{2}$) = 2πr × $\frac{3r}{2}$ = $3\pi r^2$

Sol.631.(b) Circumference of the base of hemispherical bowl = 132 cm

2 × $\frac{22}{7}$ × r = 132 ⇒ $\frac{44}{7}$ × r = 132

r = $\frac{132 \times 7}{44}$ = 21 cm

The capacity of the bowl

= $\frac{2}{3}$ × $\frac{22}{7}$ × 21 × 21 × 21 = 19404 cm^3

Sol.632.(a)

Radius of cylinder = $\frac{14}{2}$ = 7 cm

Diameter of sphere = height of cylinder ...(Since cylinder is circumscribing a sphere)

So, volume of cylinder

= $\frac{22}{7}$ × 7^2× 14 = 2156 cm^3

Sol.633.(c) Surface area of spherical volleyball = 100π

$4\pi r^2$ = 100π ⇒ r^2 = 25 ⇒ r = 5

Volume of air

= $\frac{4}{3}$ × π × 5 × 5 × 5 = $\frac{500}{3}$π

Sol.634.(d) Length of diagonal of cuboid

= $\sqrt{13^2 + 7^2 + 3^2}$ = $\sqrt{169 + 49 + 9}$

= $\sqrt{227}$ m

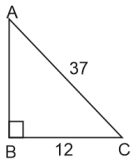
Sol.635.(d) Area of playground = CSA of roller × Number of complete revolutions

= 2πrh × 235

= 2 × $\frac{22}{7}$ × 14 × 20 × 235

= 413600 = 4136 × 10^2 cm^2

Sol.636.(d) According to the question,



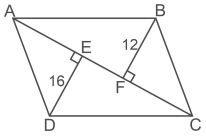
AB^2 = $\sqrt{AC^2 - BC^2}$ = $\sqrt{37^2 - 12^2}$

= $\sqrt{1369 - 144}$ = $\sqrt{1225}$ = 35 cm

Area of triangle = $\frac{1}{2}$ × AB × BC

= $\frac{1}{2}$ × 35 × 12 = 210 cm^2

Sol.637.(d)



Area of ABCD

= area of ADC + area of ABC

336 = $\frac{1}{2}$ × AC × DE + $\frac{1}{2}$× AC × BF

336 = $\frac{1}{2}$ × AC (DE + BF)

672 = AC(16 + 12)

672 = AC × 28 ⇒ AC = 24 cm

Sol.638.(d)

Let the number of spherical balls be n.

According to the question,

Volume of n spherical balls

= Volume of spherical clay ball

n × $\frac{4}{3}$ πr^3 = $\frac{4}{3}$ πR^3 ⇒ n × r^3 = R^3

n × 5^3 = 15^3 ⇒ n = 3^3 = 27

Sol.639.(c) Total surface area= 2πr(h + r)

60π = 2 × π × 3(h + 3)

10 = h + 3 ⇒ h = 10 - 3 = 7 cm

Sol.640.(d) Let,

the rise of water level = a cm

According to the question,

Volume of cube = Length of rectangle × Breadth of rectangle × a

= 8 × 8 × 8 = 16 × 8 × a ⇒ a = 4 cm

Sol.641.(d)

Let, the rise of water level = a

According to the question,

Volume of cube = Length of rectangle × Breadth of rectangle × a

8 × 8 × 8 = 16 × 8 × a ⇒ h = 4 cm

Sol.642.(c) Required difference = Volume of sphere - Volume of cone

= $\frac{4}{3}$ πr^3 − $\frac{1}{3}$ $\pi r^2 h$ = $\frac{1}{3}$ π r^2(4r − h)

= $\frac{1}{3}$ × $\frac{22}{7}$ × 7^2 × (4 × 7 − 10)

= $\frac{1}{3}$ × 154 × (18) = 924 cm^3

Sol.643.(b) Length of square

= $\frac{Diagonal}{\sqrt{2}}$ = $\frac{(a+b)}{\sqrt{2}}$

So, Area of square = [$\frac{(a+b)}{\sqrt{2}}$]^2

= $\frac{a^2 + b^2 + 2ab}{2}$ = $\frac{1}{2}$(a^2 + b^2) + ab

Sol.644.(b) According to the question,

y = 14x

Volume of sphere = 14 × surface area of sphere

$\frac{4}{3}\pi r^3$ = 14 × 4πr^2

$\frac{1}{3}$ × r = 14 ⇒ r = 42 cm

Sol.645.(c) Curved surface area of the hemisphere = $2\pi r^2$

Base area of the hemisphere = πr^2

Effective area increase on each face of the cube = $2\pi r^2$ − πr^2 = πr^2

Area of each face of the cube

=$(10)^2$ + πr^2 = 100 + $\frac{22}{7}$× 2^2= 112$\frac{4}{7}$ cm^2

Total surface area of the cube

= 6 × 112$\frac{4}{7}$ = 675$\frac{3}{7}$ cm^2

Sol.646.(a) Here, length (l) = 20 cm, breadth (b) = 10 cm and height (h)= 8 cm

Area of a cardboard needed

= 2(lb + bh + hl)

= 2(20 × 10 + 10 × 8 + 8 × 20)

= 2(200 + 80 + 160)= 2(440) ⇒ 880 cm^2

Sol.647.(b) Volume of cube = volume of sphere + remaining part volume

a^3 = $\frac{4}{3}$πr^3 + 163$\frac{1}{3}$

7^3 = $\frac{4}{3}$ × $\frac{22}{7}$ × r^3 + $\frac{490}{3}$

343 − $\frac{490}{3}$ = $\frac{4}{3}$ × $\frac{22}{7}$ × r^3

$\frac{539}{3}$ = $\frac{4}{3}$ × $\frac{22}{7}$ × r^3

r^3 = $\frac{7 \times 7 \times 7}{2 \times 2 \times 2}$ ⇒ r = $\frac{7}{2}$ ⇒ d = 2r = 7cm

Sol.648.(b) When we melt and convert any solid then volume of both the solids remains same. R = 3 cm = radius of sphere

r = 0.1mm = $\frac{1}{100}$cm = radius of wire

h = length of wire

$\frac{4}{3}$ πR^3 = $\pi r^2 h$

= $\frac{4}{3}$ π × 3 × 3 × 3 = π $\frac{1}{10000}$ h

h = 360000 cm

Sol.649.(c) Take inner radius = r

Outer radius = R = (r + 3)

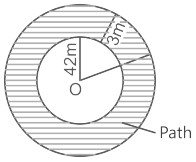
According to the question

2πr = 264 m ⇒ r = $\frac{264 \times 7}{22 \times 2}$ = 42 m

R = (r + 3) = 42 +3 =45 m

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

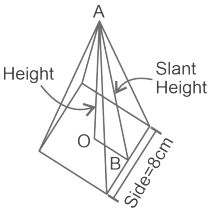


Area of path = π (R² - r²)

$\frac{22}{7}(R + r)(R - r)$

$= \frac{22}{7}(87m \times 3m)$= 820.28 ≈ 820 m²

Sol.650.(c)



Total surface area of square based pyramid = Surface area of base + 4 × surface area of wall

8² + 4 × $\frac{1}{2}$ × 8 × AB = 208 cm²

AB = Slant height = $\frac{208 - 64}{16}$ = 9 cm

Sol.651.(b) Upper radius = $\frac{21}{2}$ = 10.5

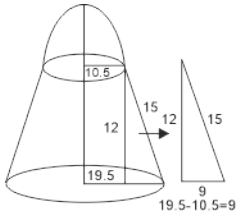
Lower radius = $\frac{39}{2}$ = 19.5

Height of frustum = 22.5 - radius of hemisphere

Height of frustum = 22.5 - 10.5 = 12

Now by pythagoras theorem

Slant height (l)= $\sqrt{12^2 + 9^2}$ = 15



Total surface area = surface area of hemisphere + surface area of frustum

Total surface area = $2\pi r^2$ + π(R + r)l

= 2 × $\frac{22}{7}$ × 10.5 × 10.5 + $\frac{22}{7}$ × (19.5 + 10.5) × 15 = $\frac{14751}{7}$ = 2107$\frac{2}{7}$ cm²

Sol.652.(a) Let, side of each cube so formed be a.

Volume of cuboid = number of cubes formed × a^3

Volume of cuboid = 8 × a^3

12 × 54 × 72 = 8 × a^3

a^3 = 5832 ⇒ a = 18 cm

Lateral surface area of 2 such cube

= 2 × (4 × 18^2) = 8 × 324 = 2592 cm^2

Sol.653.(b) Ratio of old radius to new radius = 3.5 : 4.9 = 5 : 7.

	Old	:	New
Radius	5	:	7
Volume	5^3	:	7^3
	125	:	343

Required percentage increase

= $\frac{343 - 125}{125}$ × 100 = 174.4%

Sol.654.(c) Let the height of the cylindrical tank be "h"

Curved surface area = 2π × 4 × h = 8πh

3 times of sum of areas of two circular faces = 6πr^2= 6π × 4 × 4 = 96π

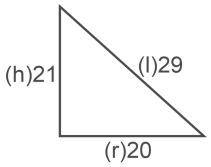
According to the question,

96π = 2 × 8 πh ⇒ h = 6

Volume of cylindrical tank

= πr^2h = π × 4 × 4 ×6 = 96 π.

Sol.655.(c)



As height, radius and slant height of a cone form a triplet, we have height 21x and radius = 20x

$\frac{1}{3}$π. $(20x)^2$ × 21x = 4838.4π

$x^3 = 1.728$ ⇒ x = 1.2

radius = 20x = 20 × 1.2 = 24 cm

Sol.656.(b) According to the question,

$(l \times b) \times (b \times h) \times (h \times l)$

= 216 × 96 × 144

$(lbh)^2$ = 216 × 96 × 144

$lbh = \sqrt{216 \times 96 \times 144}$ = 1728 cm^3

Let the edge of each cube = x

So,

volume of cuboid = 8 (volume of cube)

lbh = 8 $(x)^3$

1728 = 8 $(x)^3$ ⇒ $(x)^3$ = 216 ⇒ x = 6 cm

Lateral surface area of three cubes

= 3 × 4$(x)^2$ = 3 × 4$(6)^2$ = 432 cm^2

Sol.657.(d)

Let inner radius = r and outer radius = R

According to the question,

R − r = 2 ⇒ R − 3 = 2 ⇒ So, R = 5 m

Volume of the soil taken out = Volume of embankment

πr^2h = π$(R^2 - r^2)H$ ⇒ $r^2h = (R^2 - r^2)H$

$(3)^2 \times 6 = (5^2 - 3^2) \times H$

54 = 16 × H ⇒ $H = \frac{54}{16}$ = 3$\frac{3}{8}$ m

Sol.658.(c)

Let "n" small spheres have been formed.

$\frac{4}{3}$π$(4)^3$ = n × $\frac{4}{3}$π$(2)^3$ ⇒ n = $\frac{64}{8}$ = 8.

Surface area of original sphere

= 4π ×4^2 = 64π

Surface area of 8 small spheres

= 8 × 4π × 2^2 = 128π

Required ratio = 1 : 2.

Sol.659.(c) Volume of the sheet

= volume of cylinder with outer radius - volume of cylinder with inner radius.

Inner radius = 4 cm - 0.5 cm = 3.5 cm

h = 2 m = 200 cm.

Required volume = π × 200$(4^2 - 3.5^2)$

= π × 200(16 − 12.25)

= π × 200 × 3.75 = 750π

Sol.660.(c) Lateral surface area of prism = Perimeter of base × Height

480 = 40 × Height ⇒ Height = 12 cm

Volume of prism = Area of base × height

= $(\frac{1}{2} \times 8 \times 15) \times 12$ = 720 cm^3

Sol.661.(d) According to the question,

CSA of cone = 2310 cm^2

$\frac{22}{7} \times 21 \times l$ = 2310 ⇒ l = 35 cm

So, $h = \sqrt{l^2 - r^2} = \sqrt{35^2 - 21^2}$

$= \sqrt{1225 - 441} = \sqrt{784}$ = 28 cm

Let new height = H and new radius = R

So, H = 28 × $\frac{50}{100}$ = 14 cm and R

= 21 × $\frac{200}{100}$ = 42 cm

Capacity of cone = $\frac{1}{3}\pi R^2 H$

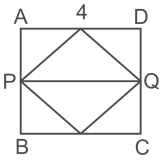
= $\frac{1}{3} \times \frac{22}{7} \times (42)^2 \times 14$ = 25872 cm^3

So, capacity (in litres)

= $\frac{25872}{1000}$ = 25.872 ≈ 25.9 litres

Sol.662.(b) Let the side of square = 4

So area of square S = 4^2 = 16



For square formed by joining mid point, diagonal (PQ) = 4

So, area of square which formed

= $\frac{1}{2}$ × (diagonal)^2 = $\frac{1}{2}$ × $(4)^2$ = 8

So, $\frac{A}{S} = \frac{8}{16} = \frac{1}{2}$ = 0.5

Sol.663.(c)

Radius of spherical droplet (in cm) = R

= $\frac{2}{10 \times 2} = \frac{1}{10}$ cm

Radius of cone = Height of cone = r

Volume of 128000 droplets = Volume of cone

128000 × $\frac{4}{3}$ πR^3 = $\frac{1}{3}\pi r^2 h$

128000 × 4 $\left(\frac{1}{10}\right)^3$ = $r^2 \times r$

r^3= 512 ⇒ r = 8 cm

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.664.(b) TSA of cylinder = 880 cm^2

$2\pi r(h + r) = 880$

$2 \times \frac{22}{7} \times r(13 + r) = 880$

$13r + r^2 = 140 \Rightarrow r^2 + 13r - 140 = 0$

$r^2 + 20r - 7r - 140 = 0$

$r(r + 20) - 7(r + 20) = 0 \Rightarrow r = 7$ cm

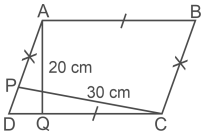
According to question,

Volume of cylinder = 11k

$\pi r^2 h = 11k$

$= \frac{22}{7} \times (7)^2 \times 13 = 11k \Rightarrow k = 182$

Sol.665.(b) According to question,



Area of parallelogram = Base × Altitude

For base AD,

300 = AD × CP ⇒ 300 = AD × 30

⇒ AD = 10 cm,

BC = AD = 10 cm

Similarly, for base CD,

300 = CD × AQ ⇒ 300 = CD × 20

⇒ CD = 15 cm, AB = CD = 15 cm

So, perimeter = AB + BC + CD + AD

= 10 + 15 + 10 + 15 = 50 cm

Sol.666.(a) Volume of frustum

$= \frac{1}{3}\pi h(r_1^2 + r_2^2 + r_1 r_2)$

$= \frac{1}{3} \times \frac{22}{7} \times 12 \times (20^2 + 13^2 + 20 \times 13)$

$= \frac{1}{3} \times \frac{22}{7} \times 12 \times (400 + 169 + 260)$

$= \frac{1}{3} \times \frac{22}{7} \times 12 \times 829 \approx 10422\ cm^3$

$= 10422\ cm^3 \Rightarrow 10.4$ liters

Sol.667.(a)

Let each side of the square be "a"

Side including the road

= a + 2 × 4.5 = a + 9

According to the question,

$(a + 9)^2 - a^2 = 252$

$a^2 + 18a + 81 - a^2 = 252$

$18a = 171 \Rightarrow a = \frac{171}{18} = 9.5$ m

Sol.668.(b)

Volume of the cube = base area of the cylinder × (raised height of water)

$12 \times 12 \times 12 = \frac{22}{7} \times 20 \times 20 \times h$

$h = \frac{12 \times 12 \times 12 \times 7}{22 \times 20 \times 20} \approx 1.4$ cm

Sol.669.(c) For box prepared after cutting squares from rectangular sheet,

Length = 48 − 2(3.5) = 48 − 7 = 41 cm

Breadth = 27 − 2(3.5) = 27 − 7 = 20 cm

Height = 3.5 cm

Volume of the box = 41 × 20 × 3.5

= 2870 cm^3

Sol.670.(b) Here the thickness = 1 cm, so for outer surface : Length

= 30 + 2(1) = 32 cm,

Breadth = 18 + 2(1) = 20 cm,

Height = 23 + 2(1) = 25 cm

Space occupied by rectangular box

$= Length \times Breadth \times Height$

$= 32 \times 20 \times 25 = 16000\ cm^3$

Sol.671.(a) According to question,

$\frac{90}{100} \times$ [Volume of cylinder] = Volume of sphere $= \frac{90}{100} \times [\pi R^2 h] = \frac{4}{3}\pi r^3$

$= \frac{9}{10} \times [3^2 \times 120] = \frac{4}{3} r^3$

$= \frac{9}{10} \times [1080] = \frac{4}{3} r^3$

$= r^3 = 729 \Rightarrow r = 9$ cm

Sol.672.(b) Difference between areas of two concentric circles = 88 cm^2

$\pi R^2 - \pi r^2 = 88 \Rightarrow \pi(R^2 - r^2) = 88$

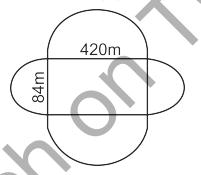
$\frac{22}{7}(R^2 - 6^2) = 88$

$R^2 - 36 = 28 \Rightarrow R^2 = 64$

Area of largest circle = πR^2

$= \frac{22}{7} \times 64 = 201.14 \approx 201\ cm^2$

Sol.673.(c)



Total area(x) = Area of rectangular plot + Area of two semi-circular of diameter 84 m + Area of two semi-circular of diameter 420 m

$= 420 \times 84 + 2(\frac{\pi r^2}{2}) + 2(\frac{\pi R^2}{2})$

$= 35280 + \pi(r^2 + R^2)$

$= 35280 + \frac{22}{7}[(\frac{84}{2})^2 + (\frac{420}{2})^2]$

$= 35280 + \frac{22}{7}[(42)^2 + (210)^2]$

$= 35280 + \frac{22}{7}[1764 + 44100]$

$= 35280 + \frac{22}{7}[45864]$

$= 35280 + 144144 = 179424\ m^2$

1 hectare = 10000 m^2

so, Area of plot = x

$= \frac{179424}{10000} = 17.9$ hectares

Sol.674.(b)

Let the side of cubical block be x.

Volume of cubical box

$= x^3 = 10^3 = 1000\ cm^3$

Volume of sphere $= \frac{4}{3}\pi r^3$

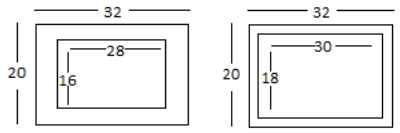
$= \frac{4}{3} \times \frac{22}{7} \times (4.2)^3 = 310.464\ cm^3$

So, wood wasted

= 1000 − 310.464 = 689.536 cm^3

Sol.675.(a)

(Figure 1) (figure 2)



When margin of 2 cm is left, area available for typing (figure 1)

$= (32 - 4) \times (20 - 4) = 28 \times 16 = 448\ cm^2$

When margin of 1 cm is left, area available for typing (figure 2)

$= (32 - 2) \times (20 - 2) = 30 \times 18 = 540\ cm^2$

So percentage increase in typing area

$= \frac{540 - 448}{448} \times 100 = \frac{92}{448} \times 100$

= 20.54%

Sol.676.(a) $1m^3$ = 1000 litres, so 126 kilolitres = 126 × 1000 = 126000 litres which is equivalent to 126 m^3.

Width of reservoir $= \frac{126}{8 \times 3.5} = 4.5$ m

Sol.677.(c) Area of four walls = Area of floor and ceiling

2h(l + b) = 2(l × b)

2h(18 + 12) = 2(18 × 12)

60h = 432 ⇒ h = 7.2 m

Volume of hall = l × b × h

$= 18 \times 12 \times 7.2 = 1555.2\ m^3$

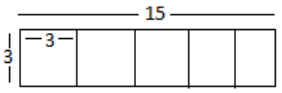
Sol.678.(d)

Let the edge of each cube be x.

Volume of each cube so formed

$= 27\ cm^3 \Rightarrow x^3 = 27 \Rightarrow x = 3$

So length of cuboid = 3 × 5 = 15 cm, breadth = 3 cm, and height = 3 cm



So, TSA of cuboid = 2 (lb + bh + hl)

= 2(15 × 3 + 3 × 3 + 3 × 15)

= 2(45 + 9 + 45) = 2(99) = 198 cm^2

Sol.679.(d) For hollow cylindrical shell:

Outer radius R = b, Inner radius P = b − a , and R + P = b + (b − a) = 2b − a

According to the question,

Volume of sphere = Volume of hollow cylindrical shell

$\frac{4}{3}\pi r^3 = \pi(R^2 - P^2)H$

$\frac{4}{3} r^3 = (R^2 - P^2)H$

$\frac{4}{3} r^3 = (R - P)(R + P)H$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\frac{4}{3}r^3 = (a) \times (2b - a) \times H$

$H = \frac{\frac{4}{3}r^3}{(a) \times (2b - a)} = \frac{4r^3}{3a\,(2b - a)}$

Sol.680.(c)
Volume of cone = Volume of hemisphere

$\frac{1}{3}\pi r^2 h = \frac{2}{3}\pi r^3$, $h = 2r$

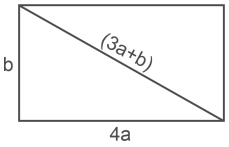
So, slant height of cone = $\sqrt{r^2 + h^2}$

$= \sqrt{r^2 + (2r)^2} = \sqrt{5r^2} = \sqrt{5}\,r = 14\sqrt{5}$ cm

CSA of cone = $\pi r l$

$= \frac{22}{7} \times 14 \times 14\sqrt{5} = 616\sqrt{5}\ cm^2$

Sol.681.(c) Let the larger side of the rectangle be "4a", and other side be "b"
According to the question, length of diagonal = 4a + b - a = 3a + b



Applying pythagoras theorem we get,

$b^2 + (4a)^2 = (3a + b)^2$

$b^2 + 16a^2 = 9a^2 + b^2 + 6ab$

$7a^2 = 6ab \Rightarrow \frac{a}{b} = \frac{6}{7}$,

ratio of larger side : smaller side

= 4a : b ⇒ 4 × 6 : 7 = 24 : 7

Sol.682.(c) Area of the square = 6400 m^2

Side of the square = $\sqrt{6400}$ = 80 m

So, radius of circle = 80 m

Length of rectangle = $\frac{3}{5}$ × 80 = 48 m

Area of rectangle = length × breadth

= 48 × 20 = 960 m^2

Sol.683.(d) Volume of 3 cylinder to be filled with grain

= 3 × volume of each cylinder

= 3 × (πr^2h) = 3 × ($\frac{22}{7} \times (20)^2 \times 70$)

= 3 × (88000) = 264000 cm^3

3000 cm^3 corresponds to 1 kg of grain,

so 264000 cm^3 = $\frac{264000}{3000}$ = 88 kg

Grain left in the bag = 100 − 88 = 12 kg

Sol.684.(d) Surface area of original balloon : Surface area of inflated balloon

= $4\pi r^2 : 4\pi R^2 = r^2 : R^2 = (6)^2 : (10)^2$

= 36 : 100 = 9 : 25

Sol.685.(d) Let the original radius r = 8,

so new radius R = $\frac{r}{2} = \frac{8}{2}$ = 4

Let the height of original cylinder h = 10 and new height = H

Volume of original cylinder = Volume of new cylinder

$\pi r^2 h = \pi R^2 H \Rightarrow r^2 h = R^2 H$

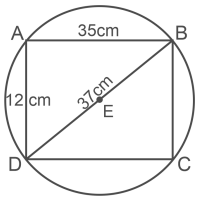
$8^2 \times 10 = 4^2 \times H$

H = 40 = 4(10) = 4H, so value of k = 4

Sol.686.(d) BD = $\sqrt{AB^2 + AD^2}$

$= \sqrt{35^2 + 12^2} = \sqrt{1225 + 144}$

$= \sqrt{1369}$ = 37 cm

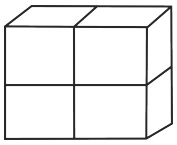


Diagonal of rectangle = Diameter of circle = BD = 37 cm

Circumference of circle

= 2πr = 2 × $\frac{22}{7} \times \frac{37}{2} = \frac{814}{7}$ =116$\frac{2}{7}$cm

Sol.687.(b) Clearly, the following cuboidal figure with dimensions 24 × 24 × 12 will be formed.



Total surface area of a cuboid

= 2 (lb + bh + lh)

= 2(24 × 24 + 24 × 12 + 24 × 12)

= 2(576 + 288 + 288)

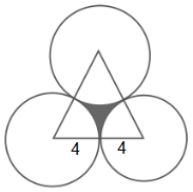
= 2 × 1152 = 2304 cm^2

Sol.688.(c)
For maximum volume of the cone we must have the height and diameter of the cone equal to the side of the cube.
The side of the cube be 14 units, then the height of the cone is 14 units and its radius is 7 units.
Required ratio

= 14 × 14 × 14 : $\frac{1}{3} \times \frac{22}{7}$ × 7 × 7 × 14

= 42 : 11

Sol.689.(b)



Required area = Area of equilateral triangle - Area of 3 sectors with angle 60°

Area of equilateral triangle

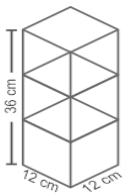
= $\frac{\sqrt{3}}{4}a^2 = \frac{\sqrt{3}}{4} \times 8 \times 8 = 16\sqrt{3}\ cm^2$

Area of three sectors with central angle 60° and radius 4 cm

= 3 × $\frac{60^0}{360^0}$ × π × 4 × 4 = 8π.

Required area = $16\sqrt{3}$ - 8π = 8($2\sqrt{3} - \pi$)

Sol.690.(d)
Side of each cube = $\sqrt{1728}$ = 12 cm
By putting three cubes one above the other, the resulting figure will be cuboid with dimension of 36 cm × 12 cm × 12 cm



Total surface area of the cuboid

= 2 (LB + BH + HL)

= 2(12 × 12 + 12 × 36 + 12 × 36)

= 2 × 1008 = 2016 cm^2

Sol.691.(c) Area of shaded region

= 80 × 50 = 4000 m^2

So , area of unshaded region

= $\frac{35}{100}$ × 4000 = 1400 m^2

Total area = (80 + x) × (50 + x)

4000 + 1400 = 4000 + 130x + x^2

x^2 + 130x − 1400 = 0

x^2 + 140x − 10x − 1400 = 0

x (x + 140) − 10 (x + 140) = 0

x ≠ − 140, so x = 10

Sol.692.(a) Here, (r + h) = 46 cm,
Total surface area of cylinder

= $2\pi r(r + h) \Rightarrow 2\pi r(r + h)$ = 6072

2 × $\frac{22}{7}$ × r × 46 = 6072

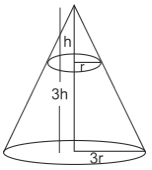
r = $\frac{6072 \times 7}{2 \times 22 \times 46}$, r = 21 cm

h = 46 - 21 = 25 cm.

Volume = $\pi r^2 h$ = π × 21 × 21 × 25

= 11025π

Sol.693.(c) The respective ratio of height and radius of the two cones will be 1 : 3.
Let radius and height of smaller cone be "r" and "h"
Radius and height of whole cone become 3r and 3h



= $\frac{volume\ of\ smaller\ cone}{volume\ of\ whole\ cone}$

= $\frac{\frac{1}{3}\pi r^2 h}{\frac{1}{3}\pi (3r)^2 3h} = \frac{1}{3^2 \times 3} = \frac{1}{27}$

Sol.694.(c) Let the radius of the outer circumference be 'R' and the radius of the inner circumference be 'r'.
Now, 2πR = 748 m.

2 × $\frac{22}{7}$ × R = 748.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$R = \frac{748 \times 7}{22 \times 2} \Rightarrow R = 119$ m.

Again, $2\pi r = 396$ m.

$2 \times \frac{22}{7} \times r = 396 \Rightarrow r = \frac{396 \times 7}{22 \times 2} = 63$ m.

Width of the track = (R - r)

= (119 - 63) = 56m.

Sol.695.(b)

Area of the floor = l × b = 18 × 12 = 216

Area of four walls

= 2 × (l + b) × h ⇒ 2 × (18 + 12) × h

Given, 2 × (30) × h = 216

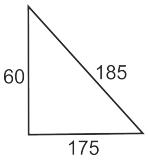
So, h = 3.6

Now volume of a cuboidal shape

= l × b × h = 12 × 18 × 3.6 = 777.6 cm^3

Sol.696.(d)

Sides of the triangular field are triplets.



Area of Δ = Area of rectangular park

$\frac{1}{2} \times 60 \times 175 = 21x \times 10x$

$x^2 = 25 \Rightarrow x = 5$

Perimeter of rectangular park

= 2 [21x + 10x] = 62x = 62 (5) = 310 m

Sol.697.(b) $r = \frac{56}{2} = 28$ cm

Length of circular wire

$= 2\pi r = 2 \times \frac{22}{7} \times 28 = 176$ cm

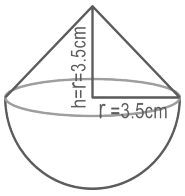
Length of circular wire = Perimeter of rectangle

176 = 2 (7x + 4x) ⇒ 88 = 11x ⇒ x = 8

Area of rectangle = 7x × 4x = $28x^2$

= 28 (8^2) = 28 (64) = 1792 cm^2

Sol.698.(c)



Height of cone = radius of base , so h = r

Volume of metal used = Volume of cone + volume of hemisphere

$= \frac{1}{3} \pi r^2 h + \frac{2}{3} \pi r^3$

$= \frac{1}{3} \pi r^3 + \frac{2}{3} \pi r^3$

$= \frac{1}{3} \pi r^3 (1 + 2) = \frac{1}{3} \pi r^3 (3)$

$= \frac{22}{7} \times \left(\frac{7}{2}\right)^3 = \frac{539}{4} = 134\frac{3}{4}\ cm^3$

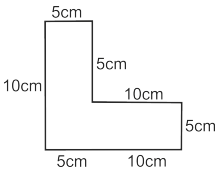
Sol.699.(d) Volume of frustum

$= \frac{1}{3} \pi h [r_1^2 + r_2^2 + (r_1 \times r_2)]$

$= \frac{1}{3} \times \frac{22}{7} \times 24(20^2 + 10^2 + 20 \times 10)$

$= \frac{1}{3} \times \frac{22}{7} \times 24 \times 700 = 17600\ cm^3$

Sol.700.(c) The given figure is



Total perimeter

= (5 + 10 + 5 + 10 + 5 + 10 + 5) = 50 cm.

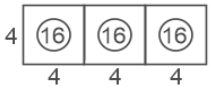
Sol.701.(d) Let the radius of the hemisphere be "r" and the side of the triangle be "a".

Now, given $3\pi r^2 = \frac{\sqrt{3}}{4} a^2$

$= \frac{a^2}{r^2} = \frac{3\pi \times 4}{\sqrt{3}} \Rightarrow \frac{a}{r} = (4\pi\sqrt{3})^{0.5}$

Sol.702.(c)

Each side of the square = √16 = 4 cm



Clearly, the breadth of the rectangle is 4 cm while the length of the rectangle is 3 × 4 = 12 cm

Perimeter of the rectangle

= 2 (l + b) = 2 (4 + 12) = 32 cm.

Sol.703.(d) Area of sector making angle θ at the centre = $\frac{\theta}{360°} \times \pi r^2$

$= \frac{\theta}{360°} \times \pi (2)^2 = \frac{4\pi}{5} \Rightarrow \theta = \frac{360°}{5} = 72°$

Sol.704.(a)

Radius = 4.2m, Height = 1.75m

As radius and height is in the ratio of 12 : 5 So slant height = 13 unit

Slant height $l = \frac{1.75}{5} \times 13 = 4.55$ m

Curved surface area of the canvas

$= \pi r l = \frac{22}{7} \times 4.2 \times 4.55$

= 13.2 × 4.55 = 60.06 m^2

Sol.705.(c)

Side of the square = $\sqrt{1764}$ = 42 m

Breadth = $\frac{1}{3}$of 42 = 14 m

Length = 28 m , Area = 28 × 14

Cost of levelling = 28 × 14 × 15 = ₹ 5880

Sol.706.(c) Let width of the wall = x

Height of the wall = 10x

Length of the wall = 80x

Volume of the wall

= 800 x^3= 51.2 m³ ⇒ x = 0.4 m

Length of the wall = 32 m

Height of the wall = 4 m

Area of the one side of the wall = 128 m^2

Cost of painting = 128 × 100 = ₹ 12800

Sol.707.(b)

circumference of the circle = $2\pi r$ = 44 cm

Side of the square = a = $\frac{44}{4}$ = 11 cm

Ratio of area = $\pi r^2 : a^2$

$= \frac{22}{7} \times 7 \times 7 : 11 \times 11 = 14 : 11$

Sol.708.(c)

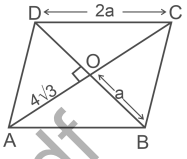
Area of the ring = $\pi(R^2 - r^2) = 3080$

$(R^2 - r^2) = 3080 \times \frac{7}{22} = 980$

(R + r)(R - r) = 980

(R + r) × 10 = 980 ⇒ R + r = 98

Sol.709.(d)



Let side of the rhombus = 2a

Other diagonal = 2a ; OB = OD = a cm

In ΔOAB ; AB = 2a, OB = a, AO = $4\sqrt{3}$

$(2a)^2 = a^2 + (4\sqrt{3})^2$

⇒ $4a^2 = a^2 + 48$ ⇒ a = 4

Other diagonal = 2a = 8

Area of the rhombus

$= \frac{1}{2} \times 8 \times 8\sqrt{3} = 32\sqrt{3}$

Short trick : Let the other diagonal = a

So, side = a In a rhombus,

$4a^2 = d_1^2 + d_2^2 \Rightarrow 4a^2 = (8\sqrt{3})^2 + a^2$

$a^2 = 64$, a = 8

Area of the rhombus =

$\frac{1}{2} \times 8 \times 8\sqrt{3} = 32\sqrt{3}\ cm^2$

Sol.710.(a) As we know that 15, 20 and 25 are pythagoras triplet so third side is $25\sqrt{3}$

So, total perimeter

$= 15\sqrt{3} + 20\sqrt{3} + 25\sqrt{3} = 60\sqrt{3}$

Sol.711.(a) Let the equal side of the isosceles triangle = 4x and its base = 5x.

4x + 4x + 5x = 91 ⇒ x = 7 cm

Length of its base = 35 cm

Sol.712.(a) Let the sides of a triangle are 3x, 4x and 5x respectively.

5x - 3x = 3.6 ⇒ x = 1.8 cm

Area of triangle = $\frac{1}{2} \times 3x \times 4x$

$= 6 \times 1.8 \times 1.8 = 19.44\ cm^2$

Sol.713.(b) Diameter = 28 cm

Radius = 14 cm

Perimeter of circular pizza

= 2 π r = 88 cm

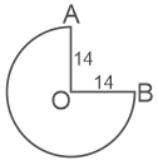
Perimeter of circular part of one - quarter

$= \frac{1}{4} \times$ 88 cm = 22 cm

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Perimeter of the circular part of remaining pizza = (88 - 22) = 66 cm
Perimeter of remaining pizza
= Perimeter of the circular part + 2 × r
= 66 + 28 = 94 cm
Alternate method :



Perimeter of remaining pizza = length of arc AB + AO + OB
= $\frac{3}{4}$ × 2 × $\frac{22}{7}$ × 14 + 14 + 14 = 94 cm

Sol.714.(b) After cutting,
Length of Box = 32 - (3 + 3) = 26
Breadth of Box = 18 - (3 + 3) = 12
Height = 3
Volume of the box= 26 ×12 × 3 = 936 cm^3

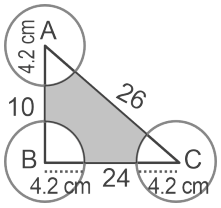
Sol.715.(d)
Volume of n sphere = volume of cube
$\frac{4}{3} \times \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times \frac{7}{2} \times n$
$= 77 \times 77 \times 77 \Rightarrow n$ = 2541

Sol.716.(a) Diagonal of the square =$7\sqrt{2}$
Side of the square = 7 cm
Perimeter = 4a = 28 = base of a triangle
Area of another square = 169
Side of another square = height of the triangle = 13
Required area of triangle
= $\frac{1}{2} \times 28 \times 13$ = 182 cm^2

Sol.717.(b)
Let the area and breadth of the rectangle are 9x and x respectively.
Area = l × b ⇒ 9x = l × x ⇒ l = 9
Perimeter of rectangle = 2(l + b)
86 = 2(l + b) ⇒ l + b = 43
= 9 + b = 43 ⇒ b = 34 cm

Sol.718.(d) If side of a cube is = a
then its diagonal = a$\sqrt{3}$ and total surface area = 6a^2
($\sqrt{3}$a)^2 = 2175 then 3a^2 = 2175 ,
a^2 = 725 and 6a^2 = 6 × 725 = 4350 cm^2

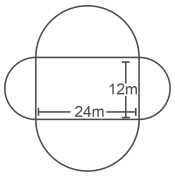
Sol.719.(d)



Since we know that (10,24,26) is a pythagorean triplet so we can easily find out the area of the triangle to be
= $\frac{1}{2}$ × $base$ × height
= $\frac{1}{2}$ × 24 × 10 = 120 cm^2
So the area of the triangle will be equal to 120. At each vertices a circle of radius 4.2 cm is drawn so the total area of circle will be = $\frac{1}{2}$ × area of a circle (as the sum of angles of a triangle is equal to 180°)
Area of circle = $\frac{1}{2}$ × π × 4.2 × 4.2
= 27.72
Area of triangle excluding the portion covered by circle = 120 - 27.72 = 92.28 cm^2

Sol.720.(d)
Volume of cube = a^3 = 9^3 = 729 cm^3
Volume of cuboid = 5 × 13 × 31 = 2015
Total volume = 2015 + 729 = 2744 cm^3
Side of resultant cube = 14 cm
Surface area of resultant cube
= 6a^2 = 6 × 14^2 = 1176 cm^2

Sol.721.(a)



Total area of rectangular lawn
= 24 × 12 + πR^2 + πr^2 (Where R = radius of bigger semicircle and r = radius of smaller semicircle)
Area = 288 + 3.14 × (12^2 + 6^2)
= 288 + 565.2 = 853.2 m^2
Cost = 853.2 ×100 = 85320

Sol.722.(b)
Volume of cube = a^3 = 9^3 = 729 cm^3
Volume of cuboid = 5 × 13 × 31 = 2015
Total volume = 2015 + 729 = 2744 cm^3
Side of a new cube = 14 cm
Surface area of a new cube
= 6a^2 = 6 × 14^2 = 1176 cm^2
Cost = 1176 × 10 = 11,760

Sol.723.(d) Area of a hexagon = $\frac{3\sqrt{3}}{2}a^2$
= $1944\sqrt{3}$ = $\frac{3\sqrt{3}}{2}a^2$ ⇒ a = 36
Perimeter = 36 × 6 = 216 m
Cost = 216 × 11.50 = Rs. 2,484

Sol.724.(a) Diagonal of square = 6$\sqrt{2}$ cm
Side of square = 6 cm
perimeter of square = 24 cm
Base of triangle = 24 cm
Height of triangle = $\sqrt{144}$ = 12 (area of square = side^2)
Area of triangle = $\frac{1}{2}$ × 12 × 24 =144 cm^2

Sol.725.(d) Perimeter of square = 40 m
Perimeter of rectangle = 2 × 40 = 80 m
Let length of rectangle = 3x
Breadth of rectangle = 2x
Total perimeter of rectangle
= 2(3x + 2x) ⇒ 10x = 80 ⇒ x = 8
length of rectangle = 24 m
Breadth of rectangle = 16 m
area of rectangle = 24 ×16 = 384 m^2

Search on TG: @apna_pdf

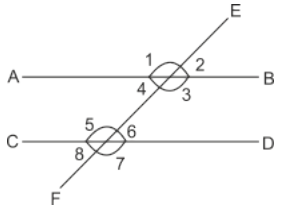
Search on Telegram @apna_pdf

Geometry

LINES

1). Parallel Lines : Two or more lines which will never meet just like railway track.

2). Transversal Lines: A line which cuts parallel lines as shown in the figure below.



- EF is the transverse line. AB and CD are parallel lines. Symbol of parallel lines is '||'. To denote a line symbols like $\overline{AB}$ or simply AB are used.
- Let's take a look at various angles made by the transverse line and the parallel lines :

(i) Corresponding Angles:- $\angle 1$ and $\angle 5$, $\angle 2$ and $\angle 6$, $\angle 4$ and $\angle 8$, $\angle 3$ and $\angle 7$ are pairs of corresponding angles.

• Corresponding angles are equal. E.g. $\angle 1 = \angle 5$

(ii) Alternate Angles:- E.g. $(\angle 1 = \angle 7)$, $(\angle 2 = \angle 8)$, $(\angle 4 = \angle 6)$, $(\angle 3 = \angle 5)$.

(iii) Vertically opposite angles :-
E.g. $(\angle 1 = \angle 3)$, $(\angle 2 = \angle 4)$, $(\angle 6 = \angle 8)$, $(\angle 5 = \angle 7)$

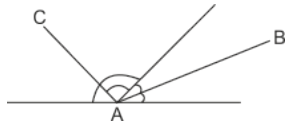
(iv) Adjacent angles:- $\angle 1 + \angle 2 = 180°$ in this case as these are linear pairs. It is not necessary that their sum should be $180°$.

(v) Sum of Interior angles on same side = = $180°$. The angle, made by bisectors of interior angle will be $90°$.

(vi) Sum of Exterior angles on same side = $180°$

Note: From a point, an infinite number of lines can be drawn.

3). Internal angle bisector and External angle bisector. In the given figure AB is the internal angle bisector and AC is the external angle bisector.



ANGLES

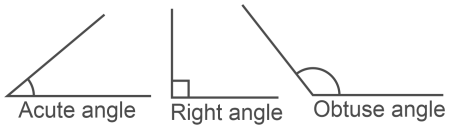
Various types of angles are as follows:

1). Acute Angle: Angles which are less than $90°$.

2). Right Angle: $90°$ angle is called right angle.

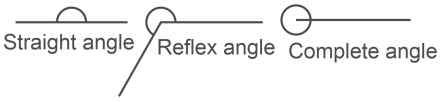
3). Obtuse Angle: Angles greater than $90°$ and less than $180°$.

4). Straight Angles: Angle equal to $180°$.



5). Reflex angle: Angles greater than $180°$ and less than $360°$.

6). Complete Angle: $360°$ angle is called Complete angle or whole angle.



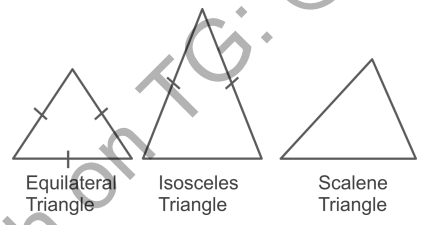
7). Complementary Angles: Sum of two angles is equal to $90°$.

8). Supplementary Angles: Sum of the two angles is equal to $180°$.

TYPES OF TRIANGLES

1). Based on sides:-

- **Equilateral Triangles:** All three sides are equal to each other.
- **Isosceles Triangles**: Any two sides are equal to each other.
- **Scalene Triangle:** All three sides are different in length.

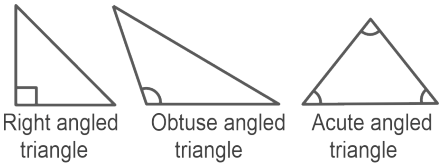


2). Based on angles :-

⇒ **Right angle triangle :-** One of the angle is $90°$.

⇒ **Obtuse angled triangle :-** One angle is more than $90°$.

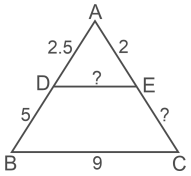
⇒ **Acute angled triangle :-** All three angles are less than $90°$.



Properties of Triangles

[1.] If a line DE intersects two sides of a triangle AB and AC at D and E respectively, then : $\frac{AD}{DB} = \frac{AE}{EC}$ and $\frac{AD}{AB} = \frac{DE}{BC}$. Also if D and E are mid points of AB and AC respectively, then:

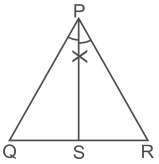
$DE = \frac{BC}{2}$ and DE will be parallel to BC.



E.g. Let AD = 2.5 units; DB = 5, AE = 2 and BC = 9, then EC = ? and DE = ?

$\frac{AD}{DB} = \frac{AE}{EC} \Rightarrow EC = AE \times \frac{DB}{AD} = 2 \times \frac{5}{2.5}$ = $4\ units$. Similarly DE = 3 units.

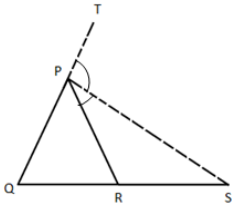
[2.] In case of Internal angle bisector: $\frac{PQ}{QS} = \frac{PR}{SR}$ or, $\frac{QS}{SR} = \frac{PQ}{PR}$



Here PS is the internal angle bisector and a common side of the triangles $\Delta\ PQS\ and\ \Delta PSR$.

[3.] In case of Exterior angle bisector :

$\frac{PQ}{PR} = \frac{QS}{RS}$



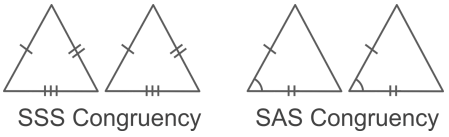
PS is the external angle bisector.

Congruency of Triangles

Two triangles will be congruent if:

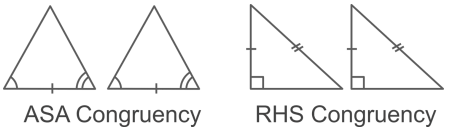
1. SSS: (Side – Side – Side rule): When all three sides are equal.

2. SAS: (Side – Angle – Side rule): When two sides and one angle are equal.



3. ASA: (Angle – Side – Angle rule): When two angles and one side are equal.

4. RHS: (Right angle – Hypotenuse – Side rule): When one side and hypotenuse of the right angled triangle are equal.



Similarity of Triangles

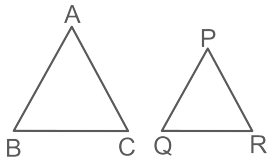
1). Similar triangles are triangles that have the same shape, but their sizes may

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

vary.

2). In congruency the triangles are mirror images of each other. We can say that all congruent triangles are similar but the vice versa is not true.



Similar triangles

3). Important properties of similar triangles:

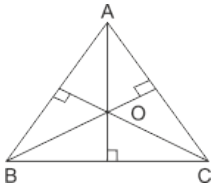
- $\frac{Area\ of\ \Delta ABC}{Area\ of\ \Delta PQR} = \frac{AB^2}{PQ^2}$
  $= \frac{AC^2}{PR^2} = \frac{BC^2}{QR^2}$
- $\frac{Perimeter\ of\ \Delta ABC}{Perimeter\ of\ \Delta PQR} =$
  $\frac{AB}{PQ} = \frac{AC}{PR} = \frac{BC}{QR}$

Altitude :

- It is also known as height. The line segment drawn from the vertex of a triangle perpendicular to its opposite side is called an Altitude of a triangle.

Orthocenter:

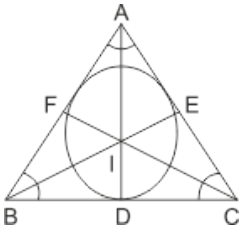
- The point at which the altitudes of a triangle intersect is called an Orthocenter.
- Generally Orthocenter is denoted by 'O'.

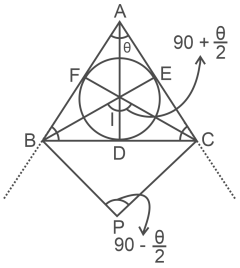


- Here, ∠AOC = 180° - ∠B
- In the case of a right angled triangle, the orthocenter lies at the vertex of right angle.
- In case of an obtuse angled triangle, the orthocenter lies outside the triangle.

In-center:

The point at which the *internal angle bisectors* of a triangle meet. It is generally denoted by 'I'. From the in-center the in-circle of a triangle is drawn. The radius of the in-circle is equal to ID = IE = IF.





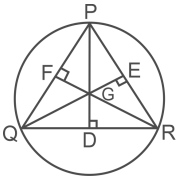
Important Results:

- $\angle BIC = 90° + \frac{\angle A}{2}$ (for Internal angle bisectors)
- $\angle BPC = 90° - \frac{\angle A}{2}$ (for external angle bisectors)
- $\frac{AB}{AC} = \frac{BD}{DC}$
- In-radius r = $\frac{Area\ of\ Triangle}{Semi-perimeter\ of\ Triangle}$
- AI : ID = AB + AC : BC
  BI : IE = AB + BC : AC
  CI : IF = AC + BC : AB
- Length of angle bisector(AD) $= \frac{2 \times AB \times AC\ cos\theta}{AB + AC}$

Circum-center :-

The point at which the *perpendicular bisectors* of the sides of the triangle meet.

- From the circum-center the circumcircle of a triangle is drawn. The radius of the circum-circle is equal to PG = RG = QG.

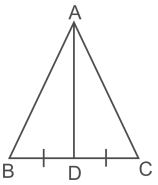


- Since the angle formed at the center of a circle is double of the angle formed at the circumference, we have:: $\angle QGR = 2\angle P$, $\angle QGP = 2\angle R$ and $\angle PGR = 2\angle Q$.
- For an obtuse angle triangle, the circumcenter lies outside the triangle.

Note: A line which is perpendicular to another line and also bisects it into two equal parts is called a perpendicular bisector.

Centroid: It is the point of intersection of *the medians* of a triangle. It is also called the center of mass.

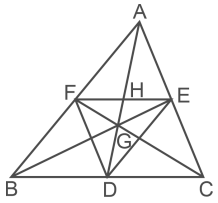
- The median is a line drawn from the vertex of a triangle to the mid – point of the opposite side.
- Each median is divided in the ratio of 2 : 1 at the centroid.
- Median divides the triangle into two equal areas.
- **Apollonius theorem:**



- $AB^2 + AC^2 = 2(AD^2 + BD^2)$

Other key points for medians:

- All the medians of a triangle divide it into six parts with equal areas.
  Therefore, $Area\ of\ \Delta ABC = 6 \times Area\ of\ any\ of\ the\ smaller\ parts.$
- $Area\ of\ \Delta FEG = \frac{1}{12} \times Area\ of \Delta ABC$



- FE divides the line AG in the ratio of 3 : 1 i.e. $\frac{AH}{HG} = \frac{3}{1}$.
- Area of ΔABG = Area of ΔBCG = Area of ΔACG
- Area of ΔDEF = $\frac{1}{4}$ΔABC

Note : In case of Equilateral triangle, orthocenter, in-center, circum-center and centroid lie at the same point.

Other Facts about triangles:

1). Sum of two sides is always greater than the third side.

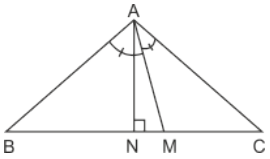
E.g. AB + BC > CA, AB + AC > BC, BC + CA > AB.

2). Difference of two sides is always less than the third side.

E.g. AB - BC < CA, AB - AC < BC, BC - CA < AB.

3). In ΔABC, ∠B > ∠C, if AM is the bisector of ∠BAC and AN ⊥ BC, then

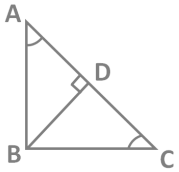
∠MAN = $\frac{1}{2}$(∠B - ∠C)



4). In right angled Δ ABC, where BD is an altitude to hypotenuse AC, then Altitude BD = $\frac{AB \times BC}{AC}$.

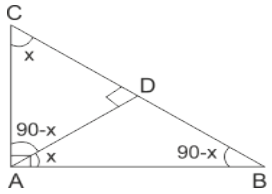
Search on TG: @apna_pdf

Search on Telegram @apna_pdf



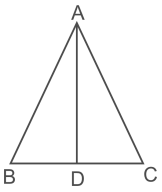
Similarly, if BE is a median drawn to hypotenuse AC, then BE = $\frac{1}{2}$AC. (Length of median is half the length of hypotenuse)

5). In right angled ΔABC, AD is perpendicular to BC, then



- $AD^2 = BD \times DC$
- $AB^2 = BD \times BC$
- $AC^2 = CD \times BC$

Formulas of triangle :-



In case of equilateral triangle,

• Area(A) = $\frac{\sqrt{3}}{4}$ (side)^2

• Inradius(r) = $\frac{side}{2\sqrt{3}}$

• circumradius(R) = $\frac{side}{\sqrt{3}}$

• height(h) = $\frac{\sqrt{3}}{2}$ × side

In case of isosceles triangle,

•Area(A) = $\frac{BC}{4}\sqrt{4AB^2 - BC^2}$

Where AB = AC

• Inradius(r) = $\frac{area\ of\ triangle}{Semi-perimeter}$

• circumradius(R) = $\frac{AB \times BC \times AC}{4 \times Area\ of\ triangle}$

• height(h) = $\sqrt{AB^2 - \frac{BD^2}{4}}$

In case of scalene triangle,

• Area(A) = $\sqrt{s(s-a)(s-b)(s-c)}$

Where a,b,c are sides of triangle

s = $\frac{a+b+c}{2}$

In case of right angle triangle ,

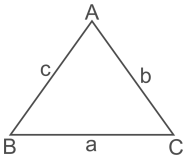
• Area(A) = $\frac{1}{2}$ × Base × height

• Inradius(r) = $\frac{Perpendicular + base - hypotenuse}{2}$

• circumradius(R) = $\frac{hypotenuse}{2}$

Note :- Distance between circumcentre and incentre of any triangle = $\sqrt{R^2 - 2Rr}$

Sine rule :-



$\frac{a}{sinA} = \frac{b}{sinB} = \frac{c}{sinC}$ = 2R

Where R = circumradius of triangle

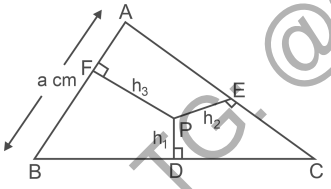
Cosine rule :-

CosA = $\frac{c^2 + b^2 - a^2}{2bc}$

CosB = $\frac{c^2 + a^2 - b^2}{2ac}$

CosC = $\frac{a^2 + b^2 - c^2}{2ab}$

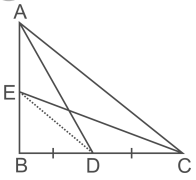
• If P is any point inside the equilateral triangle , the sum of altitude from the point P to the sides AB, BC and AC equal to the sides of the triangle.



$h_1 + h_2 + h_3 = \frac{\sqrt{3}}{2}$a

Where a = side of equilateral triangle

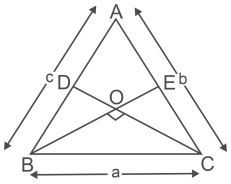
• if ΔABC is right angle triangle and AD, CE are medians then:



(i) 4(AD^2 + CE^2) = 5 AC^2

(ii) AD^2 + CE^2 = AC^2 + ED^2

• If BE and CD are medians and perpendicular to each other then:



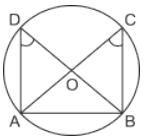
AB^2 + AC^2 = 5 BC^2

• If length of median of triangles are given then area of triangle = $\frac{4}{3}$ × area of triangle formed by medians.

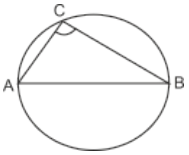
CIRCLE

Properties of circles :-

1). Angles in the same segment of a circle from the same base are always equal.

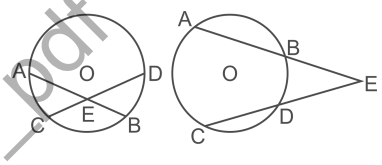


2). Angle dropped on the circumference of a circle with the diameter as base is always a right angle.



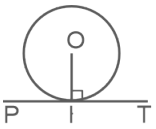
3). Two chords AB and CD of a circle intersect, internally or externally, at E then:

$AE \times EB = CE \times ED$

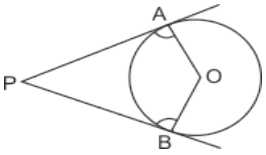


4). The tangent to a circle at a point on its circumference is perpendicular to the radius at that point.

OI ⊥ PT

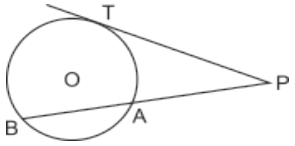


5). Two tangents PA and PB are drawn from an external point P on a circle with center O is equal. PA = PB



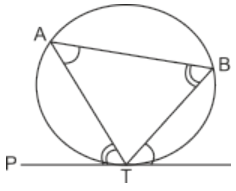
6). For a tangent, PT, and a secant, PB, drawn to a circle from a point P, we have.

$PT^2 = PB \times PA$



7). Angle made by a chord with a tangent is always equal to the angle dropped on any point of circumference taking the chord as base.

$\angle PTA = \angle ABT$

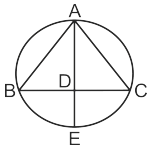


Search on TG: @apna_pdf

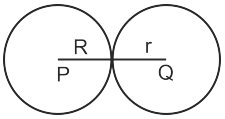
Search on Telegram @apna_pdf

8). In the following case:

$AB \times AC + AE \times DE = AE^2$

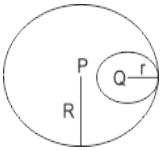


9). If two circles touch each other externally, then distance between their centres is the sum of their radius.



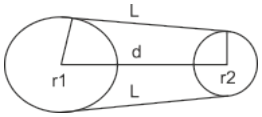
Here, PQ = R + r

10). If two circles touch each other internally, then distance between their centres is the difference of their radius.



Here, PQ = R - r

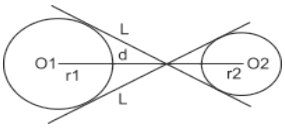
Direct common Tangents:



Length of direct common tangent (L) = $\sqrt{d^2 - (r_1 - r_2)^2}$

Where, d = distance between two centers and r_1, r_2 are radii of the circles.

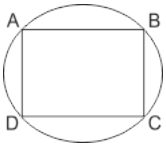
Transverse common Tangents:-



Length of transverse tangent (L) = $\sqrt{d^2 - (r_1 + r_2)^2}$

Cyclic Quadrilateral :-

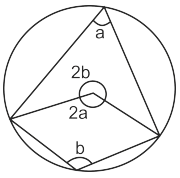
A quadrilateral drawn inside a circle with its vertices lying on the circumference.



Sum of opposite angles = 180°

i.e. $\angle A + \angle C = \angle B + \angle D = 180°$

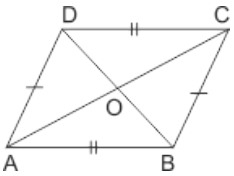
Important result: In the following type of cyclic quadrilateral remember the relationship between the angles, as shown:



QUADRILATERAL

Any closed figure that has four sides is called a quadrilateral. Depending on length of sides, orientation, they can be classified as followed:

1). Parallelogram : Opposite sides are equal and parallel.

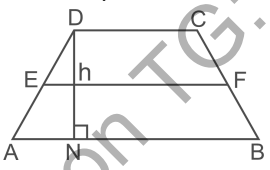


- AB = DC and AD = BC
- $\angle A + \angle B = \angle B + \angle C = \angle C + \angle D = \angle D + \angle A = 180°$
- $\angle A = \angle C$ and $\angle B = \angle D$
- The diagonals bisect each other i.e. AO = OC and OB = OD
- Area of parallelogram = Base × Altitude
- Sum of squares of all four sides = Sum of squares of diagonals, So,

$AC^2 + BD^2 = AB^2 + BC^2 + CD^2 + AD^2$

- Square, Rectangle and Rhombus are parallelogram.
- All rectangles are parallelogram but all parallelogram are not rectangles.

2). Trapezium : Only one pair of opposite sides are parallel.



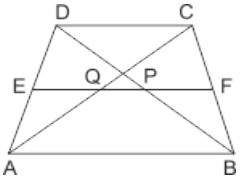
Area of trapezium ABCD

$= \frac{1}{2} \times Sum\ of\ parallel\ side \times height$

$= \frac{1}{2} \times (AB + DC) \times h$

- If E is the midpoint of $\overline{AD}$ and F is the midpoint of $\overline{BC}$, then

  EF = $\frac{AB + DC}{2}$.



- If P is the midpoint of diagonal $\overline{BD}$ and Q is the midpoint of diagonal $\overline{AC}$, then

  PQ = $\frac{AB - DC}{2}$

3). Rhombus : All sides are equal and opposite sides are parallel to each other.

$\angle A + \angle B = \angle B + \angle C = \angle C + \angle D = \angle D + \angle A = 180°$

- $\angle A = \angle C$ and $\angle B = \angle D$
- $4a^2 = d_1^2 + d_2^2$

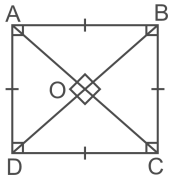
i.e. Sum of squares of sides = Sum of squares of diagonals.

- Diagonals bisect each other at right angles and form four right angled triangles with equal areas.

  $Area\ of\ \Delta AOB = \Delta BOC = \Delta COD = \Delta DOA = \frac{1}{4} \times area\ of\ rhombus\ ABCD$

- The diagonals of Rhombus are not of equal length.

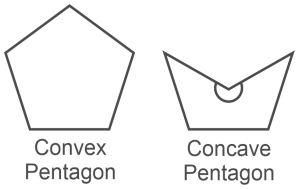
4). Square: All sides are equal in length and adjacent sides are perpendicular to each other.



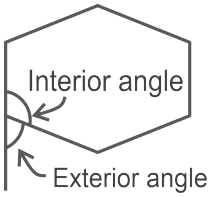
- AB = BC = CD = AD and $\angle A = \angle B = \angle C = \angle D = 90°$
- Diagonals bisect each other at right angles and form four right angled isosceles triangles.
- Diagonals are of equal length: i.e. AC = BD.
- In a rectangle the diagonals do not intersect at right angles.

5). Polygons:

- Convex polygon: All its interior angles are less than 180°.
- Concave polygon: At least one angle is more than 180°.



- Regular Polygons: All sides and angles are equal.



* Sum of all exterior angles = 360°.
* Each exterior angle = $\frac{360°}{n}$, where n = number of sides.
* Exterior angle + Interior angle = 180°
* In case of convex polygon, sum of all interior angles = $(2n - 4) \times 90°$
* Number of diagonals = $\frac{n(n-3)}{2}$

  Where , n = number of sides.

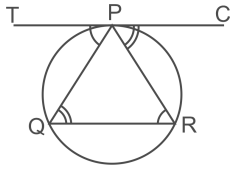
ALTERNATE SEGMENT THEOREM

The Alternate Segment Theorem states that : An angle between a tangent and a chord through a point of contact is equal

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

to the angle in the alternate segment.

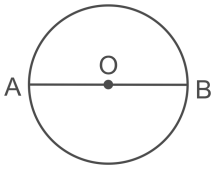


Here, in above diagram, $\overline{TC}$ is tangent. $\overline{PQ}$ and $\overline{PR}$ are chord which touches tangent $\overline{TC}$ at point P. Hence, ∠TPQ = ∠PRQ and ∠CPR = ∠PQR

Important formulas :-

Circle :-

• If r be the radius and O be the center of the circle.

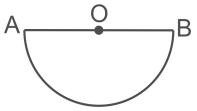


Diameter = 2 × radius

Area = πr^2

Circumference = $2\pi r$

Semi - Circle :-

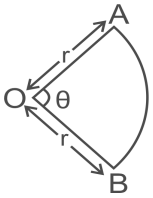


Diameter = 2 × radius

Perimeter = $(\pi + 2)r$

Area = $\frac{\pi r^2}{2}$

Sector :-

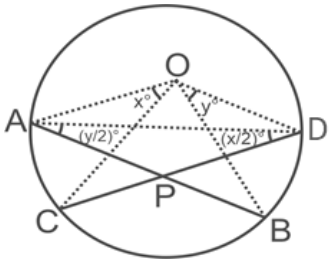


If ∠AOB = θ

Perimeter = $[2r + \frac{\theta}{360} \times (2\pi r)]$

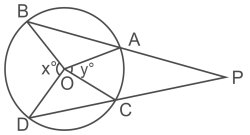
Area = $\frac{\theta}{360°} \times \pi r^2$

•Two Chords AB and CD of a circle with center O, intersect each other at P. If ∠AOC = x° and ∠BOD = y° then the value of ∠BPD is :-



∠BPD = $\frac{x+y}{2}$

• Chords are intersecting at external points.



∠BPD = $\frac{x-y}{2}$

Variety Questions

Q.1. From a point T, a tangent TP at point P, is drawn to a circle with centre O. A secant TQR (point Q is near to point T) is drawn from the point T. ΔPQR is inscribed into the circle by joining the points P, Q and R. Draw lines OQ and OR. If ∠PTQ is 27° and ∠ TPQ = 55°, what is the degree measure of ∠ROQ?
SSC CGL 25/09/2024 (3rd Shift)
(a) 86 (b) 82 (c) 98 (d) 94

Q.2. AB is the chord of the circle with centre O. A line segment DOC originating from a point D on the circumference of the circle in the major segment meets AB produced at C such that BC = OD. If angle BCO = 30°, then angle AOD is:
SSC CGL 23/09/2024 (2nd Shift)
(a) 30° (b) 90° (c) 60° (d) 80°

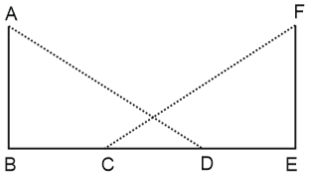
Q.3. A triangle ABC is made on a circle, where AB is the diameter of the circle. If BC is equal to the radius of the circle and ∠ABC = x ∠BAC, then x is :
SSC CGL 23/09/2024 (1st Shift)
(a) 2.5 (b) 2 (c) 1 (d) 1.5

Q.4. AB is a chord of length 32 cm of a circle of radius 20 cm, the tangents at A and B intersect at a point T. Find length TA (rounded off to two digits after decimal).
SSC CGL 19/09/2024 (1st Shift)
(a) 36.50 cm (b) 21.33 cm
(c) 26.67 cm (d) 19.93 cm

Q.5. WXYZ is a quadrilateral in which XQ and ZP are perpendicular to WY such that XQ = ZP. Diagonals ZX and WY intersect each other at point O. If OX = 12 cm, then find the value of ZX (in cm).
SSC CGL 19/09/2024 (1st Shift)
(a) 12 (b) 24 (c) 36 (d) 18

Q.6. In triangle ABC, D is the mid-point of BC. If DL perpendicular to AB and DM perpendicular to AC such that DL = DM, then the triangle will be:
SSC CGL 17/09/2024 (3rd Shift)
(a) isosceles triangle
(b) right angled triangle
(c) obtuse angle triangle
(d) equilateral triangle

Q.7. In ΔABD and ΔFEC, ∠BAD = 60°, l(BD) = l(EC), ∠ABD = ∠FEC = 90°, and l(AB) = l(FE). Find the ratio of $\frac{\angle BAD}{\angle FCE}$.



SSC CGL 12/09/2024 (3rd Shift)
(a) 2 : 3 (b) 1 : 2 (c) 2 : 5 (d) 2 : 1

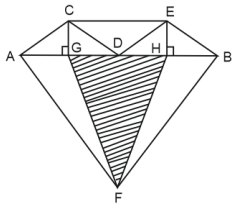
Q.8. If the length of a common external tangent to two circles is 9 and that of a common internal tangent is 5, then the product of the radii of the two circles is:
SSC CGL 10/09/2024 (3rd Shift)
(a) 12 (b) 8 (c) 14 (d) 10

Q.9. X, Y, and Z are three points on a plane with XY = 11 cm, YZ = 13 cm, and XZ = 24 cm. The number of circles that travel through points X, Y, and Z is:
SSC CGL 10/09/2024 (1st Shift)
(a) 0 (b) 2 (c) 1 (d) 3

Q.10. In an obtuse-angled triangle ABC, the length of its longest side AB is 50 cm and one of the other two sides are 42 cm. If the area of the triangle is 294 cm^2, what is the length (in cm) of its third side?
SSC CHSL 11/07/2024 (4th Shift)
(a) $12\sqrt{43}$ (b) $8\sqrt{35}$ (c) $15\sqrt{21}$ (d) $2\sqrt{58}$

Q.11. In a triangle PQR, RS intersects PQ at point S. The sides of the triangle QR = 36 cm, SQ = 27 cm, RS = 18 cm and ∠QRS = ∠QPR. What is the ratio of the perimeter of ΔPRS to that of ΔQSR?
SSC CHSL 10/07/2024 (3rd Shift)
(a) $\frac{5}{8}$ (b) $\frac{7}{9}$ (c) $\frac{8}{6}$ (d) $\frac{9}{12}$

Q.12. In the diagram, if $\overline{AB} \| \overline{CE}$, AG = GD = DH = HB, then which of the following is correct?



I) ΔACG ≅ ΔBEH
II) ΔCDE ≅ ΔDEB ≅ ΔDCA
III) ΔHFB ≅ ΔAFG
SSC CHSL 09/07/2024 (4th Shift)
(a) I, II and III (b) I and III
(c) Only I (d) I and II

Q.13. ABC is a right-angled triangle, right angled at A in such a way that AB = AC and the bisector of angle B intersects the side AC at D. DM is perpendicular to BC, intersecting BC at M. If AB = 12 cm and BC = $12\sqrt{2}$ cm, then find the length of side AD.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 08/07/2024 (2nd Shift)
(a) $12(\sqrt{2}+2)$ cm (b) $12(\sqrt{2}-1)$ cm
(c) $12(\sqrt{2}-2)$ cm (d) $12(\sqrt{2}+1)$ cm

Q.14. Two circles with centres M and N have radii 5 cm and 8 cm, respectively. The circles touch each other externally at point T. A line PR is drawn such that the points M, T and N lie on PR, P being closer to M. From P, a tangent PQ = 12 cm is drawn to the circle with centre M touching at Q, and from R, another tangent RS = 15 cm is drawn to the circle with centre N touching at S. What is the length (in cm) of PR ?
SSC CHSL 04/07/2024 (3rd Shift)
(a) 53 (b) 43 (c) 26 (d) 37

Q.15. Two circles of radius 7 units each, intersect in such a way that the common chord is of length 7 units. What is the common area in square units of the intersection ?
SSC CHSL 01/07/2024 (4th Shift)
(a) $98(\frac{\pi}{6}-\frac{\sqrt{3}}{3})$ (b) $98(\frac{\pi}{3}-\frac{\sqrt{3}}{4})$
(c) $98(\frac{\pi}{6}-\frac{\sqrt{3}}{6})$ (d) $98(\frac{\pi}{6}-\frac{\sqrt{3}}{4})$

Q.16. In a circle, ABCD is a cyclic quadrilateral in which AE is drawn parallel to CD, and BA is produced to F. If ∠ABC = 85° and ∠FAE = 24°, find the value of ∠BCD.
SSC CHSL 01/07/2024 (2nd Shift)
(a) 119° (b) 124° (c) 115° (d) 125°

Q.17. What is the length (in cm) of chord PQ in a circle with a radius of 7 cm, where a diameter AB and non-diameter chord PQ intersect perpendicularly at point C, and the ratio of AC to BC is 4 : 3?
SSC CPO 28/06/2024 (2nd Shift)
(a) $4\sqrt{3}$ (b) $8\sqrt{3}$ (c) $2\sqrt{3}$ (d) $6\sqrt{3}$

Q.18. The angles of a triangle are in the ratio 1 : 2 : 3, then find the ratio of the corresponding sides.
SSC CPO 28/06/2024 (1st Shift)
(a) $1:2:\sqrt{3}$ (b) 1 : 2 : 3
(c) $1:\sqrt{2}:3$ (d) $1:\sqrt{3}:2$

Q.19. In ΔABC, P is a point on AB such that PB : AP = 3 : 4 and PQ is parallel to AC. If AR and QS are perpendicular to PC and QS = 9 cm, what is the length (in cm) of AR ?
SSC CPO 27/06/2024 (1st Shift)
(a) 28 (b) 35 (c) 21 (d) 14

Q.20. The lengths of the three sides of a triangle are given as 3 cm, 4 cm and 5 cm. The ratio of their corresponding altitudes to the opposite vertices will be:
Graduate Level 26/06/2024 (Shift - 3)
(a) 3 : 4 : 5 (b) 9 : 8 : 7
(c) 20 : 15 : 12 (d) 5 : 4 : 3

Q.21. The median AD of a triangle ABC is produced and a perpendicular CF is dropped on it. BE is perpendicular to AD. If BC = 34 cm and DF = 8 cm, what is the length (in cm) of BE ?
Graduate Level 20/06/2024 (Shift - 3)
(a) 17 (b) 9 (c) 15 (d) 19

Q.22. How many times does the hour hand and minute hand of a clock coincide in half a day ?
Higher Secondary 20/06/2024 (Shift - 2)
(a) 55 (b) 22 (c) 11 (d) 44

Q.23. If a transversal intersects two parallel lines, and the difference between two interior angles on the same side of the transversal is 40°, then find the smallest angle among the interior angles.
SSC CHSL Tier II (10/01/2024)
(a) 70° (b) 50° (c) 40° (d) 60°

Q.24. Which of the following statements is NOT true ?
SSC CHSL Tier II (02/11/2023)
(a) If the sides of a triangle are in the ratio 13 : 5 : 12, then two of its angles are acute angles.
(b) The triangle formed by connecting the midpoints of the sides of a triangle has one-fourth area of the bigger triangle.
(c) The area of the triangle with the largest side l always has an area less than $\frac{l^2}{2}$.
(d) The area of an isosceles triangle with sides 2a, 2a and 3a is $\frac{3\sqrt{3}a^2}{2}$.

Q.25. ΔPQR is right angled at Q such that PQ = (x - y), QR = x and PR = (x + y). S is a point on QR such that QS = PQ . The ratio QS : SR for any values of x and y is:
SSC CPO 05/10/2023 (3rd Shift)
(a) 1 : 3 (b) 1 : 2 (c) 2 : 1 (d) 3 : 1

Q.26. Two circles with centres P and Q of radii 6 cm and 4 cm, respectively, touch each other internally. If the perpendicular bisector of PQ meets the bigger circle in A and B, then the value of AB is:
SSC CPO 05/10/2023 (2nd Shift)
(a) $\sqrt{35}$ cm (b) $\sqrt{5}$ cm
(c) $2\sqrt{5}$ cm (d) $2\sqrt{35}$ cm

Q.27. Two circles of radius 13 cm and 15 cm intersect each other at points A and B. If the length of the common chord is 12 cm, then what is the distance between their centers?
SSC CPO 03/10/2023 (1st Shift)
(a) $\sqrt{145}+\sqrt{184}$ (b) $\sqrt{131}+\sqrt{181}$
(c) $\sqrt{145}+\sqrt{169}$ (d) $\sqrt{133}+\sqrt{189}$

Q.28. M is the mid-point of side QR of a parallelogram PQRS (P being on the top left hand, followed by other points going clockwise). The line SM is drawn intersecting PQ produced at T. What is the length (in terms of the length of SR) of PT ?
SSC CHSL 10/08/2023 (1st Shift)
(a) $\frac{3SR}{2}$ (b) $\frac{SR}{2}$ (c) 2SR (d) SR

Q.29. Two circles with diameters 50 cm and 58 cm, respectively, intersect each other at points A and B, such that the length of the common chord is 40 cm. Find the distance (in cm) between the centres of these two circles.
SSC CHSL 08/08/2023 (3rd Shift)
(a) 34 (b) 37 (c) 36 (d) 35

Q.30. PQ is a chord of a circle. The tangent XR at X on the circle cuts PQ produced at R. If XR = 12 cm, PQ = x cm, QR = x - 2 cm, then x (in cm) is:
SSC CHSL 04/08/2023 (3rd Shift)
(a) 7 (b) 6 (c) 10 (d) 14

Q.31. A triangle PQR has three sides equal in measurement and if PM is perpendicular to QR, then which of following equality holds ?
SSC CHSL 04/08/2023 (2nd Shift)
(a) $3PM^2 = 2PQ^2$ (b) $3PQ^2 = 4PM^2$
(c) $3PM^2 = 4PQ^2$ (d) $3PQ^2 = 2PM^2$

Q.32. AB = 8 cm and CD = 6 cm are two parallel chords on the same side of the centre of a circle. If the distance between them is 2 cm, then the radius (in cm) of the circle is :
SSC CHSL 02/08/2023 (4th Shift)
(a) $\frac{\sqrt{265}}{4}$ (b) $\frac{\sqrt{256}}{4}$ (c) $\frac{\sqrt{156}}{4}$ (d) $\frac{\sqrt{198}}{4}$

Q.33. If the distance between the centres of two circles is 12 cm and the radii are 5 cm and 4 cm, then the length (in cm) of the transverse common tangent is :
SSC CHSL 02/08/2023 (2nd Shift)
(a) 9 (b) $\sqrt{143}$ (c) $\sqrt{63}$ (d) 7

Q.34. In ΔABC, the straight line parallel to the side BC meets AB and AC at the points P and Q, respectively. If AP = QC, the length of AB is 16 cm and the length of AQ is 4 cm, then the length (in cm) CQ is:
SSC CHSL 02/08/2023 (2nd Shift)
(a) $(2\sqrt{21}+2)$ (b) $(2\sqrt{18}-2)$
(c) $(2\sqrt{17}-2)$ (d) $(2\sqrt{19}+2)$

Q.35. The three sides of a triangle are 9,

Search on TG: @apna_pdf

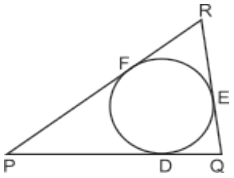
Search on Telegram @apna_pdf

24 and S units. Which of the following is correct ?
SSC CHSL 02/08/2023 (1st Shift)
(a) 15 < S < 33 (b) 15 ≤ S < 33
(c) 15 < S ≤ 33 (d) 15 ≤ S ≤ 33

Q.36. If ΔABC and ΔDEF are congruent triangles, then which of the following is FALSE ?
SSC CGL 24/07/2023 (3rd shift)
(a) The ratio of AC to DF is 2 : 1.
(b) The perimeter of both the triangles is equal.
(c) AB = DE, and BC = EF.
(d) The ratio of the angles in both the triangles is the same.

Q.37. The length of the common chord of two circles of radii 15 cm and 13 cm, whose centres are 14 cm apart, is:
SSC CGL 24/07/2023 (2nd shift)
(a) 14cm (b) 12cm (c) 15cm (d) 24cm

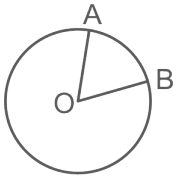
Q.38. In the given figure, a circle is inscribed in ΔPQR, such that it touches the sides PQ, QR and RP at points D, E, F, respectively. If the lengths of the sides PQ = 18 cm, QR = 13 cm and RP = 15 cm, then find the length of PD.



SSC CGL 21/07/2023 (1st shift)
(a) 10cm (b) 8 cm (c) 15 cm (d) 12cm

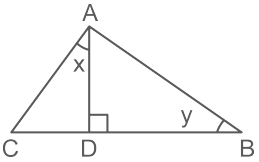
Q.39. In a ΔABC, DE || BC, where D is a point on AB and E is a point on AC. If DE divides the area of ΔABC into two equal parts, then DB : AB is equal to:
SSC CGL 20/07/2023 (4th shift)
(a) $\sqrt{2} : \sqrt{3}$ (b) $\sqrt{2} : \sqrt{2} + 1$
(c) $\sqrt{2} + 1 : \sqrt{2}$ (d) $\sqrt{2} - 1 : \sqrt{2}$

Q.40. In the given figure, the length of arc AB is equal to 3 times radius r of the circle.



Find the area of sector OAB in terms of radius r.
SSC CGL 20/07/2023 (1st shift)
(a) $1.5\,r^2$ (b) $2.5\,r^2$ (c) $\frac{1}{2}r^2$ (d) $3\,r^2$

Q.41. In the given figure, if AD⊥ BC, AC = 26 units, CD = 10 units, BC = 42 units, ∠DAC = x and ∠B = y, then the value of $\frac{6}{\cos x} - \frac{5}{\cos y}$ + 8 tan y is: (in unit)



SSC CGL 17/07/2023 (4th shift)
(a) $\frac{16}{9}$ (b) $\frac{13}{6}$ (c) $\frac{25}{4}$ (d) $\frac{15}{7}$

Q.42. AB is the diameter of a circle with centre O. P be a point on it. If ∠AOP = 95°, then ∠OBP = _____.
SSC CGL 14/07/2023 (3rd shift)
(a) 57.5° (b) 45.5° (c) 47.5° (d) 55.5°

Q.43. In a parallelogram, one of the parallel sides is 16 cm and the other side is 12 cm. If the perpendicular distance between the two parallel sides of dimension 16 cm is 24 cm, then the perpendicular distance between its other two parallel sides is:
Matriculation Level 27/06/2023 (Shift - 2)
(a) 16 cm (b) 12 cm (c) 32 cm (d) 24 cm

Q.44. Two medians DM and EN of △DEF intersect each other at G at right angles. If EF = 20 cm and EN = 12 cm, then what is the length of DM ? (in cm)
SSC CHSL 16/03/2023 (3rd Shift)
(a) 20 (b) 12 (c) 18 (d) 15

Q.45. In a triangle ABC, AB = 6 cm, BC = 11 cm. How many integral values of AC can be possible?
SSC CHSL 10/03/2023 (2nd Shift)
(a) 10 (b) 8 (c) 12 (d) 11

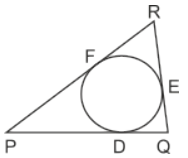
Q.46. Two circles of radius of 6 cm each. They intersect each other such that each passes through the centre of the other. What is the length of the common chord?
SSC CHSL 09/03/2023 (2nd Shift)
(a) $9\sqrt{3}$ cm (b) 12 cm (c) $6\sqrt{3}$ cm (d) 8 cm

Q.47. In a trapezium ABCD, AB and DC are parallel to each other with a perpendicular distance of 8 m between them. Also, (AD) = (BC) = 10 m, and (AB) = 15 m < (DC). What is the perimeter (in m) of the trapezium ABCD ?
SSC CGL Tier II (07/03/2023)
(a) 50 (b) 66 (c) 62 (d) 58

Q.48. 'O' is a point in the interior of an equilateral triangle. The perpendicular distance from 'O' to the sides are √3 cm, 2√3cm, 5√3 cm. The perimeter of the triangle is:
SSC CGL 13/12/2022 (4th Shift)
(a) 48 cm (b) 32 cm (c) 24 cm (d) 64 cm

Q.49. Three circles of radius 6 cm are kept touching each other. The string is tightly tied around these three circles. What is the length of the string?
SSC CGL 03/12/2022 (2nd Shift)
(a) 36 + 12π cm (b) 36 + 18π cm
(c) 24 + 36π cm (d) 36 + 20π cm

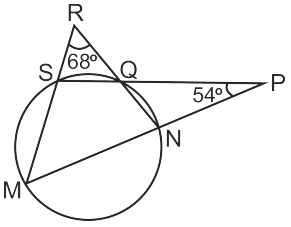
Q.50. In the given figure, a circle is inscribed in △PQR, such that it touches the sides PQ, QR and RP at points D, E, F, respectively. If the lengths of the sides PQ=15 cm, QR=11 cm and RP = 13 cm, then find the length of PD.



SSC CGL 02/12/2022 (1st Shift)
(a) 9 cm (b) 8 cm (c) 7.5 cm (d) 8.5 cm

Q.51. Two circles touch each other externally at P. AB is a direct common tangent to the two circles, A and B are points of contact, and ∠PAB = 40°. The measure of ∠ABP is:
SSC CGL 01/12/2022 (1st Shift)
(a) 45° (b) 55° (c) 50° (d) 40°

Q.52. In the given figure, MNP, SQP, NQR and MSR are straight lines. ∠NPQ = 54° and ∠QRS = 68°. What is the degree measure of ∠SMN ?



SSC CPO 10/11/2022 (Evening)
(a) 29° (b) 38° (c) 54° (d) 68°

Q.53. PQ and RS are two parallel chords of a circle such that PQ is 48 cm and RS is 40 cm. If the chords are on the opposite sides of the centre and the distance between them is 22 cm, what is the radius (in cm) of the circle?
SSC CPO 09/11/2022 (Afternoon)
(a) 25 (b) 24 (c) 35 (d) 22

Q.54. An arc on a circle that is 15 cm long subtends a 24° angle at the centre. What is the circumference of the circle?
SSC CHSL 02/06/2022 (Afternoon)
(a) 240 cm (b) 220 cm
(c) 236 cm (d) 225 cm

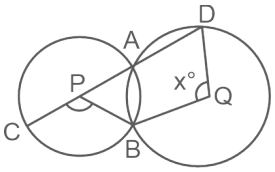
Q.55. Calculate the area of the quadrilateral formed with the vertices (-3, 2), (5, 4), (7, -6) and (-5, -4).
SSC CHSL 27/05/2022 (Morning)
(a) 80 square units (b) 160 square units
(c) 0 square units (d) 150 square units

Q.56. In the following figure, P and Q are centers of two circles. The circles are intersecting at points A and B. PA

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

produced on both the sides meets the circles at C and D. If ∠CPB = $100°$, then find the value of x.



SSC CGL 18/04/2022 (Morning)
(a) 115 (b) 120 (c) 110 (d) 100

Q.57. An isosceles ΔMNP is inscribed in a circle. If MN = MP = $16\sqrt{5}$ cm, and NP = 32 cm what is the radius (in cm) of the circle ?
SSC CGL 13/04/2022 (Evening)
(a) 20 (b) $18\sqrt{5}$ (c) 18 (d) $20\sqrt{5}$

Q.58. In triangle ABC, D and E are points on BC such that AD = AE and ∠BAD = ∠CAE. If AB = (2p + 3), BD = 2p, AC = (3q - 1) and CE =q, then find the value of (p + q).
SSC CGL 13/04/2022 (Morning)
(a) 3 (b) 4.5 (c) 3.6 (d) 2

Q.59. In a circle with centre O, AC and BD are two chords. AC and BD meet at E, when produced. If AB is a diameter and ∠AEB = 36°, then the measure of ∠DOC is:
SSC CGL 12/04/2022 (Evening)
(a) 112° (b) 124° (c) 136° (d) 108°

Q.60. AB is a chord in the minor segment of a circle with center O. C is a point on the minor arc (between A and B). The tangents to the circle at A and B meet at a point P. If ∠ACB = 108°, then ∠APB is equal to:
SSC CGL Tier II (03/02/2022)
(a) 36° (b) 54° (c) 27° (d) 18°

Q.61. In ΔABC, M is the midpoint of the side AB. N is a point in the interior of ΔABC such that CN is the bisector of ∠C and CN⊥NB. What is the length (in cm) of MN, if BC = 10 cm and AC = 15 cm ?
SSC CGL Tier II (29/01/2022)
(a) 5 (b) 2.5 (c) 4 (d) 2

Q.62. The side of an equilateral ΔABC is $3\sqrt{7}$cm. P is a point on side BC such that BP : PC = 1 : 2. The length (in cm) of AP is:
SSC CGL 20/08/2021 (Evening)
(a) $6\sqrt{3}$ (b) $7\sqrt{3}$ (c) 6 (d) 7

Q.63. How many isosceles triangles with integer sides are possible such that the sum of two of the sides is 16 cm?
SSC CHSL 13/04/2021 (Evening)
(a) 18 (b) 15 (c) 9 (d) 24

Q.64. If a and b are the length of two sides of a triangle such that the product ab = 24, where a and b are integers, then how many such triangles are possible?
SSC CHSL 12/04/2021 (Evening)
(a) 15 (b) 12 (c) 18 (d) 16

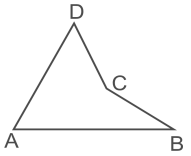
Q.65. In ΔABC, AD is a median. If points E, F and G midpoints of AD, AE and DE, respectively, then what will be the area Δ BFG ?
SSC CHSL 12/04/2021 (Morning)
(a) $\frac{1}{2}(Area\ \Delta ABC)$ (b) $\frac{1}{8}(Area\ \Delta ABC)$
(c) $\frac{1}{4}(Area\ \Delta ABC)$ (d) $\frac{1}{2}(Area\ \Delta BGC)$

Q.66. D, E and F are the feet of the perpendiculars from the vertices A,B and C respectively, of a triangle ABC. If angle BED and angle BFE(in degrees) are 24 and 110, respectively, what is the measure of angle EBF? (in degrees)
SSC CHSL 06/08/2021 (Morning)
(a) 55 (b) 67 (c) 86 (d) 46

Q.67. In a ΔABC, ∠A = 90°, if BM and CN are two medians, $\frac{BM^2 + CN^2}{BC^2}$ is equal
SSC CHSL 21/10/2020 (Evening)
(a) $\frac{3}{5}$ (b) $\frac{4}{5}$ (c) $\frac{5}{4}$ (d) $\frac{3}{4}$

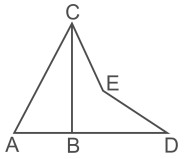
Q.68. The side MN of ΔLMN is produced by X. If ∠LNX = 117° and ∠M = $\frac{1}{2}$∠L, then ∠L is:
SSC CHSL 19/10/2020 (Afternoon)
(a) 77° (b) 78° (c) 76° (d) 75°

Q.69. In the following figure (not to scale), ∠DAB + ∠CBA = 90°, BC = AD, AB = 20 cm, CD = 10 cm, then the area of the quadrilateral (in cm²) ABCD is:



SSC CHSL 13/10/2020 (Afternoon)
(a) 120 (b) 150 (c) 100 (d) 75

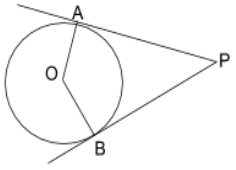
Q.70. If in the given figure, ∠ACB + ∠BAC = 80°; ∠BDE = 35° ; ∠BCE = 45° , then the marked angle ∠CED is:



SSC CHSL 13/10/2020 (Morning)
(a) 150° (b) 120° (c) 160° (d) 135°

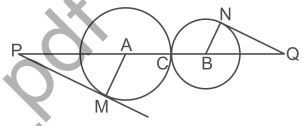
Q.71. XYZ is a triangle. If the medians ZL and YM intersect each other at G, then (Area of ΔGLM : Area of ΔXYZ)
SSC CHSL 12/10/2020 (Afternoon)
(a) 1 : 14 (b) 1 : 12 (c) 1 : 11 (d) 1 : 10

Q.72. PA and PB are tangents to the circle and O is the centre of the circle. The radius is 5 cm and PO is 13 cm. If the area of the triangle PAB is M, then the value of $\sqrt{\frac{M}{15}}$ is :



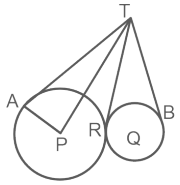
SSC CHSL 18/03/2020 (Morning)
(a) $\sqrt{\frac{24}{13}}$ (b) $\frac{24}{13}$ (c) $\frac{12}{13}$ (d) $\sqrt{\frac{12}{13}}$

Q.73. In the given figure, MP is the tangent to a circle with centre A and NQ is a tangent to a circle with centre B. If MP = 15 cm, NQ = 8 cm, PA = 17 cm and BQ = 10 cm, then AB is:



SSC CGL 07/03/2020 (Morning)
(a) 13.5 cm (b) 23 cm (c) 14 cm (d) 28 cm

Q.74. In the figure, two circles with centres P and Q touch externally at R. Tangents AT and BT meet the common tangent TR at T. If AP = 6cm and PT = 10 cm, then BT = ?



SSC CGL 05/03/2020 (Evening)
(a) 6 cm (b) 12 cm (c) 8 cm (d) 10 cm

Q.75. PRT is a tangent to a circle with centre O, at the point R on it. Diameter SQ of the circle is produced to meet the tangent at P and QR is joined. If ∠QRP = 28°, then the measure of ∠SPR is :
SSC CGL 04/03/2020 (Afternoon)
(a) 29° (b) 34° (c) 62° (d) 32°

Q.76. PQRS is a cyclic quadrilateral in which PQ = x cm, QR = 16.8 cm, RS = 14 cm and PS = 25.2 cm and PR bisects QS. What is the value of x ?
SSC CGL 03/03/2020 (Afternoon)
(a) 18 (b) 21 (c) 28 (d) 24

Q.77. In ΔABC, ∠C = 90°, M and N are the mid-points of the sides AB and AC respectively. CM and BN intersect each other at D and ∠BDC = 90°. If BC = 8 cm, then the length of BN is:
SSC CPO 13/12/2019 (Morning)
(a) $6\sqrt{3}\ cm$ (b) $6\sqrt{6}$ cm
(c) $4\sqrt{6}$cm (d) $8\sqrt{3}$cm

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.78. Two equilateral triangle of side 10 $\sqrt{3}$ cm are joined to form a quadrilateral. What is the altitude of the quadrilateral ?
SSC CPO 12/12/2019 (Evening)
(a) 12 cm (b) 14 cm (c) 16 cm (d) 15 cm

Q.79. The lengths of the parallel sides of a trapezium are 51 cm, and 21 cm, and that of each of the other two sides is 39 cm. What is the area (in cm^2) of the trapezium?
SSC CPO 12/12/2019 (Morning)
(a) 1206 (b) 1296 (c) 1152 (d) 1260

Q.80. ABCD is a cyclic quadrilateral. Sides AB and DC, when produced, meet at E, and sides BC and AD, when produced, meet at F. If ∠BFA = 60° and ∠AED = 30° , then the measure of ∠ABC is :
SSC CPO 12/12/2019 (Morning)
(a) 65° (b) 75° (c) 70° (d) 80°

Q.81. PT is a tangent at the point R on a circle with centre O. SQ is a diameter. Which when produced meets the tangent PT at P. If $\angle SPT = 32°$, then what will be the measure of $\angle QRP$?
SSC CPO 11/12/2019 (Morning)
(a) 32° (b) 58° (c) 30° (d) 29°

Q.82. PQRS is a rectangle . T is a point on PQ such that RTQ is an isosceles triangle and PT= 5 QT. if the area of the triangle RTQ is 12√3 cm^2 , then the area of rectangle PQRS is :
SSC CPO 09/12/2019 (Morning)
(a) 142√3 cm^2 (b) 134√3 cm^2
(c) 144√3 cm^2 (d) 142 cm^2

Q.83. If in ΔPQR, ∠P = 120° , PS⊥QR at S and PQ + QS = SR, then the measure of ∠Q is :
SSC CGL Tier II (13/09/2019)
(a) 20° (b) 50° (c) 40° (d) 30°

Q.84. A circle is inscribed in a quadrilateral ABCD touching AB, BC, CD and AD at the points P, Q, R and S, respectively, and ∠B = 90° . If AD = 24 cm, AB = 27 cm and DR = 6cm, then what is the circumference of the circle ?
SSC CGL Tier II (12/09/2019)
(a) 20π (b) 18π (c) 15π (d) 12π

Q.85. The sum of the interior angles of a regular polygon is 1260° What is the difference between an exterior angle and an interior angle of the polygon?
SSC CGL Tier II (12/09/2019)
(a) 105° (b) 100° (c) 120° (d) 90°

Q.86. In a trapezium ABCD, DC||AB, AB = 12 cm and DC = 7.2 cm. What is the length of the line segment joining the mid-points of its diagonals?
SSC CGL Tier II (11/09/2019)
(a) 2.6 (b) 4.8 (c) 2.4 (d) 3.6

Q.87. If each interior angle of a regular polygon is $(128\frac{4}{7})°$ then what is the sum of the number of its diagonal and the number of its sides?
SSC CGL Tier II (11/09/2019)
(a) 15 (b) 19 (c) 17 (d) 21

Q.88. A quadrilateral ABCD is inscribed in a circle with centre O. If ∠BOC = 92° and ∠ADC = 112°, then ∠ABO is equal to :
SSC CHSL 11/07/2019 (Evening)
(a) 22° (b) 24° (c) 28° (d) 26°

Q.89. The perimeter of ΔABC is 24 cm and its side, BC = 9 cm. AD is the bisector of ∠BAC, while I is the incentre AI : ID is equal to :
SSC CHSL 11/ 07/2019 (Afternoon)
(a) 7 : 5 (b) 5 : 2 (c) 3 : 2 (d) 5 : 3

Q.90. The area of a sector of a circle with central angle 60° is A. The circumference of the circle is C. Then A is equal to :
SSC CHSL 10/07/2019 (Evening)
(a) $\frac{c^2}{6\pi}$ (b) $\frac{c^2}{18\pi}$ (c) $\frac{c^2}{24\pi}$ (d) $\frac{c^2}{4\pi}$

Q.91. It is given that the area of a triangle is A. The values of its perimeter, inradius, circumradius and the average of the lengths of the medians are respectively p, r, R and d. The ratio A : p is equal to
SSC CHSL 10/07/2019 (Afternoon)
(a) $(R+r)^2 : d$ (b) r : 2
(c) r : 1 (d) $(R-r)^2 : r$

Q.92. A regular hexagon is inscribed in a circle. What is the ratio of the area of the circle to that of its portion not covered by the hexagon?
SSC CHSL 10/07/2019 (Morning)
(a) $\frac{2\pi}{2\pi - 3\sqrt{3}}$ (b) $\frac{\pi}{\pi - 3\sqrt{3}}$
(c) $\frac{2\pi}{\sqrt{3}}$ (d) $\frac{\pi}{\sqrt{3}}$

Q.93. In a stadium an athlete is running on a circular path with uniform speed during a practice session. The angle covered by him during one second is found to be 10° by a coach observing him from the centre of the circular track. What would be the measure of angle (in degrees) described by the athlete by an observer standing on the circle?
SSC CHSL 09/07/2019 (Evening)
(a) 5
(b) It depends on the exact position of the observer on the circle
(c) 10
(d) 20

Q.94. The circumcentre, incentre, orthocentre and the centroid of a triangle are one and the same point. The triangle must be:
SSC CHSL 09/07/2019 (Evening)
(a) Isosceles (b) right-angled
(c) right-angled isosceles (d) equilateral

Q.95. There is a polygon of 11 sides. How many triangles can be drawn by only using the vertices of the polygon?
SSC CHSL 08/07/2019 (Afternoon)
(a) 165 (b) 150 (c) 175 (d) 180

Q.96. In a circle with centre O, AB is a diameter. Points C, D and E are on the circle on one side of AB such that ABEDC is a pentagon. The sum of angles ACD and DEB is :
SSC CHSL 04/07/2019 (Morning)
(a) 240° (b) 225° (c) 270° (d) 180°

Q.97. In ΔABC, D is a point on BC such that ∠BAD = $\frac{1}{2}$∠ADC, ∠BAC = 87° and ∠C = 42°. What is the measure of ∠ADB ?
SSC CHSL 04/07/2019 (Morning)
(a) 94° (b) 68° (c) 102° (d) 78°

Q.98. In a circle with centre O, A diameter AB and a chord CD intersect each other at E, AC and AD are joined. If ∠BOC = 48° and ∠AOD = 100°, then what is the measure of ∠CEB ?
SSC CHSL 03/07/2019 (Evening)
(a) 72° (b) 74° (c) 78° (d) 82°

Q.99. In △ABC, AD, the bisector of ∠A, meets BC at D. If BC = a, AC = b and AB = c, then BD - DC =
SSC CHSL 03/07/2019 (Afternoon)
(a) $\frac{ac}{b+c}$ (b) $\frac{a(c+b)}{c-b}$
(c) $\frac{a(c-b)}{c+b}$ (d) $\frac{ab}{b+c}$

Q.100. In a circle with centre O, ABDC is a cyclic quadrilateral with AB as a diameter of the circle. AC and BD produced meet at E. If ∠CED = 70°, then what is the measure of ∠COD ?
SSC CHSL 03/07/2019 (Afternoon)
(a) 45° (b) 60° (c) 30° (d) 40°

Q.101. In △ABC, BD is perpendicular to AC. E is a point on BC such that ∠BEA = x°. If ∠EAC = 38° and ∠EBD = 40°, then the value of x is :
SSC CHSL 03/07/2019 (Morning)
(a) 88° (b) 68° (c) 78° (d) 72°

Q.102. A circle is inscribed in a quadrilateral ABCD , touching sides AB, BC, CD and DA at P, Q, R, and S respectively. If AS = 8 cm , BC = 11 cm and CR = 5 cm, then the length AB (in cm) is equal to:

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 02/07/2019 (Evening)
(a) 12 (b) 13 (c) 16 (d) 14

Q.103. In △ABC, ∠A = 90°. If BL and CM are medians, then:
SSC CHSL 02/07/2019 (Evening)
(a) 4 $(BL^2 + CM^2) = 3BC^2$
(b) 4 $(BL^2 + CM^2) = 5BC^2$
(c) 3 $(BL^2 + CM^2) = 4BC^2$
(d) 5 $(BL^2 + CM^2) = 4BC^2$

Q.104. Two concentric circles are of radius 15 cm and 9 cm. What is the length of the chord of the larger circle which is tangent to the smaller circle (in cm) ?
SSC CHSL 02/07/2019 (Morning)
(a) 24 (b) 18 (c) 20 (d) 25

Q.105. Tangents AB and AC are drawn to a circle from a point A, such that, ∠BAC = 40°. A chord CP is drawn parallel to BA. The measure of ∠CBP is:
SSC CHSL 01/07/2019 (Evening)
(a) 55° (b) 45° (c) 35° (d) 40°

Q.106. In a circle with centre O, AD is a diameter and AC is a chord. B is a point on AC, such that OB = 5 cm and ∠OBA = 60°. If ∠DOC = 60°, then what is the length of BC (in cm) ?
SSC CHSL 01/07/2019 (Evening)
(a) 4 (b) 3√5 (c) 5√3 (d) 5

Q.107. Chords AB and CD of a circle, when produced, meet at point P outside the circle. If AB = 6 cm, CD = 3 cm and PD = 5 cm, then PB is equal to :
SSC CGL 11/06/2019 (Morning)
(a) 6 cm (b) 6.25 cm (c) 5 cm (d) 4 cm

Q.108. In a △ ABC, the sides are AB = 16cm, AC = 63cm, BC = 65cm. From A, a straight line AM is drawn up to the midpoint M of side BC. Then the length of AM is equal to in (cm) :
SSC CGL 10/06/2019 (Evening)
(a) 32.5 (b) 24.5 (c) 23.5 (d) 31.5

Q.109. In △ ABC, AD is the median and G is a point on AD such that AG : GD = 2 : 1, then ar(△ BDG) : (△ ABC) is equal to :
SSC CGL 10/06/2019 (Afternoon)
(a) 1 : 4 (b) 1 : 9 (c) 1 : 6 (d) 1 : 3

Q.110. From a point P , outside a circle, PAB is a secant and PT is a tangent to the circle, where A , B and T are points on the circle. If PT = 5 cm , PA = 4 cm and AB = x , then x is equal to :
SSC CGL 10/06/2019 (Afternoon)
(a) 2.25 (b) 2.75 (c) 2.45 (d) 1.75

Q.111. Let O be the centre of a circle and AC be its diameter. BD is a chord intersecting AC at E. Point A is joined at B and D. If ∠BOC = 50° and ∠AOD = 110° , then ∠BEC = ?
SSC CGL 10/06/2019 (Morning)
(a) 80° (b) 70° (c) 55° (d) 90°

Q.112. In a △ABC, right angled at B, AB = 7 cm and (AC - BC) = 1 cm. The value of (secC + cotA) is :
SSC CGL 10 /06/2019 (Morning)
(a) $\frac{19}{24}$ (b) $\frac{4}{3}$ (c) $\frac{3}{4}$ (d) 1

Q.113. In a circle with centre O, PQR is a tangent at the point Q on it. AB is a chord in the circle parallel to the tangent such that ∠BQR = 70°. What is the measure of ∠AQB ?
SSC CGL 07/06/2019 (Evening)
(a) 40° (b) 60° (c) 55° (d) 35°

Q.114. The base and altitude of an isosceles triangle are 10 cm and 12 cm respectively. Then the length of each equal side (in cm) is:
SSC CGL 07/06/2019 (Evening)
(a) 10 (b) 7.5 (c) 8.5 (d) 13

Q.115. ABCD is a quadrilateral whose side AB is the diameter of a circle through A, B, C and D. If ∠ADC = 130°, then the measure of ∠BAC is :
SSC CGL 07/06/2019 (Afternoon)
(a) 40° (b) 45° (c) 35° (d) 50°

Q.116. In △ABC , ∠A is a right angle. The lengths of AC and BC are 6 cm and 10 cm respectively. Point D is on AB such that BD = 4 cm. What is the length of CD in (cm) ?
SSC CGL 07/06/2019 (Afternoon)
(a) $2\sqrt{13}$ (b) $3\sqrt{10}$ (c) $2\sqrt{10}$ (d) $3\sqrt{13}$

Q.117. AB is a diameter of a circle with centre O. CB is a tangent to the circle at B. AC intersects the circle at G. If the radius of the circle is 6 cm and AG = 8cm, then the length of BC is in (cm) :
SSC CGL 07/06/2019 (Morning)
(a) $2\sqrt{5}$ (b) $6\sqrt{6}$ (c) $2\sqrt{6}$ (d) $6\sqrt{5}$

Q.118. In a circle with centre O, ACBO is a parallelogram where C is a point on the minor arc AB. What is the measure of ∠AOB ?
SSC CGL 06/06/2019 (Afternoon)
(a) 150° (b) 100° (c) 110° (d) 120°

Q.119. The vertices of △PQR lie on a circle with centre O. SR is a tangent to the circle at the point R. If QR bisects the ∠ORS, then what is the measure of ∠RPQ?
SSC CGL 06/06/2019 (Afternoon)
(a) 60° (b) 45° (c) 40° (d) 30°

Q.120. In △ABC with sides 6 cm, 7 cm and 8 cm, the angle bisector of the largest angle divides the opposite side into two segments. What is the length of the shorter segment?
SSC CGL 06/06/2019 (Afternoon)
(a) $\frac{24}{5}$ (b) $\frac{21}{5}$ (c) $\frac{48}{13}$ (d) $\frac{56}{13}$

Q.121. ABCD is a cyclic quadrilateral whose diagonals intersect at P. If AB = BC, ∠DBC = 70° and ∠BAC = 30°, then the measure of ∠PCD is:
SSC CGL 06/06/2019 (Morning)
(a) 35° (b) 50° (c) 55° (d) 30°

Q.122. ABCD is a cyclic quadrilateral in which $\angle A = 67°$ and $\angle B = 92°$. What is the difference between the measure of $\angle C$and ∠D ?
SSC CGL 04/06/2019 (Evening)
(a) 29° (b) 27° (c) 19° (d) 25°

Q.123. In ΔABC, AD ⊥ BC and BE ⊥ AC, AD and BE intersect each other at F. If BF = AC, then the measure of ∠ABC is:
SSC CGL 04/06/2019 (Afternoon)
(a) 45° (b) 60° (c) 70° (d) 50°

Q.124. A triangle ABC is inscribed in a circle with centre O. AO is produced to meet the circle at K and AD ⊥ BC. If ∠B = 80° and ∠C = 64°, then the measure of ∠DAK is :
SSC CGL 04/06/2019 (Afternoon)
(a) 10° (b) 16° (c) 12° (d) 20°

Q.125. In a circle of radius 10 cm, with centre O, PQ and PR are two chords each of length 12 cm. PO bisects chord QR at the points S. The length of OS (in cm) :
SSC CGL 04/06/2019 (Morning)
(a) 2.8 (b) 2.5 (c) 3.2 (d) 3

Q.126. In ΔABC, F and E are the points on sides AB and AC respectively, such that FE || BC and FE divide the triangle in two parts of equal area. If AD ⊥ BC and AD intersect FE at G, then GD : AG = ?
SSC CGL 04/06/2019 (Morning)
(a) $\sqrt{2} : 1$ (b) $(\sqrt{2} - 1) : 1$
(c) $2\sqrt{2} : 1$ (d) $(\sqrt{2} + 1) : 1$

Q.127. A circle is inscribed in a triangle ABC. It touches the sides AB, BC and AC at the points R, P and Q respectively. If AQ = 4.5 cm, PC = 5.5 cm and BR = 6 cm, then the perimeter of the triangle ABC is:
SSC CGL 04/06/2019 (Morning)
(a) 30.5 (b) 28 (c) 32 (d) 26.5

Q.128. A unique circle can always be drawn through x number of given non-collinear points, then x must be:
SSC CPO 16/03/2019 (Evening)
(a) 2 (b) 3 (c) 4 (d) 1

Q.129. Side AB of a triangle ABC is 80

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

cm long, whose perimeter is 170 cm. If angle ABC = 60°, the shortest side of triangle ABC measures_____cm.
SSC CPO 16/03/2019 (Evening)
(a) 17 (b) 15 (c) 25 (d) 21

Q.130. Which of the following solids has the least number of faces?
SSC CPO 15/03/2019 (Morning)
(a) Cube (b) Cone
(c) Triangular prism (d) Square pyramid

Q.131. Which of the following has the maximum number of vertices?
SSC CPO 14/03/2019 (Evening)
(a) Cuboid (b) Triangular Prism
(c) Hexagonal pyramid (d) Tetrahedron

Practice Questions

SSC CHSL 2024 Tier - 2

Q.132. In a triangle PQR, incentre is A and ∠QAR = 116°. Find the measure of ∠QPR.
SSC CHSL Tier II (18/11/2024)
(a) 52° (b) 54° (c) 27° (d) 26°

Q.133. The numbers of Commerce, Science and Arts postgraduates working in a company are 40, 80 and 60, respectively. If these figures are represented by a pie chart, then what is the angle corresponding to Commerce postgraduates?
SSC CHSL Tier II (18/11/2024)
(a) 60° (b) 50° (c) 70° (d) 80°

Q.134. A quadrilateral having equal diagonals and equal opposite sides is always a _____.
SSC CHSL Tier II (18/11/2024)
(a) trapezium (b) kite
(c) rhombus (d) rectangle

Q.135. ABCD is a trapezium in which AB is parallel to CD, and E and F are the mid - points of non - parallel sides AD and BC. If EF is parallel to AB, AB = 28 cm and CD = 18 cm, then find EF (in cm).
SSC CHSL Tier II (18/11/2024)
(a) 46 (b) 10 (c) 5 (d) 23

SSC MTS 2024 Tier - 1

Q.136. The centroid of a ΔXYZ is G. The area of ΔXYZ is 45 cm^2. The area of ΔGYZ is:
SSC MTS 08/10/2024 (Evening)
(a) 22.5 cm^2 (b) 7.5 cm^2
(c) 15 cm^2 (d) 30 cm^2

Q.137. A quadrilateral ABCD has sides AB = 5 units, BC = 12 units, CD = DA and ∠ABC = ADC = 90°. What is the area of the quadrilateral (in square units) ?
SSC MTS 12/11/2024 (Morning)
(a) 72.75 (b) 74.75 (c) 74.25 (d) 72.25

Q.138. If the perimeter of an equilateral triangle is 24 cm,then the length of each median is:
SSC MTS 12/11/2024 (Morning)
(a) $3\sqrt{2}$ cm (b) $4\sqrt{2}$ cm
(c) $4\sqrt{3}$ cm (d) $3\sqrt{3}$cm

Q.139. ABCD is a quadrilateral in which diagonal BD = 62 cm, AL ⊥ BD and CM ⊥ BD, such that AL = 14.3 cm and CM = 17.7 cm. The area of the quadrilateral ABCD is:
SSC MTS 14/11/2024 (Morning)
(a) 982 cm^2 (b) 902 cm^2
(c) 992 cm^2 (d) 900 cm^2

SSC CGL 2024 Tier - 1

Q.140. Which of the following statements is sufficient to conclude that two triangles are congruent ?
SSC CGL 09/09/2024 (1st Shift)
(a) These have two equal sides and the same perimeter
(b) These have the same area and the same base.
(c) One side and one angle of both triangles are equal.
(d) These have the same base and the same height.

Q.141. If the sum of two sides of an equilateral triangle is 16 cm, then find the third side.
SSC CGL 09/09/2024 (1st Shift)
(a) 1. 4 cm (b) 16 cm
(c) Cannot be found (d) 8 cm

Q.142. Let O be the centre of the circle and AB and CD are two parallel chords on the same side of the radius. OP is perpendicular to AB and OQ is perpendicular to CD. If AB = 10 cm, CD = 24 cm and PQ = 7 cm, then the diameter (in cm) of the circle is equal to:
SSC CGL 09/09/2024 (1st Shift)
(a) 26 (b) 13 (c) 12 (d) 24

Q.143. The distance between the centres of two circles of radii 22 cm and 10 cm is 37 cm. If the points of contact of a direct common tangent to these circles are M and Q, then find the length of the line segment MQ .
SSC CGL 09/09/2024 (1st Shift)
(a) 35 cm (b) 39 cm (c) 29 cm (d) 25 cm

Q.144. The points P and S are on the same side of the line segment QR, such that ∠PQR = 90°, ∠SRQ = 90° and PQ = SR. Select the correct statement.
SSC CGL 09/09/2024 (2nd Shift)
(a) ΔPQR ≅ ΔSRQ by RHS
(b) ΔPQR ≅ ΔSQR by SAS
(c) ΔPQR ≅ ΔSQR by RHS
(d) ΔPQR ≅ ΔSRQ by SAS

Q.145. The angles of triangle are such that one is average of other two, then the angles are:
1) $\frac{\pi}{6}, \frac{\pi}{3}, \frac{\pi}{2}$ 2) $\frac{\pi}{3}, \frac{\pi}{3}, \frac{\pi}{2}$
3) $\frac{\pi}{6}, \frac{\pi}{3}, \frac{\pi}{4}$ 4) $\frac{\pi}{2}, \frac{\pi}{2}, \frac{\pi}{3}$
SSC CGL 09/09/2024 (2nd Shift)
(a) 4 (b) 3 (c) 2 (d) 1

Q.146. Let C be a circle with centre O and P be an external point to C. Let PA and PB be two tangents to C with A and B being the points of tangency, respectively. If PA and PB are inclined to each other at an angle of 60°, then find∠POA.
SSC CGL 09/09/2024 (2nd Shift)
(a) 40° (b) 60° (c) 80° (d) 30°

Q.147. Two triangles EFG and HIJ are congruent. If the area of ΔEFG is 124 cm^2 , then the area of ΔHIJ will be:
SSC CGL 09/09/2024 (3rd Shift)
(a) 124 cm^2 (b) 248 cm^2
(c) 62 cm^2 (d) 31 cm^2

Q.148. By applying which of the following criteria can two triangles NOT be proved congruent?
SSC CGL 10/09/2024 (1st Shift)
(a) angle-side-angle (b) angle-angle-angle
(c) side-side-side (d) side-angle-side

Q.149. Two circles of radii 18 cm and 12 cm touch each other externally. Find the length (in cm) of their direct common tangent.
SSC CGL 10/09/2024 (1st Shift)
(a) $15\sqrt{6}$ (b) $10\sqrt{6}$ (c) $12\sqrt{6}$ (d) $18\sqrt{6}$

Q.150. The side of an equilateral triangle is 28 cm. Taking each vertex as the centre, a circle is described with a radius equal to half the length of the side of the triangle. Find the area of that part of the triangle which is not included in the circles (use π = $\frac{22}{7}$ and $\sqrt{3}$ = 1.73).
SSC CGL 10/09/2024 (1st Shift)
(a) 30.89 cm^2 (b) 38.08 cm^2
(c) 31.08 cm^2 (d) 39.08 cm^2

Q.151. ΔEFG and ΔHIJ are similar. Also, ∠E = ∠H and ∠F = ∠I. If 3EF = HI and FG = 9 cm, then IJ is equal to _____ .
SSC CGL 10/09/2024 (2nd Shift)
(a) 9 cm (b) 27 cm (c) 3 cm (d) 18 cm

Q.152. If 45° and 65° are the angles of a triangle, then find the exterior angle of

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

the third angle (remaining angle).
SSC CGL 10/09/2024 (2nd Shift)
(a) 110° (b) 120 (c) 70° (d) 100°

Q.153. In a circle of radius $5\sqrt{13}$ cm, a chord is at a distance of 10 cm from the centre of the circle. Find the length (in cm) of the chord.
SSC CGL 10/09/2024 (2nd Shift)
(a) 30 (b) 28 (c) 36 (d) 15

Q.154. If ΔPQR ≅ ΔMON such that ∠PQR = 82°, ∠QRP = 47°, ∠RPQ = 51°, ∠MON = $(5y - 8)°$, QR = 24 and ON = $3x + y$, then find $(x + y)$.
SSC CGL 10/09/2024 (3rd Shift)
(a) 14 (b) 18 (c) 16 (d) 20

Q.155. In a circle, two chords MN and PQ intersect at O. If MO = 9 cm, ON = 5 cm and OQ = 6 cm, then the value of OP (in cm) is:
SSC CGL 11/09/2024 (1st Shift)
(a) 7.5 (b) 6.5 (c) 6 (d) 7

Q.156. In a △ABC right- angled at C, if tan A = $\sqrt{3}$, then the value of sinA cosB cot(A + B) is:
SSC CGL 11/09/2024 (1st Shift)
(a) $\sqrt{3}$ (b) 1 (c) 0 (d) 2

Q.157. In a rhombus ABCD, O is any interior point such that OA = OC. What is five-ninths of the degree measure of ∠DOB?
SSC CGL 11/09/2024 (1st Shift)
(a) 120° (b) 150° (c) 100° (d) 90°

Q.158. In ΔPQR, M, N, and S are the mid-points of sides PQ, PR and QR, respectively. If the area of the ΔPQR is 46 cm^2, what is the area (in cm^2) of the quadrilateral MNRQ?
SSC CGL 11/09/2024 (2nd Shift)
(a) 39 (b) 27.6 (c) 23 (d) 34.5

Q.159. In a triangle ΔABC, the ∠ABC = 90°. If sin(A) = $\frac{1}{2}$, then cos(C) is equal to:
SSC CGL 11/09/2024 (2nd Shift)
(a) $\frac{1}{\sqrt{2}}$ (b) 1 (c) $\frac{\sqrt{3}}{2}$ (d) $\frac{1}{2}$

Q.160. In a triangle ΔABC, AB = AC and ∠A = 80°, then find ∠B.
SSC CGL 11/09/2024 (2nd Shift)
(a) 50° (b) 80° (c) 40° (d) 45°

Q.161. △ABC and △RPQ are congruent, then the side of △ABC that corresponds to PQ is:
SSC CGL 11/09/2024 (2nd Shift)
(a) AB (b) CA (c) AR (d) BC

Q.162. In a ΔABC, if $\frac{1}{2}$∠A + ∠B + ∠C = 120°, then the value of $\frac{1}{4}$ ∠A is :
SSC CGL 11/09/2024 (3rd Shift)
(a) 20° (b) 40° (c) 60° (d) 30°

Q.163. P and Q are centres of two circles whose radii are 7 cm and 3 cm, respectively. If the direct common tangents to the circles meet PQ extended at A, then A divides PQ _____.
SSC CGL 11/09/2024 (3rd Shift)
(a) externally in the ratio 3 : 7
(b) internally in the ratio 3 : 7
(c) externally in the ratio 7 : 3
(d) internally in the ratio 7 : 3

Q.164. Consider a triangle PQR, right angled at R, in which PQ = 29 units, QR = 21 units and ∠PQR = θ. Find the value of $\cos^2\theta - \sin^2\theta$.
SSC CGL 11/09/2024 (3rd Shift)
(a) $\frac{21}{841}$ (b) 1 (c) $\frac{20}{841}$ (d) $\frac{41}{841}$

Q.165. In ΔABC, two medians AD and BE intersect at G at right angles. If AD = 12 cm and BE = 9 cm, then the length of AB is equal to:
SSC CGL 11/09/2024 (3rd Shift)
(a) 14 cm (b) 16 cm (c) 12 cm (d) 10 cm

Q.166. In a triangle PQR, S is a point on the side QR such that PS⊥QR, then which of the following options is true?
SSC CGL 12/09/2024 (1st Shift)
(a) $PS^2 + PR^2 = PQ^2 + QR^2$
(b) $PR^2 + QS^2 = PQ^2 + SR^2$
(c) $PQ^2 + PR^2 = QS^2 + SR^2$
(d) $PS^2 + QS^2 = PQ^2 + PR^2$

Q.167. In triangles ABC and DEF, AB = FD and ∠A = ∠D. The two triangles are congruent by SAS criterion if :
SSC CGL 12/09/2024 (1st Shift)
(a) BC = DE (b) AC = EF
(c) BC = EF (d) AC = DE

Q.168. The measures of the three angles of a triangle are in the ratio 17 : 13 : 15. Find the positive difference between the greatest and the smallest of these three angles.
SSC CGL 12/09/2024 (1st Shift)
(a) 16° (b) 24° (c) 20° (d) 12°

Q.169. In triangle ABC, the length of side BC is 2 cm less than twice the length of side AB. The length of side AC exceeds the length of side AB by 10 cm. The perimeter of the triangle is 40 cm. Determine the length (in cm) of the smallest side of the triangle.
SSC CGL 12/09/2024 (2nd Shift)
(a) 12 (b) 14 (c) 10 (d) 8

Q.170. In ΔDEF, the bisector of ∠D intersects side EF at point N. If DE = 36 cm, DF = 40 cm and EF = 38 cm, then the length (in cm) of NF is _____.
SSC CGL 12/09/2024 (2nd Shift)
(a) 16 (b) 20 (c) 18 (d) 12

Q.171. From a point T, the length of the tangent to a circle is 32 cm and the distance of T from the centre is 40 cm. The diameter (in cm) of the circle is:
SSC CGL 12/09/2024 (2nd Shift)
(a) 36 (b) 16 (c) 32 (d) 48

Q.172. A pair of straight lines from an external point F intersects a circle at A and B (FA < FB), and touches the circle at C. O is the centre of the circle. Given that ∠ACF = 50° and ∠AFC = 30°, find ∠AOB.
SSC CGL 12/09/2024 (3rd Shift)
(a) 80° (b) 90° (c) 100° (d) 40°

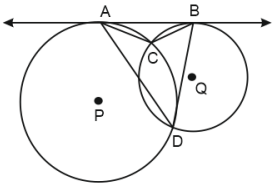
Q.173. If ΔPQR ≅ ΔABC, AB = 6 cm, ∠B = 50° and ∠A = 70°, then which of the following is true ?
SSC CGL 13/09/2024 (1st Shift)
(a) QR = 6 cm, ∠Q = 60°
(b) QR = 6 cm, ∠R = 60°
(c) QP = 6 cm, ∠P = 60°
(d) QP = 6 cm, ∠R = 60°

Q.174. A circle's centre is connected to its 50 cm long chord by a perpendicular that is 21 cm long. Find the circle's radius.
SSC CGL 13/09/2024 (2nd Shift)
(a) $\sqrt{1065}$ cm (b) $\sqrt{1068}$ cm
(c) $\sqrt{1064}$ cm (d) $\sqrt{1066}$ cm

Q.175. ABC is an equilateral triangle. P, Q and R are the mid-points of sides AB, BC and CA, respectively. If the length of the side of the triangle ABC is 11 cm, then the area (in cm^2) of ΔPQR is:
SSC CGL 13/09/2024 (2nd Shift)
(a) $\frac{21\sqrt{3}}{16}$ (b) $\frac{11\sqrt{3}}{16}$
(c) $\frac{121\sqrt{3}}{16}$ (d) $\frac{111\sqrt{3}}{16}$

Q.176. P and Q are two fixed points 10 cm apart, and R is a point on PQ such that PR = 6 cm. By what percentage is the length of QR decreased when the length of PR is increased by 5% ?
SSC CGL 13/09/2024 (2nd Shift)
(a) 8.5% (b) 7.5% (c) 7% (d) 8%

Q.177. Two circles, centred at P and Q intersect at two points C and D. AB is tangent to the two circles at A and B. If ∠ADB = 68°, then ∠ACB = _____.



Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 13/09/2024 (3rd Shift)
(a) 132° (b) 112° (c) 124° (d) 102°

Q.178. The perimeters of two similar triangles ΔRST and ΔABC are 26 cm and 39 cm, respectively. If AB = 24 cm, then RS is _____.
SSC CGL 13/09/2024 (3rd Shift)
(a) 16 cm (b) 36 cm (c) 18 cm (d) 24 cm

Q.179. In the following sets, which set represents the angles of a triangle ?
SSC CGL 13/09/2024 (3rd Shift)
(a) {30°, 60°, 90°} (b) {80°, 50°, 90°}
(c) {30°, 50°, 110°} (d) {30°, 50°, 90°}

Q.180. What is the difference in area (in cm²) of ΔABC having sides of 10 cm, 20 cm and 20 cm, and a right angled triangle ΔPQR with hypotenuse of 13 cm and one of the perpendiculars of 12 cm ?
Note: $\sqrt{2}$ = 1.41, $\sqrt{3}$ = 1.73, $\sqrt{7}$ = 2.65, $\sqrt{13}$ = 3.61, $\sqrt{15}$ = 3.87, $\sqrt{21}$ = 4.58
SSC CGL 17/09/2024 (1st Shift)
(a) 70.05 (b) 36.57 (c) 66.75 (d) 53.58

Q.181. In a triangle, the lengths of sides are 6 units, 12 units and x units. How many possible integer values are there for x?
SSC CGL 17/09/2024 (3rd Shift)
(a) 9 (b) 12 (c) 11 (d) 10

Q.182. If a triangle has a perimeter of 52 units, then all its sides have length _____ units.
SSC CGL 17/09/2024 (3rd Shift)
(a) < 26 (b) < 20 (c) < 24 (d) < 18

Q.183. A chord of length 32 cm is drawn at a distance of 12 cm from the centre of a circle. Find the radius of the circle.
SSC CGL 18/09/2024 (1st Shift)
(a) 18 cm (b) 22 cm (c) 20 cm (d) 28 cm

Q.184. In a circle with centre O, AOC is the diameter. B is a point on the circumference of the circle such that arc AB is $\frac{1}{5}$ of the arc BC. What is the degree measure of ∠BOC ?
SSC CGL 18/09/2024 (1st Shift)
(a) 120° (b) 150° (c) 80° (d) 30°

Q.185. If ΔABC and ΔQPR are congruent triangles such that AB = 7 cm, AC = 8 cm, ∠B = 65° and ∠C = 75°, then which of the following is true?
SSC CGL 18/09/2024 (1st Shift)
(a) ∠R = 75° and PQ = 8 cm
(b) PQ = 7 cm and ∠R = 75°
(c) ∠Q = 40° and RQ = 7 cm
(d) AC = PR and ∠P = 65°

Q.186. On a circle of radius 7 units, PQ and QR are chords of length 7 units each. What is the length of the chord PR in units?
SSC CGL 18/09/2024 (2nd Shift)
(a) $\frac{28}{\sqrt{3}}$ (b) $\frac{7}{\sqrt{3}}$ (c) $\frac{14}{\sqrt{3}}$ (d) $\frac{21}{\sqrt{3}}$

Q.187. If arcs PAQ and RBS of a circle are congruent, then find the ratio of PQ and RS.
SSC CGL 18/09/2024 (2nd Shift)
(a) 2 : 3 (b) 1 : 3 (c) 1 : 1 (d) 1 : 2

Q.188. In a ΔPQR, PQ = PR and PT is perpendicular to QR. If PQ = 17 cm, PT = 15 cm, then what is the measure (in cm) of QR?
SSC CGL 18/09/2024 (2nd Shift)
(a) 8 (b) 24 (c) 16 (d) 32

Q.189. Two equal circles pass through each other's centre. If the radius of each of the circle is 13 cm, then what is the length of the common chord?
SSC CGL 18/09/2024 (3rd Shift)
(a) 13 $\sqrt{6}$ (b) 7$\sqrt{3}$ (c) 13 $\sqrt{2}$ (d) 13$\sqrt{3}$

Q.190. The side MN of a parallelogram MNOP is produced to Q such that MN = NQ . PQ intersects ON at R. The point R divides ON in the ratio:
SSC CGL 18/09/2024 (3rd Shift)
(a) 3 : 1 (b) 2 : 1 (c) 1 : 2 (d) 1 : 1

Q.191. If we extend a chord infinitely on both sides, then the chord becomes a _____.
SSC CGL 18/09/2024 (3rd Shift)
(a) diameter (b) tangent
(c) secant (d) normal

Q.192. P, Q and R are the three angles of a triangle. If P − Q = 20° and Q − R = 26°, then ∠P is equal to:
SSC CGL 19/09/2024 (1st Shift)
(a) 52° (b) 46° (c) 92° (d) 82°

Q.193. PQ and RS are common tangents to two circles intersecting at A and B. A and B, when produced on both sides, meet the tangents PQ and RS at X and Y, respectively. If AB = 3 cm and XY = 5 cm, then PQ is _____.
SSC CGL 19/09/2024 (2nd Shift)
(a) 5 cm (b) 3 cm (c) 6 cm (d) 4 cm

Q.194. A quadrilateral PQRS is inscribed in a circle of centre O, such that PQ is a diameter and ∠PSR = 120°. Find the value of ∠QPR.
SSC CGL 19/09/2024 (2nd Shift)
(a) 30° (b) 60° (c) 40° (d) 50°

Q.195. ΔABC and ΔDEF are two triangles such that ΔABC ≅ ΔFDE. If AB = 17 cm, ∠B=52° and ∠A = 95°, then which of the following options is true ?
SSC CGL 19/09/2024 (2nd Shift)
(a) DE = 17 cm, ∠F = 33°
(b) DF = 17 cm, ∠E = 33°
(c) DE= 1 7 cm, ∠E = 33°
(d) DF = 17 cm, ∠D = 33°

Q.196. In a kite ABCD, longer diagonal BD is drawn. If ∠ABD = 54°and ∠ADB = 50°, then what is the measure (in degrees) of the ∠DCB ?
SSC CGL 19/09/2024 (3rd Shift)
(a) 108 (b) 76 (c) 100 (d) 54

Q.197. In ΔPQR, if PT is the median, then which of the following is correct?
SSC CGL 19/09/2024 (3rd Shift)
(a) $PQ^2 + PR^2 = PT^2 + QR^2$
(b) $PQ^2 + PR^2 = 2(PT^2 + QT^2)$
(c) $PQ^2 + PR^2 = 2(PT^2 - QT^2)$
(d) $PQ^2 + PR^2 = PT^2 + QT^2$

Q.198. In the following sets, which set represents the sides of a right-angled triangle?
SSC CGL 23/09/2024 (1st Shift)
(a) {3, 4, 6} (b) {8, 15, 16}
(c) {5, 10, 12} (d) {5, 12, 13}

Q.199. Which of the following are the angles of a scalene triangle?
SSC CGL 23/09/2024 (1st Shift)
(a) 60°, 30° and 90° (b) 60°, 60° and 60°
(c) 110°, 35° and 35° (d) 90°, 45° and 45°

Q.200. The distance between the longest chord and the centre of a circle is:
SSC CGL 23/09/2024 (2nd Shift)
(a) Equal to zero unit
(b) Equal to the diameter
(c) Equal to half of the radius
(d) Equal to the radius

Q.201. If the medians of a triangle are equal, then the triangle will be:
SSC CGL 23/09/2024 (2nd Shift)
(a) Equilateral triangle
(b) Obtuse-angle triangle
(c) Scalene triangle
(d) Right-angled triangle

Q.202. If in a circle a chord of length 14 cm is at a distance of 24 cm from its centre, then the length of the radius of the circle is:
SSC CGL 23/09/2024 (3rd Shift)
(a) 28 cm (b) 31 cm (c) 24 cm (d) 25 cm

Q.203. If each side of an equilateral triangle is 37√3 cm, then its altitude (in cm) is equal to
SSC CGL 23/09/2024 (3rd Shift)
(a) 37.5 (b) 18.5 (c) 60.5 (d) 55.5

Q.204. In ΔPQR, if 4 ∠ P = 5 ∠ Q = 20 ∠ R, then the value of ∠ Q is:
SSC CGL 23/09/2024 (3rd Shift)
(a) 72° (b) 36° (c) 90° (d) 45°

Q.205. Triangle XYZ is an isosceles

Search on TG @apna_pdf

Search on Telegram @apna_pdf

triangle with sides XY = XZ. If the measure of angle Y is 80°, what is the measure of angle X ?
SSC CGL 24/09/2024 (1st Shift)
(a) 30° (b) 40° (c) 20° (d) 50°

Q.206. PQ is the diameter of a circle with centre A. M is a point on the circumference of the circle. If m∠MAP = 110°, then find the value of m∠MQA.
SSC CGL 24/09/2024 (1st Shift)
(a) 55° (b) 35° (c) 65° (d) 70°

Q.207. Let C be a circle with centre O and PQ be a minor arc on C. Let R and S be two points on the major arc of PQ on C. If PQ subtends an angle 80° at O, find ∠PRQ and ∠PSQ, respectively.
SSC CGL 24/09/2024 (2nd Shift)
(a) 40° and 60° (b) 50° and 80°
(c) 40° and 40° (d) 40° and 50°

Q.208. In ΔDEF, DE = 12 cm, EF = 15 cm, and ∠DEF = 90°. ΔDEF is congruent to Δ XYZ. If YZ = 15 cm, then what is the length of XZ ?
SSC CGL 24/09/2024 (2nd Shift)
(a) $3\sqrt{41}$ cm (b) $2\sqrt{41}$ cm
(c) $5\sqrt{41}$ cm (d) $4\sqrt{41}$ cm

Q.209. If two straight lines are coinciding with each other, then the number of points of intersection is/are:
SSC CGL 24/09/2024 (3rd Shift)
(a) infinitely many points of intersection
(b) finite number of point of intersection
(c) no points of intersection
(d) unique point of intersection

Q.210. Let ABC be a triangle. If the mid-points of AB, BC and AC are D, E and F, respectively, then ΔDEF is NOT congruent to ____.
SSC CGL 24/09/2024 (3rd Shift)
(a) ΔBDE (b) ΔECF (c) ΔADF (d) ΔABC

Q.211. In ΔABC, AB = 6 cm, BC = 9 cm and AC = 12 cm. If AD is the angle bisector of ∠BAC, where D is a point on BC, then find DC.
SSC CGL 24/09/2024 (3rd Shift)
(a) 9 (b) 6 (c) 3 (d) 7

Q.212. A line cuts two concentric circles. The length of chords formed by this line on the circles is 6 cm and 18 cm. Find the difference in the squares of the radii of two circles.
SSC CGL 24/09/2024 (3rd Shift)
(a) 90 (b) 120 (c) 60 (d) 72

Q.213. It is always possible to draw a circle passing through _____ non - collinear points in a plane.
SSC CGL 25/09/2024 (1st Shift)
(a) 3 (b) 6 (c) 5 (d) 4

Q.214. If the lengths of two sides of an isosceles triangle are 6 cm and 12 cm, then find the length of the third side.
SSC CGL 25/09/2024 (1st Shift)
(a) 8 cm (b) 6 cm (c) 12 cm (d) 14 cm

Q.215. The centres of two circles are 36 cm apart. If the radii of these two circles are 15 cm and 9 cm, respectively, then what is the sum of the lengths (in cm) of a direct common tangent and a transverse common tangent of these two circles?
SSC CGL 25/09/2024 (1st Shift)
(a) $6\sqrt{5}(\sqrt{7}+2)$ (b) $6\sqrt{7}(\sqrt{5}+2)$
(c) $6\sqrt{5}(\sqrt{5}+2)$ (d) $6\sqrt{7}(\sqrt{7}+2)$

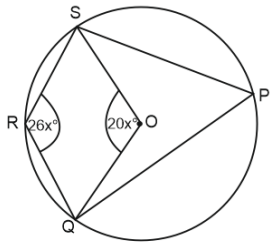
Q.216. The side BC of ΔABC is produced to a point D. If AC = BC and ∠BAC = 70°, then find the value of ∠ACD − ∠ABC.
SSC CGL 25/09/2024 (1st Shift)
(a) 70° (b) 60° (c) 75° (d) 45°

Q.217. In a quadrilateral ABCD, AB = BC, AD = DC, ∠ABD = 68°, ∠ADB = (2y -7)°, ∠BDC = 33°, ∠DBC = (3x + 2)°. Then the value of 2x + 3y is:
SSC CGL 25/09/2024 (2nd Shift)
(a) 108 (b) 144 (c) 104 (d) 118

Q.218. The two circles intersect at two points P and Q . PR and PS are diameters of the two circles. What is ∠PQR ?
SSC CGL 25/09/2024 (2nd Shift)
(a) 90° (b) 0° (c) 45° (d) 60°

Q.219. A circular arc whose radius is 14 cm, makes an angle of 45°at the centre. Find the perimeter (in cm) of the sector. (Use π = $\frac{22}{7}$)
SSC CGL 25/09/2024 (2nd Shift)
(a) 38 (b) 28 (c) 39 (d) 34

Q.220.



NOT TO SCALE

In the figure shown above, quadrilateral PQRS has its vertices on the circumference of the circle with centre O. If m∠QOS = 20x° and m∠QRS = 26x°, then what is the value of 'x' ?
SSC CGL 25/09/2024 (3rd Shift)
(a) 6 (b) 5 (c) 4 (d) 3

Q.221. For triangles, which of the following statement(s) are true?
(a) Sum of interior angles is 180°.
(b) All interior angles can't be equal.
(c) Can have at the most one obtuse angle.
(d) Sum of two sides may or may not be equal to the third side.
SSC CGL 26/09/2024 (1st Shift)
(a) (a) and (b) (b) (b), (c) and (d)
(c) (a), (b) and (d) (d) (a) and (c)

Q.222. If the angles of a triangle are in the ratio 7 : 8 : 3, then the value of the largest angle is:
SSC CGL 26/09/2024 (1st Shift)
(a) 120° (b) 80° (c) 100° (d) 60°

Q.223. △ABC is a right-angled triangle with ∠ABC = 90°. If m($\overline{AB}$) = 28 cm, and m($\overline{BC}$) = 96 cm, find the area (in cm²) of the circumcircle of △ABC. (Use π = 3.14.)
SSC CGL 26/09/2024 (1st Shift)
(a) 7,850 (b) 8,164 (c) 7,693 (d) 7,536

Q.224. The side BC of ΔABC is produced to a point D. If AC = BC and ∠BAC = 70°, then find the value of 2.5∠ACD − 1.5∠ABC.
SSC CGL 26/09/2024 (2nd Shift)
(a) 245° (b) 235° (c) 225° (d) 230°

Q.225. In ΔABC, DE || BC and 5AE = 3EC. If AB = 6.4 units, then the value of DB (in units) is:
SSC CGL 26/09/2024 (2nd Shift)
(a) 2.4 (b) 5 (c) 3.2 (d) 4

Q.226. In a circle with center O, an arc ABC subtends an angle of 138° at the centre of the circle. The chord AB is produced to a point P. Then, the measure of ∠CBP is:
SSC CGL 26/09/2024 (2nd Shift)
(a) 108° (b) 42° (c) 111° (d) 69°

Q.227. If the altitude from two vertices of a triangle to the opposite sides are equal, then the triangle will be:
SSC CGL 26/09/2024 (3rd Shift)
(a) isosceles triangle
(b) equilateral triangle
(c) scalene triangle
(d) obtuse angle triangle

Q.228. In a triangle PQR, ∠P + ∠Q = 84°. Find the value of ∠R .
SSC CGL 26/09/2024 (3rd Shift)
(a) 74° (b) 96° (c) 60° (d) 102°

Q.229. In triangle XYZ, A is a point on YZ such that XA = YA. If ∠XYA = 50° and ∠AXZ = 19°, what is the degree measure of ∠XZA.
SSC CGL 26/09/2024 (3rd Shift)
(a) 61° (b) 53° (c) 49° (d) 41°

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 2024 Tier - 1

Q.230. Given that the perimeters of two similar triangles, ΔABC and ΔDEF, are 24 cm and 9 cm, respectively, and DE = 3 cm, what is the ratio between the area of ΔABC and that of ΔDEF ?
SSC CHSL 01/07/2024 (1st Shift)
(a) 54 : 9 (b) 54 : 7 (c) 64 : 9 (d) 64 : 7

Q.231. Which of the following is a correct statement?
SSC CHSL 01/07/2024 (1st Shift)
(a) If two circles touch each other, the point of contact lies on the line joining the two centres.
(b) Equal chords are equidistant from the centre of the circle but not always subtend equal angle at centre of the circle
(c) The sum of the angles of a cyclic quadrilateral is always 180°.
(d) Angles subtended by the arc in the same segment of the circle are in ratio of 2 : 1.

Q.232. PQ is a diameter of a circle with centre O. The tangents at R meets PQ produced at A. If ∠RPQ = 27°, then measure of ∠RQP is:
SSC CHSL 01/07/2024 (2nd Shift)
(a) 63° (b) 54° (c) 27° (d) 153°

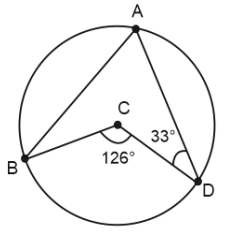
Q.233. Two circles touch each other at a point O. AB is a simple common tangent to both the circles touching at point A and point B. If radii of the circles are 9 cm and 4 cm, then find AB.
SSC CHSL 01/07/2024 (2nd Shift)
(a) 72 cm (b) 12 cm (c) 24 cm (d) 144 cm

Q.234. In a ΔABC, two medians AD and BE intersect at G at right angles. If AD = 18 cm and BE = 12 cm, then the length of BD is equal to:
SSC CHSL 01/07/2024 (2nd Shift)
(a) 15 cm (b) 10 cm (c) 20 cm (d) 8 cm

Q.235. CD is a tangent to a circle of circumference of 88 cm with its centre at O. OC cuts the circle at P while OD cuts circle at V such that ∠COD = 90°. Length of PC is 6 cm. What is half of CD (in cm) if OD exceeds OC by 1 cm ?
SSC CHSL 01/07/2024 (3rd Shift)
(a) 14.5 (b) 15.5 (c) 16.5 (d) 31

Q.236. In a triangle ABC, AB = 6 units, BC = 8 units and AC = 10 units. Let M be a point on AC such that BM = 5 units. With a point D, a triangle BMD is formed and the triangle BMD is similar to the triangle ABC with $\frac{BM}{AB} = \frac{BD}{AC}$ What is the length of BD in units ?
SSC CHSL 01/07/2024 (3rd Shift)
(a) $\frac{40}{3}$ (b) $\frac{10}{3}$ (c) $\frac{25}{3}$ (d) $\frac{35}{3}$

Q.237. Given is a circle with centre at C. A, B and D are the points on the circumference. Find ∠ABC.



SSC CHSL 01/07/2024 (4th Shift)
(a) 37° (b) 33° (c) 35° (d) 30°

Q.238. Diagonals of a trapezium ABCD with AB∥DC, intersect each other at the point 'O'. If AB = 2.5 CD, find the ratio of the area of triangle AOB to the area of triangle COD.
SSC CHSL 01/07/2024 (4th Shift)
(a) 16 : 1 (b) 25 : 4 (c) 9 : 2 (d) 5 : 2

Q.239. The areas of two similar triangles ΔPQR and ΔXYZ are 12.96 cm^2 and 635.04 cm^2, respectively. If QR = 2.9 cm, then the length (in cm) of YZ equals:
SSC CHSL 02/07/2024 (1st Shift)
(a) 23.2 (b) 25.2 (c) 30.4 (d) 20.3

Q.240. If ΔABC and ΔPQR are similar. AB = 8 cm, PQ = 12 cm, QR = 18 cm and RP = 24 cm, then the perimeter of ΔABC is _____ cm.
SSC CHSL 02/07/2024 (2nd Shift)
(a) 36 (b) 42 (c) 54 (d) 27

Q.241. Two circles of diameters 16 cm and 20 cm are such that the distance between their centers is 13 cm. What is the length (in cm) of a common tangent to these circles that does not intersect the line joining the centers ?
SSC CHSL 02/07/2024 (3rd Shift)
(a) $\sqrt{167}$ (b) $\sqrt{165}$ (c) $\sqrt{163}$ (d) $\sqrt{173}$

Q.242. If Δ ABC ~ Δ QRP; area of Δ ABC : area of Δ PQR = 9 : 4; AB = 18 cm and BC = 15 cm, then find the length of PR.
SSC CHSL 02/07/2024 (3rd Shift)
(a) 15 cm (b) 12 cm (c) 10 cm (d) 14 cm

Q.243. In ΔEFG, XY ∥ FG, area of the quadrilateral XFGY = 44 m^2 . If EX : XF = 2 : 3, then find the area of ΔEXY (in m^2).
SSC CHSL 02/07/2024 (4th Shift)
(a) 7.28 (b) 8.10 (c) 8.38 (d) 9.46

Q.244. Two circles touch each other externally at M. PQ is a direct common tangent to the two circles, P and Q are points of contact and ∠MPQ = 38°. ∠MQP is:
SSC CHSL 03/07/2024 (2nd Shift)
(a) 38° (b) 42° (c) 52° (d) 48°

Q.245. In a right-angled triangle ABC such that ∠BAC = 90° and AD is perpendicular to BC. If the area of ΔABC is 63 cm^2, area of ΔACD = 7 cm^2, and AC = 5 cm, then the length of BC is equal to:
SSC CHSL 03/07/2024 (2nd Shift)
(a) 10 cm (b) 18 cm (c) 12 cm (d) 15 cm

Q.246. A, B, C are three points such that AB = 11 cm, BC = 13 cm and AC = 24 cm. Number of circles passing through the points A, B, C is:
SSC CHSL 03/07/2024 (2nd Shift)
(a) 0 (b) 1 (c) 2 (d) 3

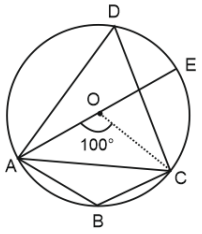
Q.247. A circle of diameter 26 cm has two equal parallel chords of length 10 cm each, then the distance between the two chords is:
SSC CHSL 03/07/2024 (2nd Shift)
(a) 21 cm (b) 24 cm (c) 26 cm (d) 23 cm

Q.248. PQ is parallel to SR in a trapezium PQRS. It is given that PQ > SR and the diagonals PR and QS intersect at O. If PO = 3 x − 15, OQ = x + 9, OR = x − 5 and OS = 5 and x has two values $x_1$and x_2, then the value of $(x_1^2 - x_2^2)$ is:
SSC CHSL 03/07/2024 (3rd Shift)
(a) 15 (b) 11 (c) 13 (d) 19

Q.249. If the perimeters of two similar triangles are in the ratio of 4 : 7, and the sum of the areas is 195 cm^2, then what is $\frac{1}{3}$ of the difference between the areas (in cm^2) of the two triangles?
SSC CHSL 03/07/2024 (4th Shift)
(a) 99 (b) 33 (c) 63 (d) 54

Q.250. Two parallel chords of length 8 units each are 6 units away from each other in a circle.
What is the radius of the circle in units?
SSC CHSL 03/07/2024 (4th Shift)
(a) 6 (b) 5 (c) 4 (d) 3

Q.251. In the given figure, O is the centre of the circle, AE is the diameter and ∠AOC = 100°.



The value of ∠CDE + ∠CEA is:
SSC CHSL 04/07/2024 (1st Shift)
(a) 90° (b) 60° (c) 80° (d) 100°

Q.252. There is a circle with a centre T and a radius of 8 cm. Two tangents KE and KI are drawn from point K, which is 17 cm from the centre. The area of the quadrilateral TEKI is:

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 04/07/2024 (1st Shift)
(a) 127.5 sq .cm (b) 130 sq .cm
(c) 136 sq .cm (d) 120 sq .cm

Q.253. ΔABC is a right-angled triangle where m∠ABC = 90°. If m($\overline{AB}$) = 15 cm, m($\overline{BC}$) = 20 cm, and $\overline{BD}$ ⊥ $\overline{AC}$, intersecting $\overline{AC}$ at the point D, find m($\overline{BD}$) (in cm).
SSC CHSL 04/07/2024 (1st Shift)
(a) 9 (b) 12 (c) 12.5 (d) 10

Q.254. In ΔABC, P and Q are the middle points of the sides AB and AC, respectively. R is a point on the segment PQ such that PR : RQ = 1 : 5. If PR = 6 cm, then BC = ____.
SSC CHSL 04/07/2024 (2nd Shift)
(a) 72 cm (b) 68 cm (c) 66 cm (d) 70 cm

Q.255. The measures of the three angles of a triangle are such that the smallest angle measures 42° less than the greatest angle, while the measure of the remaining angle is 24° more than the measure of the smallest angle. Find the measure of the smallest angle of the triangle.
SSC CHSL 04/07/2024 (2nd Shift)
(a) 40° (b) 42° (c) 36° (d) 38°

Q.256. In right triangle ABC with right angle at C, M is the mid - point of hypotenuse AB. C is joined to M and produced to a point D, such that DM = CM. Point D is joined to B. If CD = 10 cm, and BD = 6 cm, find the value of CM.
SSC CHSL 04/07/2024 (2nd Shift)
(a) 11.4 cm (b) 5 cm (c) 9.5 cm (d) 8 cm

Q.257. The centers of two circles of radii 25 cm and 35 cm are 80 cm apart. What is the ratio of the lengths of the transverse common tangent to the direct common tangent to these circles?
SSC CHSL 04/07/2024 (2nd Shift)
(a) $\sqrt{7}$: 3 (b) 2 : 3
(c) 2 : $\sqrt{7}$ (d) 3$\sqrt{7}$: 2

Q.258. A circle of diameter 26 cm has two equal chords of length 10 cm each, separated by a distance h cm. What is the value of h ?
SSC CHSL 04/07/2024 (3rd Shift)
(a) 16 (b) 18 (c) 24 (d) 12

Q.259. In a triangle ABC, AB = AC. BC is extended to D such that CD = AB and the angle ADC is 30°. What are the angles of triangle ABC ?
SSC CHSL 04/07/2024 (4th Shift)
(a) 60°, 60°, 60° (b) 50°, 60°, 70°
(c) 30°, 60°, 90° (d) 45°, 60°, 75°

Q.260. In a circle, O is the centre and AOB is the diameter. AT is a tangent to the circle. Line TB intersects the circle at Q . Given that ∠AOQ = 94°, find ∠ATQ .
SSC CHSL 04/07/2024 (4th Shift)
(a) 133° (b) 43° (c) 86° (d) 47°

Q.261. AB is parallel to DC in a trapezium ABCD. It is given that AB > DC and the diagonals AC and BD intersect at O. If AO = 3x - 15, OB = x + 9, OC = x - 5 and OD = 5, and x has two values x_1 and x_2 , then the value of ($x_1^2 + x_2^2$) is:
SSC CHSL 05/07/2024 (1st Shift)
(a) 45 (b) 56 (c) 61 (d) 73

Q.262. In triangle XYZ, XY = YZ and m∠X = 78°. Find the value of m∠Y.
SSC CHSL 05/07/2024 (1st Shift)
(a) 24° (b) 39° (c) 34° (d) 28°

Q.263. Two parallel chords are drawn in a circle of radius 25 cm. The distance between the two chords is 27 cm. If the length of one chord is 48 cm, then length of the other chord is equal to:
SSC CHSL 05/07/2024 (3rd Shift)
(a) 42 cm (b) 48 cm (c) 30 cm (d) 36 cm

Q.264. In a triangle ABC, BD is perpendicular to AC. E is a point on BC such that angle BEA = x°. If angle EAC = 38° and angle EBD = 40°, then the value of x is:
SSC CHSL 05/07/2024 (3rd Shift)
(a) 88 (b) 82 (c) 48 (d) 96

Q.265. If the angle of the sector with radius 7 cm is 120° then find the length of arc (in cm). (Use π = $\frac{22}{7}$)
SSC CHSL 05/07/2024 (3rd Shift)
(a) $\frac{67}{3}$ (b) $\frac{22}{3}$ (c) $\frac{47}{3}$ (d) $\frac{44}{3}$

Q.266. Let ABC be a triangle such that ∠ABC = 70° and ∠ACB = 50°. Let O be the incentre of the triangle. Find ∠BOC.
SSC CHSL 05/07/2024 (4th Shift)
(a) 120° (b) 130° (c) 100° (d) 60°

Q.267. Let C be a circle with center O and AB be a chord of C such that the length of AB is equal to the radius of C. Let D be any point on major arc of AB. Find ∠AOB and ∠ADB, respectively.
SSC CHSL 08/07/2024 (1st Shift)
(a) 60°; 30° (b) 90°; 60°
(c) 120°; 100° (d) 100°; 80°

Q.268. Two circles have radii of 27 cm and 36 cm. The distance between their centres is 45 cm. What is the length (in cm) of their common chord?
SSC CHSL 08/07/2024 (2nd Shift)
(a) 47.5 cm (b) 37.2 cm
(c) 40.5 cm (d) 43.2 cm

Q.269. Find the altitude (in cm) of side MT of triangle MNT with side MN = 36 cm, MT = 36 cm and NT = 48 cm.
SSC CHSL 08/07/2024 (3rd Shift)
(a) 18$\sqrt{3}$ (b) 16$\sqrt{5}$ (c) 12$\sqrt{5}$ (d) 24$\sqrt{3}$

Q.270. Side BC of a ΔABC is extended upto D such that CD = AC. If ∠BAD = 118° and ∠ACB = 80°, then the value of ∠ABC is equal to:
SSC CHSL 08/07/2024 (4th Shift)
(a) 36° (b) 27° (c) 22° (d) 32°

Q.271. Two triangles ABC and DEF are similar. The smallest side of ABC is equal to 15 units. If the sides of ABC are in the ratio 3 : 4 : 5, and the area of DEF is half of the area of ABC, then what is the largest side of DEF (in units) ?
SSC CHSL 08/07/2024 (4th Shift)
(a) $\frac{25}{\sqrt{3}}$ (b) $\frac{25}{\sqrt{2}}$ (c) 25$\sqrt{2}$ (d) 25$\sqrt{3}$

Q.272. The hypotenuse of a right triangle is 6m more than twice the shortest side. If the third side is 2 m less than the hypotenuse, find the area(in m^2) of the triangle.
SSC CHSL 09/07/2024 (1st Shift)
(a) 110 (b) 100 (c) 120 (d) 130

Q.273. Find the length of the sides of a triangle, if its angles are in the ratio 2 : 4 : 6 and its circumradius is 12 cm.
SSC CHSL 09/07/2024 (1st Shift)
(a) 6cm, 6$\sqrt{3}$ cm, 12 cm
(b) 5 cm, 6 cm, 10 cm
(c) 15 cm, 15$\sqrt{3}$ cm, 30 cm
(d) 12 cm, 12$\sqrt{3}$ cm, 24 cm

Q.274. PQ is the diameter of a circle with centre O. PT is a tangent touching the circle at P.
The secant QT intersects the circle at S. O and S are joined. If ∠ SOP = 104°, what is the measure (in degrees) of ∠PTQ?
SSC CHSL 09/07/2024 (2nd Shift)
(a) 45 (b) 62 (c) 76 (d) 38

Q.275. △XYZ is similar to △PQR. If the ratio of the perimeter of △XYZ to the perimeter of △PQR is 16 : 9 and PQ = 3.6 cm, then what is the length (in cm) of XY?
SSC CHSL 09/07/2024 (2nd Shift)
(a) 3$\frac{4}{5}$ (b) 2$\frac{3}{5}$ (c) 6$\frac{2}{5}$ (d) 4$\frac{3}{5}$

Q.276. Consider AD is a tangent to a circle of radius 6 cm. AC is a secant meeting the circle at B and CD is a diameter. If AB is 7 cm, then the value of AC (in cm) is:
SSC CHSL 09/07/2024 (2nd Shift)
(a) 16 (b) 20 (c) 9 (d) 18

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.277. The sides ST and TR and the median SU of the Δ STR are equal to the sides MN and NJ and the median MV of the ΔMNJ, respectively. If ∠TSU = 46°, ∠NMJ = 79°and ∠MVN = 88°, what is the degree measure of $\frac{7}{11}$∠SRT ?
SSC CHSL 09/07/2024 (3rd Shift)
(a) 35° (b) 56° (c) 47° (d) 55°

Q.278. The lengths of the three sides of a triangle are 19 cm, 25 cm and y cm. Which of the following options most accurately gives the possible values of 'y'?
SSC CHSL 09/07/2024 (4th Shift)
(a) 6 ≤ y ≤ 44 (b) 6 < y < 44
(c) 6 < y ≤ 44 (d) 6 ≤ y < 44

Q.279. If three sides of a triangle are 6 cm, 8 cm and 10 cm, then the area of the triangle is:
SSC CHSL 09/07/2024 (4th Shift)
(a) 24 cm^2 (b) $12\sqrt{3}$ cm^2
(c) $24\sqrt{3}$ cm^2 (d) 30 cm^2

Q.280. By decreasing 17° from each angle of a triangle, the ratio of their angles is 3 : 4 : 7. The radian measure of the greatest angle is:
SSC CHSL 09/07/2024 (4th Shift)
(a) $\frac{153\pi}{360}$ (b) $\frac{167\pi}{180}$ (c) $\frac{163\pi}{180}$ (d) $\frac{163\pi}{360}$

Q.281. R wishes to use a stick of length 6 units as a common internal tangent to two circles of radius two units and three units. What can be the maximum distance (in units) between the centres of the circle?
SSC CHSL 10/07/2024 (1st Shift)
(a) $\sqrt{67}$ (b) $\sqrt{33}$ (c) $\sqrt{37}$ (d) $\sqrt{61}$

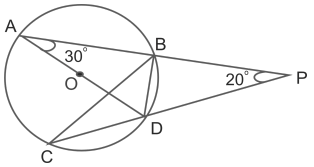
Q.282. A line from point A is drawn that is tangent to the circle at point B. A secant is also drawn from point A to the circle intersecting it at points C and D. If AB = 42 cm and AC = 21 cm, then what is the ratio between AB and CD?
SSC CHSL 10/07/2024 (2nd Shift)
(a) 3 : 2 (b) 2 : 5 (c) 3 : 4 (d) 2 : 3

Q.283. The sides AB and AC of △ABC are produced to points D and E, respectively. The bisectors of ∠CBD and ∠BCE meet at P. If ∠A = 72°, then the measure of ∠P is:
SSC CHSL 10/07/2024 (3rd Shift)
(a) 65° (b) 54° (c) 55° (d) 35°

Q.284. Let ABCD be a quadrilateral and AC, BD be diagonals. The length of BD = 20 cm and the heights of the triangles ABD and BCD are, respectively, 6 cm, 8 cm. Find the area of the quadrilateral ABCD (in cm²).
SSC CHSL 10/07/2024 (3rd Shift)
(a) 140 (b) 1282 (c) 148 (d) 120

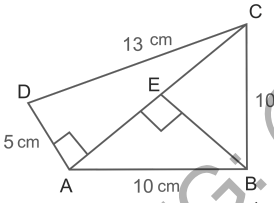
Q.285. In ΔABC , if AB = $\sqrt{3}$ units. BC = 1 unit and AC = 2 units, then ∠ACB is equal to:
SSC CHSL 10/07/2024 (4th Shift)
(a) 30° (b) 90° (c) 60° (d) 45°

Q.286. PBA and PDC are two secants. AD is the diameter of the circle with the centre at O. ∠A = 30°, ∠P = 20°. Find the measure of ∠DBC.



SSC CHSL 11/07/2024 (1st Shift)
(a) 45° (b) 30° (c) 50° (d) 40°

Q.287. What is the area of a quadrilateral ABCD. (shown below) in which sides AB and BC are equal, sides AD and CD are of lengths 5 cm and 13 cm, respectively, and side AD is perpendicular to the diagonal AC ?



SSC CHSL 11/07/2024 (1st Shift)
(a) 78 cm² (b) 75 cm²
(c) 82 cm² (d) 80 cm²

Q.288. Find the altitude (in cm) from the vertex Q to side PR of triangle PQR with side lengths PQ = 40 cm, PR = 40 cm and QR = 60 cm.
SSC CHSL 11/07/2024 (1st Shift)
(a) $25\sqrt{7}$ (b) $20\sqrt{7}$ (c) $15\sqrt{7}$ (d) $30\sqrt{7}$

Q.289. Which of the following is NOT true regarding a circle?
SSC CHSL 11/07/2024 (2nd Shift)
(a) Given any three points in a plane, there is always a circle passing through these points
(b) The largest chord in a circle has a length twice its radius
(c) The ratio of the perimeter and radius of a circle is always constant
(d) A triangle with vertices on a circle and one side as its diameter is a right-angled triangle

Q.290. ΔABC~ΔEDF and area(ΔABC): area (ΔEDF) = 1 : 4. If AB = 7 cm, BC = 8 cm and CA = 9 cm, then DF is equal to:
SSC CHSL 11/07/2024 (3rd Shift)
(a) 14 cm (b) 12 cm (c) 18 cm (d) 16 cm

Q.291. Let C be a circle with center O and PQ be the diameter of C. Let AB be a chord on C. If ∠QOB = 40°, ∠AOP = 80°, then find ∠AOB.
SSC CHSL 11/07/2024 (3rd Shift)
(a) 70° (b) 90° (c) 100° (d) 60°

Q.292. If L is the midpoint of side BC of Δ ABC and the area of ΔABL is 15 cm², then the area (in sq cm) of ΔABC is:
SSC CHSL 11/07/2024 (4th Shift)
(a) 32 (b) 27 (c) 30 (d) 25

Q.293. A right angled triangle of area 600 m² is to be made such that the hypotenuse is double the base. For the triangle, the hypotenuse is _____ more than the base.
SSC CHSL 11/07/2024 (4th Shift)
(a) 26.32 m (b) 22.32 m
(c) 24.36 m (d) 20.36 m

SSC CPO 2024 Tier - 1

Q.294. From an external point A, tangents AP and AQ are drawn to a circle with centre O. If ∠ APQ = 40°, then find ∠ POQ .
SSC CPO 27/06/2024 (1st Shift)
(a) 110° (b) 100° (c) 60° (d) 80°

Q.295. What is the length of the arc of a circle whose radius is 35 cm and whose arc subtends an angle of 72° at the centre of the circle?
SSC CPO 27/06/2024 (2nd Shift)
(a) 28 cm (b) 44 cm (c) 38 cm (d) 56 cm

Q.296. In a ΔABC, angle BAC = 30° and angle BCA = 60°. If AC = 13 cm and AB = 12 cm, then BC is equal to:
SSC CPO 27/06/2024 (3rd Shift)
(a) 6 cm (b) 5 cm (c) 4 cm (d) 7 cm

Q.297. Triangle DEF is an equilateral triangle with a side length of 12 cm. If point G is the mid-point of side DE, what is the length (in cm) of side FG?
SSC CPO 27/06/2024 (3rd Shift)
(a) 6 (b) $6\sqrt{3}$ (c) 12 (d) $3\sqrt{6}$

Q.298. Which of the following statements is/are correct ?
A. A triangle can have all angles less than 60°.
B. A triangle can have one obtuse angle.
C. A triangle can have two right angles.
D. A triangle can have two acute angles.
SSC CPO 28/06/2024 (1st Shift)
(a) B (b) B and D (c) A and C (d) A

Q.299. If one angle of triangle PQR is greater than the sum of the other two, the triangle PQR will be:
SSC CPO 29/06/2024 (1st Shift)
(a) obtuse angle (b) equilateral
(c) right angle (d) acute angle

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.300. Taking any three of the line segments out of segments of length 2 cm, 5 cm, 7 cm and 8 cm, the number of triangles that can be formed is:
SSC CPO 29/06/2024 (2nd Shift)
(a) 2 (b) 4 (c) 1 (d) 3

Q.301. The secant CD intersects the circle at E and CF is tangent to the circle at F. If the length of the secant CD is equal to 20 cm and the length of tangent CF is 15 cm, find the length of the chord DE.
SSC CPO 29/06/2024 (2nd Shift)
(a) 3.75 cm (b) 11.25 cm
(c) 9.25 cm (d) 8.75 cm

Q.302. A scalene triangle ABC has two sides whose measures are 3.8 cm and 6 cm, respectively. Which of the following CANNOT be the measure (in cm) of its third side?
SSC CPO 29/06/2024 (3rd Shift)
(a) 3.0 (b) 2.7 (c) 2.4 (d) 2.2

SSC Selection Post (Phase - XII)

Q.303. If the vertical angle of an isosceles triangle is 42°, then the measure of the other two angles will be:
Higher Secondary 20/06/2024 (Shift - 2)
(a) 59° and 59° (b) 79° and 79°
(c) 89°and 89° (d) 69° and 69°

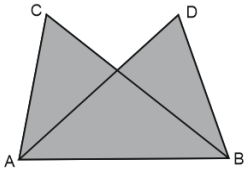
Q.304. ΔABC is inscribed in a circle with centre O. If AB = 35 cm, BC = 12 cm and AC = 37 cm, then what is the circumradius of a triangle ?
Higher Secondary 21/06/2024 (Shift - 2)
(a) 13.5 cm (b) 16.5 cm
(c) 18.5 cm (d) 14.5 cm

Q.305. In a parallelogram ABCD, if vertices are in respective order and diagonals AC and BD intersect at O, then which of the following is NOT always correct ?
Higher Secondary 21/06/2024 (Shift - 2)
(a) ΔAOB ≅ ΔCOD (b) ΔAOD ≅ ΔCOD
(c) ΔABC ≅ ΔADC (d) ΔBOC ≅ ΔAOD

Q.306. In ΔABC, D is the mid-point of BC and G is the centroid. If GD = 10 cm, then the length of AD is _____ .
Higher Secondary 24/06/2024 (Shift - 2)
(a) 20 cm (b) 10 cm (c) 15 cm (d) 30 cm

Q.307. In a triangle ABC, P is the midpoint of BC. If AB = $(2x + 4)$ cm, AC = 6 cm and AP ⊥ BC, then the value of x is:
Higher Secondary 24/06/2024 (Shift - 2)
(a) 3 (b) 4 (c) 1 (d) 2

Q.308. ΔABC and ΔABD are on a common base AB and AC = BD and BC = AD as shown in the given figure.



Which of the following options is true ?
Higher Secondary 25/06/2024 (Shift - 4)
(a) There are no congruent triangles in the given figure
(b) ΔABC ≅ ΔABD
(c) ΔABC ≅ ΔBAD
(d) ΔABC ≅ ΔADB

Q.309. In an isosceles ΔLMN, LM = LN, and ∠MLN = 37°. Find ∠MNL.
Higher Secondary 26/06/2024 (Shift - 2)
(a) 70.0° (b) 65.0° (c) 71.5° (d) 60.5°

Q.310. If x^2 -1, 2x and x^2 + 1 are the three sides of a right angled triangle, then which of the following can be its hypotenuse ?
Graduate Level 20/06/2024 (Shift - 3)
(a) $x^2 + 1$ (b) x^2 (c) 2x (d) $x^2 - 1$

Q.311. PQ is a diameter of a circle and PS is a chord. If PQ is 82 cm and PS is 80 cm, the distance (in cm) of PS from the center of the circle is:
Graduate Level 20/06/2024 (Shift - 3)
(a) 18 (b) 9 (c) 39 (d) 24

Q.312. If the angles of a triangle are in the ratio of 9 : 11 : 16, then the difference between the greatest angle and the smallest angle is :
Graduate Level 21/06/2024 (Shift - 3)
(a) 30° (b) 25° (c) 40° (d) 35°

Q.313. In ΔABC and ΔPQR, AB = 7 m, BC = 8 m, AC = 9 m, PQ = 7 m, QR = 8 m and PR = 9 m.
Which of the following is true for these triangles ?
Graduate Level 21/06/2024 (Shift - 3)
(a) ΔCBA ≅ ΔPQR (b) ΔABC ≅ ΔPQR
(c) ΔABC ≅ ΔRQP (d) ΔABC ≅ ΔQRP

Q.314. Select the correct statement about the properties of a triangle.
Graduate Level 24/06/2024 (Shift - 3)
(a) The sum of two sides is always greater than the third side.
(b) The sum of two sides may be equal to the third side.
(c) The sum of two sides is always equal to the third side.
(d) The sum of two sides is always less than the third side.

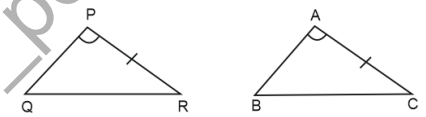
Q.315. ΔPQR and ΔABC are two congruent triangles. If the area of ΔPQR is 225 cm^2 , then the area of ΔABC is:
Graduate Level 25/06/2024 (Shift - 3)
(a) 15 cm^2 (b) 112.5 cm^2
(c) 25 cm^2 (d) 225 cm^2

Q.316. If three angles of a triangle are $(18x + 6°)$, $(10x + 30°)$ and $(15x + 15°)$, then the triangle is:
Graduate Level 25/06/2024 (Shift - 3)
(a) scalene (b) equilateral
(c) isosceles (d) right angled

Q.317. ΔXYZ is an isosceles triangle such that XY = XZ. It is given that YS ⊥ XZ and ZT ⊥ XY. What is the relation between YS and ZT ?
Graduate Level 26/06/2024 (Shift - 3)
(a) YS > ZT (b) YS = 2 ZT
(c) YS < ZT (d) YS = ZT

Q.318. In ΔABC, AB = 9 cm and AC = 13 cm, then the length of BC could be:
Graduate Level 26/06/2024 (Shift - 4)
(a) 4 cm (b) 2 cm (c) 22 cm (d) 20 cm

Q.319. In the following figure, ∠A = ∠P and AC = PR.



Which of the following options needs to be satisfied for Δ PQR and Δ ABC to be congruent ?
Graduate Level 26/06/2024 (Shift - 4)
(a) BC = QR by ASS criteria
(b) AB = PQ by SAS criteria
(c) BC = QR by SSA criteria
(d) AB = PQ by SSA criteria

SSC CHSL 2023 Tier - 2

Q.320. Let ABC and PQR be two congruent triangles, such that ∠A = ∠P = 90°. If BC = 29 cm, PR = 21 cm, find the value (in cm) of AB.
SSC CHSL Tier II (02/11/2023)
(a) 23 (b) 19 (c) 20 (d) 22

Q.321. In ΔABC, ∠A = 85° and ∠C = 58°. If ΔPQR is similar to ΔABC, and in correspondence, then find ∠Q .
SSC CHSL Tier II (02/11/2023)
(a) 37° (b) 85° (c) 58° (d) 73°

Q.322. In △XYZ, if XY = 5 cm, XZ = 7 cm and Q is a point on YZ such that XQ bisects ∠X, then YQ : QZ is:
SSC CHSL Tier II (10/01/2024)
(a) 5 : 7 (b) 7 : 12 (c) 7 : 5 (d) 5 : 12

Q.323. The measures of two angles of a triangle are in the ratio 3 : 7. If the sum of these two measures is equal to the measure of the third angle, then find the smallest angle.
SSC CHSL Tier II (10/01/2024)
(a) 27° (b) 3° (c) 9° (d) 36°

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 2023 Tier - 2

Q.324. An equilateral triangle ABC surmounts a square BCDE. The value of ∠EAB + 3∠AEB is :
SSC CGL Tier II (26/10/2023)
(a) 60° (b) 80° (c) 280° (d) 240°

Q.325. One chord of a circle is given as 20.5 cm. Then the radius (r) of the circle must be:
SSC CGL Tier II (26/10/2023)
(a) r = 10cm (b) r < 10.25
(c) r > 10.25 (d) r ≥ 10.25

SSC CPO 2023 Tier - 1

Q.326. If the hypotenuse of a right-angled triangle is 29 cm and the sum of the other two sides is 41 cm, then the difference between the other two sides is:
SSC CPO 03/10/2023 (1st Shift)
(a) 2 cm (b) 5 cm (c) 10 cm (d) 1 cm

Q.327. For a triangle ABC, D and E are two points on AB and AC such that AD = $\frac{1}{6}$ AB, AE = $\frac{1}{6}$AC. If BC = 22 cm, then DE is _____. (Consider up to two decimals)
SSC CPO 03/10/2023 (2nd Shift)
(a) 3.67 cm (b) 1.67 cm
(c) 1.33 cm (d) 3.33 cm

Q.328. A sector of a circle has a central angle of 45° and an arc length of 22 cm. Find the radius of the circle.
(Use $\pi = \frac{22}{7}$)
SSC CPO 03/10/2023 (2nd Shift)
(a) 28 cm (b) 35 cm (c) 36 cm (d) 32 cm

Q.329. In two circles centered at O and O', the distance between the centers of both circles is 17 cm. The points of contact of a direct common tangent between the circles are P and Q . If the radii of both circles are 7 cm and 15 cm, respectively, then the length of PQ is equal to:
SSC CPO 03/10/2023 (3rd Shift)
(a) 15 cm (b) 22 cm (c) 10 cm (d) 17 cm

Q.330. PQR is a triangle. The bisectors of the internal angle ∠Q and external angle ∠R intersect at S. If ∠QSR = 40°, then ∠P is:
SSC CPO 04/10/2023 (1st Shift)
(a) 80° (b) 60° (c) 40° (d) 30°

Q.331. E, F, G, and H are four points lying on the circumference of a circle to make a cyclic quadrilateral. If ∠FGH = 57°, then what will be the measure of the ∠HEF ?
SSC CPO 04/10/2023 (1st Shift)
(a) 33° (b) 143° (c) 123° (d) 93°

Q.332. In a Δ PQR, ∠P : ∠Q : ∠R = 3 : 4 : 8. The shortest side and the longest side of the triangle, respectively, are:
SSC CPO 04/10/2023 (2nd Shift)
(a) QR and PR (b) PQ and PR
(c) PQ and QR (d) QR and PQ

Q.333. In a triangle ABC, if ∠B = 90°, ∠C = 45° and AC = 4 cm, then the value of BC is :
SSC CPO 04/10/2023 (2nd Shift)
(a) 4 cm (b) $2\sqrt{2}$ cm
(c) $4\sqrt{2}$ cm (d) $\sqrt{2}$ cm

Q.334. Find the area of a triangle whose length of two sides are 4 cm and 5 cm and the angle between them is 45°.
SSC CPO 04/10/2023 (2nd Shift)
(a) $7\sqrt{2}\ cm^2$ (b) $4\sqrt{2}\ cm^2$
(c) $6\sqrt{2}\ cm^2$ (d) $5\sqrt{2}\ cm^2$

Q.335. Let ABC, PQR be two congruent triangles such that ∠A = ∠P = 90°. If BC = 17 cm, PR = 8 cm, find AB (in cm).
SSC CPO 04/10/2023 (2nd Shift)
(a) 9 (b) 14 (c) 12 (d) 15

Q.336. Out of two concentric circles, the radius of the outer circle is 6 cm and the chord PQ of the length 10 cm is a tangent to the inner circle. Find the radius (in cm) of the inner circle.
SSC CPO 05/10/2023 (2nd Shift)
(a) $\sqrt{11}$ (b) $\sqrt{7}$ (c) $\sqrt{13}$ (d) 4

Q.337. The chord of a circle is equal to its radius. Find the difference between the angle subtended by this chord at the minor arc and major arc of the circle.
SSC CPO 05/10/2023 (3rd Shift)
(a) 30° (b) 120° (c) 150° (d) 60°

Q.338. In ΔABC with sides 8 cm, 9 cm and 12 cm, the angle bisector of the largest angle divides the opposite sides into two segments. What is the length of the shorter segment?
SSC CPO 05/10/2023 (3rd Shift)
(a) $5\frac{11}{17}$ cm (b) $6\frac{13}{17}$ cm
(c) $4\frac{11}{17}$ cm (d) $3\frac{9}{17}$ cm

SSC CHSL 2023 Tier - 1

Q.339. A tangent AB at point A of a circle of radius 6 cm meets a line through the centre O at point B. If OB = 10 cm, then the length of AB (in cm) is equal to:
SSC CHSL 02/08/2023 (1st Shift)
(a) 5 (b) 6 (c) 4 (d) 8

Q.340. Which of the following sets of angles forms a triangle?
SSC CHSL 02/08/2023 (2nd Shift)
(a) 60°, 70°, 80° (b) 60°, 70°, 30°
(c) 60°, 40°, 80° (d) 60°, 50°, 80°

Q.341. Two triangles MNO and XYZ are given similar with the ratio of their side as 9 : 4. If the area of the larger triangle is 243 sq .cm, then the area of smaller triangle will be:
SSC CHSL 02/08/2023 (3rd Shift)
(a) 162 sq .cm (b) 28 sq .cm
(c) 48 sq .cm (d) 16 sq .cm

Q.342. In a circle of radius 14 cm, an arc subtends an angle of 90° at the centre. The length of arc (in cm) is equal to:
Take ($\pi = \frac{22}{7}$)
SSC CHSL 02/08/2023 (3rd Shift)
(a) 22 (b) 18 (c) 20 (d) 24

Q.343. AB is a chord of the circle and AOC is its diameter such that angle ACB = 65°. If AT is the tangent to the circle at the point A, then angle BAT is equal to:
SSC CHSL 02/08/2023 (4th Shift)
(a) 65° (b) 75° (c) 55° (d) 40°

Q.344. ΔPQR and Δ SQR are both isosceles triangles on a common base QR such that P and S lie on the same side of QR. If ∠QSR = 60° and ∠QPR = 100°, then find ∠SRP.
SSC CHSL 03/08/2023 (1st Shift)
(a) 80° (b) 60° (c) 100° (d) 20°

Q.345. Which option with given sides forms a Triangle?
SSC CHSL 03/08/2023 (2nd Shift)
(a) 8, 6, 9 (b) 100, 200, 300
(c) 10, 25, 11 (d) 8, 2,6

Q.346. In a triangle PQR, QR is produced to S. If ∠PRS = (9x - 15)°, ∠RPQ = (2x)° and ∠PQR = (4x + 15)°, what is the value of x ?
SSC CHSL 03/08/2023 (3rd Shift)
(a) 55° (b) 20° (c) 10° (d) 75°

Q.347. If in ΔPQR and ΔDEF, ∠P = 52°, ∠Q = 74°, ∠R = 54°, ∠D = 54°, ∠E = 74° and ∠F = 52°, then which of the following is correct?
SSC CHSL 03/08/2023 (3rd Shift)
(a) $\Delta PQR \sim \Delta FED$ (b) $\Delta RQP \sim \Delta FED$
(c) $\Delta PRQ \sim \Delta FED$ (d) $\Delta PQR \sim \Delta DEF$

Q.348. Minor arc BC subtends angles BAC and BDC at points A and D, respectively, on the circumference in the major sector of the circle with centre O. What is the value (in degrees) of (∠ABC + ∠ACB), if ∠BDC = 73° ?
SSC CHSL 03/08/2023 (4th Shift)
(a) 117° (b) 107° (c) 103° (d) 113°

Q.349. In ΔABC, the internal bisectors of ∠ABC and ∠ACB meet at X and ∠BAC =

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

30°. The measure of ∠BXC is:
SSC CHSL 03/08/2023 (4th Shift)
(a) 120° (b) 115° (c) 105° (d) 150°

Q.350. In triangle RST, M and N are two points on RS and RT such that MN is parallel to the base ST of the triangle RST. If RM = $\frac{1}{3}$ MS, and ST = 5.6 cm, what is the ratio of $\frac{Area\ of\ Triangle\ RMN}{Area\ of\ Trapezium\ MNST}$?
SSC CHSL 04/08/2023 (1st Shift)
(a) $\frac{14}{15}$ (b) $\frac{15}{16}$ (c) $\frac{1}{15}$ (d) $\frac{1}{16}$

Q.351. If two tangents inclined at an angle 120° are drawn to a circle of radius 6 cm, then what is the length (in cm) of each tangent ?
SSC CHSL 04/08/2023 (1st Shift)
(a) $3\sqrt{3}$ (b) $2\sqrt{3}$ (c) $4\sqrt{3}$ (d) $\sqrt{3}$

Q.352. PS and PT are two tangents from a point P outside the circle with centre O. If S and T are points on the circle such that ∠SPT = 130°, then the degree measure of ∠OST is equal to:
SSC CHSL 04/08/2023 (2nd Shift)
(a) 25° (b) 55° (c) 65° (d) 35°

Q.353. In a rhombus STUV, S and U are joined ∠SUV = 44°, ∠STU = 92°, what is the degree measure of 4 ∠SVU – 3∠TSU?
SSC CHSL 04/08/2023 (2nd Shift)
(a) 451° (b) 360° (c) 169° (d) 236°

Q.354. MN is the diameter of a circle with centre O. P and S are two points on the circumference of the circle on either side of MN, such that ∠PMN = 50° and ∠MNS = 35°. What is the degree measure of the difference of ∠PMS and ∠PNS ?
SSC CHSL 04/08/2023 (3rd Shift)
(a) 25° (b) 55° (c) 65° (d) 30°

Q.355. ΔABC ~ ΔPQR, AB = 12 cm, PQ = 18 cm and the perimeter of ΔABC is 45 cm. Find the perimeter of ΔPQR.
SSC CHSL 04/08/2023 (3rd Shift)
(a) 60 cm (b) 30 cm
(c) 67.5 cm (d) 70 cm

Q.356. The sides of similar triangle ΔABC and ΔDEF are in the ratio of $\frac{\sqrt{3}}{\sqrt{5}}$. If the area of ΔABC is 90 cm², then the area of ΔDEF (in cm²) is:
SSC CHSL 04/08/2023 (4th Shift)
(a) 150 (b) 152 (c) 154 (d) 156

Q.357. The radius of a circle is 21 cm. What will be the length (in cm) of an arc of the circle that subtends a 22.5° angle at the center? (user π = $\frac{22}{7}$)
SSC CHSL 04/08/2023 (4th Shift)
(a) 8.25 (b) 7.75 (c) 8.50 (d) 7.50

Q.358. One angle of an isosceles obtuse triangle is $28\frac{1}{2}^{\circ}$. Find the measure of its obtuse angle in degrees.
SSC CHSL 07/08/2023 (1st Shift)
(a) 132° (b) 112° (c) 121° (d) 123°

Q.359. In ΔABC and ΔPQR, B = Q, C = R and AB = 2PQ, then the two triangles are _____.
SSC CHSL 07/08/2023 (1st Shift)
(a) congruent as well as similar
(b) neither similar nor congruent
(c) similar but not congruent
(d) congruent but not similar

Q.360. If the angles P, Q and R of ΔPQR satisfy the relation 2 R - P = Q - R, then find the measure of ∠R.
SSC CHSL 07/08/2023 (1st Shift)
(a) 45° (b) 60° (c) 50° (d) 55°

Q.361. If the radius of a circle is 8 cm, then find the length of its largest chord.
SSC CHSL 07/08/2023 (2nd Shift)
(a) 16 cm (b) 64 cm (c) 8 cm (d) 4 cm

Q.362. In a square ABCD, E is a point inside the square such that ΔDEC is an equilateral triangle. If E is joined to vertices A and B of the square, what is the degree measure of ∠AEB?
SSC CHSL 07/08/2023 (2nd Shift)
(a) 135° (b) 150° (c) 210° (d) 225°

Q.363. At one end of a diameter PQ of a circle of radius 8 cm a tangent APB is drawn to the circle. Find the length of the chord RS, which is parallel to AB and at a distance of 12 cm from P.
SSC CHSL 07/08/2023 (3rd Shift)
(a) 6√3 cm (b) 4√3 cm
(c) 2√3 cm (d) 8√3 cm

Q.364. The perpendicular distance from the centre of a circle to the chord is 20 cm. Calculate the chord's length in centimetres if the circle's diameter is 58 cm.
SSC CHSL 07/08/2023 (4th Shift)
(a) 42 (b) 21 (c) 56 (d) 28

Q.365. The diameter PQ of a circle with centre O is perpendicular to the chord RS. PQ intersects RS at T. If RS = 16 cm and QT = 4 cm, what is the length (in cm) of the diameter of the circle?
SSC CHSL 07/08/2023 (4th Shift)
(a) 20 (b) 48 (c) 24 (d) 10

Q.366. Half of the length of the chord of a circle is 12 cm and the perpendicular distance between the centre and the chord is 5 cm. The radius of the circle is:
SSC CHSL 08/08/2023 (1st Shift)
(a) 12 cm (b) 13 cm (c) 10 cm (d) 24 cm

Q.367. ΔLON and ΔLMN are two right-angled triangles with common hypotenuse LN such that ∠LON = 90° and ∠LMN = 90°. LN is the bisector of ∠OLM. If LN = 29 cm and ON = 20 cm, then what is the perimeter (in cm) of ΔLMN ?
SSC CHSL 08/08/2023 (3rd Shift)
(a) 67 (b) 62 (c) 65 (d) 70

Q.368. In ΔABC, ∠A = 5x - 60°, ∠B = 2x + 40°, ∠C = 3x - 80°. find m ∠A.
SSC CHSL 08/08/2023 (3rd Shift)
(a) 75° (b) 90° (c) 80° (d) 60°

Q.369. If the two interior opposite angles of an exterior angle of a triangle are 35° and 65°, then the measurement of the exterior angle is:
SSC CHSL 08/08/2023 (4th Shift)
(a) 135° (b) 125° (c) 100° (d) 90°

Q.370. In a triangle ABC, AP, the bisector of ∠A, is perpendicular to BC at point P. The measures of BP and PC are x and 3y, respectively. The measures of AB and AC are 4x and (5y + 21), what is the value of (x + y) ?
SSC CHSL 08/08/2023 (4th Shift)
(a) 21 (b) 15 (c) 12 (d) 18

Q.371. The largest chord of the circle is:
SSC CHSL 09/08/2023 (1st Shift)
(a) point (b) tangent
(c) diameter (d) radius

Q.372. Chords $\overline{AB}$ and $\overline{CD}$ of a circle intersect inside the circle at point F. If m($\overline{AF}$) = 2.4 cm, m($\overline{BF}$) = 1.8 cm, and m($\overline{CD}$) = 5.7 cm, what is the length (in cm) of the longer of the two line segments, $\overline{CF}$ and $\overline{DF}$?
SSC CHSL 09/08/2023 (1st Shift)
(a) 4.5 (b) 4.8 (c) 5.4 (d) 3.6

Q.373. Let ABC and PQR be two congruent right-angled triangles such that ∠A = ∠P = 90°. If BC = 13 cm and PR = 12 cm, then find the length of AB.
SSC CHSL 09/08/2023 (2nd Shift)
(a) 25 cm (b) 20 cm (c) 10 cm (d) 5 cm

Q.374. Δ ABC is an equilateral triangle. The side BC is produced to point D. If A joines D and BC = CD, then the degree measure of angle CAD is equal to:
SSC CHSL 09/08/2023 (3rd Shift)
(a) 30° (b) 15° (c) 45° (d) 18°

Q.375. The lengths of two parallel chords of a circle are 10 cm and 24 cm lie on the opposite sides of the centre. If the smaller chord is 12 cm from the centre, what is the distance (in cm) between the

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

two chords ?
SSC CHSL 09/08/2023 (4th Shift)
(a) 13 (b) 5 (c) 17 (d) 12

Q.376. In ΔABC, P and Q are the middle points of the sides AB and AC, respectively. R is point on the segment PQ such that PR : RQ = 1 : 3. If PR = 6 cm, then BC:
SSC CHSL 09/08/2023 (4th Shift)
(a) 46 cm (b) 48 cm (c) 44 cm (d) 50 cm

Q.377. In a circle of radius 8 units, a chord of length 10 units is drawn. What is the perpendicular distance of the chord from the centre of the circle in units?
SSC CHSL 10/08/2023 (2nd Shift)
(a) $\sqrt{39}$ Unit (b) $\sqrt{35}$ Unit
(c) $\sqrt{30}$ Unit (d) $\sqrt{33}$ Unit

Q.378. In a circle, an are subtends an angle of 84° at the centre. If the length of the arc is 22 cm, then the radius of the circle (in cm) is equal to: Take $\pi = \frac{22}{7}$
SSC CHSL 10/08/2023 (2nd Shift)
(a) 19 (b) 15 (c) 17 (d) 13

Q.379. In triangle STU, V is a point on the side ST and W is a point on the side SU such that VWUT is a trapezium. Given that VW : TU = 2 : 7, what is the ratio of area of trapezium VWUT to the area of the triangle STU?
SSC CHSL 10/08/2023 (2nd Shift)
(a) 4 : 49 (b) 4 : 45
(c) 45 : 49 (d) 49 : 81

Q.380. The sides of a triangle are 20 cm, 21 cm and 29 cm. The area of the triangle formed by joining the mid points of the sides of triangle will be:
SSC CHSL 10/08/2023 (3rd Shift)
(a) $67\frac{2}{3}\ cm^2$ (b) $52\frac{1}{2}\ cm^2$
(c) $47\frac{1}{2}\ cm^2$ (d) $58\frac{1}{3}\ cm^2$

Q.381. If the triangles ABC and PQR are similar and if ∠A = 35°, ∠B = 65° then ∠R = _____ .
SSC CHSL 10/08/2023 (3rd Shift)
(a) 80° (b) 90° (c) 35° (d) 65°

Q.382. If one diagonal of a rhombus is equal to its side, then the diagonals of the rhombus are in the ratio of:
SSC CHSL 10/08/2023 (3rd Shift)
(a) $\sqrt{3} : \sqrt{6}$ (b) $\sqrt{2} : 1$ (c) $\sqrt{2} : \sqrt{3}$ (d) $1 : \sqrt{3}$

Q.383. In a triangle ABC, 8 ∠A = 6 ∠B = 3 ∠C. What are the degree measures of ∠A, ∠B and ∠C ?
SSC CHSL 10/08/2023 (4th Shift)
(a) 48°, 96°, 36° (b) 36°, 96°, 48°
(c) 36°, 48°, 96° (d) 96°, 48°, 36°

Q.384. Two similar triangles are given i.e. △LMN ~ △PQR, with measurement of angle and side as angle L = 40°, angle N = 80°, LM = 6 cm, LN = 8 cm and PQ = 7.5 cm. Find the value of angle Q and side PR, respectively.
SSC CHSL 10/08/2023 (4th Shift)
(a) 60°, 20 cm (b) 50°, 6.5 cm
(c) 40°, 10 cm (d) 60°, 10 cm

Q.385. In ΔABC, $\overline{BD} \perp \overline{AC}$, intersecting $\overline{AC}$ at D. Also, BD = 12 cm. If m($\overline{AD}$) = 6 cm and m($\overline{CD}$) = 4 cm, find the area (in cm²) of ΔABC.
SSC CHSL 11/08/2023 (2nd Shift)
(a) 45 (b) 50 (c) 60 (d) 75

Q.386. It is given that △PQR ≅ △MNY and PQ = 8 cm, ∠Q = 55° and ∠P = 72°. Which of the following is true ?
SSC CHSL 11/08/2023 (3rd Shift)
(a) NY = 8 cm, ∠Y = 72°
(b) NM = 8 cm, ∠M = 53°
(c) NM = 8 cm, ∠Y = 53°
(d) NY = 8 cm, ∠N = 55°

Q.387. The lengths of the two sides adjacent to the right angle of a right-angled triangle are 1.6 cm and 6.3 cm. Find the length of the hypotenuse.
SSC CHSL 11/08/2023 (3rd Shift)
(a) 6.7 cm (b) 7.5 cm (c) 6.5 cm (d) 7 cm

Q.388. AB and BC are two chords of a circle with centre O. Both chords are on either side of the centre O. Point A and point Care connected to the centre 0, such that ∠BAO=36° and ∠BCO = 48°. What is the degree measure of the angle subtended by the minor arc AC at the centre O ?
SSC CHSL 11/08/2023 (4th Shift)
(a) 136° (b) 144° (c) 120° (d) 168°

Q.389. In ΔXYZ, L and M are the middle points of the sides XY and XZ, respectively. N is a point on the segment LM such that LN : NM = 1 : 2. If LN = 5 cm, then YZ is equal to:
SSC CHSL 14/08/2023 (1st Shift)
(a) 30 cm (b) 24 cm (c) 28 cm (d) 26 cm

Q.390. Two equal circles of radius 6 cm intersect each other such that each pass through the centre of the other. The length (in cm) of the common chord is:
SSC CHSL 14/08/2023 (1st Shift)
(a) $5\sqrt{3}$ (b) $6\sqrt{3}$ (c) $4\sqrt{3}$ (d) $3\sqrt{3}$

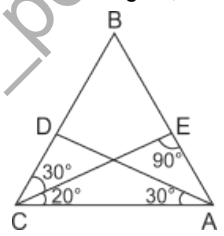
Q.391. $\overline{CT}$ is a tangent to a circle at the point T on the circle. Chord $\overline{AB}$ of the circle is extended to meet the tangent $\overline{CT}$ at the point C. If m ($\overline{AB}$) = 3 cm and m ($\overline{BC}$) = 2.4 cm, find the length (in cm) of the tangent $\overline{CT}$.
SSC CHSL 14/08/2023 (3rd Shift)
(a) 4.2 (b) 3.6 (c) 3.2 (d) 4.0

Q.392. The area of two similar triangles TUV and PQR are 18 cm² and 32 cm², respectively. If TU = 6 cm, then PQ is equal to:
SSC CHSL 14/08/2023 (4th Shift)
(a) 4 cm (b) 8 cm (c) 2 cm (d) 64 cm

Q.393. An equilateral triangle has sides of 18 cm each. The ratio of the inradius to circumradius of the triangle is:
SSC CHSL 14/08/2023 (4th Shift)
(a) 2 : 1 (b) 3 : 2 (c) 3 : 4 (d) 1 : 2

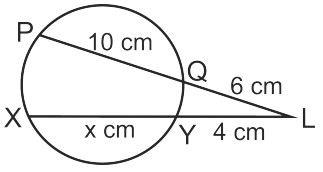
Q.394. In ΔCAB, ∠CAB = 90° and AD ⊥ BC. If AC = 24 cm, AB = 10 cm, then find the value of AD (in cm).
SSC CHSL 17/08/2023 (1st Shift)
(a) 9.23 (b) 8.23 (c) 7.14 (d) 10.23

Q.395. In figure, ∠ADB is equal to:



SSC CHSL 17/08/2023 (1st Shift)
(a) 40° (b) 60° (c) 80° (d) 50°

Q.396. In the figure, chords XY = x cm and PQ = 10 cm are intersecting each other at point L. Find the length of XY (in cm).



SSC CHSL 17/08/2023 (1st Shift)
(a) 22 (b) 21 (c) 20 (d) 23

Q.397. An arc of length 33 π cm subtends an angle of 132° at the centre of the circle. Find the radius of the circle.
SSC CHSL 17/08/2023 (2nd Shift)
(a) 45 cm (b) 40 cm (c) 30 cm (d) 35 cm

Q.398. Three angles of a triangle are (x - 15)°, (x + 45)° and (x + 60)° . Identify the type of triangle.
SSC CHSL 17/08/2023 (2nd Shift)
(a) Obtuse angle triangle
(b) Right angle triangle
(c) Isosceles triangle
(d) Equilateral triangle

Q.399. It is given that ΔABC ≅ Δ FDE and AB = 5 cm, ∠B = 40° and ∠A = 80°. Then which of the following is true?
SSC CHSL 17/08/2023 (3rd Shift)
(a) DE = 5 cm, ∠D = 40°

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(b) DE = 5 cm, ∠E = 60°
(c) DF = 5 cm, ∠F = 60°
(d) DF = 5 cm, ∠E = 60°

Q.400. If three angles of a triangle are (2y + 40°), (5y - 60°), and (3y - 80°), then what is the value of y ?
SSC CHSL 17/08/2023 (3rd Shift)
(a) 30° (b) 24° (c) 28° (d) 26°

Q.401. ΔABC inscribe in a circle with center O. If AB = 9 cm, BC = 40 cm and AC = 41 cm, then what is the circum-radius of a triangle?
SSC CHSL 17/08/2023 (4th Shift)
(a) $20\frac{1}{2}$ cm (b) $12\frac{1}{2}$ cm
(c) $18\frac{1}{2}$ cm (d) $16\frac{1}{2}$ cm

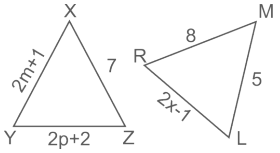
Q.402. The perimeters of two similar triangles XYZ and PQR are respectively 62 cm and 42 cm. If PQ = 21 cm, find XY ?
SSC CHSL 17/08/2023 (4th Shift)
(a) 27 cm (b) 28 cm (c) 29 cm (d) 31cm

SSC CGL 2023 Tier - 1

Q.403. Two concentric circles are of radii 10 cm and 6 cm. Find the length of the chord of the larger circle which touches the smaller circle.
SSC CGL 14/07/2023 (1st shift)
(a) 8 cm (b) 16 cm (c) 12 cm (d) 9 cm

Q.404. Which of the following statements is INCORRECT?
SSC CGL 14/07/2023 (3rd shift)
(a) If a chord is extended outside the circle on both ends then it is called secant.
(b) Tangent is perpendicular to the radius of the circle at the point of contact.
(c) A line which intersects two distinct points of a circle is called tangent.
(d) Tangent is a line touching only one point of the circle.

Q.405. If △XYZ ≅ △LMR, then m + x + p = _____.



SSC CGL 14/07/2023 (4th shift)
(a) 7 (b) 6 (c) 9 (d) 13

Q.406. The lengths of the three sides of a triangle are 30 cm, 42 cm and x cm. Which of the following is correct?
SSC CGL 17/07/2023 (2nd shift)
(a) 12 ≤ x < 72 (b) 12 > x > 72
(c) 12 < x < 72 (d) 12 ≤ x ≤ 72

Q.407. Which of the following statements is INCORRECT ?
SSC CGL 17/07/2023 (4th shift)
(a) Radius is the longest chord of a circle.
(b) The ratio of circumference of two circles is equal to the ratio of their radii.
(c) The perpendicular drawn from the center of the circle on the chord of the circle bisects the chord.
(d) Circles are congruent to each other if they have equal radii.

Q.408. Let A, B, C be the mid-points of sides PQ, QR and PR, respectively, of Δ PQR. If the area of ΔPQR is 32cm², then find the area (in cm²) of ΔABC.
SSC CGL 18/07/2023 (1st shift)
(a) 24 (b) 16 (c) 32 (d) 8

Q.409. D and E points on the sides AB and AC, respectively, of ΔABC such that DE is parallel to BC and AD : DB = 7 : 9. If CD and BE intersect each other at F, then find the ratio of areas of ΔDEF and ΔCBF.
SSC CGL 18/07/2023 (3rd shift)
(a) 49 : 144 (b) 49 : 81
(c) 49 : 256 (d) 256 : 49

Q.410. If in ΔXYZ, XY = 4 and XZ = 5 cm and Q is a point on YZ such that XQ bisects ∠X, then YQ : QZ is :
SSC CGL 18/07/2023 (3rd shift)
(a) 2 : 3 (b) 3 : 2 (c) 5 : 4 (d) 4 : 5

Q.411. In a ΔABC, if∠A = 90°, AC = 5 cm, BC = 9 cm and in ΔPQR, ∠P = 90°, PR = 3 cm, QR = 8 cm, then:
SSC CGL 18/07/2023 (4th shift)
(a) ΔABC ≅ ΔPQR (b) ΔABC ≇ ΔPQR
(c) ΔABC ≠ ΔPQR (d) ΔABC = ΔPQR

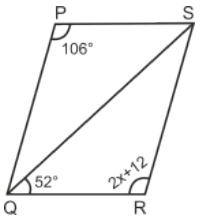
Q.412. Two chords of a circle, $\overline{AB}$ and $\overline{CD}$, meet outside the circle at the point P. If m($\overline{AP}$) = 200 mm, m($\overline{AB}$) = 120 mm, and m($\overline{CP}$) = 160 mm, what is the length (in mm) of $\overline{CD}$?
SSC CGL 19/07/2023 (1st shift)
(a) 100 (b) 75 (c) 60 (d) 150

Q.413. What is the number of common tangents that can be drawn to two circles that touch each other externally?
SSC CGL 19/07/2023 (3rd shift)
(a) 2 (b) 4 (c) 3 (d) 1

Q.414. If ΔABC ~ ΔPQR, AB = 4 cm, PQ = 6 cm, QR = 9 cm and RP = 12 cm, then find the perimeter of ΔABC.
SSC CGL 19/07/2023 (3rd shift)
(a) 18 cm (b) 16 cm (c) 20 cm (d) 22 cm

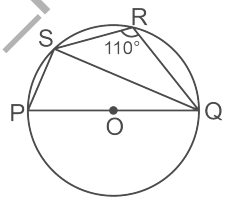
Q.415. Which of the following is a FALSE statement?
SSC CGL 20/07/2023 (2nd shift)
(a) The circumcentre is the centre of a circle which circumscribes the triangle.
(b) The angle formed by any side at the incentre is always 90° more than the angle at the opposite vertex.
(c) Incentre is the point of concurrency of angle bisectors of a triangle.
(d) Centroid of the triangle divides each median in the ratio of 2 : 1

Q.416. In the given figure, ΔQPS ≅ ΔSRQ Find the measure of ∠PSR.



SSC CGL 21/07/2023 (1st shift)
(a) 64° (b) 74° (c) 52° (d) 82°

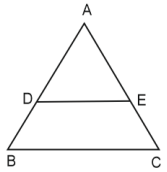
Q.417. In the given figure, PQ is a chord passing through the centre 'O' of the circle. Calculate ∠PQS.



SSC CGL 21/07/2023 (4th shift)
(a) 40° (b) 60° (c) 20° (d) 80°

Q.418. The centroid of an equilateral triangle PQR is L. If PQ = 6 cm, the length (in cm) of PL is:
SSC CGL 24/07/2023 (3rd shift)
(a) $2\sqrt{3}$ (b) $4\sqrt{3}$ (c) $5\sqrt{3}$ (d) $3\sqrt{3}$

Q.419. In the given ΔABC, DE II BC. If BC = 8 cm, DE = 6 cm and area of ΔADE = 90 cm², then what is the area (in cm²) of Δ ABC ?



SSC CGL 24/07/2023 (4th shift)
(a) 140 (b) 120 (c) 160 (d) 190

Q.420. The following formula is used to calculate which of the following?
$\frac{Angle\ of\ arc\ at\ centre}{360°}$ × π × diameter
SSC CGL 25/07/2023 (1st shift)
(a) Length of a sector (b) Area of an arc
(c) Radius of a circle (d) Length of an arc

Q.421. When two circles of radii r_1 and r_2 have their centres at a distance d apart, then length of the common transverse tangent is:
SSC CGL 25/07/2023 (1st shift)

Search on Tg: @apna_pdf

Search on Telegram @apna_pdf

(a) $\sqrt{d^2 - (r_1 - r_2)^2}$

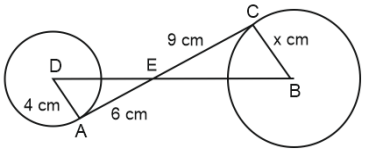
(b) $\sqrt{d^2 + (r_1 - r_2)^2}$

(c) $\sqrt{d - (r_1 - r_2)^2}$

(d) $\sqrt{d^2 - (r_1 + r_2)^2}$

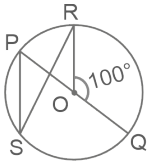
Q.422. The three sides of two triangles are 4, 5 and 6 cm. Select the INCORRECT statement.
SSC CGL 25/07/2023 (2nd shift)
(a) The angle opposite to the greater side in those triangles will be greater.
(b) The area of the two triangles will be different.
(c) The two triangles are congruent.
(d) The two triangles are scalene triangles.

Q.423. In the following figure, the circles with centres D and B have radii 4 cm and x cm, respectively. AC is a tangent to both the circles. Find the value of x.



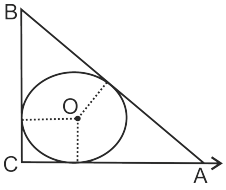
SSC CGL 25/07/2023 (4th shift)
(a) 6 (b) 3 (c) 7 (d) 5

Q.424. In the figure given below, PQ is the diameter of the circle with centre O. If ∠QOR = 100° then the measure of ∠PSR is:



SSC CGL 25/07/2023 (4th shift)
(a) 160° (b) 80° (c) 40° (d) 100°

Q.425. A circle of radius 4 cm is drawn inscribed in a right angle triangle ABC, right angled at C. If AC = 12 cm, then the value of CB is:

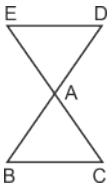


SSC CGL 25/07/2023 (4th shift)
(a) 8 cm (b) 12 cm (c) 20 cm (d) 16 cm

Q.426. Which of the following sets of lengths (in cm) will give three sides of an obtuse-angled triangle?
SSC CGL 26/07/2023 (1st shift)
(a) 15, 62, 64 (b) 17, 64, 66
(c) 16, 63, 65 (d) 18, 65, 67

Q.427. In a triangle ABC, the three angles are x, y and y + 10. Also, 2x - 4y = 20°. Which type of triangle is ABC ?
SSC CGL 26/07/2023 (3rd shift)
(a) Equilateral (b) Obtuse
(c) Acute (d) Right-angled

Q.428. In the figure, AB = AD = 9 cm and AC = AE = 13 cm and BC = 15 cm. Find ED?



SSC CGL 27/07/2023 (1st shift)
(a) 18 cm (b) 16 cm (c) 14 cm (d) 15 cm

Q.429. If in acute angled triangle ABC, AL, BM and CN are the three altitudes of triangle ABC, then which of the following statements will be true?
SSC CGL 27/07/2023 (2nd shift)
(a) AL + BM + CN = AB + BC + CA
(b) AL + BM = AB + BC
(c) AL + BM + CN > AB + BC + CA
(d) AL+ BM + CN < AB + BC + CA

Q.430. Select the correct statement about the properties of a triangle.
SSC CGL 27/07/2023 (3rd shift)
(a) The sum of two sides is always equal to the third side.
(b) The sum of two sides may be equal to the third side.
(c) The sum of two sides is always greater than the third side.
(d) The sum of two sides is always less than the third side

SSC Selection Post (Phase - XI)

Q.431. In ΔABC, D and F are the middle points of the sides AB and AC, respectively. E is a point on the segment DF such that DE : EF = 1 : 2. If DE = 4 cm, then BC is equal to:
Graduate Level 27/06/2023 (Shift - 4)
(a) 20 cm (b) 26 cm (c) 22 cm (d) 24 cm

Q.432. R and S are the points of the sides XY and XZ, respectively, of ΔXYZ. Also, XR = 15 cm, XY = 25 cm, XS = 12 cm and XZ = 20 cm. RS is equal to :
Graduate Level 27/06/2023 (Shift - 4)
(a) $\frac{2}{5}$ YZ (b) $\frac{5}{3}$ YZ (c) $\frac{3}{5}$ YZ (d) $\frac{3}{4}$ YZ

Q.433. Let A,B,C be the mid-points of sides XY,YZ and XZ, respectively of ΔXYZ. If the area of ΔXYZ is 8464 cm^2, then find the area (in "cm^2") of ΔABC.
Higher Secondary 27/06/2023 (Shift - 3)
(a) 2116 (b) 1812 (c) 1516 (d) 3112

SSC CHSL 2022 Tier - 2

Q.434. If sums of the radii and distance between the centres of two circles are equal, then:
SSC CHSL Tier II (26/06/2023)
(a) the circles are concentric
(b) the circles touch externally
(c) the circles touch internally
(d) the circles intersect each other

Q.435. AD is a tangent of a circle, and ABC is the secant. If AB = 8 cm and BC = 10 cm, then find the length of AD.
SSC CHSL Tier II (26/06/2023)
(a) 144 cm (b) 12.5 cm
(c) 13.45 cm (d) 12 cm

SSC CHSL 2022 Tier - 1

Q.436. Angle subtended by a chord xy on the centre of a circle is 180 degree. If the length of this chord is 36 cm, then what will be the radius of this circle?
SSC CHSL 09/03/2023 (1st Shift)
(a) 24 cm (b) 18 cm (c) 27 cm (d) 21 cm

Q.437. The radii of two concentric circles are x cm and 26 cm. P and S are the points on larger circle and Q and R are points on smaller circle. If PQRS is a straight line and QR = 40 cm and PS = 48 cm, then what is the value of x? (x < 26 cm)
SSC CHSL 09/03/2023 (4th Shift)
(a) 11√5 cm (b) 10√5 cm
(c) 12√5 cm (d) 9√5 cm

Q.438. In ΔXYZ, ∠Y = 90 degree and YN is perpendicular to XZ. If XY = 30 cm and XZ = 34cm, then what is the value of YN ?
SSC CHSL 09/03/2023 (4th Shift)
(a) $\frac{280}{17}$ cm (b) $\frac{210}{17}$ cm
(c) $\frac{220}{17}$ cm (d) $\frac{240}{17}$ cm

Q.439. In a ΔRST, Z is a point on side ST and SZ = ZT. If ∠RZS = 90 degree and RS = 10 cm, then what is the value of RT?
SSC CHSL 09/03/2023 (4th Shift)
(a) 15 cm (b) 10 cm (c) 8 cm (d) 12 cm

Q.440. The length of the rectangular sheet of paper is 24 cm more than the breadth and perimeter of the rectangular sheet is 128 cm. Find the length of the rectangular sheet.
SSC CHSL 10/03/2023 (2nd Shift)
(a) 20 cm (b) 44 cm (c) 48 cm (d) 34 cm

Q.441. Sides of a triangle are 12 cm, 9 cm and 9 cm. What is the radius of the circumcircle of this triangle?
SSC CHSL 10/03/2023 (3rd Shift)
(a) $\frac{181}{\sqrt{5}}$ (b) $\frac{27}{\sqrt{5}}$ (c) $\frac{27\sqrt{5}}{10}$ (d) $\frac{54}{\sqrt{5}}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.442. Point D, E and F all lie on the circumference of a circle with centre O. If angle DEF = 48°, then what is a possible value of angle DOF ?
SSC CHSL 13/03/2023 (3rd Shift)
(a) 84° (b) 96° (c) 90° (d) 48°

Q.443. ABCD is a cyclic quadrilateral, AB is diameter of the circle. If angle ∠ACD = 45°, then what is the value of ∠BAD ?
SSC CHSL 13/03/2023 (4th Shift)
(a) 90° (b) 45° (c) 135° (d) 35°

Q.444. The length of the diagonals of a rhombus is 40 cm and 60 cm. What is the length of the side of the rhombus ?
SSC CHSL 13/03/2023 (4th Shift)
(a) $50\sqrt{3}$ cm (b) $20\sqrt{3}$ cm
(c) $10\sqrt{13}$ cm (d) $40\sqrt{13}$ cm

Q.445. Length of the chord AB of a circle is equal to the radius of the circle. What will be the angle subtended by the chord at the centre of the circle?
SSC CHSL 14/03/2023 (2nd Shift)
(a) 40° (b) 60° (c) 30° (d) 50°

Q.446. JKLM is a cyclic quadrilateral in which ∠K is opposite to ∠M. When JK and ML are produced, meet at point Z. JK = 10 cm, KZ = 12 cm and MZ = 33 cm. What is the length of LZ ?
SSC CHSL 14/03/2023 (2nd Shift)
(a) 9 cm (b) 8 cm (c) 10 cm (d) 12 cm

Q.447. M is the incentre of the ΔXYZ. If ∠YXZ + ∠YMZ =150 degree, then what is the value of ∠YXZ ?
SSC CHSL 14/03/2023 (3rd Shift)
(a) 40° (b) 55° (c) 60° (d) 45°

Q.448. In ΔPQR, ∠Q = 90 degrees and QX is perpendicular to PR. If PQ =15 cm and PR = 25 cm, then what is the ratio of PX : XR ?
SSC CHSL 14/03/2023 (4th Shift)
(a) 2 : 3 (b) 7 : 18 (c) 1 : 4 (d) 9 : 16

Q.449. ΔPQR is similar to ΔUVW, Perimeter of ΔPQR and ΔUVW are 120 cm and 240 cm respectively. If PQ = 30 cm, then what is the length of UV ?
SSC CHSL 15/03/2023 (1st Shift)
(a) 45 cm (b) 60 cm (c) 75 cm (d) 90 cm

Q.450. In a triangle MNO, XA, XB and XC are perpendicular bisectors on sides MN, ON and OM respectively intersect each other at X. If $\angle NMO$ = 55 degree, then what is the value of ∠NXO?
SSC CHSL 15/03/2023 (2nd Shift)
(a) 130° (b) 110° (c) 95° (d) 125°

Q.451. Circumference of a circle is 58π cm. There is a chord XY of length 42 cm in this circle. What is the distance of this chord XY from the centre?
SSC CHSL 15/03/2023 (2nd Shift)
(a) 32 cm (b) 20 cm (c) 28 cm (d) 24 cm

Q.452. A circle is circumscribing a triangle whose sides are 30 cm, 40 cm and 50 cm. Find the circumference of the circle.
SSC CHSL 15/03/2023 (3rd Shift)
(a) 100π cm (b) 50π cm
(c) 25π cm (d) 75π cm

Q.453. In Δ XYZ, points P, Q and R are points on the sides XY, YZ and XZ respectively ∠YXZ = 50 degree, XR = PR , ZR = QR and ∠RQZ = 80 degree.
What is the value of ∠PRQ ?
SSC CHSL 16/03/2023 (1st Shift)
(a) 80° (b) 90° (c) 75° (d) 60°

Q.454. Distance of a chord JK from the centre is 7 cm. If the diameter of this circle is 50 cm, then what will be the length of the chord? (in cm)
SSC CHSL 16/03/2023 (1st Shift)
(a) 74 (b) 96 (c) 48 (d) 24

Q.455. Sum of the angles made by a chord XY at the centre and on the circumference of the circle is 270 degrees. If the radius of this circle is 24 cm, then what will be the length of this chord ? (in cm)
SSC CHSL 16/03/2023 (2nd Shift)
(a) 60 (b) 12 (c) 36 (d) 48

Q.456. If PQ is a tangent of a circle (touches the circle at Q) with centre O and angle POQ is 75°, then what is the value of angle OPQ?
SSC CHSL 16/03/2023 (4th Shift)
(a) 15° (b) 35° (c) 30° (d) 25°

Q.457. Sides of a triangle are 9 cm, 6 cm and 5 cm. What is the value of circumradius of this triangle ? (in cm)
SSC CHSL 17/03/2023 (3rd Shift)
(a) $\frac{9\sqrt{3}}{4}$ (b) $\frac{9\sqrt{3}}{5}$ (c) $\frac{27\sqrt{2}}{8}$ (d) $\frac{9\sqrt{2}}{2}$

Q.458. In an equilateral triangle ABC, P is the centroid of this triangle. Side of ΔABC is $16\sqrt{3}$ cm. What is the distance of point P from side BC ?
SSC CHSL 17/03/2023 (4th Shift)
(a) 8 cm (b) 12 cm (c) 9 cm (d) 10 cm

Q.459. A is a point outside of a circle with centre O. AP and AQ are two tangents of the circle. If AP = a^2 + 14 and AQ = 239, then what is the value of a ?
SSC CHSL 20/03/2023 (1st Shift)
(a) 22 (b) 13 (c) 15 (d) 14

Q.460. Two medians NA and OB of ΔNOP intersect each other at C at right angles. If NA = 15 cm and OB = 15 cm, then what is the length of OA ? (in cm)
SSC CHSL 20/03/2023 (2nd Shift)
(a) $5\sqrt{5}$ (b) $7\sqrt{5}$ (c) $6\sqrt{5}$ (d) $3\sqrt{5}$

Q.461. Find the length of the arc if the angle at the centre of the circle of radius 7 units is 60°.
SSC CHSL 20/03/2023 (3rd Shift)
(a) 4 units (b) $\frac{11}{4}$ units
(c) $\frac{22}{3}$ units (d) 21 units

Q.462. In triangle XYZ, ∠Y is the smallest angle and ∠Y = 25 degree. If the ratio of the angle is 20 : 11 : 5. then what is the largest angle of ΔXYZ ?
SSC CHSL 21/03/2023 (1st Shift)
(a) 80° (b) 85° (c) 95° (d) 100°

Q.463. Distance of a chord RS from the centre is 20 cm, If the length of this chord is 30 cm, then what will be the diameter of this circle ? (in cm)
SSC CHSL 21/03/2023 (3rd Shift)
(a) 45 (b) 55 (c) 60 (d) 50

SSC CGL 2022 Tier - 2

Q.464. A, B, C are three points such that AB = 9 cm, BC = 11 cm and AC = 20 cm. The number of circles passing through points A, B, C is:
SSC CGL Tier II (02/03/2023)
(a) 2 (b) 0 (c) 1 (d) 3

Q.465. In ΔPQR, PQ = QR and O is an interior point of ΔPQR such that ∠OPR= ∠ORP. Consider the following statements:
(i) ΔPOR is an isosceles triangle.
(ii) O is the centroid of ΔPQR.
(iii) ΔPQO is congruent to ΔRQO.
Which of the above statements are correct?
SSC CGL Tier II (02/03/2023)
(a) Only (i) and (ii) (b) Only (i) and (iii))
(c) Only (ii) and (iii) (d) Only (ii)

Q.466. ABCD is a cyclic quadrilateral and BC is a diameter of the related circle on which A and D also lie. ∠BCA = 19° and ∠ CAD = 32°. What is the measure of ∠ ACD?
SSC CGL Tier II (03/03/2023)
(a) 41° (b) 38° (c) 40° (d) 39°

Q.467. If the external angle of a regular polygon is 18°, then the number of diagonals in this polygon is:
SSC CGL Tier II (03/03/2023)
(a) 180 (b) 150 (c) 170 (d) 140

Q.468. If △ABC is right angled at B, AB = 12 cm and ∠CAB = 60°, determine the

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

length of BC.
SSC CGL Tier II (06/03/2023)
(a) $24\sqrt{3}$ cm (b) 12 cm
(c) $12\sqrt{2}$ cm (d) $12\sqrt{3}$ cm

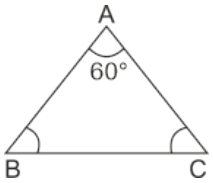
Q.469. Find the number of diagonals of a regular polygon, sum of whose interior angles is 2700°.
SSC CGL Tier II (06/03/2023)
(a) 121 (b) 119 (c) 127 (d) 117

Q.470. PQRS is a cyclic quadrilateral. If ∠P is three times of ∠ R and ∠S is four times of ∠Q, then the sum of ∠S + ∠R will be:
SSC CGL Tier II (07/03/2023)
(a) 169° (b) 171° (c) 187° (d) 189°

SSC CGL 2022 Tier - 1

Q.471. The circumference of the two circles is 198 cm and 352 cm respectively. What is the difference between their radii ?
SSC CGL 01/12/2022 (1st Shift)
(a) 45 cm (b) 16.5 cm
(c) 49.5 cm (d) 24.5 cm

Q.472. In the triangle ABC, AB = 12 cm and AC = 10 cm, and ∠BAC = 60°. What is the value of the length of the side BC ?



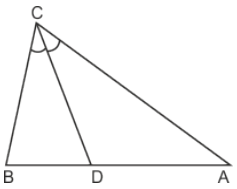
SSC CGL 01/12/2022 (1st Shift)
(a) 10 cm (b) 7.13 cm
(c) 13.20 cm (d) 11.13 cm

Q.473. If areas of similar triangles ΔABC and ΔDEF are x²cm² and y²cm² respectively, and EF = a cm, then BC (in cm) is:
SSC CGL 01/12/2022 (2nd Shift)
(a) $\frac{y^2}{a^2x^2}$ (b) $\frac{y}{ax}$ (c) $\frac{ax}{y}$ (d) $\frac{a^2x^2}{y^2}$

Q.474. If the angles of a triangle are (x - 46)°, (x + 96)° and 8x°, then what is the value of 2x ?
SSC CGL 01/12/2022 (2nd Shift)
(a) 15° (b) 24° (c) 26° (d) 13°

Q.475. In triangle ABC, the bisector of angle BAC cuts the line BC at D. If BD = 6 and BC = 14, then what is the value of AB : AC ?
SSC CGL 01/12/2022 (3rd Shift)
(a) 3 : 4 (b) 7 : 3 (c) 3 : 10 (d) 3 : 7

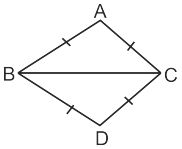
Q.476. In the given triangle, CD is the bisector of ∠BCA. CD = DA. If ∠BDC = 76°, what is the degree measure of ∠CBD ?



SSC CGL 01/12/2022 (4th Shift)
(a) 32° (b) 76° (c) 80° (d) 66°

Q.477. In ΔABC, AB = AC, O is a point on BC such that BO = CO and OD is perpendicular to AB and OE is perpendicular to AC. If ∠BOD = 60°, then measure of ∠AOE is:
SSC CGL 02/12/2022 (2nd Shift)
(a) 120° (b) 60° (c) 30° (d) 90°

Q.478. In the given figure, AB=DB and AC = DC. If ∠ABD = 58° and ∠DBC = (2x - 4)°, ∠ACB = (y + 15)° and ∠DCB = 63°, then the value of 2x + 5y is:



SSC CGL 02/12/2022 (4th Shift)
(a) 325 (b) 273 (c) 259 (d) 268

Q.479. From the circumcentre L of ΔXYZ, perpendicular LM is drawn on side YZ. If ∠YXZ = 60°, then the measure of ∠YLM is:
SSC CGL 02/12/2022 (4th Shift)
(a) 60° (b) 120° (c) 180° (d) 90°

Q.480. Select the correct option with respect to the given statement.
Two tangents are drawn at the end of the diameter of a circle.
SSC CGL 03/12/2022 (1st Shift)
(a) They intersect each other.
(b) They pass through origin.
(c) They are parallel to each other.
(d) They are perpendicular to each other.

Q.481. ΔXYZ ~ Δ GST and XY : GS = 2 : 3, XV is the median to the side YZ, and GD is the median to the side ST. The value of $(\frac{YV}{SD})^2$ is _____.
SSC CGL 03/12/2022 (2nd Shift)
(a) $\frac{4}{9}$ (b) $\frac{3}{5}$ (c) $\frac{1}{4}$ (d) $\frac{2}{3}$

Q.482. A,B,C are three angles of a triangle. If ∠A - ∠B = 45° and ∠B - ∠C = 15° then ∠A = ?
SSC CGL 03/12/2022 (3rd Shift)
(a) 83° (b) 85° (c) 95° (d) 75°

Q.483. Find the number of common tangents, if $r_1 + r_2 = C_1C_2$.(With usual notations, r_1 & r_2 and C_1 & C_2 are the radii and centres of the two circles.)
SSC CGL 05/12/2022 (1st Shift)
(a) 1 (b) 0 (c) 3 (d) 4

Q.484. The perimeter of a triangle with sides of integer values are equal to 13. How many such triangles are possible ?
SSC CGL 05/12/2022 (3rd Shift)
(a) 5 (b) 8 (c) 7 (d) 6

Q.485. In a ΔABC, the internal bisectors of the angle B and the angle C intersect at an angle of 105°. What is the value of the angle A ?
SSC CGL 05/12/2022 (3rd Shift)
(a) 52.5° (b) 75° (c) 15° (d) 30°

Q.486. Three circles of radius 4 cm are kept touching each other. The string is tightly tied around these three circles. What is the length of the string?
SSC CGL 05/12/2022 (4th Shift)
(a) 24 + 8π cm (b) 24π + 16 cm
(c) 32 + 16π cm (d) 24 + 18π cm

Q.487. The mid point of AB and AC of a ΔABC are X and Y, respectively. If BC + XY = 24 units, then the value of BC - XY is :
SSC CGL 06/12/2022 (1st Shift)
(a) 5 cm (b) 4 cm (c) 6 cm (d) 8 cm

Q.488. The number of parallel tangents of a circle with a given tangent is:
SSC CGL 06/12/2022 (4th Shift)
(a) 1 (b) 2 (c) 3 (d) 4

Q.489. ΔPQR is an isosceles triangle and PQ = PR = 2a unit, QR = a unit. Draw PX ⊥QR, and find the length of PX.
SSC CGL 06/12/2022 (4th Shift)
(a) $\sqrt{5}a$ (b) $\frac{\sqrt{5}a}{2}$ (c) $\frac{\sqrt{10}\,a}{2}$ (d) $\frac{\sqrt{15}\,a}{2}$

Q.490. The height of an equilateral triangle is $9\sqrt{3}$ cm. What is the area of this equilateral triangle?
SSC CGL 07/12/2022 (1st Shift)
(a) $92\sqrt{3}$ cm² (b) $67\sqrt{3}$ cm²
(c) $49\sqrt{3}$ cm² (d) $81\sqrt{3}$ cm²

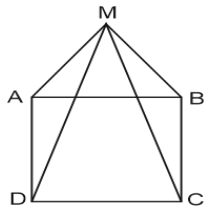
Q.491. In a ΔXYZ, XO is the median and XO = $\frac{1}{2}$YZ. If ∠YXO = 30°,then what is the value of ∠XYZ ?
SSC CGL 07/12/2022 (3rd Shift)
(a) 15° (b) 90° (c) 30° (d) 60°

Q.492. The length of the altitude of an equilateral triangle is $6\sqrt{3}$ m. The perimeter of the equilateral triangle (in m) is:
SSC CGL 07/12/2022 (3rd Shift)
(a) $12\sqrt{2}$ (b) $36\sqrt{2}$ (c) 36 (d) $24\sqrt{3}$

Q.493. ABCD is a square and △MAB is an equilateral triangle. MC and MD are joined. What is the degree measure of ∠MDC ?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf



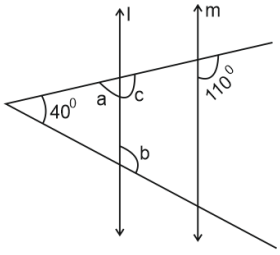
SSC CGL 08/12/2022 (1st Shift)
(a) 78° (b) 60° (c) 65" (d) 75°

Q.494. AB is the diameter of a circle with centre O. If P be a point on the circle such that ∠AOP = 110°, then the measure of ∠OBP is:
SSC CGL 08/12/2022 (1st Shift)
(a) 50° (b) 65° (c) 60° (d) 55°

Q.495. In ΔABC and ΔDEF, ∠A = 55°, AB = DE, AC = DF, ∠E = 85° and ∠F = 40°. By which property are Δ ABC and Δ DEF congruent?
SSC CGL 08/12/2022 (2nd Shift)
(a) SAS property (b) ASA property
(c) RHS property (d) SSS property

Q.496. If two circles do not touch or intersect each other and one does not lie inside the other, then find the number of common tangents.
SSC CGL 08/12/2022 (2nd Shift)
(a) 5 (b) 4 (c) 2 (d) 3

Q.497. In the following figure, if *l* || m, then find the measures of angles marked by 'a' and 'b'.



SSC CGL 08/12/2022 (4th Shift)
(a) a = 90° and b = 90°
(b) a = 55° and b = 125°
(c) a = 70° and b = 110°
(d) a = 60° and b = 120°

Q.498. The radius of a circle with centre at O is 6 cm and the central angle of a sector is 40°. Find the area of the sector.
SSC CGL 08/12/2022 (4th Shift)
(a) 6π cm² (b) 5π cm²
(c) 4π cm² (d) 8π cm²

Q.499. In triangle ABC, ∠B = 90°, and ∠C = 45°. If AC = 2√2 cm, then the length of BC is:
SSC CGL 09/12/2022 (1st Shift)
(a) 3 (b) 2 (c) 1 (d) 4

Q.500. In a circle of radius 3 cm, two chords of length 2 cm and 3 cm lie on the same side of a diameter. What is the perpendicular distance between the two chords?
SSC CGL 09/12/2022 (2nd Shift)
(a) $\frac{4\sqrt{3}-3\sqrt{2}}{2}$ cm (b) $\frac{4\sqrt{2}-3\sqrt{3}}{2}$ cm
(c) $\frac{4\sqrt{2}-3\sqrt{3}}{3}$ cm (d) $\frac{4\sqrt{2}-3\sqrt{3}}{4}$ cm

Q.501. A coconut tree swings with the wind in such a manner that the angle covered by its trunk is 18 degrees. If the topmost portion of the tree covers a distance of 44 meters, find the length of the tree.
SSC CGL 12/12/2022 (2nd Shift)
(a) 120 meters (b) 210 meters
(c) 140 meters (d) 70 meters

Q.502. If C_1, C_2 be the centres of two circles and r_1, r_2 be the respective radii such that the distance between the centres is equal to the sum of the radii of the two circles, find the number of common tangents.
SSC CGL 12/12/2022 (2nd Shift)
(a) 4 (b) 2 (c) 1 (d) 3

Q.503. What is the ASA congruence rule of triangles, where A and S represent angle and side of triangle respectively?
SSC CGL 12/12/2022 (3rd Shift)
(a) Two triangles are said to be congruent if all three sides of both the triangles are equal.
(b) Two triangles are said to be congruent if 2 angles and the included side of one triangle are equal to 2 angles and the included side of the other triangle.
(c) Two triangles are said to be congruent if 2 sides and the included angle of one triangle are equal to 2 sides and the included angle of the another triangle.
(d) Two triangles are said to be congruent if any pair of 2 angles and any 1 pair of sides of both the triangles are equal.

Q.504. If the areas of two isosceles triangles are in the ratio of $x^2 : y^2$, then the ratio of their corresponding heights is:
SSC CGL 12/12/2022 (4th Shift)
(a) x : y (b) $\sqrt{x} : \sqrt{y}$ (c) $x^3 : y^3$ (d) $x^2 : y^2$

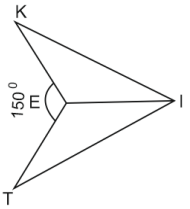
Q.505. The hour hand moves through 4 hours and has a length of 6 cm. Find the area (in cm², rounded off to two decimal places) of the sector covered by the hour hand.
SSC CGL 13/12/2022 (1st Shift)
(a) 32.69 (b) 30.67 (c) 37.71 (d) 35.75

Q.506. A triangle and a parallelogram have the same base 28 cm and the same area. If the height of the parallelogram is 12 cm, then find the length of the altitude of the triangle.
SSC CGL 13/12/2022 (2nd Shift)
(a) 28 cm (b) 23 cm (c) 24 cm (d) 21 cm

Q.507. Select the INCORRECT statement with respect to the properties of a circle.
SSC CGL 13/12/2022 (2nd Shift)
(a) Two tangents drawn at the end of the the diameter of a circle is parallel.
(b) The radius drawn perpendicular to a chord bisects the chord.
(c) The diameter of a circle is the longest chord of a circle.
(d) The perpendicular distance from the centre of a circle increases when the length of a chord increases.

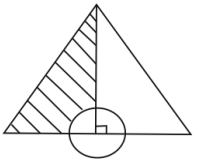
Q.508. If ΔABC ≅ ΔPQR and ∠ABC = (x + 60)°, ∠PQR = (85 − 4x)°, and ∠ RPQ = (3x + 65)°, then the value of ∠ABC in degree is:
SSC CGL 13/12/2022 (3rd Shift)
(a) 15 (b) 5 (c) 45 (d) 65

Q.509. In the given figure, if KI = IT and EK = ET, then ∠TEI = _____.



SSC CGL 13/12/2022 (4th Shift)
(a) 75° (b) 125° (c) 105° (d) 150°

Q.510. Find the area of the shaded portion of an equilateral triangle with 6 units shown in the following figure.A circle of radius 1 unit is centered at the midpoint of a side of the triangle.



SSC CGL 13/12/2022 (4th Shift)
(a) $\frac{1}{2}$ (9√3 - $\frac{11}{7}$) unit²
(b) $\frac{1}{4}$ (9√3 - $\frac{11}{7}$) unit²
(c) $\frac{1}{2}$(6√3 - $\frac{11}{7}$) unit²
(d) $\frac{1}{2}$ (9√3 - $\frac{22}{7}$) unit²

SSC CPO 2022 Tier - 1

Q.511. In ΔABC, DE ∥ BC in such a way that A-D-B and A - E - C. If m∠ACB = 40°, then m∠DAE + m∠ADE = _____.
SSC CPO 09/11/2022 (Morning)
(a) 240° (b) 120° (c) 140° (d) 230°

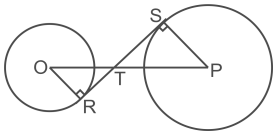
Q.512. If two tangents to a circle of

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

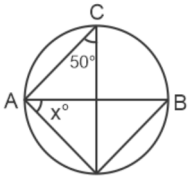
radius 3 cm are inclined to each other at angle of 60°, then the length of each tangent is:
SSC CPO 09/11/2022 (Afternoon)
(a) $\frac{3\sqrt{3}}{4}$ cm (b) $3\sqrt{3}$ cm
(c) 3 cm (d) 6 cm

Q.513. In the given figure, the circle with centre O has radius 10 cm. The radius of the circle with centre P is x. STR is a common tangent to the two circles at points R and S as shown in the figure.
RT = 16 cm and TS = 24 cm. What is the value of x (in cm)?



SSC CPO 09/11/2022 (Evening)
(a) 15 (b) 16 (c) 12 (d) 18

Q.514. In the given circle with diameter AB, find the value of X.



SSC CPO 10/11/2022 (Afternoon)
(a) 40° (b) 20° (c) 30° (d) 50°

Q.515. If the arc of a circle of radius 30 cm has a length of 19 cm, then the angle (in degrees, rounded off to two decimal places) subtended at the centre of the circle is:(Take π = $\frac{22}{7}$)
SSC CPO 11/11/2022 (Morning)
(a) 51.25 (b) 16.27 (c) 36.27 (d) 46.25

Q.516. If the hypotenuse of an isosceles right-angled triangle is 10 cm, then the other two sides (in cm) are _____.
SSC CPO 11/11/2022 (Evening)
(a) 10√2 and 10√2 (b) 8√2 and 8√2
(c) 6√2 and 6√2 (d) 5√2 and 5√2

SSC CGL 2021 Tier - 2

Q.517. ABC is an isosceles right angle triangle. ∠ABC = 90° and AB = 12 cm. What is the ratio of the radius of the circle inscribed in it to the radius of the circle circumscribing triangle ABC ?
SSC CGL Tier II (08/08/2022)
(a) 6 - $\sqrt{2}$: $3\sqrt{2}$ (b) 2 - $\sqrt{2}$: $\sqrt{2}$
(c) 6 - 3 $\sqrt{2}$: $1\sqrt{2}$ (d) 6 - 3 $\sqrt{2}$: $6\sqrt{2}$

Q.518. ABC is a right angle triangle and angle ABC = 90 degrees. BD is a perpendicular on the side AC. what is the value of BD^2 ?
SSC CGL Tier II (08/08/2022)
(a) AD × DC (b) BC × AB
(c) BC × CD (d) AD × AC

Q.519. ABC and PQR are two triangles. AB = PQ = 6 cm, BC = QR = 10 cm and AC = PR = 8 cm. If angle ABC = x degrees, then what is the value of angle PRQ ?
SSC CGL Tier II (08/08/2022)
(a) (180 - x) degree (b) x degree
(c) (90 - x) degree (d) (90 + x) degree

Q.520. x, y and z are the sides of a triangle. If z is the largest side and $x^2 + y^2 > z^2$, then the triangle is a :
SSC CGL Tier II (08/08/2022)
(a) Isosceles right angled triangle
(b) Acute angled triangle
(c) Obtuse angled triangle
(d) Right angled triangle

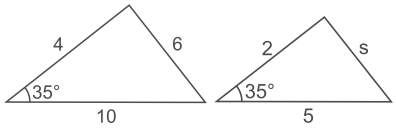
SSC Selection Post (Phase - X)

Q.521. ΔTAP, ∠TAP = 60°, TA = 6cm, AP = 8 cm. K is the midpoint of AP. A line form k is produced to meet TP at O such that ∠AKO = 120°. Find the length of OK.
Graduate Level 01/08/2022 (Shift - 4)
(a) 3 cm (b) 4 cm (c) 5 cm (d) 6 cm

Q.522. If AB is a chord of a circle with radius 5 units and C is a point on the circle such that ∠ ACB = $\frac{\pi}{2}$, then the length of chord AB is:
Graduate Level 02/08/2022 (Shift - 3)
(a) 10 units (b) 2.5 units
(c) 7.5 units (d) 5 units

Q.523. Given that ΔMAN and ΔCPT are congruent to each other such that $\angle M$ = 75, $\angle N$ = 65, $\angle A$ = 40, $\angle C = \frac{x}{2}$, $\angle P$ = 6y + 16. Find the value of (x- 5y).
Graduate Level 04/08/2022 (Shift - 2)
(a) 130 (b) 125 (c) 135 (d) 120

Q.524. Observe the given figure and find the value of s.



Graduate Level 04/08/2022 (Shift - 4)
(a) 5 (b) 3 (c) 2 (d) 4

Q.525. Given that triangle ABC is congruent to triangle DEF. If AC = 11m, ED = 6m, EF = 15m, ∠ FDE = 85° and ∠ABC = 55°,then the perimeter of triangle ABC and ∠EFD are, respectively:
Higher Secondary 01/08/2022 (Shift - 3)
(a) 32 m, 45° (b) 32 m, 40°
(c) 30 m, 50° (d) 35 m, 45°

Q.526. The longest chord of a circle is equal to :
Higher Secondary 02/08/2022 (Shift - 2)
(a) three times the radius
(b) two times the diameter
(c) two times the radius
(d) the radius

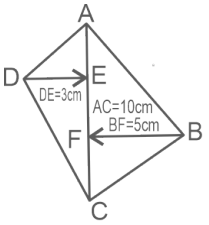
SSC CHSL 2021 Tier - 1

Q.527. In a triangle ABC, if the three sides are a = 5, b = 7 and c = 3, what is angle B?
SSC CHSL 24/05/2022 (Morning)
(a) 120° (b) 60° (c) 90° (d) 150°

Q.528. Triangle ABC and PQR are similar to each other. If m($\overline{BC}$) = 5 cm, m($\overline{QR}$) = 12.5 cm, and m($\overline{PQ}$) = 6.25 cm. Find m($\overline{AB}$) in (cm).
SSC CHSL 26/05/2022 (Afternoon)
(a) 6 (b) 2.5 (c) 6.25 (d) 10

Q.529. If the circumradius of an equilateral triangle is 18 cm, then the measure of its in-radius Is in (cm):
SSC CHSL 27/05/2022 (Morning)
(a) 9 (b) 3 (c) 10 (d) 12

Q.530. Find the area (in cm^2) of the given quadrilateral ABCD.



SSC CHSL 31/05/2022 (Afternoon)
(a) 50 (b) 35 (c) 45 (d) 40

Q.531. An arc on a circle that is 15 cm long subtends a 24° angle at the centre. What is the circumference of the circle?
SSC CHSL 02/06/2022 (Afternoon)
(a) 240 cm (b) 220 cm
(c) 236 cm (d) 225 cm

Q.532. PQ and RS are two parallel chords of a circle of length 10 cm and 24 cm, respectively, and lie on the same side of the centre O. If the distance between the chords is 7 cm, what is the radius (in cm) of the circle?
SSC CHSL 03/06/2022 (Afternoon)
(a) 11 (b) 9 (c) 13 (d) 7

Q.533. If the corresponding angles of two triangles are equal and satisfy $\frac{PX}{ER} = \frac{ZX}{RF} = \frac{PZ}{EF}$, then
SSC CHSL 06/06/2022 (Afternoon)
(a) ΔPXZ is similar to ΔEFR
(b) ΔPXZ is similar to ΔERF
(c) ΔXPZ is similar to ΔERF
(d) ΔPXZ is similar to ΔREF

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.534. Given below are some of the measures of the sides and angles of five triangles. Which of the triangles given in the options is not congruent to ΔABC ?

In ΔABC, $m(\overline{AB}) = 3.6cm, m(\overline{BC})$ = 5cm $m(\overline{CA})$ = 4cm, $m(\angle B)$ = 52.4°, $m(\angle C)$ = $45.5°$

InΔDEF, $m(\overline{DE}) = 4cm$, $m(\overline{EF}) = 5cm$, $m(\overline{FD}) = 3.6cm$

In $\Delta GHL, m(\overline{HI})$ = 5cm $m(\angle H) = 52.4°$, $m(\angle I) = 45.5°$

In $\Delta JKL, m(\overline{JK})$ = 3.6 cm, $m(\overline{LJ}) = 4cm$, $m(\angle J) = 52.4°$

In$\Delta MNO, m(\overline{MN})$ = 3.6cm, $m(\overline{NO})$ = 5 cm , $m(\angle N) = 52.4°$

SSC CHSL 06/06/2022(Evening)

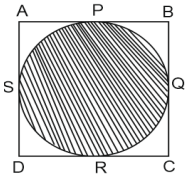
(a) ΔMNO (b) ΔGHI (c) ΔJKL (d) ΔDEF

Q.535. The area of a right-angled triangle is 42 cm^2. If the length of one of its two sides containing the right angle is 10 cm, find the length (in cm) of the other side that contain the right angle.

SSC CHSL 06/06/2022 (Evening)

(a) 4.0 (b) 8.0 (c) 8.4 (d) 4.8

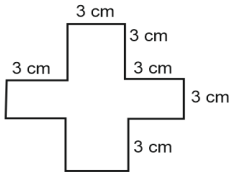
Q.536. ABCD is a square of 21 cm. A circle is inscribed in the square, which touches the sides of the square at P, Q , R , and S as shown below in the figure . What is the area (in cm^2) of the non-shaded region? [figure is not drawn to scale and take π = $\frac{22}{7}$]



SSC CHSL 07/06/2022 (Afternoon)

(a) 88.4 (b) 84.6 (c) 90.7 (d) 94.5

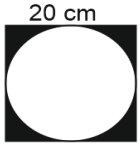
Q.537. Calculate the area (in cm^2) of the following diagram.



SSC CHSL 07/06/2022 (Afternoon)

(a) 45 (b) 42 (c) 48 (d) 50

Q.538. Each edge of the following square is 20 cm long, and a circle is inscribed in the square as shown. What is the area of the shaded region (in cm^2) ? [Use π = 3.14]



SSC CHSL 08/06/2022 (Afternoon)

(a) 88 (b) 85 (c) 86 (d) 84

Q.539. In a circle, AB and CD are two diameters which are perpendicular to each other. Find the length of chord AC.

SSC CHSL 09/06/2022 (Afternoon)

(a) $\sqrt{2}$ CD (b) $\frac{AB}{\sqrt{2}}$ (c) $\frac{CD}{2}$ (d) 2 AB

Q.540. The ratio in which a transverse common tangent is drawn to two circles with radii 4 cm and 6 cm, respectively, divides the line joining their centres is:

SSC CHSL 09/06/2022 (Evening)

(a) 2 : 3 (b) 1 : 1 (c) 1 : 2 (d) 3 : 4

SSC CGL 2021 Tier - 1

Q.541. AB is a diameter of a circle with centre O. A tangent is drawn at point A. C is a point on the circle such that BC produced meets the tangent at P. If ∠APC = 62°, then find the measure of angle subtended by the minor arc AC.

SSC CGL 11/04/2022 (Morning)

(a) 56° (b) 62° (c) 28° (d) 31°

Q.542. In a ΔABC, points P, Q and R are taken on AB, BC and CA, respectively, such that BQ = PQ and QC = QR. If ∠BAC = 75°, what is the measure of ∠PQR (in degrees)?

SSC CGL 11/04/2022 (Morning)

(a) 40 (b) 30 (c) 50 (d) 75

Q.543. An equilateral triangle ABC is inscribed in a circle with centre O. D is a point on the minor arc BC and ∠CBD = 40°. Find the measure of ∠BCD.

SSC CGL 11/04/2022 (Morning)

(a) 30° (b) 50° (c) 20° (d) 40°

Q.544. In ΔACD, B and E are two points on side AC and AD respectively, such that BE is parallel to CD. CD = 9 cm, BE = 6 cm, AB = 5 cm and ED = 2 cm. What is the measure of the lengths(in cm) of AE and BC ?

SSC CGL 11/04/2022 (Evening)

(a) 4, 2.5 (b) 3, 4 (c) 4, 3 (d) 2.5, 4

Q.545. AB is the diameter of a circle with center O , C and D are two points on the circumference of the circle on either side of AB such that ∠CAB = 42° and ∠ABD = 57° . What is the measure of ∠CAD and ∠CBD ?

SSC CGL 11/04/2022 (Evening)

(a) 105 and 75 (b) 75 and 105

(c) 81 and 99 (d) 99 and 81

Q.546. A cyclic quadrilateral ABCD is drawn in a circle with centre O. A and C are joined to O. If ∠ABC = 2p and ∠ADC = 3p, what is the measure (in degrees) of the ∠AOC reflex ?

SSC CGL 12/04/2022 (Afternoon)

(a) 200 (b) 245 (c) 210 (d) 216

Q.547. In a circle with centre O, AC and BD are two chords. AC and BD meet at E, when produced. If AB is a diameter and ∠AEB = 36°, then the measure of ∠DOC is:

SSC CGL 12/04/2022 (Evening)

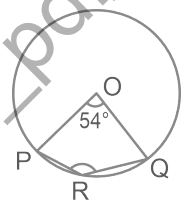
(a) 112° (b) 124° (c) 136° (d) 108°

Q.548. In a circle of diameter 20 cm, chords AB and CD are parallel to each other. BC is diameter. If AB is 6 cm from the centre of the circle, what is the length (in cm) of the chord CD ?

SSC CGL 13/04/2022 (Morning)

(a) 8 (b) 12 (c) 20 (d) 16

Q.549. In the given figure, O is the centre of the circle. ∠POQ = 54°. What is the measure (in degree) of ∠PRQ ?



SSC CGL 13/04/2022 (Afternoon)

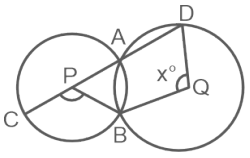
(a) 235 (b) 137 (c) 207 (d) 153

Q.550. Let ΔABC ~ ΔPQR and $\frac{ar(\Delta ABC)}{ar(\Delta QPR)}$ = $\frac{64}{169}$. If AB = 10cm, BC = 7cm and AC = 16cm, then PR(in cm) is equal to :

SSC CGL 13/04/2022 (Evening)

(a) 21 (b) 13 (c) 26 (d) 15

Q.551. In the following figure, P and Q are centers of two circles. The circles are intersecting at points A and B. PA produced on both the sides meets the circles at C and D. If ∠CPB = 100°, then find the value of x.



SSC CGL 18/04/2022 (Morning)

(a) 115 (b) 120 (c) 110 (d) 100

Q.552. A circle is inscribed in Δ ABC, touching AB , BC and AC at points P, Q and R, respectively. If AB - BC = 4 cm, AB - AC = 2 cm, and the perimeter of Δ ABC = 32 cm, then AC (in cm) = ?

SSC CGL 18/04/2022 (Morning)

(a) $\frac{35}{3}$ (b) $\frac{38}{3}$ (c) $\frac{32}{3}$ (d) $\frac{26}{3}$

Q.553. In a Δ ABC D , E and F are the mid-points of side BC, CA and AB respectively. If BC = 14.4 cm. CA = 15.2

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

cm and AB = 12.4 cm, what is the perimeter of the Δ DEF ?
SSC CGL 19/04/2022 (Morning)
(a) 42 (b) 28 (c) 21 (d) 35

Q.554. Let Δ ABC ~ Δ QPR and (Area of Δ ABC) : (Area of Δ PQR) = 121 : 64. If QP = 14.4 cm, PR = 12 cm and AC = 18 cm. Then what is the length of AB (in cm)?
SSC CGL 19/04/2022 (Morning)
(a) 32.4 (b) 21.6 (c) 19.8 (d) 16.2

Q.555. The circumcenter of an equilateral triangle is at a distance of 3.2 cm from the base of the triangle. What is the length (in cm) of each of its altitudes?
SSC CGL 19/04/2022 (Afternoon)
(a) 9.6 (b) 7.2 (c) 6.4 (d) 12.8

Q.556. AB is a chord of a circle with centre O. C is a point on the circumference of the circle in the minor sector. If ∠ABO = 40°. what is the measure (in degree) of ∠ACB ?
SSC CGL 19/04/2022 (Afternoon)
(a) 110° (b) 130° (c) 100° (d) 120°

Q.557. In a circle with centre O and radius 13 cm, and two parallel chords are drawn on different sides of the centre.If the length of one chord 10cm and the distance between two chords is 17cm, then find the difference in length of the two chords (in cm)
SSC CGL 19/04/2022 (Evening)
(a) 10 (b) 14 (c) 24 (d) 12

Q.558. In a circle with center O, PA and PB are tangents to the circle at point A and point B , respectively , C is a point on the major arc AB, If ∠ACB = 50°, then find the measure of ∠APB.
SSC CGL 20/04/2022 (Morning)
(a) 100° (b) 90° (c) 80° (d) 50°

Q.559. In a right triangle ABC , right angle at B, altitude BD is drawn to the hypotenuse AC of the triangle . If AD = 6 cm, CD = 5cm, then find the value of $AB^2 + BD^2$ (In cm^2)
SSC CGL 20/04/2022 (Morning)
(a) 30 (b) 96 (c) 36 (d) 66

Q.560. AC is the diameter of a circle dividing the circle into two semicircles. ED is a chord in one semicircle, such that ED is parallel to AC, B is a point on the circumference of the circle in the other circumference . ∠CBE = 75°, what is the measure (in degree) of $\angle CED$?
SSC CGL 20/04/2022 (Afternoon)
(a) 68° (b) 37° (c) 75° (d) 15°

Q.561. AB is a chord in the minor segment of a circle with centre O . C is a point between A and B on the minor arc AB. The tangents of the circle at A and B meet at the point D. If ∠ACB = 116° Then the measure of ∠ADB is :
SSC CGL 20/04/2022 (Afternoon)
(a) 64° (b) 48° (c) 56° (d) 52°

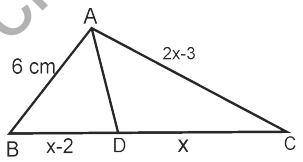
Q.562. PQRS is a cyclic quadrilateral and PQ is a diameter of the circle. If ∠RPQ = 23°, then what is the measure of ∠PSR ?
SSC CGL 20/04/2022 (Evening)
(a) 113° (b) 157° (c) 147° (d) 123°

Q.563. A circle is circumscribed on a quadrilateral ABCD, If ∠DAB = 100°, ∠ ADB = 35° and ∠CDB = 40°, then find the measure of ∠DBC.
SSC CGL 20/04/2022(Evening)
(a) 35° (b) 60° (c) 45° (d) 40°

Q.564. The radii of two concentric circles with center O are 26 cm and 16 cm. Chord AB of the larger circle is tangent to the smaller circle at C and AD is a diameter. What is the Length of a CD ?
SSC CGL 21/04/2022(Morning)
(a) 42 (b) 36 (c) 35 (d) 38

Q.565. In ΔABC, the perpendiculars drawn from A, B and C meet the opposite sides at points D,E and F respectively, AD, BE and CF intersect at point P. If ∠EPD = 110° and the bisectors of ∠A and ∠B meet at point Q, then ∠AQB = ?
SSC CGL 21/04/2022(Afternoon)
(a) 115° (b) 110° (c) 135° (d) 125°

Q.566. In the following figure , AD bisects angle BAC. Find the length (in cm) of BD ?



SSC CGL 21/04/2022(Afternoon)
(a) 4 (b) 5 (c) 9 (d) 6

Q.567. AB and CD are two chords in a circle O and AD is the diameter . when produced, AB and CD meet at the point P, If ∠DAP = 27° , ∠APD = 35° then what is the measures (in degrees) of ∠DBC ?
SSC CGL 21/04/2022 (Afternoon)
(a) 28 (b) 26 (c) 30 (d) 32

SSC CGL 2020 Tier - 2

Q.568. In ΔPQR, S is a point on the side QR such that ∠QPS = $\frac{1}{2}$∠PSR, ∠QPR = 78° and ∠PRS = 44°. What is the measure of ∠PSQ ?
SSC CGL Tier II (29/01/2022)
(a) 56° (b) 64° (c) 58° (d) 68°

Q.569. G is the centroid of a triangle ABC, whose sides AB = 35 cm, BC = 12 cm, and AC = 37 cm. The length of BG (in cm)is (correct to one decimal place):
SSC CGL Tier II (29/01/2022)
(a) 12.3 (b) 12.9 (c) 17.5 (d) 11.7

Q.570. In ΔABC, ∠B = 78°, AD is a bisector of ∠A meeting BC at D, and AE⊥BC at E. If ∠DAE = 24°, then the measure of ∠ACB is:
SSC CGL Tier II (29/01/2022)
(a) 32° (b) 38° (c) 30° (d) 42°

Q.571. S and T are points on the sides PQ and PR, respectively, of ΔPQR such that PS × PR = PQ × PT. If ∠Q = 96° and ∠PST = ∠PRQ + 34°, then ∠QPR =?
SSC CGL Tier II (29/01/2022)
(a) 26° (b) 24° (c) 22° (d) 25°

Q.572. O is a point in the interior of ΔABC such that OA = 12 cm, OC = 9 cm, ∠AOB = ∠BOC = ∠COA and ∠ABC = 60°. What is the length (in cm) of OB ?
SSC CGL Tier II (29/01/2022)
(a) $6\sqrt{2}$ (b) $6\sqrt{3}$ (c) $4\sqrt{3}$ (d) $4\sqrt{6}$

Q.573. ABCD is a quadrilateral in which AB || DC. E and F are the midpoints of the diagonals AC and BD, respectively. If AB = 18 cm and CD = 6 cm, then EF = ?
SSC CGL Tier II (29/01/2022)
(a) 12 (b) 9 (c) 6 (d) 8

Q.574. A_1 and A_2 are two regular polygons. The sum of all the interior angles of A_1 is 1080°. Each interior angle of A_2 exceeds its exterior angle by 132°. The sum of the number of sides A_1 and A_2 is :
SSC CGL Tier II (03/02/2022)
(a) 21 (b) 22 (c) 23 (d) 24

Q.575. ABCD is a cyclic quadrilateral. Sides AB and DC, when produced, meet at E and sides AD and BC when produced, meet at F. If ∠ADC = 76° and ∠AED = 55°, then ∠AFB is equal to:
SSC CGL Tier II (03/02/2022)
(a) 34° (b) 26° (c) 29° (d) 27°

Q.576. In ΔABC, D and E are points on the sides BC and AB, respectively, such that ∠ACB = ∠DEB. If AB = 12 cm, BE = 5 cm and BD : CD = 1 : 2, then BC is equal to:
SSC CGL Tier II (03/02/2022)
(a) $8\sqrt{3}$ cm (b) $5\sqrt{5}$ cm
(c) $6\sqrt{5}$ cm (d) $6\sqrt{3}$ cm

Q.577. In a square ABCD, diagonals AC and BD intersect at O. The angle bisector of ∠CAB meets BD and BC at F and G, respectively. OF: CG is equal to:
SSC CGL Tier II (03/02/2022)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) 1 : 2 (b) 1 : 3 (c) 1 : $\sqrt{2}$ (d) 1 : $\sqrt{3}$

Q.578. In ΔABC, ∠A = 50°, BE and CF are perpendiculars on AC and AB at E and F, respectively. BE and CF intersect at H. The bisectors of ∠HBC and ∠HCB intersect at P. ∠BPC is equal to:
SSC CGL Tier II (03/02/2022)
(a) 155° (b) 100° (c) 115° (d) 120°

Q.579. In equilateral ΔABC, D and E are points on the sides AB and AC, respectively, such that AD = CE, BE and CD intersect at F. The measure (in degrees) of ∠CFB is:
SSC CGL Tier II (03/02/2022)
(a) 120° (b) 135° (c) 125° (d) 105°

Q.580. In ΔABC, D is a point on BC such that ∠ADB = 2∠DAC, ∠BAC = 70° and ∠B = 56°. What is the measure of ∠ADC ?
SSC CGL Tier II (03/02/2022)
(a) 72° (b) 54° (c) 74° (d) 81°

Q.581. In ΔPQR, PQ = PR and S is a point on QR such that ∠PSQ = 96° + ∠QPS and ∠QPR = 132°. What is the measure of ∠PSR ?
SSC CGL Tier II (03/02/2022)
(a) 45° (b) 56° (c) 54° (d) 52°

SSC MTS 2020 Tier - 1

Q.582. In ΔABC, $\angle BAC = 90°$, AD is drawn perpendicular from A on BC. Which among the following is the mean proportional between BD and BC ?
SSC MTS 05/10/2021 (Morning)
(a) AD (b) AB (c) CD (d) AC

SSC CGL 2020 Tier - 1

Q.583. In a triangle ABC AB : AC = 5 : 2. BC = 9 cm. BA is produced to D, and the bisector of the Angle CAD meets BC produced at E. What is the length (in cm) of CE ?
SSC CGL 13/08/2021 (Afternoon)
(a) 9 (b) 10 (c) 6 (d) 3

Q.584. In a circle with centre O, AD is diameter and AC is chord. Point B is on AC such that OB = 7cm and ∠OBA = 60°. If ∠DOC = 60°, then what is the length of BC (in cm)?
SSC CGL 13/08/2021 (Afternoon)
(a) 7 (b) 9 (c) 5 (d) 3.5

Q.585. In ΔABC, ∠C = 90° and Q is the midpoint of BC. If AB = 10 cm and AC = 2 $\sqrt{10}\ cm$, then the length of AQ is :
SSC CGL 13/08/2021 (Evening)
(a) √55 cm (b) 5√3 cm
(c) 5√2 cm (d) 3√5 cm

Q.586. In a circle with centre O and radius 5 cm. AB and CD are two parallel chords of lengths 6 cm and x cm, respectively and the chords are on the opposite side of the centre O. The distance between the chords is 7 cm. Find the value of x ?
SSC CGL 16/08/2021 (Morning)
(a) 12 (b) 8 (c) 10 (d) 9

Q.587. In a circle with center O, AB is a diameter and CD is a chord such that ∠ABC = 34° and CD = BD. What is the measure of ∠DBC ?
SSC CGL 16/08/2021 (Morning)
(a) 30° (b) 24° (c) 32° (d) 28°

Q.588. ΔABC is inscribed in a circle with center O, such that ∠ACB = 115°, O is joined to A. What is the measure of ∠OAB ?
SSC CGL 16/08/2021 (Evening)
(a) 30° (b) 20° (c) 25° (d) 35°

Q.589. A triangle ABC has sides 5 cm, 6 cm and 7 cm. AB extends touches a circle at P and AC extended touches the same circle at Q . Find the length (in cm) of AQ .
SSC CGL 17/08/2021 (Morning)
(a) 13 (b) 12 (c) 9 (d) 11

Q.590. Points A and B are on a circle with center O. PAM and PBN are tangents to the circle at A and B respectively from a point P outside the circle. Point Q is on the major arc AB such that ∠QAM = 58° and ∠QBN = 50°, then find the measure of ∠APB.
SSC CGL 17/08/2021 (Evening)
(a) 30° (b) 32° (c) 36° (d) 40°

Q.591. In triangle ABC, D is a point on BC such that BD: DC = 3: 4. E is a point on AD such that AE:ED = 2 : 3. Find the ratio of $area\ (\Delta ECD) : area\ (\Delta AEB)$.
SSC CGL 17/08/2021 (Evening)
(a) 9 : 8 (b) 1 : 2 (c) 2 : 1 (d) 8 : 9

Q.592. Point P lies outside a circle with centre O. Tangents PA and PB are drawn to meet the circle at A and B respectively. If ∠APB = 80°, then ∠OAB is equal to:
SSC CGL 18/08/2021 (Morning)
(a) 140° (b) 40° (c) 70° (d) 35°

Q.593. $\Delta ABC \sim \Delta DEF$ If the areas of ΔABC and ΔDEF are 100 cm^2 and 81 cm^2, respectively and the altitude of ΔDEF is 6.3 cm, then the corresponding altitude (in cm) of ΔABC is :
SSC CGL 18/08/2021 (Morning)
(a) 5.6 (b) 9 (c) 7 (d) 8.4

Q.594. ΔABC is an equilateral triangle. D is a point on side BC such that BD : BC = 1 : 3. If AD = 5$\sqrt{7}$cm, then the side of the triangle is :
SSC CGL 18/08/2021 (Afternoon)
(a) 18cm (b) 12cm (c) 20cm (d) 15cm

Q.595. In a trapezium PQRS, PQ is parallel to RS and diagonal PR and QS intersect at O. PQ = 4 cm, SR = 10cm, then what is area(ΔPOQ) : area(ΔSOR) ?
SSC CGL 18/08/2021 (Afternoon)
(a) 4 : 25 (b) 2 : 3 (c) 4 : 9 (d) 2 : 5

Q.596. A chord AB of circle C_1 of radius 17 cm touches circle C_2 which is concentric to C_1. The radius of C_2 is 8 cm. What is the length (in cm) of AB ?
SSC CGL 18/08/2021 (Afternoon)
(a) 30 (b) 25 (c) 20 (d) 24

Q.597. In a right angled triangle ABC, the lengths of the sides containing the right angle are 5 cm and 12 cm respectively. A circle is inscribed in the triangle ABC. What is the radius of the circle (in cm)?
SSC CGL 18/08/2021 (Evening)
(a) 2.8 (b) 3 (c) 2 (d) 2.5

Q.598. Points A and B are on a circle with centre O. Point C is on the major arc AB. If ∠OAC = 35° and ∠OBC = 45°, then what is the measure (in degrees) of the angle subtended by the minor arc AB at the centre?
SSC CGL 18/08/2021 (Evening)
(a) 80 (b) 70 (c) 100 (d) 160

Q.599. Triangle ABC is an equilateral triangle. D and E are points on AB and AC respectively such that DE is parallel to BC and is equal to half the length of BC. If AD + CE + BC = 30 cm, then find the perimeter (in cm) of the quadrilateral BCED. SSC CGL 20/08/2021 (Morning)
(a) 45 (b) 25 (c) 37.5 (d) 35

Q.600. The angles of a triangle are in AP (arithmetic progression). If measure of the smallest angle is 50° less than that of the largest angle, then find the largest angle (in degrees)
SSC CGL 20/08/2021 (Afternoon)
(a) 80 (b) 85 (c) 90 (d) 75

Q.601. Vertices A, B, C and D of a quadrilateral ABCD lie on a circle. ∠A is three times ∠C and ∠D is two times ∠B. What is the difference between the measures of ∠D and ∠C?
SSC CGL 23/08/2021 (Morning)
(a) 55° (b) 65° (c) 75° (d) 45°

Q.602. In ΔABC, D is a point on BC such that ∠BAD = $\frac{1}{2}$ ∠ADC and ∠BAC = 77° and ∠C = 45°, What is the measure of ∠ADB?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 23/08/2021 (Afternoon)
(a) 64° (b) 77° (c) 45° (d) 58°

Q.603. In the triangle ABC, D and E are mid-points of AB and BC respectively. If area (ΔCED) = 8 cm^2, then what is the area (ADEC) in cm^2?
SSC CGL 23/8/2021 (Afternoon)
(a) 21 (b) 32 (c) 24 (d) 16

Q.604. Triangles ABC and DBC are right angled triangles with common hypotenuse BC. BD and AC intersect at P, when produced. If PA = 8 cm, PC = 4 cm and PD = 3.2, then the length of BD, in cm, is:
SSC CGL 23/08/2021 (Evening)
(a) 5.6 (b) 7.2 (c) 6.4 (d) 6.8

Q.605. ABCD is a cyclic quadrilateral in which ∠A = x°, ∠B = 5y°, ∠C = 2x° and ∠D = y°. What is the value of (3x - y) ?
SSC CGL 23/08/2021 (Evening)
(a) 120° (b) 60° (c) 90° (d) 150°

Q.606. In a triangle ABC, length of the side AC is 4 cm more than 2 times the length of the side AB. Length of the side BC is 4 cm less than the three times the length of the side AB. if perimeter of △ABC is 60 cm, then its area (in cm^2) is:
SSC CGL 24/08/2021 (Morning)
(a) 120 (b) 150 (c) 144 (d) 100

Q.607. The vertices of a ΔABC lie on a circle with centre O. AO is produced to meet the circle at the point P. D is a point on BC such that AD ⊥ BC. If ∠B = 68° and ∠C = 52°, then the measure of ∠DAP is:
SSC CGL 24/08/2021 (Morning)
(a) 28° (b) 16° (c) 12° (d) 18°

Q.608. The area of table top in the shape of an equilateral triangle is $9\sqrt{3}$ cm^2. What is the length (in cm) of each side of the table?
SSC CGL 24/08/2021 (Morning)
(a) 6 (b) 2 (c) 4 (d) 3

Q.609. In a circle with centre O, AB is a chord of length 10 cm. Tangents at points A and B intersect outside the circle at P. If OP = 2OA, then find the length (in cm) of AP.
SSC CGL 24/08/2021 (Afternoon)
(a) 10 (b) 12 (c) 12.5 (d) 15

Q.610. In ΔABC and ΔDEF, we have $\frac{AB}{DF}$ = $\frac{BC}{DE}$ = $\frac{AC}{EF}$, then which of the following is true ?
SSC CGL 24/08/2021 (Afternoon)
(a) ΔDEF ~ ΔABC (b) ΔBCA ~ ΔDEF
(c) ΔCAB ~ ΔDEF (d) ΔDEF ~ ΔBAC

SSC CHSL 2020 Tier - 1

Q.611. In a circle with centre O, Chord AB and diameter CD intersect each other at point E, inside the circle. If ∠AOD = 42° and ∠BOC = 104° then what is the measure (in degrees) of ∠AED ?
SSC CHSL 04/08/2021 (Evening)
(a) 73° (b) 62° (c) 58° (d) 84°

Q.612. In an isosceles triangle ABC, AB = AC and AD is perpendicular to BC. If AD = 12 cm and the perimeter of of ΔABC is 36 cm, then the length of BC (in cm) is:
SSC CHSL 05/08/2021 (Morning)
(a) 5 (b) 12 (c) 10 (d) 13

Q.613. The in-radius and circumradius of a right-angled triangle is 3 cm and 12.5 cm, respectively. The area of the triangle (in cm^2) is:
SSC CHSL 05/08/2021 (Evening)
(a) 64 (b) 48 (c) 88 (d) 84

Q.614. Point A, B, C and D are concyclic points of a circle with centre O, such that ∠DOC = 73°. The measure of ∠AOC is 215°. What is the measure of ∠AOD ?
SSC CHSL 06/08/2021 (Afternoon)
(a) 145° (b) 273° (c) 87° (d) 72°

Q.615. AB is the diameter of a circle of radius 9 cm. PQ is a chord (not a diameter) that intersects AB at M perpendicularly. If AM : BM = 5 : 4, then the length of chord PQ will be:
SSC CHSL 09/08/2021 (Afternoon)
(a) $5\sqrt{5}$ (b) $6\sqrt{5}$ (c) $6\sqrt{3}$ (d) $8\sqrt{5}$

Q.616. If the perimeter of an isosceles right triangle is $15(\sqrt{2}+1)\ cm$, then the area of the triangle (in cm^2) will be:
SSC CHSL 09/08/2021 ((Afternoon)
(a) 46.5 (b) 45 (c) 56.25 (d) 55

Q.617. If S is a point on side QR of a triangle PQR such that QS = 10 cm, QR = 18 cm and ∠PSR = ∠QPR, then the length of PR (in cm) will be:
SSC CHSL 10/08/2021 (Afternoon)
(a) 16 (b) 12 (c) 15 (d) 14

Q.618. In ΔPQR, QT⊥PR and S is a point on QR such that ∠PSQ = P°. If ∠TQR = 44° and ∠SPR = 32°, then the value of P is:
SSC CHSL 10/08/2021 (Evening)
(a) 72° (b) 82° (c) 76° (d) 78°

Q.619. The sides AB, BC and AC of ΔABC are 12 cm, 8 cm and 10 cm, respectively. A circle is inscribed in the triangle touching AB, BC and AC at D, E and F respectively. The ratio of the lengths of AD to CE is:
SSC CHSL 10/08/2021 (Evening)
(a) 5 : 7 (b) 3 : 5 (c) 10 : 7 (d) 7 : 3

Q.620. From a point P, which is at a distance of 13 cm from the centre O of a circle, a pair of tangents PQ and PR of length 12 cm are drawn to the circle. The area of the quadrilateral PQOR is:
SSC CHSL 11/08/2021 (Morning)
(a) 50 (b) 76 (c) 80 (d) 60

Q.621. The area (in cm^2) of the largest triangle that can be inscribed in a semicircle of radius 6 cm is:
SSC CHSL 11/08/2021 (Evening)
(a) 36 (b) 34 (c) 35 (d) 38

Q.622. The altitude AD of a triangle ABC is 9 cm. If AB = $6\sqrt{3}$cm and CD = $3\sqrt{3}$ cm, then what will be the measure of $\angle A$?
SSC CHSL 12/04/2021 (Morning)
(a) 90° (b) 30° (c) 45° (d) 60°

Q.623. ΔABC is drawn in a circle such that AC = BC and ∠BAC = 65°.From points B and C two tangents are drawn which intersect at point P. What is the measure of ∠BPC ?
SSC CHSL 12/08/2021 (Afternoon)
(a) 52.5° (b) 50° (c) 55° (d) 32.5°

Q.624. Two sides of a triangle are 12.8 m and 9.6 m. If the height of the triangle is 12 m, corresponding to 9.6 m, then what is its height (in m) corresponding to 12.8 m ?
SSC CHSL 13/04/2021 (Afternoon)
(a) 12 (b) 9 (c) 10 (d) 8

Q.625. AB is a diameter of the circle with centre D. The tangent at the point C on the circle meets AB produced at Q . If ∠BAC = 34°, then the measure of ∠CQA (in degrees) will be:
SSC CHSL 15/04/2021 (Morning)
(a) 26° (b) 36° (c) 22° (d) 24°

Q.626. The perimeter of an isosceles triangle is 3.6 m and its base is 30 cm shorter than each of the equal side. What is the area (in m^2) of the triangle ?
SSC CHSL 15/04/2021 (Afternoon)
(a) 0.6 (b) 0.72 (c) 0.54 (d) 0.8

Q.627. The sum of the radius of two circles is 286 cm and the area between the concentric circles is 50336 cm^2 .What are the radius (in cm) of the two circles? Take (π = $\frac{22}{7}$)
SSC CHSL 15/04/2021 (Afternoon)
(a) 115 and 91 (b) 115 and 171
(c) 91 and 84 (d) 171 and 84

Q.628. The three medians RQ, SP and TN of ΔRST intersect at point O. If the area of ΔRST is 48 cm^2, then the area of

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

quadrilateral SQON is: (in cm^2)
SSC CHSL 15/04/2021 (Evening)
(a) 20 (b) 12 (c) 16 (d) 18

Q.629. Two circular football grounds of radius 42 m and 35 m are to be replaced with a bigger circular ground. What would be the radius of this new ground if the new ground has the same area as the sum of the two small grounds? (in meter)
SSC CHSL 15/04/2021 (Evening)
(a) $\sqrt{2979}$ (b) $\sqrt{2981}$
(c) $\sqrt{2999}$ (d) $\sqrt{2989}$

Q.630. In ΔABC, medians BE and CF are perpendicular to each other and intersect at M. If BE = 9 cm and CF = 13 cm, then the area of ΔABCwill be: (in cm^2)
SSC CHSL 15/4/2021 (Evening)
(a) 75 (b) 78 (c) 76 (d) 68

Q.631. The side BC of ΔABC is produced to D. The bisectors of $\angle ABC$ and $\angle ACD$ meet at E. If AB = AC and $\angle BEC = 35°$, then the measure of $\angle ABC$ will be:
SSC CHSL 16/04/2021 (Afternoon)
(a) 75° (b) 55° (c) 35° (d) 45°

Q.632. ΔPQR is inscribed in a circle. The bisector of ∠P cuts QR at S and the circle at T. If PR = 5 cm, PS = 6 cm and ST = 4 cm, then the length (in cm) of PQ ?
SSC CHSL 19/04/2021 (Morning)
(a) 13 (b) 12 (c) 10 (d) 15

Q.633. In ΔABC, D and E are points on sides AB and BC, respectively, such that BD : DA = 1 : 2 and CE : EB = 1 : 4 . If DC and AE intersect at F, then FD : FC is equal to:
SSC CHSL 19/04/2021 (Morning)
(a) 3 : 2 (b) 5 : 2 (c) 8 : 3 (d) 4 : 1

Q.634. Chords AB and CD of a circle are produced to meet at the point P, outside the circle, and AD is the diameter of the circle. If ∠DAP = 36° and ∠APC = 30°, then what will be the measure of ∠CBD ?
SSC CHSL 19/04/2021 (Afternoon)
(a) 34° (b) 26° (c) 24° (d) 16°

SSC CPO 2020 Tier - 1

Q.635. In ΔABC, D is a median from A to BC, AB = 6cm , AC = 8 cm and BC = 10 cm. The length of median AD (in cm):
SSC CPO 24/11/2020 (Evening)
(a) 3 (b) 4.5 (c) 4 (d) 5

Answer Key :-

1.(a)	2.(b)	3.(b)	4.(c)
5.(b)	6.(a)	7.(d)	8.(c)
9.(a)	10.(d)	11.(b)	12.(d)
13.(b)	14.(b)	15.(d)	16.(a)
17.(b)	18.(d)	19.(c)	20.(c)
21.(c)	22.(c)	23.(a)	24.(d)
25.(d)	26.(d)	27.(d)	28.(c)
29.(c)	30.(c)	31.(b)	32.(a)
33.(c)	34.(c)	35.(a)	36.(a)
37.(d)	38.(a)	39.(d)	40.(a)
41.(c)	42.(c)	43.(c)	44.(c)
45.(d)	46.(c)	47.(c)	48.(a)
49.(a)	50.(d)	51.(c)	52.(a)
53.(a)	54.(d)	55.(a)	56.(d)
57.(a)	58.(a)	59.(d)	60.(a)
61.(b)	62.(d)	63.(d)	64.(d)
65.(c)	66.(d)	67.(c)	68.(b)
69.(d)	70.(c)	71.(b)	72.(b)
73.(c)	74.(c)	75.(b)	76.(b)
77.(c)	78.(d)	79.(b)	80.(b)
81.(d)	82.(c)	83.(c)	84.(b)
85.(b)	86.(c)	87.(d)	88.(b)
89.(d)	90.(c)	91.(b)	92.(a)
93.(a)	94.(d)	95.(a)	96.(c)
97.(d)	98.(b)	99.(c)	100.(d)
101.(a)	102.(d)	103.(b)	104.(a)
105.(d)	106.(d)	107.(d)	108.(a)
109.(c)	110.(a)	111.(a)	112.(b)
113.(a)	114.(d)	115.(a)	116.(a)
117.(d)	118.(d)	119.(b)	120.(c)
121.(b)	122.(d)	123.(a)	124.(b)
125.(a)	126.(b)	127.(c)	128.(b)
129.(a)	130.(b)	131.(a)	132.(a)
133.(d)	134.(d)	135.(d)	136.(c)
137.(d)	138.(c)	139.(c)	140.(a)
141.(d)	142.(a)	143.(a)	144.(d)
145.(d)	146.(b)	147.(a)	148.(b)
149.(c)	150.(c)	151.(b)	152.(a)
153.(a)	154.(d)	155.(a)	156.(c)
157.(c)	158.(d)	159.(d)	160.(a)
161.(d)	162.(d)	163.(c)	164.(d)
165.(d)	166.(b)	167.(d)	168.(a)
169.(d)	170.(b)	171.(d)	172.(c)
173.(d)	174.(d)	175.(c)	176.(b)
177.(b)	178.(a)	179.(a)	180.(c)
181.(c)	182.(a)	183.(c)	184.(b)
185.(b)	186.(d)	187.(c)	188.(c)
189.(d)	190.(d)	191.(c)	192.(d)
193.(d)	194.(a)	195.(b)	196.(b)
197.(b)	198.(d)	199.(a)	200.(a)
201.(a)	202.(d)	203.(d)	204.(a)
205.(c)	206.(a)	207.(c)	208.(a)
209.(a)	210.(d)	211.(b)	212.(d)
213.(a)	214.(c)	215.(a)	216.(a)
217.(c)	218.(a)	219.(c)	220.(b)
221.(d)	222.(b)	223.(a)	224.(a)
225.(d)	226.(d)	227.(a)	228.(b)
229.(a)	230.(c)	231.(a)	232.(a)
233.(b)	234.(b)	235.(a)	236.(c)
237.(d)	238.(b)	239.(d)	240.(a)
241.(b)	242.(c)	243.(c)	244.(c)
245.(d)	246.(a)	247.(b)	248.(b)
249.(b)	250.(b)	251.(a)	252.(d)
253.(b)	254.(a)	255.(d)	256.(b)
257.(b)	258.(c)	259.(a)	260.(b)
261.(c)	262.(a)	263.(c)	264.(a)
265.(d)	266.(a)	267.(a)	268.(d)
269.(b)	270.(c)	271.(b)	272.(c)
273.(d)	274.(d)	275.(c)	276.(a)
277.(a)	278.(b)	279.(a)	280.(d)
281.(d)	282.(d)	283.(b)	284.(a)
285.(c)	286.(d)	287.(a)	288.(c)
289.(a)	290.(d)	291.(d)	292.(c)
293.(a)	294.(d)	295.(b)	296.(b)
297.(b)	298.(b)	299.(a)	300.(a)
301.(d)	302.(d)	303.(d)	304.(c)
305.(b)	306.(d)	307.(c)	308.(c)
309.(c)	310.(a)	311.(b)	312.(d)
313.(b)	314.(a)	315.(d)	316.(b)
317.(d)	318.(d)	319.(b)	320.(c)
321.(a)	322.(a)	323.(a)	324.(a)
325.(d)	326.(d)	327.(a)	328.(a)
329.(a)	330.(a)	331.(c)	332.(d)
333.(b)	334.(d)	335.(d)	336.(a)
337.(b)	338.(a)	339.(d)	340.(c)
341.(c)	342.(a)	343.(a)	344.(d)
345.(a)	346.(c)	347.(a)	348.(b)
349.(c)	350.(c)	351.(b)	352.(c)
353.(d)	354.(d)	355.(c)	356.(a)
357.(a)	358.(d)	359.(c)	360.(a)
361.(a)	362.(b)	363.(d)	364.(a)
365.(a)	366.(b)	367.(d)	368.(c)
369.(c)	370.(c)	371.(c)	372.(b)
373.(d)	374.(a)	375.(c)	376.(b)

Search on TG: @apna_pdf

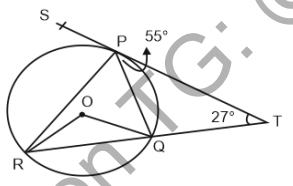
Search on Telegram @apna_pdf

377.(a)	378.(b)	379.(c)	380.(b)
381.(a)	382.(d)	383.(c)	384.(d)
385.(c)	386.(c)	387.(c)	388.(d)
389.(a)	390.(b)	391.(b)	392.(b)
393.(d)	394.(a)	395.(c)	396.(c)
397.(a)	398.(b)	399.(d)	400.(c)
401.(a)	402.(d)	403.(b)	404.(c)
405.(c)	406.(c)	407.(a)	408.(d)
409.(c)	410.(d)	411.(b)	412.(c)
413.(c)	414.(a)	415.(b)	416.(b)
417.(c)	418.(a)	419.(c)	420.(d)
421.(d)	422.(b)	423.(a)	424.(c)
425.(d)	426.(a)	427.(d)	428.(d)
429.(d)	430.(c)	431.(d)	432.(c)
433.(a)	434.(b)	435.(d)	436.(b)
437.(b)	438.(d)	439.(b)	440.(b)
441.(c)	442.(b)	443.(b)	444.(c)
445.(b)	446.(b)	447.(a)	448.(d)
449.(b)	450.(b)	451.(b)	452.(b)
453.(a)	454.(c)	455.(d)	456.(a)
457.(c)	458.(a)	459.(c)	460.(a)
461.(c)	462.(d)	463.(d)	464.(b)
465.(b)	466.(d)	467.(c)	468.(d)
469.(b)	470.(d)	471.(d)	472.(d)
473.(c)	474.(c)	475.(a)	476.(d)
477.(c)	478.(b)	479.(a)	480.(c)
481.(a)	482.(c)	483.(c)	484.(a)
485.(d)	486.(a)	487.(d)	488.(a)
489.(d)	490.(d)	491.(c)	492.(c)
493.(d)	494.(d)	495.(a)	496.(b)
497.(c)	498.(c)	499.(b)	500.(b)
501.(c)	502.(d)	503.(b)	504.(a)
505.(c)	506.(c)	507.(d)	508.(d)
509.(c)	510.(a)	511.(c)	512.(b)
513.(a)	514.(a)	515.(c)	516.(d)
517.(b)	518.(a)	519.(c)	520.(b)
521.(a)	522.(a)	523.(a)	524.(b)
525.(b)	526.(c)	527.(a)	528.(b)
529.(a)	530.(d)	531.(d)	532.(c)
533.(b)	534.(c)	535.(c)	536.(d)
537.(a)	538.(c)	539.(b)	540.(a)
541.(c)	542.(b)	543.(c)	544.(a)
545.(b)	546.(d)	547.(d)	548.(d)
549.(d)	550.(c)	551.(d)	552.(c)
553.(c)	554.(c)	555.(a)	556.(b)
557.(b)	558.(c)	559.(b)	560.(d)

561.(d)	562.(a)	563.(b)	564.(d)
565.(d)	566.(a)	567.(a)	568.(b)
569.(a)	570.(c)	571.(c)	572.(b)
573.(c)	574.(c)	575.(d)	576.(c)
577.(a)	578.(a)	579.(a)	580.(a)
581.(c)	582.(b)	583.(c)	584.(a)
585.(a)	586.(b)	587.(d)	588.(c)
589.(c)	590.(c)	591.(c)	592.(b)
593.(c)	594.(d)	595.(a)	596.(a)
597.(c)	598.(d)	599.(c)	600.(b)
601.(c)	602.(a)	603.(c)	604.(d)
605.(d)	606.(a)	607.(b)	608.(a)
609.(a)	610.(b)	611.(a)	612.(c)
613.(d)	614.(d)	615.(d)	616.(c)
617.(b)	618.(d)	619.(d)	620.(d)
621.(a)	622.(d)	623.(b)	624.(b)
625.(c)	626.(a)	627.(b)	628.(c)
629.(d)	630.(b)	631.(b)	632.(b)
633.(c)	634.(c)	635.(d)	

Solutions :-

Sol.1.(a)



In ΔPTQ

$\angle PQR = 55^\circ + 27^\circ = 82^\circ$ ... (exterior angle property)

$\angle RPS = \angle PQR$

$\angle RPS = 82^\circ$

Now,

$\angle RPS + \angle RPQ + \angle QPT = 180^\circ$ ... (linear pair)

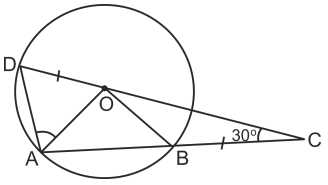
$82^\circ + \angle RPQ + 55^\circ = 180^\circ$

$\angle RPQ = 180^\circ - 137^\circ = 43^\circ$

Now,

$\angle ROQ = 2\angle RPQ = 2 \times 43^\circ = 86^\circ$

Sol.2.(b)



Given: BC = OD

then, OD = OB = OA = radii of the circle

In ΔOBC,

∠OCB = ∠COB = 30°

∠OBC = 180° - (30° + 30°) = 120°

In ΔOAB,

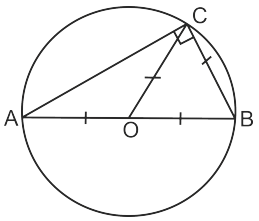
∠OBA = 180° - 120° = 60° = ∠OAB

∠AOB = 180° - (60° + 60°) = 60°

Now,

∠AOD = 180° - 60° - 30° = 90°

Sol.3.(b)



$\angle ABC = x\angle BAC$

$\frac{\angle ABC}{\angle BAC} = x$ .....(i)

In ΔOCB all sides are equal to each other then all angles to equal to each other,

∠ABC = ∠BCO = ∠COB = 60°

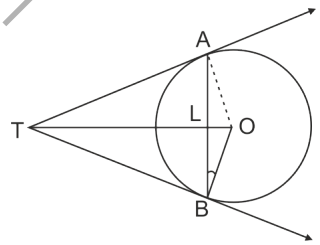
then,

∠ACO = ∠ACB - ∠BCO = 90° - 60° = 30°

∠CAO = ∠ACO = 30° (AO = OC)

Now, $x = \frac{60^\circ}{30^\circ} = 2$

Sol.4.(c) Given , OB = 20 cm and AB = 32cm , So AL = LB = 16cm



Now , TA = TB (length of tangents to a circle from external point are equal)

In , ΔOLA

$LO = \sqrt{400 - 256} = \sqrt{144} = 12cm$

$tan \angle AOL = \frac{AL}{OL} = \frac{16}{12}$

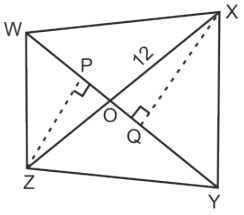
Similarly in ΔOAT

$tan \angle AOT = \frac{AT}{OA} = \frac{AT}{20}$

$\Rightarrow \frac{16}{12} = \frac{AT}{20}$ (∠AOL = ∠ AOT=common)

$\Rightarrow AT = \frac{16 \times 20}{12} = 26.67$

Sol.5.(b)



In ΔZOP and ΔXOQ

XQ = ZP .....(Given)

∠ P = ∠Q ... (each 90°)

∠ POZ = ∠XOQ ...(vertically opposite angle)

∴ ΔZOP ≅ ΔXOQ (AAS Congruence)

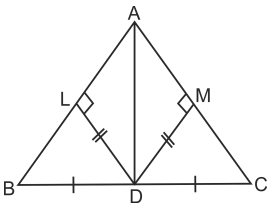
So , OX = ZO = 12 cm (CPCT)

Hence , ZX =XO + ZO = 12 + 12 = 24cm

Sol.6.(a)

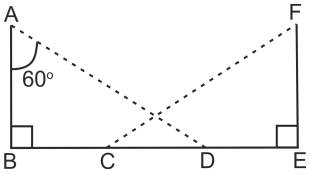
Search on TG: @apna_pdf

Search on Telegram @apna_pdf



In ΔBLD and ΔCMD
BD = DC (given)
LD = DM (given)
∠BLD = ∠CMD = 90°
ΔBLD ≅ ΔCMD [by SAS]
So, BL = MC-----(i)
Now, in the triangle ΔALD and ΔAMD
LD = DM (given)
AD = AD (common)
∠ALD = ∠AMD = 90°
ΔALD ≅ ΔAMD [by SAS]
then, AL = AM-----(ii)
From equation (i) and (ii)
AB = AC
Hence, triangle ABC is an isosceles triangle

Sol.7.(d) Given ,In ΔABD and ΔFEC, ∠BAD = 60°, l(BD) = l(EC), ∠ABD = ∠FEC = 90°, and l(AB) = l(FE)



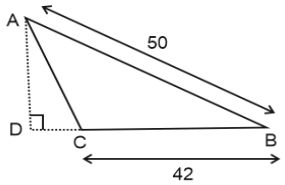
Now in ΔABD ,
$\angle A + \angle B + \angle D = 180°$
60° + 90° + ∠D = 180° ⇒ ∠D = 30°
Now, According to question ,
In ΔABD and ΔFEC
AB = FE (Given)
∠B = ∠E (Each 90°)
BD = CE (Given)
By SAS , ΔABD ≅ ΔFEC
∵ ∠D =∠C = 30°
Now, ratio of $\frac{\angle BAD}{\angle FCE}$ = 60° : 30° = 2 : 1

Sol.8.(c) Length of common external tangent = $\sqrt{d^2 - (R - r)^2}$
$\Rightarrow d^2 - (R - r)^2 = 81$
$\Rightarrow (R - r)^2 = d^2 - 81$ ----------(i)
Length of common internal tangent = $\sqrt{d^2 - (R + r)^2}$
$\Rightarrow d^2 - (R + r)^2 = 25$
$\Rightarrow (R + r)^2 = d^2 - 25$ ---------- (ii)
From equation (i) and (ii)
4 R r = 56 ⇒ Rr = 14

Short trick:-
$(\text{External tangent})^2 - (\text{internal tangent})^2$ = 4 R r
$\Rightarrow (9)^2 - (5)^2 = 4 \times Rr$
$\Rightarrow 81 - 25 = 4 \times Rr$
$\Rightarrow 56 = 4 \times Rr \Rightarrow Rr = 14$

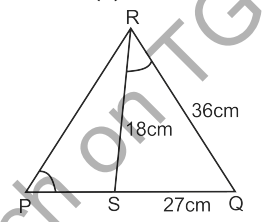
Sol.9.(a) As, XY + YZ = XZ (11+13 = 24) implies that X, Y, Z are collinear points. So, the number of circles that travel through all three points X, Y, Z is 0 .

Sol.10.(d)



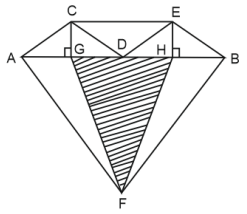
Let the height of ΔABC is AD
Area of $\Delta ABC = \frac{1}{2} \times BC \times AD$
$294 = \frac{1}{2} \times 42 \times AD$
14 = AD ..... (i)
Now in ΔADB
$AB^2 = AD^2 + BD^2$
$50^2 = 14^2 + BD^2$ ... [from (i)]
BD^2 = 2500 - 196 = 2304
BD = 48 cm
DC = BD - BC
= 48 - 42 = 6 cm
In ΔADC
$AC^2 = AD^2 + DC^2$
$= 14^2 + 6^2$ = 196 + 36 = 232 cm
$AC = 2\sqrt{58}$ cm

Sol.11.(b)



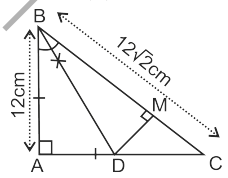
In ΔQPR and ΔQRS
∠QPR = ∠QRS ... (given)
∠PQR = ∠SQR ...(common)
So, ΔQPR ~ ΔQRS by AA similarity
Hence, $\frac{QP}{QR} = \frac{QR}{QS} \Rightarrow QP = \frac{36 \times 36}{27}$ = 48 cm
and $\frac{PR}{RS} = \frac{QR}{QS} \Rightarrow PR = \frac{36 \times 18}{27}$ = 24 cm
⇒ PS = PQ - SQ = 48 - 27 = 21 cm
In ΔPRS and ΔQSR,
$\frac{Perimeter\ of\ (\triangle PRS)}{Perimeter\ of\ (\triangle QSR)} = \frac{PR + RS + PS}{QS + SR + QR}$
$= \frac{24 + 18 + 21}{27 + 18 + 36} = \frac{63}{81} = \frac{7}{9}$ or 7 : 9

Sol.12.(d)



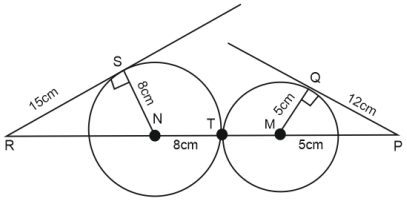
I) For, ΔACG ≅ ΔBEH
In the ΔAGC and ΔEHB
∠AGC = ∠EHB = 90°
Side (AG) = side(HB) [given]
And, CG = EH [lengths between two parallel lines]
So, by SAS theorem,
ΔACG ≅ ΔBEH (true)
II) Now, for ΔCDE ≅ ΔDEB ≅ ΔDCA
In the Δ CDE and Δ DEB , CE ∥ AB (given)
DE = DE [common]
∠CED = ∠BDE [alternate interior angle]
CE = DB
So, ΔCDE ≅ ΔDEB by SAS theorem,
Similarly,
In ΔCDE and ΔDCA , CE ∥ AB (given)
CD = CD [common]
∠ECD = ∠ADC [alternate interior angle]
CE = AD
So, ΔCDE ≅ ΔDCA by SAS theorem,
Hence, ΔCDE ≅ ΔDEB ≅ ΔDCA [true]
III) For, ΔHFB ≅ ΔAFG [false]
Only AG = HB [given]
∵ No other side or angles are equal
Therefore, option (d) is the correct answer.

Sol.13.(b)



In ΔDAB and ΔDMB,
∠ABD = ∠MBD
∠BAD = ∠BMD = 90°
BD = BD (common)
So, ΔDAB ≅ ΔDMB by ASA
⇒ AB = BM = 12 cm
Then, MC = BC - BM = $(12\sqrt{2} - 12)$ cm
Now,
∠MDC = 180° - (90° + 45°) = 45°
So, MC = DM = $(12\sqrt{2} - 12)$ cm
As, DM = AD (by congruence)
Hence, AD = $(12\sqrt{2} - 12) = 12(\sqrt{2} - 1)$ cm
Alternate method:-
In this type of question we use direct property,
The property is AB + AD = BC
⇒ AD = BC - AB
$= 12\sqrt{2} - 12 = 12(\sqrt{2} - 1)$ cm

Sol.14.(b)

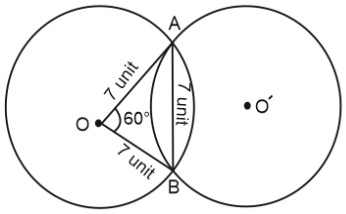


(8 , 15 , 17) are pythagorean triplet
RN = 17 cm
(5 , 12 , 13) are pythagorean triplet
MP = 13 cm
Now, PR = RN + NT + TM + MP
= 17 + 8 + 5 + 13 = 43 cm

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.15.(d)



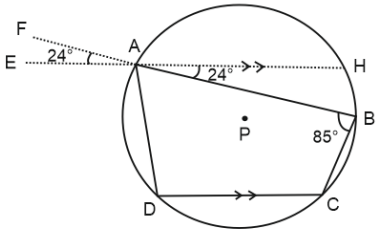
Common area = 2 × (area of sector OABO - Area of equilateral Δ OAB)

$= 2 \times (\frac{60}{360}\pi \times (7)^2 - \frac{\sqrt{3}}{4} \times (7)^2)$

$= 2 \times (7)^2 (\frac{1}{6}\pi - \frac{\sqrt{3}}{4}) = 98 (\frac{1}{6}\pi - \frac{\sqrt{3}}{4})$

Hence, required area = $98 (\frac{\pi}{6} - \frac{\sqrt{3}}{4})$

Sol.16.(a)



In cyclic quadrilateral ABCD

$\angle B + \angle D = 180^\circ$

$\angle D = 180^\circ - 85^\circ = 95^\circ$

Now EA ∥ DC

So,

$\angle DAH + \angle D = 180^\circ$ ... (co-interior angle)

$\angle DAB + \angle BAH + \angle D = 180^\circ$

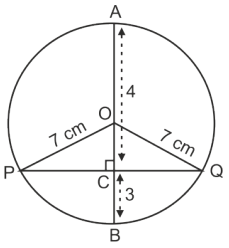
$\angle DAB = 180^\circ - 95^\circ - 24^\circ = 61^\circ$

Now

$\angle C + \angle DAB = 180^\circ$

$\angle C = 180^\circ - 61^\circ = 119^\circ$

Sol.17.(b)



AB = 2×radius = 14 cm

AC = $14 \times \frac{4}{7} = 8$

BC = 14 - 8 = 6

PC = QC ... (diameter ⊥ chord)

Now,

PC × QC = AC × BC

$PC^2 = 8 \times 6 = 48$

PC = $\sqrt{48}$

PQ = $2\sqrt{48} = 8\sqrt{3}$ cm

Sol.18.(d) Let the angles are x, $2x$, $3x$

Sum of angles of triangle = $180°$

$x + 2x + 3x = 180° \Rightarrow x = 30°$

Hence angles are ; $30°$ $60°$ $90°$

On Using sine rule

$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

$\frac{a}{\sin 30°} = \frac{b}{\sin 60°} = \frac{c}{\sin 90°}$

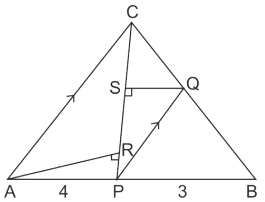
$\frac{a}{\frac{1}{2}} = \frac{b}{\frac{\sqrt{3}}{2}} = \frac{c}{1} = k$

$2a = \frac{2}{\sqrt{3}}\ b = \frac{c}{1} = k$

$a = \frac{1}{2}, b = \frac{\sqrt{3}}{2}, c = 1$

$a : b : c = 1 : \sqrt{3} : 2$

Sol.19.(c)



As, PQ∥ AC, △BQP ~ △BCA (by AAA rule)

Then, $\frac{BP}{AB} = \frac{QP}{AC} = \frac{BQ}{BC} = \frac{3}{7}$

Now, In △SPQ & △RCA

∠QSP = ∠ARC = 90°

∠QPS = ∠ACR (alternate angles)

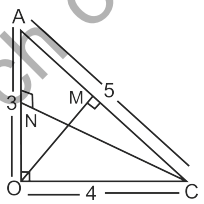
So, △SPQ ~ △RCA (by AAA rule)

Then, $\frac{QS}{AR} = \frac{QP}{AC} = \frac{3}{7}$

$\Rightarrow \frac{9}{AR} = \frac{3}{7} \Rightarrow$ AR = $\frac{9 \times 7}{3}$ = 21 cm

Sol.20.(c) Concept used :

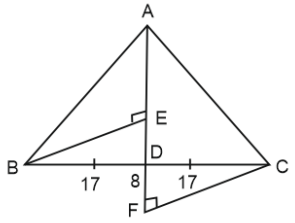
Altitudes of the triangle are inversely proportional to the side of that triangle.



Sides → 3 : 4 : 5

Altitude → $\frac{1}{3} : \frac{1}{4} : \frac{1}{5}$ = 20 : 15 : 12

Sol.21.(c) According to the question,



CF = $\sqrt{17^2 - 8^2}$ = 15 cm

In △BED and △CFD,

∠DEB = ∠CFD = 90°

∠EDB = ∠FDC (vertical angle)

BD = DC (given)

So, △BED ≅ △CFD (By AAS rule)

Then, BE = CF = 15 cm

Sol.22.(c) The minute hand and hour hand coincide after every 65 minutes.

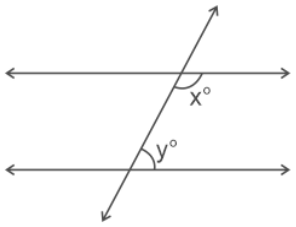
Let us take the time when they meet after 12

12 : 00, 01 : 05, 02 : 10, 03 : 15, 04 : 20, 05 : 25, 06 : 30, 07 : 35, 08 : 40, 09 : 45, 10 : 50, 11 : 55

Hence, in hlaf a day hour hand and minute hand coincide 11 times.

Sol.23.(a) Let the interior angles on the same side are $x°$ and $y°$

Where $(x > y)$



We know that the sum of interior angles is 180°.

$\therefore x + y = 180°$.....(i)

And $x - y = 40°$.....(ii)

From solving the equations (i) and (ii) we get,

$y = 70°$

Hence, small interior angle (y) = 70°

Sol.24.(d)

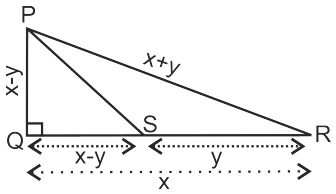
By checking all options one by one we find that option d is incorrect.

Sides of triangle = $2a$, $2a$, $3a$

Height of triangle from base with side 3a = $\frac{\sqrt{7}a}{2}$

Area of triangle = $\frac{1}{2} \times 3a \times \frac{\sqrt{7}a}{2} = \frac{3\sqrt{7}a^2}{4}$

Sol.25.(d)

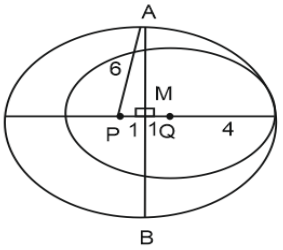


(3, 4, 5) is a pythagorean triple.

Let x = 4, y = 1

So the ratio of QS : SR = 3 : 1

Sol.26.(d)



So the length of AM = $\sqrt{36 - 1} = \sqrt{35}$

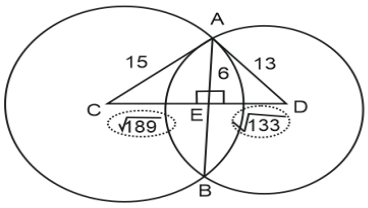
Now,

Length of AB = $2 \times \sqrt{35} = 2\sqrt{35}$ cm

Sol.27.(d)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf



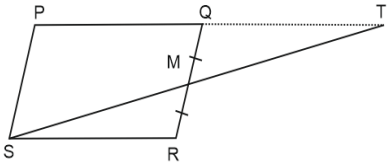
Given, length of AB = 12 cm,
then AE = 6 cm

In ΔACE, CE = $\sqrt{225 - 36} = \sqrt{189}$

In ΔADE, DE = $\sqrt{169 - 36} = \sqrt{133}$

So, the distance between the two centers = $\sqrt{189} + \sqrt{133}$

Sol.28.(c)



SR = PQ ....(PQRS is a parallelogram)

$\Delta SMR \cong \Delta QMT$

∠RMS = ∠QMT ....(vertically opposite)

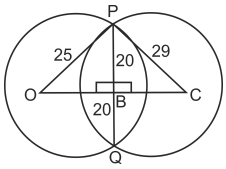
∠MRS = ∠MQT ...(alternate angle)

So , $\frac{RM}{MQ} = \frac{SR}{QT} \Rightarrow \frac{1}{1} = \frac{SR}{QT}$

⇒ SR = PQ = QT ⇒ PT = 2PQ = 2SR

Sol.29.(c) Pythagorean triplets :- (15, **20**, 25) and (**20**, 21, 29)

AP = BP = 20 cm



So , distance between the centres (OC) = 15 + 21 = 36

Sol.30.(c)

Using tangent - secant theorem :-

$RX^2 = RQ \times RP$

$144 = (x - 2) \times (2x - 2)$

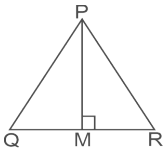
$144 = 2x^2 - 6x + 4$

$2x^2 - 6x - 140 = 0$

$x^2 - 3x - 70 = 0 \Rightarrow x = 10, -7$

Length can't be −ve , so x = 10 cm

Sol.31.(b)



In an equilateral triangle , both altitude and median are the same.

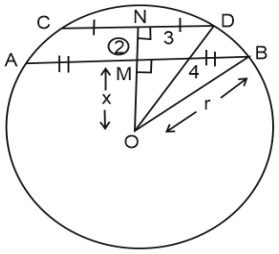
PQ = QR = RP = 2QM = 2MR

In ΔPMQ , $PQ^2 = PM^2 + QM^2$

$PQ^2 = PM^2 + (\frac{PQ}{2})^2$

$PM^2 = \frac{3PQ^2}{4} \Rightarrow 3PQ^2 = 4PM^2$

Sol.32.(a)



Equating the value of radius ,

$\Rightarrow (3)^2 + (x + 2)^2 = (4)^2 + (x)^2$

$\Rightarrow 9 + 4 + 4x = 16 \Rightarrow x = \frac{3}{4}$

Now , radius (OB=OD) = $\sqrt{(4)^2 + (x)^2}$

$= \sqrt{(4)^2 + \left(\frac{3}{4}\right)^2} = \frac{\sqrt{265}}{4}$

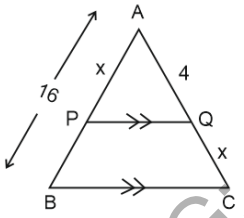
Sol.33.(c)

Length of transverse common tangent

$= \sqrt{d^2 - (r_1 + r_2)^2} = \sqrt{12^2 - (5 + 4)^2}$

$= \sqrt{144 - (81)} = \sqrt{63}$

Sol.34.(c)



By using Thales theorem

$\frac{AP}{AB} = \frac{AQ}{AC} \Rightarrow \frac{x}{16} = \frac{4}{x+4}$

$= x^2 + 4x - 64 = 0$

$x = \frac{-4 \pm \sqrt{(4)^2 - 4 \times 1 \times (-64)}}{2 \times 1}$

$x = \frac{-4 \pm \sqrt{272}}{2 \times 1} = (2\sqrt{17} - 2)$

Sol.35.(a)

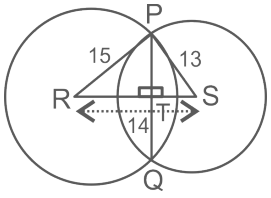
Value of third side will lies between :-

$(24 - 9) < S < (24 + 9)$

$(15) < S < (33)$

Sol.36.(a) According to the option , Option, 'a' is the false statement . Correct statement is :- ratio of same sides in congruent triangles always be the same.

Sol.37.(d)



In ΔPRS

S(semi perimeter) = $\frac{a + b + c}{2}$

$= \frac{15 + 13 + 14}{2} = \frac{42}{2} = 21$

Area of ΔPRS

$= \sqrt{21\ (21 - 15)(21 - 13)(21 - 14)}$

$= \sqrt{21 \times 6 \times 8 \times 7} = 84$

Now, area of ΔPRS = $\frac{1}{2} \times base \times height$

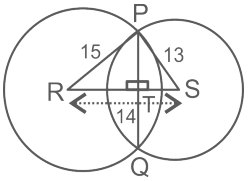
$\Rightarrow \frac{1}{2} \times RS \times PT = 84 \Rightarrow \frac{1}{2} \times 14 \times PT = 84$

$\Rightarrow 7\ PT = 84 \Rightarrow PT = 12$

So, the length of the common chord PQ = 2 × 12 = 24 cm

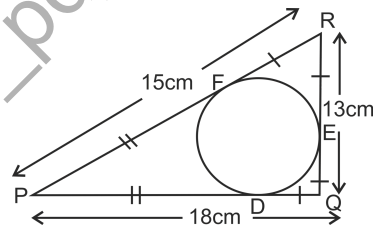
Short trick :-

Pythagoras triplets :- (5 , 12 , 13) and (9 , 12 , 15)



So , length of common chord (PQ) = 2 × 12 = 24 cm

Sol.38.(a)



Let , PF = PD = x , RF = RE = y and QE = QD = Z

According to the question,

$2(x + y + z) = 13 + 15 + 18 = 46$

$x + y + z$ = 23 cm

Now, length of PD (x) = $(x + y + z) - (y + z)$ = 23 − 13 = 10 cm

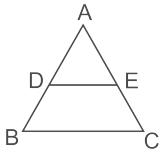
Short trick :-

PD = $(\frac{PQ + QR + RP}{2}) - RQ$

PD = $(\frac{18 + 13 + 15}{2}) - 13$

PD = 23 − 13 = 10 cm

Sol.39.(d)



As DE ∥ BC

DE divides the area of ΔABC into two equal parts

Hence, D and E is the midpoint of AB and AC

As ΔADE ~ ΔABC

$\frac{Area\ of\ \Delta ABC}{Area\ of\ \Delta ADE} = (\frac{AB}{AD})^2$

$\Rightarrow (\frac{AB}{AD})^2 = \frac{2}{1} \Rightarrow AB = \sqrt{2}AD$

⇒ AB = $\sqrt{2}$ (AB - BD) ⇒ $\sqrt{2}$ BD = ($\sqrt{2}$ - 1) AB

$\Rightarrow \frac{BD}{AB} = \frac{(\sqrt{2} - 1)}{\sqrt{2}}$

Sol.40.(a) $\pi^c = 180° \Rightarrow 1^c = (\frac{180 \times 7}{22})°$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

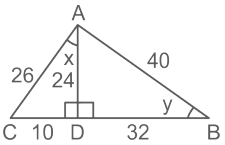
θ (in radian) = $\frac{length\ of\ arc}{radius}$ = $\frac{3x}{x}$ = 3

θ (in degree) = $\frac{3 \times 180 \times 7}{22}$

Area of sector = $\frac{\theta}{360°} \times \frac{22}{7} \times r^2$

= $\frac{3 \times 180 \times 7}{22 \times 360} \times \frac{22}{7} \times r^2$ = 1.5 r^2

Sol.41.(c)



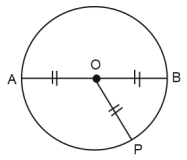
$\frac{6}{\cos x} - \frac{5}{\cos y} + 8 \tan y$

= $\frac{6}{\frac{24}{26}} - \frac{5}{\frac{32}{40}} + 8 \times \frac{24}{32}$

= $\frac{26}{4} - \frac{5 \times 5}{4} + 8 \times \frac{3}{4}$

= $\frac{26 - 25 + 24}{4}$ = $\frac{25}{4}$ units

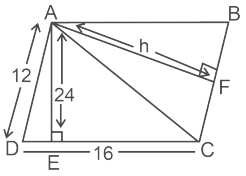
Sol.42.(c)



Given that ,
∠AOP = 95°
∠AOP + ∠BOP = 180° ⇒ ∠BOP = 85°
OB = OP = radius
So , ∠OBP = ∠OPB
Now , In ΔBOP
∠POB + ∠OBP + ∠BPO = 180°
2 × ∠OBP = 180° − 85°

∠OBP = $\frac{95°}{2}$ = 47.5°

Sol.43.(c)

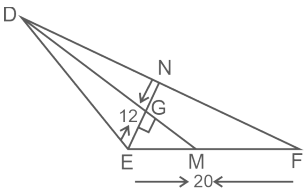


Let ABCD is a parallelogram,
DC ∥AB and DA ∥CB
We know that,
DC =AB =16 and DA=CB =12
According to the question,
⇒ Area of △ADC = Area of △ABC

⇒ $\frac{1}{2}$ × 16 × 24 = $\frac{1}{2}$ × 12 × h

⇒ h = $\frac{16 \times 24}{12}$ = 32 cm

Sol.44.(c)



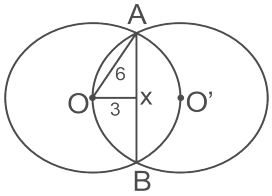
The centroid divides each median in the ratio 2 : 1 .

So the value of EG = 12 × $\frac{2}{3}$ = 8 cm

EM = 10 cm (median divides side equally)
ΔEGM follow, triplates = (6, 8, 10)
So the value of GM = 6 cm
(GM) 1 unit = 6 cm
Then (DM) 3 units = 18 cm

Sol.45.(d) Possible no. of values of AC = BC - AB < AC < BC + AB ⇒ 5 < AC < 17
Total possible values = 11
Short trick :-
Total no. of possible values of third side (AC) = 2 × (smallest side) − 1
= 2 × (6) - 1= 11

Sol.46.(c)



Let common chord AB perpendicularly bisect the distance between the centres at x

So, ox = $\frac{OO'}{2}$ = $\frac{6}{2}$ = 3cm

Now, as per figure

$(AO)^2 = (AX)^2 + (OX)^2 \Rightarrow (AX)^2$ = 36 − 9

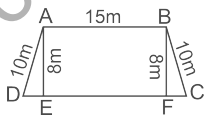
(AX) = $\sqrt{27}$ = $3\sqrt{3}$

$AB = 2 \times AX = 6\sqrt{3}$ cm

Short Trick :-

AB = 2 × ($\frac{\sqrt{3}}{2}$ ×6) = $6\sqrt{3}$ cm

Sol.47.(c)



EF = 15

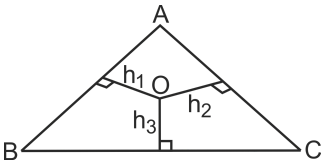
$\angle AED = \angle BFC = 90°$

$AD^2 = DE^2 + AE^2$, DE = 6 m

Similarly, FC = 6 m

Perimeter of Trapezium ABCD
= 15 + 10 + 10 + 27 = 62 m

Sol.48.(a)

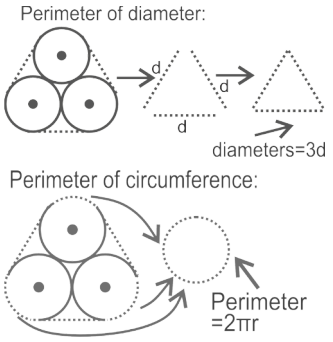


Side (a) = $\frac{2}{\sqrt{3}}(h_1 + h_2 + h_3)$

= $\frac{2}{\sqrt{3}}(\sqrt{3} + 2\sqrt{3} + 5\sqrt{3})$ = 16 cm

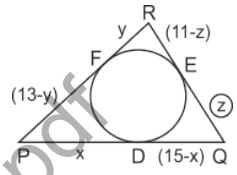
Perimeter of equilateral triangle = 3 × a
= 48 cm

Sol.49.(a)



Now, the length of string = 3d + 2πr
Where d = diameter of the circles
the length of string = 3 × 12 + 2π × 6
= 36 + 12π

Sol.50.(d) Length of tangents drawn from a common external point to the circle is always equal.



Perimeter = $PQ + QR + RP$
= 2x + 2y + 2z

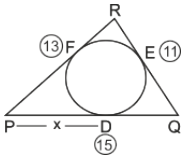
x + y + z = $\frac{39}{2}$ ..... eq . (1)

RF = RE .....(tangent from external point)
y + z = 11 ..... eq .(2)
On solving eq .(1) and eq . (2) , we get

the length of PD (x) = $\frac{39}{2} - 11$

= $\frac{39 - 22}{2}$ = 8.5 cm

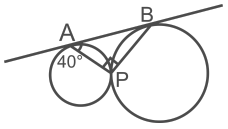
Short Trick :-



PD = $\frac{PQ + PR - RQ}{2}$

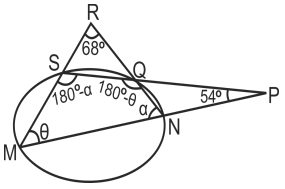
= $\frac{15 + 13 - 11}{2}$ = 8.5 cm

Sol.51.(c)



When two circle touches each other externally at point P and AB is direct common tangent , Then ∠APB = 90°
Now, In ΔAPB
$\angle APB + \angle PBA + \angle BAP = 180°$
$90° + \angle PBA + 40° = 180°$
$\angle PBA$ = 50°

Sol.52.(a)



Search on TG: @apna_pdf

Search on Telegram @apna_pdf

In Δ RMN

$\theta + \alpha + 68° = 180°$

$\theta + \alpha = 112°$ ..... eq 1

Now, In Δ PMS

$\theta + 180 - \alpha + 54° = 180°$

$\theta + 54° = \alpha$

Putting the value of α in equation 1

$\theta + \theta + 54° = 112°$

$\theta = 29°$

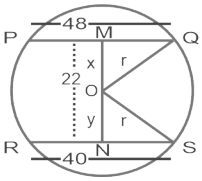
Short trick :-

$\angle SMN = 90° - \frac{\angle R + \angle P}{2}$

$\angle SMN = 90° - \frac{68° + 54°}{2}$

$\angle SMN = 29°$

Sol.53.(a)



From the given figure, MQ = $\frac{48}{2}$ = 24 cm

and NS = $\frac{40}{2}$ = 20 cm

x + y = 22 ---------- (1)

In △MOQ, we have :

$r^2 = x^2 + 24^2$ ---------- (2)

In △NOS, we have :

$r^2 = y^2 + 20^2$ ---------- (3)

From equation (2) and (3) we have :

$x^2 + 24^2 = y^2 + 20^2$

$\Rightarrow x^2 + 576 = y^2 + 400$

$\Rightarrow x^2 - y^2 = -176 \Rightarrow (x - y)(x + y) = -176$

(x - y)22 = - 176 (from eqn(1))

x - y = - 8 ---------- (4)

Solving eqn(1) and (4) we have :

x = 7 and y = 15

Now putting x = 7 in eqn(2), we get :

r = $\sqrt{49 + 576}$ = 25 cm

Short Trick :-

Pythagoras triplets →

(15 , 20 , **25**) and (7 , 24 , **25**)

20 and 24 are the given chords of the circle .

Distance between the chord = (15 + 7)

= 22 cm

Given conditions satisfied .

Clearly , radius of the circle = 25 cm

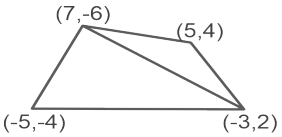
Sol.54.(d) Radius of the circle = $\frac{l}{\theta}$, where l is arc of circle and θ is the angle in radian

r = $\frac{15}{24 \times \frac{\pi}{180°}} = \frac{225}{2\pi}$ cm

Circumference of the circle

= $2 \times \pi \times \frac{225}{2\pi}$ = 225 cm

Sol.55.(a)



Let the vertices of quadrilateral be A(-3, 2) , B(5, 4), C(7, -6), D(-5, -4)

Area of the triangle whose vertices are (x_1, y_1) (x_2, y_2) (x_3, y_3) = $\frac{1}{2}[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$

Area of the △ABC =

$\frac{1}{2}|-3\times(10) + 5\times(-8) + 7\times(-2)|$

= $\frac{1}{2}$ × 84 = 42 square units

Area of the △ACD

= $\frac{1}{2}|-3\times(-2) + 7\times(-6) - 5\times(8)|$

= $\frac{1}{2}$ × 76 = 38 square units

Area of quadrilateral ABCD = 42 + 38

= 80 square units

Short trick :-

Area of quadrilateral =

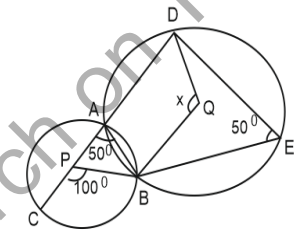
$\frac{1}{2}\begin{vmatrix} x_1 - x_3 & y_1 - y_3 \\ x_2 - x_4 & y_2 - y_4 \end{vmatrix}$

$\frac{1}{2}\begin{vmatrix} -10 & 8 \\ 10 & 8 \end{vmatrix}$

Required area = $\frac{1}{2} \times |(-80) - (80)|$

= 80 square units

Sol.56.(d)



Construction : we take a point E on the arc such that ABED is a cyclic quadrilateral.

∠PAB = $\frac{1}{2}$∠BPC (angle subtended at arc is half the angle subtended at the centre.)

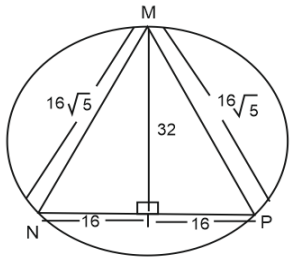
∠PAB = $\frac{1}{2}$ × 100° = 50°

∠BED = ∠PAB = 50° (external angle property of cyclic quadrilateral)

∠BQD = 2∠BED (angle subtended at centre)

∠BQD = 2 × 50° = 100°

Sol.57.(a)



Given, MN = MP = $16\sqrt{5}$,

In right ΔNIM, MI = $\sqrt{(16\sqrt{5})^2 - 16^2}$

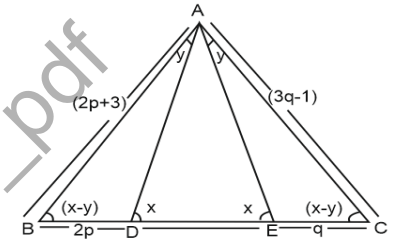
= 32 cm.

Circumradius (R) = $\frac{a \times b \times c}{4 \times ar.\Delta NIM}$

= $\frac{16\sqrt{5} \times 16\sqrt{5} \times 32}{4 \times \frac{1}{2} \times 32 \times 32}$ = $4 \times \sqrt{5} \times \sqrt{5}$

= 20 cm.

Sol.58.(a)



As, AD = AE, ∠D = ∠E = x

As ∠BAD = ∠CAE = y (let)

By exterior angle property, ∠B = ∠C = (x − y)

By symmetry, BD = CE, so, 2p = q,

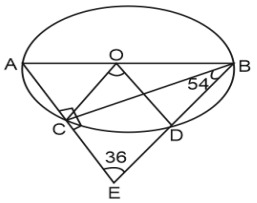
⇒ As, ∠B = ∠C, AB = AC

⇒ 2p + 3 = 3q − 1 ⇒ 2p + 3 = 3 × 2p − 1

⇒ 4 = 4p ⇒ p = 1.

So, q = 2p = 2 ⇒ (p + q) = 2 + 1 = 3.

Sol.59.(d)



Construction : Join CB.

As AB is diameter we have

∠ACB = ∠BCE = 90°

∠EBC = 90° − ∠AEB = 90° − 36° = 54°

∠DOC = 2∠EBC = 2 × 54 = 108°

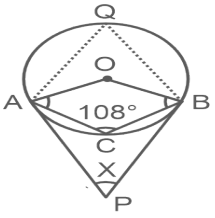
(As ∠DBC is made by arc CD at circumference while ∠DOC is angle made by it on centre.)

Short Trick :-

∠DOC = 180° − 2 × ∠CED

= 180° − 2 × 36° = 108°

Sol.60. (a)

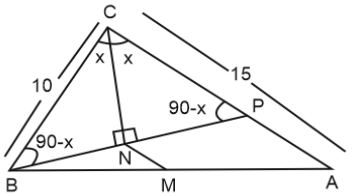


Search on TG: @apna_pdf

Search on Telegram @apna_pdf

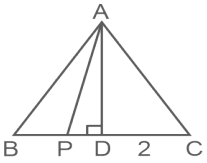
Let Q be the point on the major arc, and O be the centre of the circle.
So, ❑APBQ becomes cyclic quadrilateral.
So,
∠AQB = 180° – ∠ACB = 180° – 108° = 72°
and ∠AOB = 2 (∠AQB) = 2 (72°) = 144°
In ❑AOBP, ∠OAP = ∠OBP = 90° (∵ radius from centre is perpendicular to the tangent)
So, in ❑AOBP,
144° + 90° + 90° + x = 360°
x = 360° – 324° = 36°
So, ∠APB = x = 36°
Short Trick :-
$\angle ACB = 90° + \frac{\angle APB}{2}$
$\angle APB = 2 \times (108° - 90°)$
$\angle APB = 36°$

Sol.61.(b)



As ∠BCN = ∠PCN and ∠BNC = ∠PNC
so, $\Delta CNP \sim \Delta CNB$
Now, $\frac{CN}{BC} = \frac{CN}{CP}$,
clearly, BC = CP = 10 cm.
Similarly, BN = NP ,
hence N is the midpoint of BP.
AP = AC - CP = 15 - 10 = 5 cm
In ΔABP, M is midpoint of AB and N is midpoint of BP
So, by midpoint theorem,
NM = $\frac{1}{2} AP = \frac{5}{2} = 2.5$ cm

Sol.62.(d)

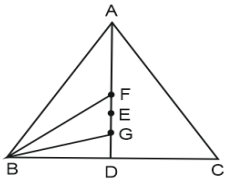


PC = $\frac{3\sqrt{7}}{3} \times 2 = 2\sqrt{7}$
AD is the altitude and median of triangle
DC = $\frac{3\sqrt{7}}{2}$
PD = $2\sqrt{7} - \frac{3\sqrt{7}}{2} = \frac{\sqrt{7}}{2}$
AD = $\frac{\sqrt{3}a}{2} = \frac{\sqrt{3}.3.\sqrt{7}}{2} = \frac{3\sqrt{21}}{2}$
AP = $\sqrt{AD^2 + DP^2} = 7$
Short Trick :-
BP = $3\sqrt{7} \times \frac{1}{3} = \sqrt{7}$
PC = $3\sqrt{7} \times \frac{2}{3} = 2\sqrt{7}$
$(AP)^2 = (Side)^2 - BP \times PC$
AP = $\sqrt{(63) - 14} = 7$ cm

Sol.63.(d) There are two possibilities to solve this question
First possibility :
if the sum of equal sides = 16
Then any value of the third side is possible from 1 to 15, so total 15 triangles
Second possibility : if the sum of two unequal sides = 16
Then the possible cases are = (1, 15, 15), (2, 14, 14), (3, 13, 13), (4, 12, 12), (5, 11, 11), (6, 10, 10), (6, 10, 6), (7, 9, 9) and (7, 9, 7) so total 9 triangles
Total triangles = 15 + 9 = 24
Short Trick :-
No. of possible isosceles triangles , when sum of two of the sides are given :-
$\frac{5 \times (sum)}{3} - 3$
$= \frac{5 \times (16)}{3} - 3 = 23.66 \approx 24$

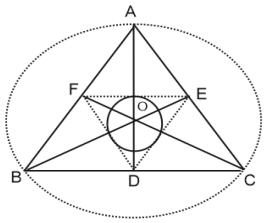
Sol.64.(d) Possible value of a and b are (1, 24); (2, 12); (3, 8); (4, 6)
Sides of the triangle are a, b, c.
If a = 1, b = 24 ⇒ a - b < c < a + b
23 < c < 25
Possible value of c = 24
If a = 2, b = 12 ⇒ a - b < c < a + b
10 < c < 14
Possible value of c = 11, 12, 13
If a = 3, b = 8 ⇒ a - b < c < a + b
5 < c < 11
Possible value of c = 6, 7, 8, 9, 10
If a = 4, b = 6 ⇒ a - b < c < a + b
2 < c < 10
Possible value of c = 3, 4, 5, 6, 7, 8, 9
Number of possible value of c = 16

Sol.65.(c)

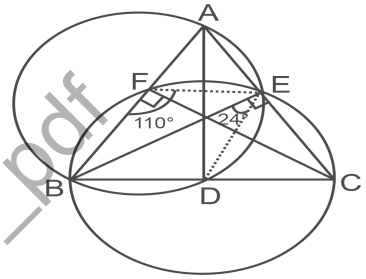


As Median divides the triangle into two equal areas.
And in ΔADB,
Area of ΔADB = 2 Area of ΔBGF(base(AD = 2GF) is half and height is same)
So, Area of ΔABC = 4 × Area of ΔBGF
⇒ Area of ΔBGF = $\frac{1}{4}$ × Area of ΔABC

Sol.66.(d) Concept : triangle formed by the joining the altitude has its incenter at the same point as the circumcenter of the bigger triangle.

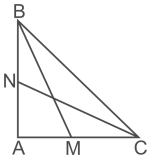


From the diagram
OE is the bisector of the ∠FED
So, ∠FEO = ∠DEO = 24°
In Triangle BFE
∠FBE = 180°- (110° + 24°)
∠FBE = 180° - 134° = 46°
Short trick :-
Draw a circle of Diameter AB which passed through D as ∠ADB =∠AEB =90°
Draw another circle of diameter BC which passed through E as ∠BEC = ∠BFC = 90°



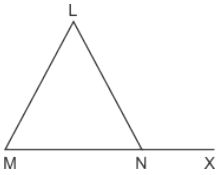
EFC = 110° - 90° = 20°
Now considering EC a chord,
∠EBC = ∠EFC = 20°
Now considering BD a chord,
∠BED = ∠BAD = 24°
So, in ΔABD,
∠BAD + ∠ADB + ∠ABD = 180°
⇒ 24°+ 90° + ∠ABE + 20° = 180°
∠ABE = 46°, ∠EBF = 46°

Sol.67.(c) Short-Trick:



We know, $4(BM^2 + CN^2) = 5BC^2$
$\frac{BM^2 + CN^2}{BC^2} = \frac{5}{4}$

Sol.68.(b)

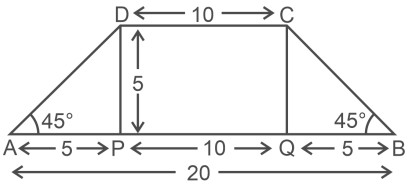


∠M = x° then ∠L = 2x
2x + x = 117° (Exterior angle)
⇒ 3x = 117° ⇒ x = 39°
⇒ ∠L = 2 × 39° = 78°

Sol.69.(d)

Search on TG: @apna_pdf

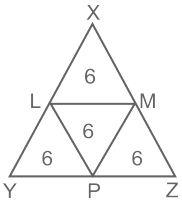
Search on Telegram @apna_pdf



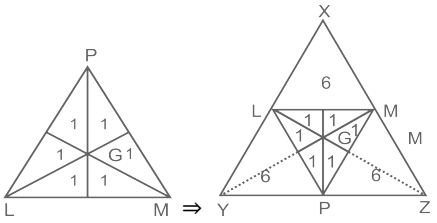
In trapezium ABCD,
CD = PQ = 10 cm
AP = QB = 5 cm
∠DAB + ∠CBA = 90°
let ∠DAB = ∠CBA = 45°
In right angle triangle APD,
∠DAP + ∠APD + ∠PDA = 180°
45° + 90° + ∠PDA = 180°
∠PDA = 180° - 135° = 45°
If ∠PDA = ∠DAP = 45°
then AP = PD = 5cm
Area of trapezium
$= \frac{1}{2} \times$ sum of parallel sides × height
$= \frac{1}{2} \times 30 \times 5 = 75$ cm^2

Sol.70.(c) ∠CBD = 80° (exterior angle)
In quadrilateral BCDE
∠CED = 360° - (80° + 45° + 35°)
∠CED = 200° (it ia a reflex angle)
Obtuse angle (∠CED) = 360° - 200°
= 160°

Sol.71.(b) concept - we know that median divides triangle in two equal parts .

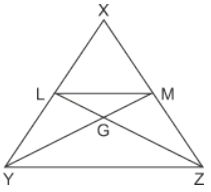


If the mid points of sides of a triangle joined. Then the triangle is divided into four equal parts (areas).
Let area of each triangle △ XLM
= △YLP = △PMZ = △LMP = 6 units
Total area of △ XYZ = 24 units
Median divides triangle in two equal parts



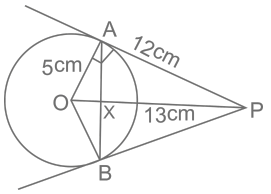
Area of △ GLM: Area of
△ XYZ = 2 : 24 = 1 : 12

Short Trick :-



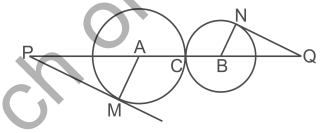
We know,
Area of ΔGLM : Area of ΔXYZ = 1 : 12

Sol.72.(b)



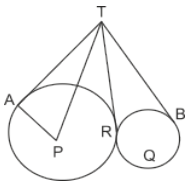
Area of ΔPAB , M = $\frac{1}{2} \times AB \times$ PX
Let OX = a and PX = 13 - a
Area of ΔPAO = $\frac{1}{2} \times AO \times$ PA
$= \frac{1}{2} \times AX \times$ PO
$\Rightarrow \frac{1}{2} \times 5 \times 12 = \frac{1}{2} \times AX \times 13$
$\Rightarrow$ AX = $\frac{60}{13}$
AB = 2 × AX = $\frac{120}{13}$
Use pythagoras theorem in ΔAXO;
OX^2 = OA^2 - AX^2
$\Rightarrow$ OX^2 = 5^2 - $(\frac{60}{13})^2$ $\Rightarrow$ OX = $\frac{25}{13}$
PX = 13 - $\frac{25}{13} = \frac{169-25}{13} = \frac{144}{13}$
Area of ΔPAB ,
M = $\frac{1}{2} \times \frac{120}{13} \times \frac{144}{13}$
$\sqrt{\frac{M}{15}} = \sqrt{\frac{1}{15} \times \frac{1}{2} \times \frac{120}{13} \times \frac{144}{13}}$
$= \frac{24}{13}$

Sol.73.(c) MP = 15 cm, NQ = 8 cm, PA = 17 cm and BQ = 10 cm



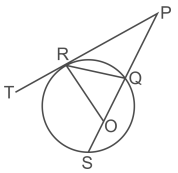
AM = $\sqrt{17^2 - 15^2}$ = 8 cm
NB = $\sqrt{10^2 - 8^2}$ = 6 cm
AB = 8 + 6 = 14 cm

Sol.74.(c) AP, radius of first circle = 6 cm and PT = 10 cm



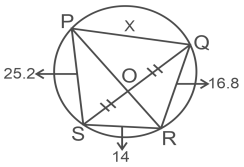
Tangent is perpendicular to the radius.
Apply pythagoras theorem in ΔTAP,
TP^2 = AP^2 + AT^2 $\Rightarrow$ AT = 8 cm
Tangents to a circle from a point outside the circle are equal in length.
Thus, AT = TR = TB = 8 cm

Sol.75.(b) In the given diagram, $\angle QRP$ = 28°, Join OR.



We get OR⊥PT.
Then $\angle ORQ = \angle OQR$ = 90°- 28° = 62°
Then $\angle ROQ$ = 180°- 124° = 56°.
In ΔORP,
$\angle ORP$ = 90°
Then $\angle RPO$ = 90°- 56° = 34°

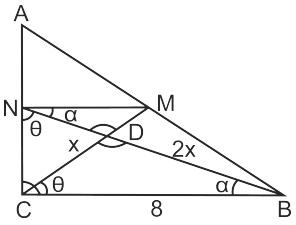
Sol.76.(b) As PR and SQ bisect each other at O.



In ΔPOS and ΔROQ,
$\angle POS = \angle ROQ$, PO = RO , OS = QO
Thus, $\Delta POS \sim \Delta ROQ$
$\frac{PO}{OR} = \frac{OS}{OQ} = \frac{PS}{QR} = \frac{25.2}{16.8} \Rightarrow \frac{3}{2}$
Similarly, $\Delta POQ \sim \Delta ROS$
So: $\frac{PO}{OR} = \frac{PQ}{SR} \Rightarrow \frac{3}{2} = \frac{x}{14} \Rightarrow x = 21$

Short trick :- As PR and SQ bisect each other at O.
Then $\frac{PS}{QR} = \frac{PQ}{SR} \Rightarrow \frac{25.2}{16.8} = \frac{x}{14} \Rightarrow$ x = 21

Sol.77.(c)



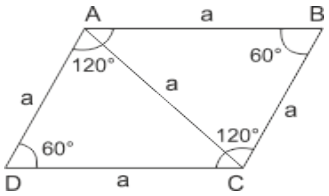
Since MN II CB , MN = $\frac{1}{2}CB$
ΔMND & ΔCBD are similar
$\frac{NM}{BC} = \frac{1}{2} = \frac{ND}{DB}$
Let ND = x and DB = 2x
In ΔNCB and ΔCDB
∠CDB = ∠NCB = 90°
α = α , θ = θ
Thus, $\frac{x+2x}{8} = \frac{8}{2x} \Rightarrow 6x^2 = 64$
$x^2 = \frac{64}{6} \Rightarrow x = \frac{8}{\sqrt{6}}$
$3x = \frac{8}{\sqrt{6}} \times 3 \Rightarrow x = 4\sqrt{6}$cm

Short trick :-
BN = $\frac{BC\sqrt{6}}{2} = \frac{8\sqrt{6}}{2} = 4\sqrt{6}$cm

Sol.78.(d)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf



When two equilateral triangles are joined then they make a parallelogram

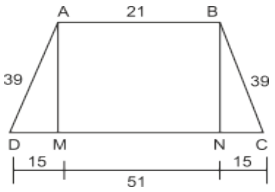
Area of the parallelogram = base ×height

a × H = 2 × $\frac{\sqrt{3}}{4}$ a^2

H = $\frac{\sqrt{3}}{2}$ a (Putting a = 10$\sqrt{3}$)

H = 15 cm

Sol.79.(b) As given, the mentioned trapezium is isosceles



In right triangle BNC

$BN = \sqrt{(39)^2 - (15)^2}$

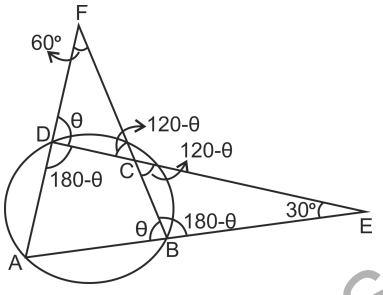
= $\sqrt{54 \times 24}$ = 3× 2 × 6 =36

Area of the trapezium

= $\frac{1}{2} \times (sum\ of\ parallel\ sides) \times height$

= $\frac{1}{2} \times 72 \times 36$ = 1296cm^2

Sol.80.(b)



Let ∠ABC = θthen ∠ADC = 180 - θ(as sum of opposite angles of cyclic quadrilateral)

∠ADC = ∠CBE = 180 - θ(Using alternate segment theorem)

similarly, ∠ABC = ∠CDF = θ

So, in triangleΔFDC,

∠FCD = 180 - 60 - θ = 120 - θ(Sum of angles of triangle property)

Now, ∠FCD = ∠BCE (vertically opposite angles)

In $\Delta BCE = 180°$

$\Rightarrow 120 - \theta + 180 - \theta + 30 = 180$

$\Rightarrow 300 - 2\theta = 150 \Rightarrow \theta = 75°$

Short Trick :-

$\angle FAE$ = 90° − $\frac{\angle F + \angle E}{2}$

$\angle FAE$ = 90° − $\frac{60° + 30°}{2}$

$\angle FAE$ = 45°

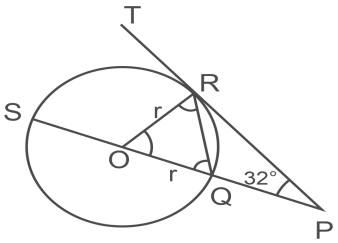
Now , In ΔAFB ,

$\angle AFB + \angle FBA + \angle ABF$ = 180°

$\angle FBA$ = 180° − (60° + 45°)

$\angle FBA$ = 75°

Sol.81.(d)



We know that OR is the radius of the circle that is perpendicular to the tangent PT.

$\angle ORP = 90°$

In ΔORQ , OR = OQ = r

∠ORQ = ∠OQR

⇒ In ΔORP

$\angle ORP = 90°$, $\angle RPO = 32°$

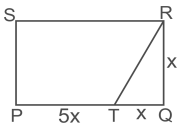
$\angle ROP = 58°$

⇒ Thus, In ΔORQ

∠ORQ = ∠OQR = 61°

∠QRP = 90 - 61 = 29°

Sol.82.(c)



Since QRT is a right angled isosceles triangle due to ∠Q= 90

Area of △ QRT = 12√3(Given)

⇒ $\frac{1 \times x \times x}{2}$ = 12√3 ⇒ x^2 = 24√3.....(1)

Now PQ = 6x, QR = x

Area of rectangle = l × b = 6x × x = $6x^2$

= 6 × 24√3.....(using 1st) = 144√3 sq cm

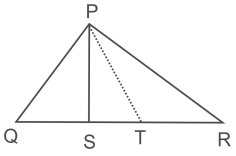
Sol.83.(c) Given, ∠P = 120°, PS⊥QR and PQ + QS = SR.

Draw PT= PQ . Let PQ = y and QT = 2x,

$\angle PQS = \theta$and $\angle PRQ = \phi$

In ΔPQR $\angle PQR + \angle PRQ + \angle QPR$ = 180

⇒ θ + ϕ = 180 - 120 = 60 .....(1)



⇒ PQT is an isosceles triangle and PS⊥ QR ⇒ QS = ST = x

$\Rightarrow \angle PTQ = \theta$ ....(PQ = PT)

And $\angle QPT = 180 - 2\theta$

Now, PQ + QS = SR ...(given)

⇒ y + x = x + TR ⇒ TR = y

⇒ PT = TR .....(Both are equal to y)

$\Rightarrow \angle PRT = \angle TPR = \phi$ ..(PT = TR)

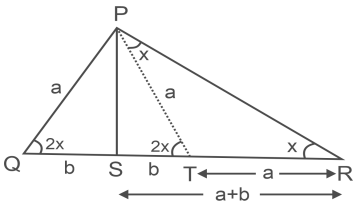
According to the question

$\angle QPT + \angle TPR$= 120

⇒ 180 - 2θ + ϕ = 120 ⇒ 2θ - ϕ = 60 .....(2)

Add eq (1) and (2) ⇒ θ = 40°

Short trick :-



Draw PT such that PT = PQ ,

PQ + QS = SR

From external angle property,

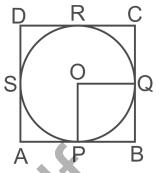
∠PQR = PTQ = 2x

In triangle PQR ,

2x + x + 120° = 180° ⇒ x = 20°

Therefore ∠Q = 2x = 2 × 20° = 40°

Sol.84.(b) Given, ∠B = 90°. If AD = 24 cm, AB = 27 cm and DR = 6cm



DR = DS = 6 cm .....(tangents)

AS = AD - DS = 24 - 6 = 18cm

AS = AP = 18 cm .....(tangents)

PB = AB - AP = 27 - 18 = 9 cm

OP⊥AB, OQ⊥BC .....(angle made by radius on tangent)

In quadrilateral OPBQ

∠B = 90°, ∠OQB = 90°, ∠OPB = 90°

⇒ ∠POQ = 90° ⇒ PB = BQ .....(tangents)

⇒ OPBQ is a square

PB = BQ = OP = OQ = 9 cm

Perimeter of the circle = $2\pi r$

= 2 × π × 9 = 18π

Sol.85.(b) sum of the interior angles of a regular polygon = (n - 2) × 180

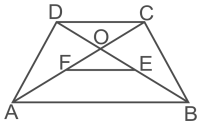
1260 = (n - 2) × 180 ⇒ n = 9

⇒ Exterior angle = $\frac{360}{n}$ = $\frac{360}{9}$ = 40°

⇒ Interior angle = $\frac{1260}{9}$ = 140°

Required difference = 140° - 40° = 100°

Sol.86.(c)



Given, DC∥AB, AB = 12 cm and DC = 7.2 cm

Let E and F be the points joining the mid points of BD and AC.

Short Trick :-

EF= $\frac{(AB-CD)}{2}$ = $\frac{(12-7.2)}{2}$ = 2.4 cm

Sol.87.(d) Each Interior angle of a regular polygon = $\frac{(n-2) \times 180}{n}$

Where n is the number of sides

⇒ $(128\frac{4}{7})^\circ$ = $\frac{(n-2) \times 180}{n}$

⇒ $\frac{900}{7}$ = $\frac{(n-2) \times 180}{n}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

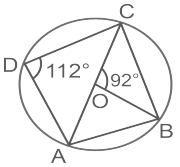
⇒ 5n = 7n - 14 ⇒ n = 7

Number of diagonals = $\frac{n(n-3)}{2}$

= $\frac{7(7-3)}{2}$ = 14

Desired sum = 7 + 14 = 21

Sol.88.(b)



∠ABC + ∠ADC = 180°

⇒ ∠ABC = 180° - 112° = 68°

In ΔOBC

∠OBC = ∠OCB ....(OB = OC = radius)

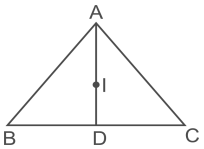
∠OBC + ∠OCB + ∠COB = 180°

2∠OBC = 180° - 92°(∠OBC = ∠OCB)

∠OBC = 44°

∠ABO = ∠ABC -∠OBC = 68° - 44° = 24°

Sol.89.(d)



⇒ AB + AC + BC = 24 cm

⇒ AB + AC = 24 - 9 = 15 cm

⇒ $\frac{AI}{ID} = \frac{AB+AC}{BC}$ ⇒ $\frac{AI}{ID} = \frac{15}{9} = \frac{5}{3}$

Sol.90.(c) We know that

Circumference of a circle (C) = $2\pi r$

⇒ r = $\frac{c}{2\pi}$

Area of the sector (A) = $\frac{\theta}{360} \times \pi r^2$

⇒ A = $\frac{60}{360} \times \pi \times \frac{c}{2\pi} \times \frac{c}{2\pi} = \frac{c^2}{24\pi}$

Sol.91.(b) We know that ,

Inradius of triangle = $\frac{Area}{Semiperimeter}$

⇒ r = $\frac{A}{\frac{p}{2}}$ ⇒ A : p = r : 2

Sol.92.(a) We know that the circumradius of a hexagon is equal to the side of the hexagon.

Let side of the hexagon = radius of the circle = a

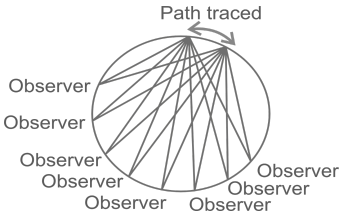
⇒ Area of the circle = πa^2

⇒ Area of hexagon = 6 × $\frac{\sqrt{3}}{4} \times a^2$

Required ratio = $\pi a^2 : \pi a^2 - 6 \times \frac{\sqrt{3}}{4} \times a^2$

= $2\pi : 2\pi - 3\sqrt{3}$

Sol.93.(a)



Whatever be the position of the observer, the angle formed from him will be the half of the angle formed by the coach from the centre.

θ = $\frac{1}{2}$ × 10° = 5°

Sol.94.(d)

Equilateral Triangle (only in equilateral triangle all converge at a point)

Sol.95.(a)

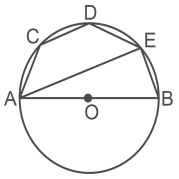
Required number of triangles = ${}^{11}c_3$

We know that

${}^{n}c_r = \frac{n!}{r!(n-r)!} = \frac{11!}{3!(11-3)!}$

= $\frac{11 \times 10 \times 9 \times 8!}{(3 \times 2 \times 1)8!}$ = $\frac{11 \times 10 \times 9}{6}$ = 165

Sol.96.(c)



Here, ACDE is a cyclic quadrilateral.

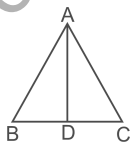
∠ACD + ∠DEA = 180° ...(opposite angles of cyclic quadrilateral)

∠AEB = 90° .....(angle of semicircle)

∠ACD + ∠DEB ⇒ ∠ACD + ∠DEA + ∠AEB

= 180° + 90° = 270°

Sol.97.(d)



Given, ∠BAD = $\frac{1}{2}$ × ∠ADC

, ∠BAC = 87° and ∠C = 42°

∠B = 180° - ∠BAC - ∠C

= 180° - 87°- 42° = 51°

∠BAD + ∠B = ∠ADC

(external opposite angle)

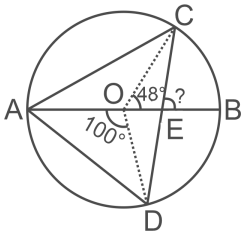
∠BAD + 51°= 102°

∠BAD = 51°

∠ADB = 180° - ∠BAD - ∠ABD

= 180° - 51° - 51° = 78°

Sol.98.(b) ∠BOC = 48° and ∠AOD = 100°



∠BAC = $\frac{1}{2}$ × ∠BOC

∠BAC = $\frac{1}{2}$ × 48 = 24°

∠ACE = $\frac{1}{2}$ × ∠AOD

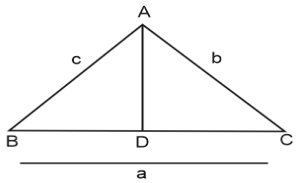
∠ACE = $\frac{1}{2}$ × 100 = 50°

∠CEB = ∠BAC + ∠ACE (external opposite angle)

= 24° + 50° = 74°

Sol.99.(c) BC = a cm

Let BD = x, DC = a - x



We know that, if AD is bisector of ∠BAC then,

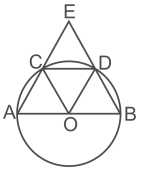
$\frac{AB}{AC} = \frac{BD}{DC}$ ⇒ $\frac{c}{b} = \frac{x}{a-x}$

⇒ ac - cx = bx ⇒ x = $\frac{ac}{b+c}$

⇒ DC = a - x ⇒ DC = a - $\frac{ac}{b+c} = \frac{ab}{b+c}$

BD - DC = $\frac{ac}{b+c} - \frac{ab}{b+c} = \frac{a(c-b)}{c+b}$

Sol.100.(d)



Given, ∠CED = 70°

In ΔAEB

∠EAB + ∠EBA =180°-∠CED

= 180°- 70° = 110°

In ΔAOC

∠OAC = ∠OCA ...(OC = OA = radius)

∠COA = 180°- (∠OAC + ∠OCA)

= 180°- 2∠OAC

In ΔBOD

∠OBD = ∠ODB .....(OD = OB = radius)

∠BOD = 180° - (∠OBD + ∠ODB)

= 180° - 2∠OBD

∠AOB =∠COA + ∠BOD + ∠COD = 180°

⇒ ∠COA + ∠BOD + ∠COD = 180°

⇒ 180°- 2∠OAC + 180° - 2∠OBD + ∠COD = 180°

⇒ 180° - 2(∠OAC + 2∠OBD) + ∠COD = 0

⇒ 180°- 2(110°) + ∠COD = 0

⇒ - 40° + ∠COD = 0 ⇒ ∠COD = 40°

Short trick :-

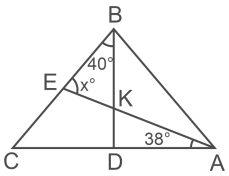
∠COD = 180° - 2 × ∠CED

= 180° - 2 × 70° = 180° - 140° = 40°

Sol.101.(a)

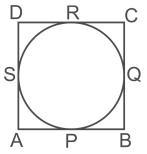
Search on TG: @apna_pdf

Search on Telegram @apna_pdf



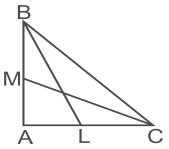
Given, $BD \perp AC$, ∠EAC = 38° and ∠EBD = 40°
In ΔADK ,∠DKA = 180°-∠KDA-∠DAK
= 180° - 90° - 38° = 52°
∠DKA = ∠BKE (Vertically opposite angles)
In ΔBEK , ∠BEK = 180° - ∠BKE - ∠EBK
= 180° - 52°- 40°= 88°

Sol.102.(d)



Given, AS = 8 cm, BC = 11 cm and CR = 5 cm
AS = AP = 8 cm (Tangent of same circle)
CQ = RC = 5 cm (Tangent of same circle)
BQ = BC - QC = 11 - 5 = 6 cm
BP = BQ = 6 cm (Tangent of same circle)
AB = AP + BP = 8 + 6 = 14 cm

Sol.103.(b)



In ΔABL

$BL^2 = AB^2 + AL^2 \Rightarrow BL^2 = AB^2 + (\frac{AC}{2})^2$

$\Rightarrow 4BL^2 = 4AB^2 + (AC)^2$ .....(1)

In ΔCAM

$CM^2 = AC^2 + AM^2 \Rightarrow CM^2 = AC^2 + (\frac{AB}{2})^2$

$\Rightarrow 4CM^2 = 4AC^2 + (AB)^2$ .....(2)

Adding (1) and (2)

$\Rightarrow 4BL^2 + 4CM^2 = 4AB^2 + (AC)^2 + 4AC^2 + (AB)^2$

$\Rightarrow 4BL^2 + 4CM^2 = 5AB^2 + 5AC^2$

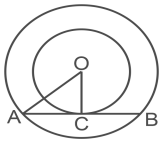
$\Rightarrow 4(BL^2 + CM^2) = 5(AB^2 + AC^2)$

$\Rightarrow 4(BL^2 + CM^2) = 5(BC^2)$

Short trick :-

Its direct relation, $4(BL^2 + CM^2) = 5(BC^2)$

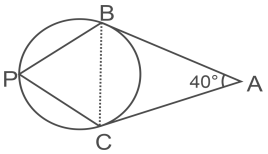
Sol.104.(a) Let OA be the radius of a bigger circle and OC be the radius of a smaller circle. And AB be the chord of a bigger circle.



$OA^2 = OC^2 + AC^2$

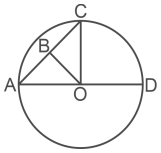
AC = $\sqrt{15^2 - 9^2}$ = 12 cm
AB = 2 × AC = 2 × 12 = 24 cm

Sol.105.(d)



In ΔABC
AB = AC .....(tangent to the circle)
∠ABC = ∠ACB ....(AB = AC)
∠ABC + ∠ACB + ∠BAC = 180°
2∠ABC + 40° = 180° ⇒ ∠ABC = 70°
∠BPC = 90° - $\frac{\angle BAC}{2}$ = 90° - $\frac{40}{2}$ = 70°
∠ABP + ∠BPC = 180° .....(CP ∥ AB)
⇒ ∠ABP = 180°- 70° = 110°
⇒ ∠CBP = ∠ABP - ∠ABC = 110° - 70° = 40°

Sol.106.(d)

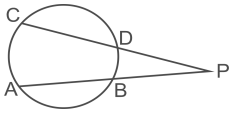


∠OCA = ∠OAC (OA = OC = radius)
∠DOC = 60°
∠OCA + ∠OAC = ∠DOC
(external opposite angle)
2∠OCA = 60° ⇒ ∠OCA = 30°
In ΔOBC
∠OCB = 30°
∠OBC = 180° - ∠OBA
= 180° - 60° (∠OBA = 60° given)
= 120°
∠BOC = 180° - ∠OCB - ∠OBC
= 180° - 30° - 120° = 30°
⇒ OB = BC = 5 cm.....(∠OCB = ∠BOC)

Short trick :-

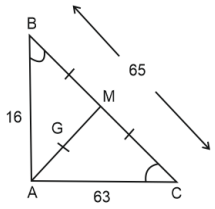
Remember, in such type of questions OB = BC = (given value)

Sol.107.(d) CD = 3 , PD = 5 and AB = 6 given
⇒ PC = PD + CD = 5 + 3 = 8



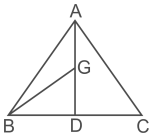
Let PB = x , Then, PA = x + 6
We know that
PB × PA = PD × PC
x(x + 6) = 5× 8 ⇒ x(x + 6) = 40
Put x = 4
x(x + 6) = 40 ⇒ 4(4 + 6) = 40
The Condition satisfied clearly x = 4 cm
So, PB = 4cm

Sol.108.(a)
Pythagoras triplets :- (16 , 63 , 65)



Here , AM is the median of the right angle triangle ABC . We know that ,
BM = MC = AM = $\frac{BC}{2}$ = 32.5 cm

Sol.109.(c)



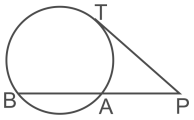
Given, AG : GD = 2 : 1
Let AG = 2 unit And GD = 1 unit
Height of triangles ABG and BDG will be the same as both the triangles are formed on the same base line and have a common vertex B. Let the height is h.

$\frac{ar\triangle ABG}{ar\Delta BDG} = \frac{\frac{1}{2} \times h \times AG}{\frac{1}{2} \times h \times DG}$

$\Rightarrow \frac{\frac{1}{2} \times h \times 2}{\frac{1}{2} \times h \times 1} = \frac{2}{1}$

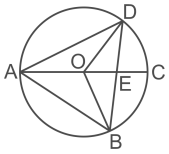
Area of ΔABD = $ar\Delta ABG + ar\Delta BDG$
= 2 + 1 = 3 unit
Area of ΔABC = 2 × Area of ΔABD
(AD is median)
= 2 × 3 = 6 unit
ar(△BDG) : (△ABC) = 1 : 6

Sol.110.(a)



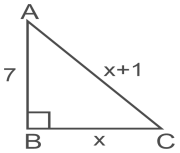
We know that
PT^2 = PA × PB
5^2 = 4 × (4 + x) ⇒ 25 - 16 = 4x
x = $\frac{9}{4}$ = 2.25

Sol.111.(a)



Given, ∠BOC = 50°
We, know that, 2∠BAC = ∠BOC = 50°
∠BAC = 25°
Similarly, 2∠ABD = ∠AOD = 110°
∠ABD = 55°
In triangle ABE,
∠BAE + ∠ABE = ∠BEC (exterior angle property)
25° + 55° = ∠BEC ⇒ ∠BEC = 80°

Sol.112.(b)



$\Rightarrow 7^2 + x^2 = (x + 1)^2$
$\Rightarrow 49 + x^2 = (x^2 + 1 + 2x) \Rightarrow$ x = 24

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sec C = $\frac{AC}{BC}$ = $\frac{25}{24}$ ⇒ Cot A = $\frac{AB}{BC}$ = $\frac{7}{24}$

(secC + cotA) = $\frac{25}{24}$ + $\frac{7}{24}$ = $\frac{32}{24}$ = $\frac{4}{3}$

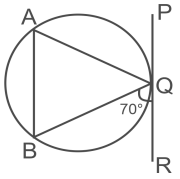
Short trick :-

Triplet 7, 24, 25 satisfies the given condition.

So, BC = 24 cm

(secC + cotA) = $\frac{25}{24}$ + $\frac{7}{24}$ = $\frac{32}{24}$ = $\frac{4}{3}$

Sol.113.(a)



$\angle BQR = 70^\circ$ .....(given)

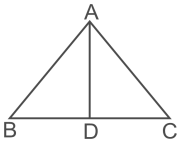
⇒ $\angle BQR = \angle ABQ = 70^\circ$ (Alternate Angle)

⇒ $\angle BQR = \angle BAQ = 70^\circ$

...(Alternate segment theorem)

⇒ $\angle AQB = 180^\circ - 70^\circ - 70^\circ$ = 40°

Sol.114.(d) Let ΔABC be the given triangle , AD = 12 cm and BC = 10 cm



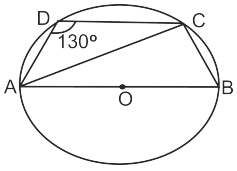
We know that the altitude of an isosceles triangle divides the base into two equal parts.

⇒ BD = DC = $\frac{BC}{2}$ = 5 cm

In $\Delta ABD \Rightarrow AD^2 + BD^2 = AB^2$

⇒ AB = $\sqrt{12^2 + 5^2}$ = 13 cm

Sol.115.(a)



$\angle ADC + \angle ABC$ = 180° .....(cyclic quadrilateral)

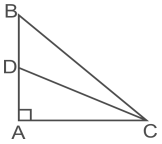
⇒ $\angle ABC$ = 180° - 130° = 50°

⇒ $\angle ACB$ = 90° ....(Angle of semicircle)

$\angle BAC$ = 180° - $\angle ABC$ - $\angle ACB$

= 180° - 90° - 50° = 40°

Sol.116.(a)



In Δ ABC

$AB^2 + AC^2 = BC^2$(Pythagoras Theorem)

⇒ $AB^2 + 6^2 = 10^2$

⇒ AB = $\sqrt{10^2 - 6^2}$ =8

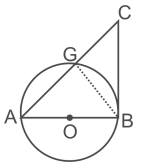
AD = AB - BD = 8 - 4 = 4 cm

In Δ ADC

$AD^2 + AC^2 = DC^2$

⇒ $4^2 + 6^2 = DC^2$ ⇒ DC = $\sqrt{52}$ = $2\sqrt{13}$

Sol.117.(d)



In ΔAGB

AG = 8 cm and AB = 12 cm (given)

$\angle AGB = 90^\circ$ (Angle made by Diameter)

⇒ $BG = \sqrt{AB^2 - AG^2}$....(Pythagoras Theorem)

⇒ $\sqrt{12^2 - 8^2} = 4\sqrt{5}$

In ΔABG and ΔABC

$\angle BAG = \angle BAC$ (same angle)

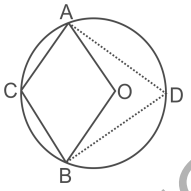
$\angle BGA = \angle ABC$ (Both 90°)

⇒ ΔAGB ~ ΔABC ⇒ $\frac{BG}{BC} = \frac{AG}{AB}$

⇒ $\frac{4\sqrt{5}}{BC} = \frac{8}{12}$ ⇒ BC = $6\sqrt{5}$ cm

Sol.118.(d) Let $\angle ACB$ = x and $\angle CBO$= y

⇒ $\angle ADB$ = 180° - x ⇒ $\angle AOB$ = 2(180° - x)



x + y = 180° .....(AC∥OB)

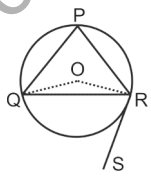
⇒ y = 180° - x

⇒ $\angle AOB + \angle QBC$ = 180° .....(AC ∥ OB)

⇒ 2(180° - x) + 180° - x = 180°

⇒ 360° = 3x ⇒ x = 120°

Sol.119.(b)



$\angle ORS$ = 90° ...(Angle made by radius on tangent)

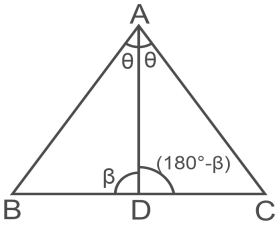
$\angle ORQ = \angle QRS = \frac{\angle ORS}{2}$ = 45°

$\angle OQR = \angle QRS$ = 45°

$\angle QOR$ = 180° - 45° - 45° = 90°

$\angle QPR = \frac{\angle QOR}{2} = \frac{90^\circ}{2}$ = 45°

Sol.120.(c)



Largest angle will be in front of the largest side. Let BC be the largest side, AB = 6cm and AC = 7 cm

Given AD is the angle bisector of Angle A.

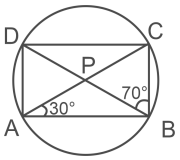
⇒ $\frac{AB}{AC} = \frac{BD}{CD}$ ⇒ $\frac{6}{7} = \frac{BD}{8 - BD}$

⇒ 48 - 6BD = 7BD

⇒ BD = $\frac{48}{13}$ and DC = $\frac{56}{13}$

Clearly BD is the shorter segment.

Sol.121.(b)



$\angle DBC$ = ∠DAC = 70°

(made by same chord)

$\angle DAB$ = 70 + 30 = 100°

$\angle DAB + \angle DCB$ = 180°

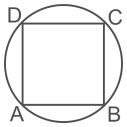
(opposite angles of cyclic quadrilateral)

$\angle DCB$ = 180 - 100 = 80°

$\angle BAC = \angle BCA$ = 30° ...(AB = BC)

$\angle PCD = \angle DCB - \angle BCA$ = 80° - 30° = 50°

Sol.122.(d)



∠DAB = 67° and ∠ABC = 92°

∠DAB + ∠BCD = 180°

(opposite angles of a cyclic quadrilateral)

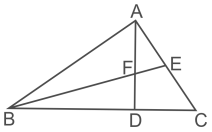
67° + ∠BCD = 180° ⇒ ∠BCD = 113°

∠ABC + ∠CDA = 180° (opposite angles of a cyclic quadrilateral)

92° + ∠CDA = 180° ⇒ ∠CDA = 88°

Required difference = 113° - 88° = 25°

Sol.123.(a)



In ΔBDF and ΔAEF

$\angle BDF = \angle AEF$, $\angle BFD = \angle AFE$

⇒ $\Delta BDF \sim \Delta AEF$

$\angle DBF = \angle FAE$

In ΔBDF and ΔADC

$\angle DBF = \angle DAC$, BF = AC

$\angle BFD = \angle ACD$

By ASA congruence, $\Delta BDF \cong \Delta ADC$

Hence, BD = AD

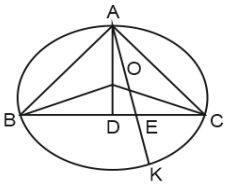
Therefore, $\angle ABD = \angle BAD$

∠ABC = 45°

Sol.124.(b)

Search on TG: @apna_pdf

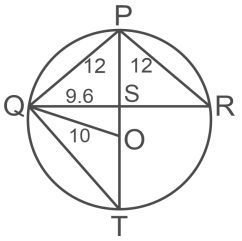
Search on Telegram @apna_pdf



$\angle BAC$ = 180° - 80° - 64° = 36°
$\angle BOC$ = 2 × $\angle BAC$ = 2 × 36° = 72°
$\angle AOC$ = 2 × $\angle ABC$ = 2 × 80° = 160°
$\angle OAC = \angle OCA$ .....(OA = OC)
$\angle OAC = \frac{1}{2}(180° - \angle AOC)$ .....($\angle OAC = \angle OCA$)
$\angle OAC$ = 10°
$\angle DAB = 180° - \angle ADB - \angle ABD$
= 180° − 90° − 80° = 10°
∠DAK = $\angle BAC - \angle OAC - \angle DAB$
= 36° - 10° - 10° = 16°

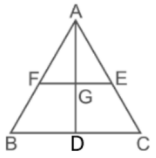
Short trick :-
∠DAK = ∠C - ∠B
= 80° - 64° = 16°

Sol.125.(a)



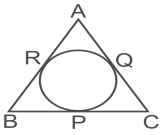
In $\triangle PQT$
PQ = 12 cm and PT (diameter) = 20 cm
∠PQT = 90° ..... (angle of semicircle)
⇒ QT = $\sqrt{PT^2 - PQ^2}$
= $\sqrt{20^2 - 12^2}$ = 16 cm
QS = $\frac{PQ \times QT}{PT}$ = $\frac{12 \times 16}{20}$ = 9.6 cm
In $\triangle QSO$
$OQ^2 = QS^2 + OS^2 \Rightarrow 10^2 = 9.6^2 + OS^2$
$\Rightarrow OS = \sqrt{(10 + 9.6)(10 - 9.6)}$
= 2.8 cm

Sol.126.(b)



Since FE ∥ BC
$\sqrt{\frac{area\ of\ \Delta AFE}{area\ of\ \Delta ABC}} = \frac{AG}{AD}$ .....(Property)
Let area of $\Delta ABC = 2\ unit$,
⇒ area of ΔAFE = 1 unit
⇒ $\frac{AG}{AD} = \frac{1}{\sqrt{2}}$ ⇒ GD = $\sqrt{2}$ - 1
GD : AG = $\sqrt{2}$ - 1 : 1

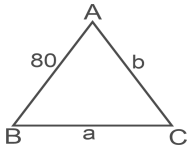
Sol.127.(c)



AQ = AR = 4.5 cm, QC = PC = 5.5 cm,
BR = BP = 6 cm .....(Tangents)
Perimeter of the triangle =
AQ + AR + QC + PC + BR + BP
= 4.5 + 4.5 + 5.5 + 5.5 + 6 + 6 = 32 cm

Sol.128.(b) **Short-Trick:** To draw a unique circle it is always required to have three non-collinear points.

Sol.129.(a) a + b + 80 = 170

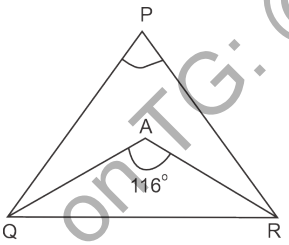


a + b = 90 ⇒ a = 90 - b
From cosine rule
Cos60 ° = $\frac{a^2 + 80^2 - b^2}{2 \times 80 \times a}$
80(90 - b) = $(90 - b)^2 + 80^2 - b^2$
7200 - 80b = 8100 - 180b + 6400
100b = 7300 ⇒ b = 73
a = 90 - 73 = 17

Sol.130.(b) Cone has only two faces. Rest have more than two faces each.

Sol.131.(a)
In the given solid figures. Cuboid has the maximum no. of vertex i.e. 8

Sol.132.(a)

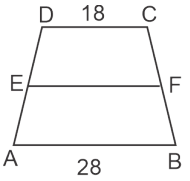


∠QAR = 90° + $\frac{\angle P}{2}$
⇒ 116° = 90° + $\frac{\angle P}{2}$
⇒ 116° = $\frac{180° + \angle P}{2}$
$\angle P$ = 232° - 180° = 52°

Sol.133.(d) Angle corresponding to commerce postgraduates
= $\frac{40}{180}$ × 360° = 80°

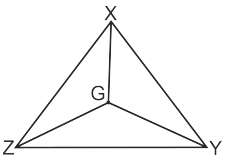
Sol.134.(d) A quadrilateral having equal diagonals and equal opposite sides is always a rectangle .

Sol.135.(d)



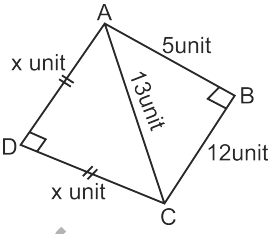
EF = $\frac{AB + DC}{2}$ = $\frac{28 + 18}{2}$ = $\frac{46}{2}$ = 23 cm

Sol.136.(c)



The centroid divides the triangle into 3 smaller(ΔGYZ, ΔGXY and ΔGXZ) triangles of equal area
Area of ΔGYZ = $\frac{area\ of\ \Delta XYZ}{3}$
= $\frac{45}{3}$ = 15 cm²

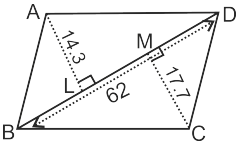
Sol.137.(d)



Area of ΔABC = $\frac{1}{2}$ × 12 × 5 = 30 unit²
In the ΔADC applying pythagoras theorem
$x^2 + x^2 = (13)^2$
$2x^2$ = 169 ⇒ $x = \frac{13}{\sqrt{2}}$
Now, area of ΔADC = $\frac{1}{2} \times \frac{13}{\sqrt{2}} \times \frac{13}{\sqrt{2}}$
= $\frac{169}{4}$ = 42.25 unit²
Hence, area of quadrilateral ABCD
= 30 + 42.25 = 72.25 unit²

Sol.138.(c) Perimeter of equilateral triangle ($3a$) = 24 cm
Each side (a) = 8 cm
Length of median = $\frac{\sqrt{3}a}{2} = \frac{\sqrt{3} \times 8}{2}$
= $4\sqrt{3}$ cm

Sol.139.(c)



Area of ABCD = area of ΔABD + area of ΔCDB
= $\frac{1}{2}$ × BD × AL + $\frac{1}{2}$ × BD × CM
= $\frac{1}{2}$ × 62 (14.3 + 17.7)
= $\frac{1}{2}$ × 62 × 32 = 992 cm^2

Sol.140.(a) If two sides of both triangles are equal, and the perimeter is the same, the third side must also be equal because the perimeter is the sum of all sides. Therefore, all three sides of both triangles would be equal, satisfying the SSS (Side-Side-Side) congruence condition. So, Option (a) is sufficient to

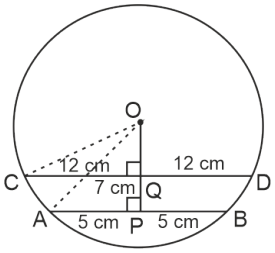
Search on TG: @apna_pdf

Search on Telegram @apna_pdf

conclude that the two triangles are congruent.

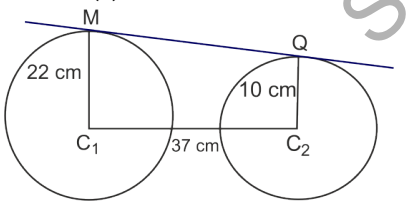
Sol.141.(d) Let the side of an equilateral triangle be x
According to the question,
$2x = 16 \Rightarrow x = 8$ cm
We know that an equilateral triangle all side equal to each other so the third side will be 8 cm.

Sol.142.(a)



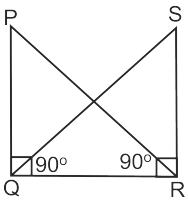
In ΔOQC,
By using pythagoras theorem,
$OQ^2 + CQ^2 = OC^2$
$OQ^2 + 12^2 = OC^2$ .....(i)
In ΔOPA,
$OP^2 + AP^2 = OA^2$
$(OQ + 7)^2 + 5^2 = OA^2$ .....(ii)
Equating the equation (i) and (ii) because OC = OA (radii of the circle)
$OQ^2 + 12^2 = (OQ + 7)^2 + 5^2$
$OQ^2 + 144 = OQ^2 + 49 + 14OQ + 25$
144 - (49 + 25) = 14OQ
70 = 14OQ
OQ = 5 cm
Put the value of OQ in equation (i)
$5^2 + 12^2 = OC^2$
$OC^2 = 25 + 144 = 169$, OC = 13
So, the diameter of the circle
= 2 × 13 = 26 cm

Sol.143.(a)



Length of the common tangent(MQ) = $\sqrt{(distance\ between\ centre\ of\ two\ circle)^2 - (c_1 - c_2)^2}$
MQ = $\sqrt{(37)^2 - (22 - 10)^2}$
= $\sqrt{(37)^2 - (12)^2}$
MQ = $\sqrt{1369 - 144} = \sqrt{1225}$ = 35 cm

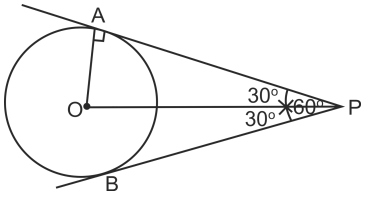
Sol.144.(d)



In the Δ PQR and ΔSRQ
PQ = SR {given}
∠Q = ∠R {both are 90°}
QR = QR {common side}
Hence, ΔPQR ≅ ΔSRQ
{by SAS congruence}

Sol.145.(d)
After checking all the options one by one only option (d) satisfies.
1) $\frac{\pi}{6}, \frac{\pi}{3}, \frac{\pi}{2}$
Multiplying by $\frac{180°}{\pi}$ to change in degree
⇒ 30°, 60°, 90°
⇒ $\frac{30° + 90°}{2}$ = 60° × $\frac{\pi}{180}$ (change in radian to multiply by $\frac{\pi}{180}$) = $\frac{\pi}{3}$ (is average of two other angles)

Sol.146.(b)

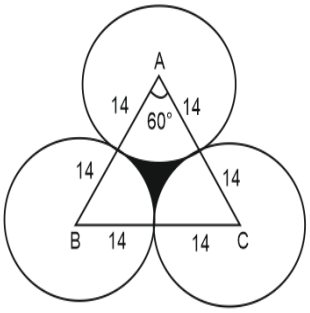


In the Δ POA
∠OPA = 30° [when two tangents are drawn to a circle from an external point, the line drawn from that external point to the center of the circle bisects the angle formed between the two tangents.]
∠OAP = 90° [radius ⊥ tangent]
Hence, ∠POA = 180° - (30 + 90) = 60°

Sol.147.(a) **Concept :-** congruent triangles always have the same area.
Hence, arΔHIJ = arΔEFG = 124 cm²

Sol.148.(b)
Applying angle-angle-angle(AAA) criteria, two triangles can never be proved congruent.
Sol.149.(c) Distance between centres (d) = 18 + 12 = 30 cm
Direct common tangent
= $\sqrt{d^2 - (R - r)^2} = \sqrt{30^2 - (18 - 12)^2}$
= $\sqrt{900 - 36} = \sqrt{864} = 12\sqrt{6}$ cm

Sol.150.(c)

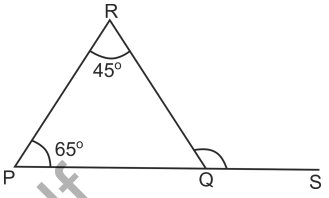


Area of 3 sectors =
$3 \times (\frac{60°}{360°} \times \frac{22}{7} \times 14^2) = 308\ cm^2$

Area of △ABC = $\frac{\sqrt{3}}{4} \times 28^2 = 339.08\ cm^2$
Then, area of shaded region
= 339.08 - 308 = 31.08 cm^2

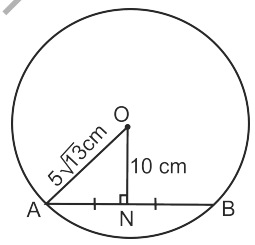
Sol.151.(b) Given: ΔEFG ~ ΔHIJ
Then, $\frac{EF}{HI} = \frac{FG}{IJ} = \frac{GE}{HJ}$
According to the question,
⇒ 3EF = HI ⇒ $\frac{EF}{HI} = \frac{1}{3}$
Now,
⇒ $\frac{EF}{HI} = \frac{FG}{IJ} \Rightarrow \frac{1}{3} = \frac{9}{IJ}$ ⇒ IJ = 27 cm

Sol.152.(a)



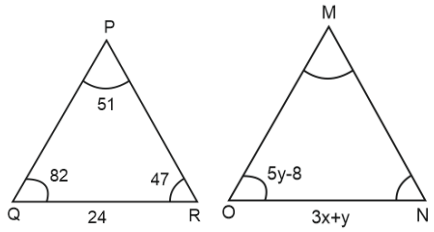
Using Exterior angle property
∠RQS = (∠P + ∠R) = 65° + 45° = 110°

Sol.153.(a)



In ΔAON,
By using pythagoras theorem,
$AN^2 + ON^2 = AO^2$
$(10)^2 + AN^2 = (5\sqrt{13})^2$
100 + AN^2 = 325
AN = $\sqrt{325 - 100} = \sqrt{225}$
AN = 15 cm
AN = NB = 15 cm
So, AB = 30 cm

Sol.154.(d)

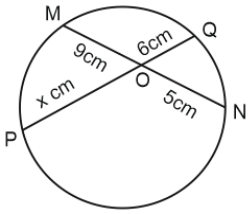


ΔPQR ≅ ΔMON
⇒ ∠P = ∠M, ∠Q = ∠O , ∠R = ∠N and QR = ON
⇒ 5y - 8 = 82 ⇒ y = 18
And 3x + y = 24 ⇒ x = 2
Hence, x + y = 18 + 2 = 20

Sol.155.(a)

Search on TG: @apna_pdf

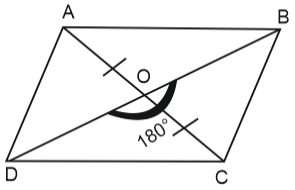
Search on Telegram @apna_pdf



From the figure,
MO × ON = OQ × OP
9 × 5 = 6 × x ⇒ x = 7.5 cm

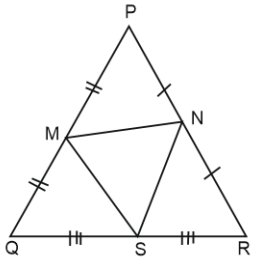
Sol.156.(c) Since,the triangle is right angled at C, we know that A + B = 90°
⇒ cot(A + B) = 90° = 0
Hence, sinA cosB cot (A + B)
= sinA cosB × 0 = 0

Sol.157.(c)



As per figure,
Since, DOB is straight line
So, $\frac{5}{9}$ of ∠DOB = $\frac{5}{9}$ × 180° = 100°

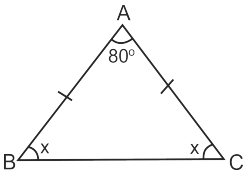
Sol.158.(d)



Area of each triangle = $\frac{46}{4}$ = 11.5 cm^2
Area of quadrilateral MNRQ = 11.5 × 3
= 34.5 cm^2

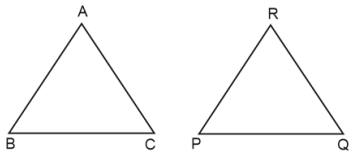
Sol.159.(d) sinA = $\frac{1}{2}$
sinA = sin30° ⇒ A = 30°
Then, ∠C = 90° - 30° = 60°
cosC = cos60° = $\frac{1}{2}$

Sol.160.(a) According to question, we have given triangle ;



80° + 2x = 180°
2x = 180° - 80° = 100° ⇒ x = 50°

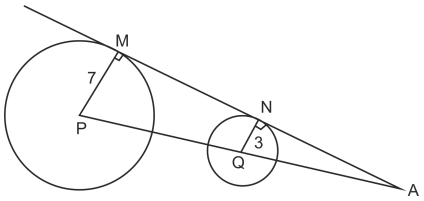
Sol.161.(d)



△ABC ≅ △RPQ (given)
Then, **BC** = PQ

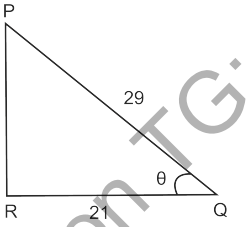
Sol.162.(d)
∠A + ∠B + ∠C = 180° ---------- (1)
$\frac{1}{2}$ ∠A + ∠B + ∠C = 120° ---------- (2)
Solving eqn(1) - eqn(2) we have ;
$\frac{1}{2}$∠A = 60° ⇒ $\frac{1}{4}$∠A = 30°

Sol.163.(c) ATQ, we have given figure ;



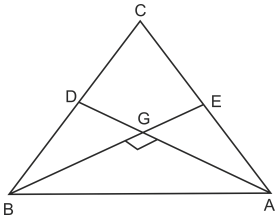
△APM ~ △AQN (BY AAA rule)
$\frac{AP}{AQ}$ = $\frac{7}{3}$
Clearly, we can see that A divides PQ externally in the ratio 7 : 3 .

Sol.164.(d)



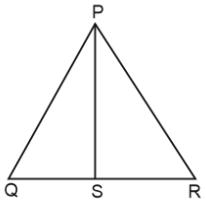
PR = $\sqrt{29^2 - 21^2}$ = $\sqrt{400}$ = 20 units
cosθ = $\frac{21}{29}$, sinθ = $\frac{20}{29}$
Then, $\cos^2\theta - \sin^2\theta = (\frac{21}{29})^2 - (\frac{20}{29})^2$
= $\frac{441-400}{841}$ = $\frac{41}{841}$

Sol.165.(d)



As we know, centroid (G) divides the median in the ratio 2 : 1. So, we have ;
AG = $\frac{2}{3}$AD = $\frac{2}{3}$ × 12 = 8 cm
BG = $\frac{2}{3}$BE = $\frac{2}{3}$ × 9 = 6 cm
Now, In △BGA, AB = $\sqrt{8^2 + 6^2}$ = $\sqrt{100}$
= 10 cm

Sol.166.(b)

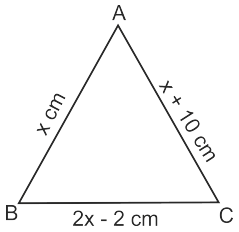


In a triangle PQR, S is a point on the side QR such that PS⊥QR
$PR^2 + QS^2 = PQ^2 + SR^2$
Always satisfies the condition.

Sol.167.(d) The triangle is congruent by SAS if two sides and their included angle in one triangle are exactly equal to the corresponding two sides and their included angle in another triangle.
Hence for congruency for triangles ABC and DEF
AB = FD and ∠A = ∠D ⇒ AC = DE

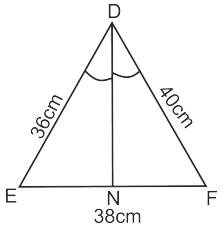
Sol.168.(a) 17 x + 13 x + 15 x = 180°
⇒ 45x = 180°⇒ x = 4°
Now,
17 x - 13 x = 4 x = 4× 4° =16°

Sol.169.(d)



Perimeter of triangle ABC
= x + 2x - 2 + x + 10 ⇒ 4x + 8 = 40
⇒ 4 x = 32 ⇒ x = 8
Hence,
The smallest side = 8 cm

Sol.170.(b)

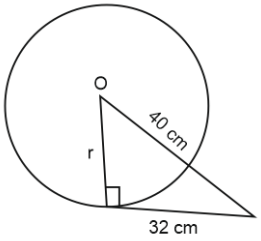


The angle bisector theorem states that when an angle in a triangle is bisected, the opposite side is divided into two segments that are proportional to the other two sides of the triangle.
Here,
DE : DF = 36 : 40 = 9 : 10
9x + 10x = 38 ⇒ x = 2
Hence,
EN = 9 × 2 =18
And NF = 10 × 2 = 20

Sol.171.(d)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf



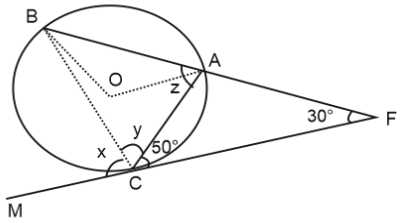
Let, r = radius

$r^2 = 40^2 - 32^2$

$\Rightarrow r^2 = 1600 - 1024 = 576 \Rightarrow r = 24$ cm

diameter = 2 × 24 = 48 cm

Sol.172.(c)



In ΔACF

$\angle CAF = 180^\circ - 50^\circ - 30^\circ = 100^\circ$

$z = \angle ACF + \angle CFA$ ....

(exterior angle property)

$= 50^\circ + 30^\circ = 80^\circ$

$z = x = 80^\circ$ ...

(alternate segment theorem)

$y = 180^\circ - x - \angle ACF$ .... (linear pair)

$= 180^\circ - 80^\circ - 50^\circ = 50^\circ$

$\angle AOB = 2 \times y = 2 \times 50^\circ = 100^\circ$

Sol.173.(d) Given: ΔPQR ≅ ΔABC and AB = 6 cm, ∠B = 50° and ∠A = 70°,

Using the angle sum property of a triangle:

∠A + ∠B + ∠C = 180°

Substituting the known values:

70° + 50° + ∠C = 180°

∠C = 180° − 120° = 60°

Corresponding sides and angles

AB = PQ = 6 cm

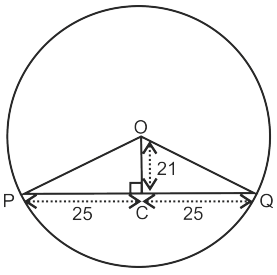
∠A = ∠P = 70°, ∠B = ∠Q = 50°

∠C = ∠R = 60°

The correct answer is option (d)

QP = 6 cm, ∠R = 60°

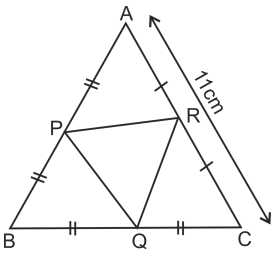
Sol.174.(d)



Radius (OP) = $\sqrt{25^2 + 21^2}$

$= \sqrt{625 + 441} = \sqrt{1066}$ cm

Sol.175.(c)



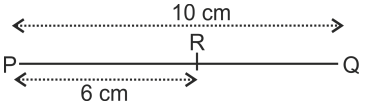
ΔABC is an equilateral triangle.

Area of $\Delta PQR = \frac{1}{4} \times$ area of ΔABC

Area of $\Delta PQR = \frac{1}{4} \times \frac{\sqrt{3}}{4} \times 11 \times 11$

$= \frac{121\sqrt{3}}{16}\ cm^2$

Sol.176.(b)



Length → PR : QR

Initial → 6 : 4

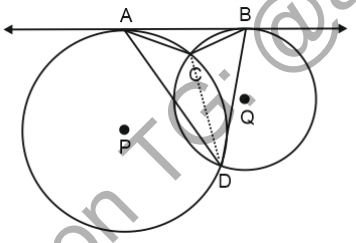
↓+5%

Final → 6.30 then QR = 3.7

Decreased % = $\frac{4 - 3.7}{4} \times 100$

= 0.30 × 25 = 7.5 %

Sol.177.(b)



In ΔACD

$\angle BAC = \angle ADC$ ... (i)... (alternate segment theorem)

In ΔBCD

$\angle ABC = \angle BDC$ ... (ii)... (alternate segment theorem)

$\angle BAC + \angle ABC = 180^\circ - \angle ACB$ ... (iii)

On adding (i) and (ii) we get,

$\angle BAC + \angle ABC = \angle ADC + \angle BDC$

$180^\circ - \angle ACB = 68^\circ$ ... [from(iii)]

$\angle ACB = 180^\circ - 68^\circ = 112^\circ$

Sol.178.(a) We know that, perimeters of two similar triangle are equal to their corresponding sides

$\Rightarrow \frac{perimeter\ of\ \Delta RST}{perimeter\ of\ \Delta ABC} = \frac{RS}{AB}$

$\Rightarrow \frac{26}{39} = \frac{RS}{24} \Rightarrow$ RS = $\frac{26 \times 24}{39}$ = 16cm

Sol.179.(a) We know that , sum of the angle of triangle = 180°

By checking all options one by one, only option (a) satisfy i.e. {30°,60°,90°}

Sol.180.(c) Sides of ΔABC are 10 cm, 20 cm and 20 cm

Area of isosceles ΔABC

$= \frac{1}{2} \times b \times \sqrt{a^2 - \frac{b^2}{4}}$

Here, a = equal side and b = unequal side

So,

Area of isosceles ΔABC

$= \frac{1}{2} \times 10 \times \sqrt{20^2 - \frac{10^2}{4}}$

$= 5 \times \sqrt{400 - \frac{100}{4}}$

$= 5 \times \sqrt{400 - 25} = 5 \times \sqrt{375}$

$= 5 \times 5 \times \sqrt{15} = 25 \times 3.87 = 96.75$

In right angle ΔPQR,

Using pythagorean triplet (5 , 12 , 13)

Area of ΔPQR = $\frac{1}{2}$ × base × height

$= \frac{1}{2} \times 5 \times 12 = 30$

Required difference = 96.75 - 30

= 66.75 cm²

Sol.181.(c)

To solve this question, we can use the triangle inequality theorem, which states that for any triangle, the sum of the lengths of any two sides must be greater than the third side.

The three inequalities will be:

(i) 6+12 > $x \Rightarrow x < 18$

(ii) 6 + x > 12 ⇒ x < 6

(iii) 12 + x > 6 ⇒ x < - 6 (which is always true since x is positive)

From inequalities (i) and (ii), we have:

6 < x < 18

The integer values of x that satisfy 6< x < 18 are:

x = 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17

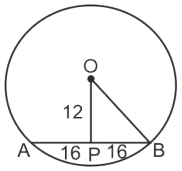
There are 11 possible integer values for x

Sol.182.(a) by using the triangle inequality theorem Largest possible side of the triangle must be less than the half of the perimeter of the triangle

So, possible largest side < 52 ÷ 2 = 26

Hence, each side of the triangle is less than 26 (i.e. <26)

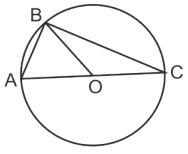
Sol.183.(c)



∴ Radius (OB) = $\sqrt{16^2 + 12^2}$

$= \sqrt{400}$ = 20cm

Sol.184.(b)



Here AOC is diameter , and Arc AB

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{1}{5} \times$ arc BC

$\therefore \angle AOB = \frac{1}{5} \angle BOC$

$\Rightarrow \angle BOC = 5\angle AOB$

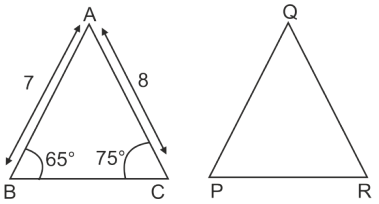
Now , $\angle AOB + \angle BOC = 180°$

$\Rightarrow \angle AOB + 5\angle AOB = 180°$

$\Rightarrow \angle AOB = 30°$

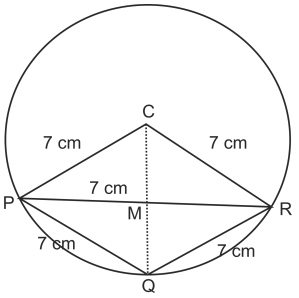
$\therefore \angle BOC = 5 \times 30° = 150°$

Sol.185.(b) **if** ΔABC and ΔQPR are congruent triangles , then their corresponding side and angles are similar



∴ PQ = 7 cm and ∠R = 75° is true .

Sol.186.(d)



CR = PC = CQ = radii of the circle

ΔCRQ and ΔPCQ are an equilateral triangle

So,

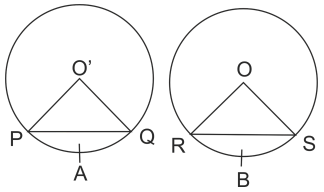
$RM = \frac{\sqrt{3}}{2}a = \frac{\sqrt{3}}{2} \times 7 = \frac{7\sqrt{3}}{2}$

Now,

$PR = 2 \times RM = 2 \times \frac{7\sqrt{3}}{2} = 7\sqrt{3} \times \frac{\sqrt{3}}{\sqrt{3}}$

$= \frac{21}{\sqrt{3}}$ units

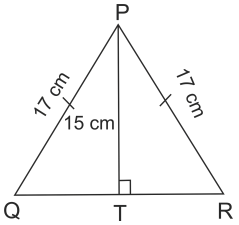
Sol.187.(c)



Arcs PAQ and RBS are congruent, then PQ = RS

So, Ratio of PQ and RS = 1 : 1

Sol.188.(c)



In ΔPTR,

By using pythagoras theorem,

$\Rightarrow PR^2 = PT^2 + TR^2$

$\Rightarrow TR^2 = PR^2 - PT^2$

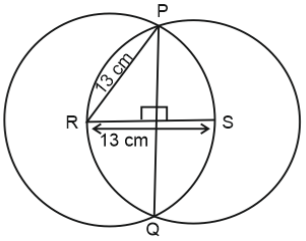
$= 17^2 - 15^2 = 289 - 225 = 64 \Rightarrow TR = 8$

PT ⊥ QR , then

TR = QT = 8 cm

So, QR = TR + QT = 8 + 8 = 16 cm

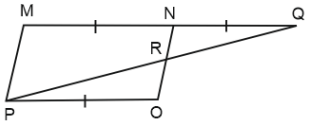
Sol.189.(d)



Length of common chord

$= \sqrt{3} \times$ radius $= 13\sqrt{3}$ cm

Sol.190.(d) MNOP is a parallelogram.



In ΔQNR and ΔPOR

∠QNR = ∠POR … (alternate interior angle)

QN = PO … (MN = OP = QN)

∠RPO = ∠NQR … (alternate interior angle)

Hence,

$\Delta QNR \cong \Delta POR$ by SAS congruency

Therefore,

OR = NR by C.P.C.T.

So, OR : NR = 1 : 1

Sol.191.(c) If we extend a chord infinitely on both sides, then the chord becomes a secant.

Sol.192.(d) Here ,

P - Q = 20° ⇒ ∠P = Q + 20° and Q - R = 26°

⇒ ∠R = Q - 26°

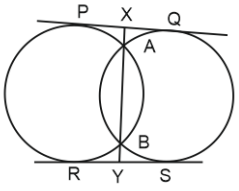
⇒ ∠P + ∠Q + ∠R = 180°

⇒ $\angle Q$ + 20° + ∠Q + ∠Q - 26° = 180°

⇒ 3$\angle Q$ = 186° ⇒ $\angle Q$ = 62°

∴ ∠P = 62° + 20° = 82°

Sol.193.(d)



Given , AB = 3cm , and XY = 5 cm

We know that XA = YB

XY = XA + AB + BY ⇒ 5 = 2XA + 3

2XA = 2 , XA = 1 ⇒ XB = 1 + 3 = 4

We know that ,

PX^2 = XA × XB

PX^2 = 1 × 4 ⇒ PX = 2

Similarly XQ = 2 cm

PQ = PX + XQ = 2 + 2 = 4

Short method:-

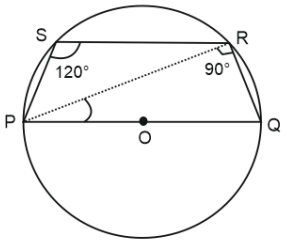
Given, AB = 3 cm, XY = 5 cm

We know,

$PQ^2 = XY^2 - AB^2 = 5^2 - 3^2 = 25 - 9 = 16$

PQ = 4 cm

Sol.194.(a)



We know that , ∠PRQ = 90°

Since , PQRS is cyclic quadrilateral , so ∠PSR + ∠ RQP = 180°

⇒ ∠ RQP = 180° - 120° = 60°

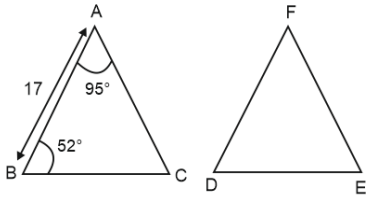
In Δ PRQ

∠P + ∠Q + ∠R = 180°

∠P = 180° - 90° -60° ⇒ ∠P = 30°

So, ∠QPR = 30°

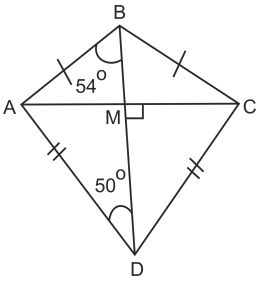
Sol.195.(b) ΔABC≅ΔFDE ∴ there corresponding angle and side are equal



∴∠ C = 180° - 95° - 52° = 33°

Hence , Option (b) DF=17 cm,∠E = 33° is true .

Sol.196.(b)



In ΔAMB,

∠ABM + ∠BAM + ∠BMA = 180°

54° + 90° + ∠BAM = 180°

∠B = 180° - 144° = 36°

In ΔAMD,

∠MAD + ∠AMD + ∠MDA = 180°

∠MAD + 90° + 50° = 180°

∠MAD = 180° - 140° = 40°

Now,

∠BAD = ∠BAM + ∠DAM = 36° + 40° = 76°

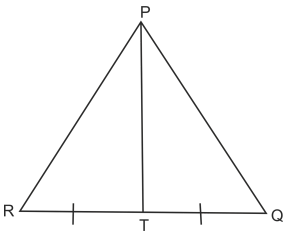
Hence,

∠BCD = ∠BAD = 76°

Sol.197.(b)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf



In ΔPTR,
By using pythagoras theorem,
$PR^2 = PT^2 + RT^2$ .....(i)
In ΔPTQ,
By using pythagoras theorem,
$PQ^2 = PT^2 + TQ^2$ .....(i)
Add equation (i) and (ii)
$PR^2 + PQ^2 = PT^2 + RT^2 + PT^2 + TQ^2$
$PR^2 + PQ^2 = 2PT^2 + (RT^2 + TQ^2)$
$PR^2 + PQ^2 = 2PT^2 + 2TQ^2$ (∵ RT = TQ)
$PR^2 + PQ^2 = 2(PT^2 + TQ^2)$

Short trick:
This is apollonius theorem, hence you should remember it .

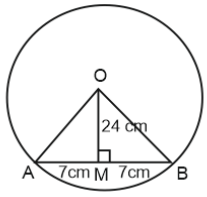
Sol.198.(d)
We know that in a right angled triangle the square of the hypotenuse is equal to the sum of the squares of the other two sides.
After checking all options one by one, only option (d) satisfies
(5 , 12 , 13)
$\Rightarrow 5^2 + 12^2 = 13^2$
⇒ 25 + 144 = 169 ⇒ LHS = RHS

Sol.199.(a)
We know that a scalene triangle has three angles of different measurements.
So, 60°, 30° and 90°
Only option (a) is the correct answer because in this option all angles are different .

Sol.200.(a)
We know the longest chord of the circle is also called the diameter of the circle.
So, the distance between the longest chord and centre of the circle = 0 unit

Sol.201.(a) If the medians of a triangle are equal, the triangle will be **equilateral.** This is because in any triangle, the medians are proportional to the sides. If all three medians are of equal length, it implies that all three sides of the triangle must also be equal. Hence, the triangle must be equilateral.

Sol.202.(d)



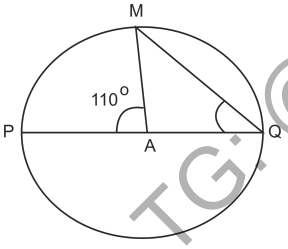
In ΔOMB,
$OM^2 + MB^2 = OB^2$
$OB^2 = 24^2 + 7^2$
$OB^2 = 576 + 49 = 625$
$OB = \sqrt{625} = 25$ cm

Sol.203.(d)
Altitude of an equilateral = $\frac{\sqrt{3}}{2}$a
$= \frac{\sqrt{3}}{2} \times 37\sqrt{3} = \frac{37 \times 3}{2} = 55.5$

Sol.204.(a) Let 4∠P = 5∠Q = 20∠R
⇒ ∠P : ∠Q : ∠R = $\frac{k}{4} : \frac{k}{5} : \frac{k}{20}$
⇒ ∠P : ∠Q : ∠R = 5 : 4 : 1
Now,
10 units = 180° ⇒ 4 units = 72°

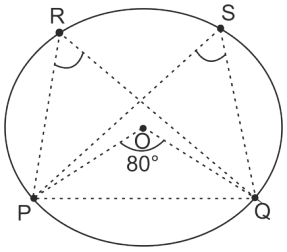
Sol.205.(c) In ΔXYZ is an isosceles triangle with side XY = XZ.
∴ ∠Y and ∠Z = 80°
In Δ XYZ,
⇒ ∠X + ∠Y + ∠Z = 180°
⇒ ∠X = 180° - 80° - 80°⇒ ∠X = 20°

Sol.206.(a)



Here , ∠ MAQ = 180° - 110° = 70°
Now in ΔMAQ , ∠M = ∠ Q = x (AM = AQ = Radius)
⇒ ∠ A + ∠M + ∠Q = 180°
⇒ 70° + 2x = 180° ⇒ x = 55°

Sol.207.(c)

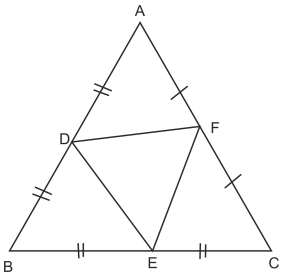


We know that the angle made by the chord on the circumference is half to the angle made by the on the center of the circle .
∴ ∠PRQ = $\frac{1}{2}$ ∠POQ = ∠PSQ
So∠PRQ = ∠PSQ = 40°

Sol.208.(a) If ΔDEF is congruent to ΔXYZ their corresponding sides and angle will be equal to each other i.e DE = XY, EF = YZ , DF = XZ
In ΔDEF , DF = $\sqrt{12^2 + 15^2} = \sqrt{369}$
= $3\sqrt{41}$ cm , Hence DF = XZ = $3\sqrt{41}$ cm

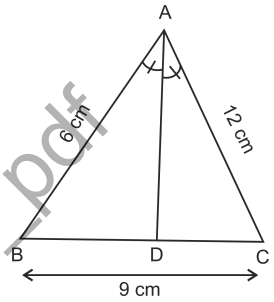
Sol.209.(a) When two lines coincide with each other then there are infinitely many solution or points of intersection.

Sol.210.(d)



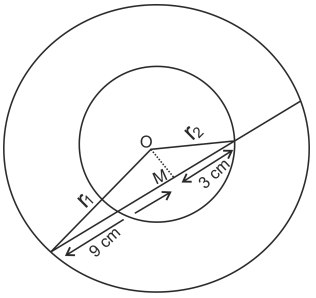
ΔDEF is not congruent to ΔABC because their size are different ,
Hence, $\Delta DEF \ncong \Delta ABC$.

Sol.211.(b)



$\frac{AB}{BD} = \frac{AC}{DC}$ ... (angle bisector theorem)
$\frac{6}{BD} = \frac{12}{DC} \Rightarrow \frac{DC}{BD} = \frac{4}{2}$
BC (6 unit) = 9 cm
DC (4 unit) = $\frac{9}{6} \times 4 = 6$ cm

Sol.212.(d)



OM is perpendicular to chord
Hence, by pythagoras theorem
$OM^2 = r_1^2 + (9)^2$ .... (i)
$OM^2 = r_2^2 + (3)^2$ .... (ii)
From (i) and (ii)
$r_2^2 + (3)^2 = r_1^2 + (9)^2$
$r_2^2 - r_1^2 = 81 - 9 = 72$ cm

Sol.213.(a) It is always possible to draw a circle passing through 3 non-collinear points in a plane.

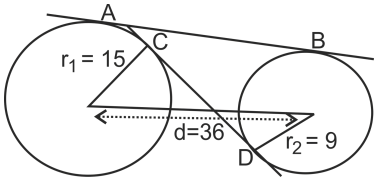
Sol.214.(c) In triangle,
Third side < 18 (12 + 6)
Third side > 6 (12 - 6)
For isosceles triangle side must be equal to 12 or 6 cm but third side should be greater than 6 cm.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Hence, third side = 12 cm

Sol.215.(a)



CD = $\sqrt{d^2 - (r_1 + r_2)^2}$

= $\sqrt{36^2 - (15 + 9)^2}$ = $\sqrt{1296 - 576}$

= $\sqrt{720}$ = $12\sqrt{5}$

AB = $\sqrt{d^2 - (r_1 - r_2)^2}$

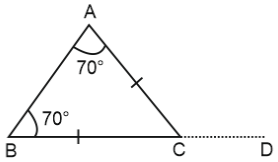
= $\sqrt{36^2 - (15 - 9)^2}$ = $\sqrt{1296 - 36}$

= $\sqrt{1260}$ = $6\sqrt{35}$

Sum (CD + AB) = $12\sqrt{5} + 6\sqrt{35}$

= $6\sqrt{5}(2 + \sqrt{7})$

Sol.216.(a)



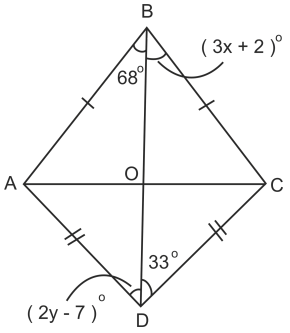
∠BAC = ∠ABC = 70° … (angle opposite to equal side)

∠ACD = ∠ABC + ∠BAC … (exterior angle property)

∠ACD - ∠ABC = ∠BAC

∠ACD - ∠ABC = 70°

Sol.217.(c)



In ΔABD and ΔCBD

AB = BC … (given)

BD = BD …(common)

AD = DC … (given)

$\Delta ABD \cong \Delta CBD$ by SSS congruency.

Hence,

∠ABD = ∠CBD by C.P.C.T.

$68^\circ = (3x + 2)^\circ$

$x = \frac{66}{3} = 22^\circ$

and ∠ADB = ∠CDB by C.P.C.T.

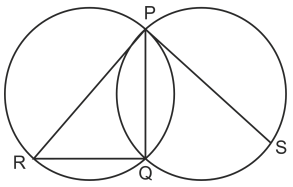
$(2y - 7)^\circ = 33^\circ \Rightarrow y = \frac{40}{2} = 20^\circ$

Now,

$2x + 3y = 2 \times 22^\circ + 3 \times 20^\circ$

$= 44^\circ + 60^\circ = 104^\circ$

Sol.218.(a)



As PR is the diameter of the circle then

∠PQR = 90°

Sol.219.(c) Perimeter of sector

= length of arc + 2 × radius

$= \frac{\theta}{360^\circ} \times 2\pi r + 2r$

$= \frac{1}{8} \times 2 \times \frac{22}{7} \times 14 + 2 \times 14$

= 11 + 28 = 39

Sol.220.(b) ∠QPS = $\frac{1}{2}$ × ∠QOS = $10x^\circ$

Now,

∠QPS + ∠QRS = 180° … (opposite angles of cyclic quadrilateral)

$10x^\circ + 26x^\circ = 180^\circ \Rightarrow x = \frac{180^\circ}{36^\circ} = 5$

Sol.221.(d) both (a) and (c) are correct.

A triangle can have at most one obtuse angle and sum of all interior angles is always 180°.

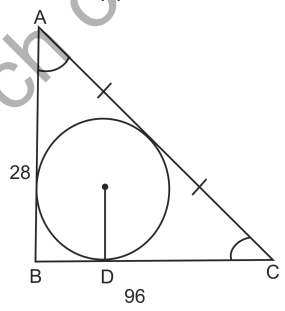
Sol.222.(b) Ratio of angle = 7 : 8 : 3

Sum of angle = 18 unit

18 unit = 180°

Largest angle (8 unit) = $\frac{180^\circ}{18} \times 8 = 80^\circ$

Sol.223.(a)



AC = $\sqrt{AB^2 + BC^2} = \sqrt{28^2 + 96^2}$

= $\sqrt{784 + 9216}$ = 100

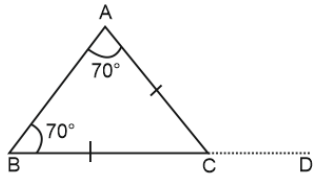
Circumradius = $\frac{Hypotenuse}{2} = \frac{100}{2}$

= 50 cm

Area of circumcircle = π × 50 × 50

= 3.14 × 2500 = 7850 cm^2

Sol.224.(a)



In ΔABC

∠A + ∠B + ∠C = 180°

∠ACD = ∠A + ∠B … (exterior angle property)

∠ACD = 140°

now,

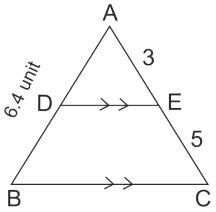
2.5 × ∠ACD - 1.5 ∠ABC

2.5 × 140° - 1.5° × 70° = 350° - 105°= 245°

Sol.225.(d)

$5AE = 3EC$

$\frac{AE}{EC} = \frac{3}{5}$



DE ∥ BC

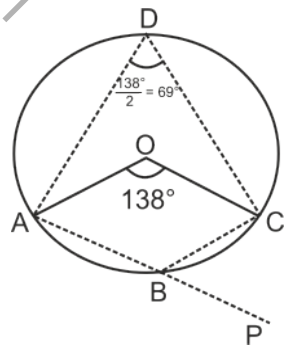
Hence by BPT

$\frac{AD}{AB} = \frac{AE}{AC} \Rightarrow \frac{AD}{6.4} = \frac{3}{8}$

$AD = 2.4$

DB = 6.4 - 2.4 = 4 unit

Sol.226.(d)



∠ADC = $\frac{1}{2} \times 138^\circ = 69^\circ$

Now,

∠ABC = $180^\circ - 69^\circ = 111^\circ$

∠ABC + ∠CBP = 180° … (linear pair)

∠CBP = $180^\circ - 111^\circ = 69^\circ$

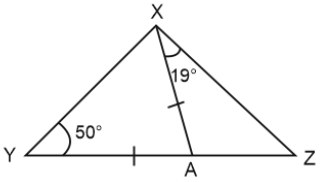
Sol.227.(a) Isosceles triangle

If 2 altitudes of a triangle are equal then the triangle formed is an isosceles triangle.

Sol.228.(b) $\angle P + \angle Q + \angle R = 180^\circ$

$\angle R = 180^\circ - 84^\circ = 96^\circ$

Sol.229.(a)



In ΔXYA

$\angle YXA = \angle AYX = 50^\circ$ ….(angle opposite to equal sides)

Now

$\angle XAZ = \angle YXA + \angle AYX = 50^\circ + 50^\circ$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= 100^\circ$

In ΔAXZ

$\angle XZA + \angle XAZ + \angle AXZ = 180^\circ$

$\angle XZA = 180^\circ - 100^\circ - 19^\circ = 61^\circ$

Sol.230.(c)

$\frac{perimeter\ of\ \Delta ABC}{perimeter\ of\ \Delta DEF} = \frac{24}{9} = \frac{AB}{DE} = \frac{BC}{EF}$

$\frac{24}{9} = \frac{AB}{3}$, AB = 8 cm

$\frac{area\ of\ \Delta ABC}{area\ of\ \Delta DEF} = (\frac{AB}{DE})^2$

$\frac{area\ of\ \Delta ABC}{area\ of\ \Delta DEF} = (\frac{8}{3})^2$

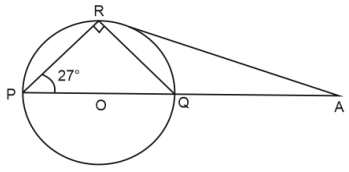
Required ratio = 64 : 9

Sol.231.(a)

Only option (a) is the correct option.

If two circles touch each other, the point of contact lies on the line joining the two centres.

Sol.232.(a)



In Δ PQR

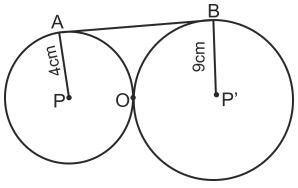
∠PRQ = 90° [angle made by diameter at the circumference of the circle]

∠RPQ = 27° [given]

90° + 27° + ∠RQP = 180°

So, ∠RQP = 180° - 117° = 63°

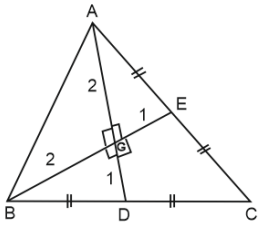
Sol.233.(b)



Length of tangent AB = $2\sqrt{r_1 r_2} = 2\sqrt{4 \times 9}$

= 12 cm

Sol.234.(b)



Centroid intersect the medians into 2 : 1

AD = 18 cm

AD (3 unit) = 18 cm ⇒ 1 unit = 6 cm

Then, AG (2unit) = 12 cm , GD (1cm) = 6 cm

Now, BE = 12 cm

BE (3 unit) = 12 cm ⇒ 1 unit = 4 cm

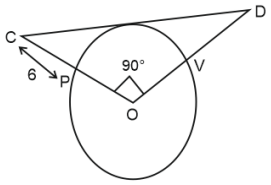
BG (2 unit) = 8 cm , GE (1 unit) = 4 cm

Now, in right angle Δ BGD

$BD^2 = BG^2 + GD^2 \Rightarrow BD^2 = 8^2 + 6^2 = 100$

$BD = 10$ cm

Sol.235.(a)



Circumference of the circle = $2\pi r$

$88 = 2 \times \frac{22}{7} \times r \Rightarrow r = 14$ cm

Length of PO and OV = 14 cm

So the length of CO = 6 + 14 = 20 cm

And the length of OD = 20 + 1 = 21

$(CD)^2 = (CO)^2 + (OD)^2$

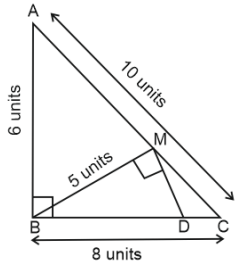
$(CD)^2 = (20)^2 + (21)^2$

$(CD)^2 = 400 + 441 = 841$

CD = 29 cm

Half of the CD = $\frac{29}{2}$ = 14.5 cm

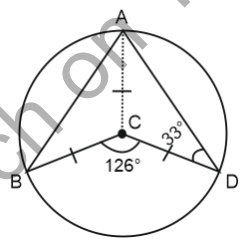
Sol.236.(c)



According to the question,

$\frac{BM}{AB} = \frac{BD}{AC} \Rightarrow \frac{5}{6} = \frac{BD}{10} \Rightarrow$ BD = $\frac{25}{3}$ units

Sol.237.(d)



Construction : join A and C

(∵ The angle subtended by an arc at the center is twice the angle subtended at the circumference of the circle)

So, ∠BCD = 2∠BAD

126° = 2∠BAD ⇒ ∠BAD = 63°

in Δ ACD

∠CAD = ∠CDA = 33° … {angle opposite to equal side}

Now, ∠BAC = ∠BAD - ∠CAD

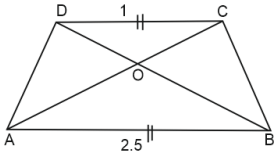
∠BAC = 63° - 33° = 30°

in Δ ACB

∠CAB = ∠ABC = 30° … {angle opposite to equal side}

Hence, ∠ABC = 30°

Sol.238.(b)



In the trapezium ABCD

$\frac{ar\ \Delta\ AOB}{ar\ \Delta\ DOC} = \frac{AB^2}{DC^2}$

$\frac{ar\ \Delta\ AOB}{ar\ \Delta\ DOC} = \frac{(2.5)^2}{(1)^2} = \frac{(\frac{5}{2})^2}{(1)^2} = \frac{25}{4}$

Hence, required ratio = 25 : 4

Sol.239.(d) ΔPQR ~ ΔXYZ

The ratio of the area of two similar triangles is equal to the square of the ratio of any pair of the corresponding sides of the similar triangles.

Then, $\frac{ar\Delta PQR}{ar\Delta XYZ} = (\frac{QR}{YZ})^2$

$\frac{12.96}{635.04} = (\frac{2.9}{YZ})^2 \Rightarrow \frac{1.44}{70.56} = (\frac{2.9}{YZ})^2$

$\sqrt{\frac{1.44}{70.56}} = \frac{2.9}{YZ} \Rightarrow \frac{1.2}{8.4} = \frac{2.9}{YZ}$

$\frac{1}{7} = \frac{2.9}{YZ} \Rightarrow YZ = 20.3$

Sol.240.(a)

ΔABC and ΔPQR are similar triangles

Then, $\frac{AB}{PQ} = \frac{BC}{QR} = \frac{AC}{PR}$

Now, according to the question,

$\frac{AB}{PQ} = \frac{BC}{QR} \Rightarrow \frac{8}{12} = \frac{BC}{18}$

$BC = 12$ cm

Now,

$\frac{BC}{QR} = \frac{AC}{PR} \Rightarrow \frac{12}{18} = \frac{AC}{24}$

$AC = 16$ cm

So, perimeter of ΔABC = (AB + BC + AC)

= (8 + 12 + 16) = 36 cm

Sol.241.(b)

Length of the common tangent

$= \sqrt{d^2 - (R - r)^2}$

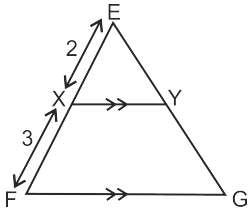
$= \sqrt{(13)^2 - (10 - 8)^2} = \sqrt{169 - 4}$

$= \sqrt{165}$ cm

Sol.242.(c) $\frac{area\ of\ \Delta ABC}{area\ of\ \Delta QRP} = (\frac{BC}{RP})^2$

$\sqrt{\frac{9}{4}} = \frac{BC}{RP} \Rightarrow \frac{15}{RP} = \frac{3}{2} \Rightarrow$ PR = 10 cm

Sol.243.(c)



$\frac{area\ of\ \Delta EXY}{area\ of\ \Delta EFG} = (\frac{2}{(2+3)})^2 = \frac{4}{25}$

Area of quadrilateral XFGY= 25- 4 = 21 units

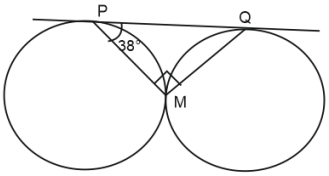
21 units = 44 m^2

(area of ΔEXY) 2 units = $\frac{44}{21} \times 4 = 8.38\ m^2$

Sol.244.(c)

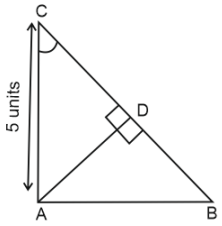
Search on TG: @apna_pdf

Search on Telegram @apna_pdf



Concept used :- if two circle touch each other externally at some point and a direct common tangent is drawn to both circle, the angle subtended by the direct common tangent at the point where two circles touch each other is 90°
According to the concept, ∠PMQ = 90°
Hence the ∠PQM = 90° - 38° = 52°

Sol.245.(d)

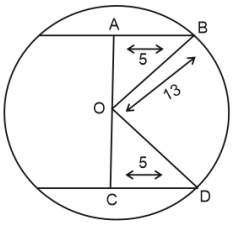


$\frac{area\ of\ \Delta ACB}{area\ of\ \Delta DCA} = (\frac{BC}{AC})^2$ [∵ ΔACB~ΔDCA]

$\sqrt{\frac{63}{7}} = \frac{BC}{5} \Rightarrow \sqrt{9} = \frac{BC}{5} \Rightarrow$ BC = 15 cm

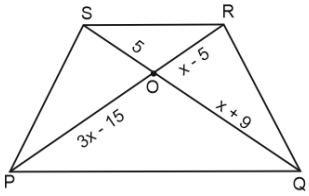
Sol.246.(a) If AB = 11 cm, BC = 13 cm, and AC = 24 cm these three point A, B and C lie on a straight line
Since the points are collinear, the number of circles that can pass through all three points is 0.
No circle can be drawn through three collinear points

Sol.247.(b)



By pythagorean formula :-
AO = $\sqrt{(OB)^2 - (AB)^2}$
AO = $\sqrt{(13)^2 - (5)^2} \Rightarrow$ AO = $\sqrt{144}$
AO = 12 cm
So the distance between AC = 12 + 12 = 24 cm

Sol.248.(b) According to the question,



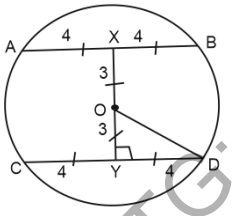
Concept used : - $\frac{PO}{OR} = \frac{QO}{OS}$

$\frac{3x-15}{x-5} = \frac{x+9}{5}$

$15x - 75 = x^2 + 9x - 5x - 45$
$x^2 - 11x + 30 = 0$
$x^2 - 6x - 5x + 30 = 0$
$x(x - 6) - 5(x - 6) = 0$
$(x - 5)(x - 6)$
$x = 5, x = 6$
Now, the value of $(x_1^2 - x_2^2) = (6^2 - 5^2)$
= 36 - 25 = 11

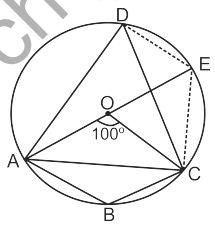
Sol.249.(b)
concept :- in similar triangles the ratio of their area is equal to square of their corresponding sides or perimeters
Perimeter ratio of similar triangles = 4 : 7
So their area ratio = 16 : 49
Sum of areas = (16 + 49) sq . unit
= 65 sq . unit
According to the question,
65 sq . unit = 195 sq . cm
1 sq . unit = 3 sq . cm
Now, difference of area = (49 - 16) unit^2
= 33 unit^2 = 33 × 3 = 99 sq . cm
So, required difference = $\frac{1}{3}$ × 99
= 33 sq . cm

Sol.250.(b)



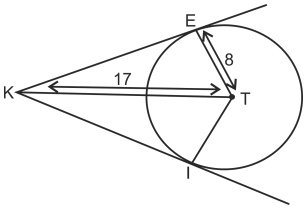
Radius of circle (OD) = $\sqrt{(OY)^2 + (YD)^2}$
= $\sqrt{9 + 16} = \sqrt{25}$ = 5 unit

Sol.251.(a)



Concept used : - The angle made by an arc at the center is twice the angle made by the same arc at the circumference.
So, ∠CEA = ∠ADC = $\frac{100}{2}$ = 50°
∠ADE = 90° (In a semicircle, any angle formed by a diameter is always 90°)
∠CDE = ∠ADE - ∠ADC = 90° - 50° = 40°
∠CDE + ∠CEA = 40° + 50° = 90°

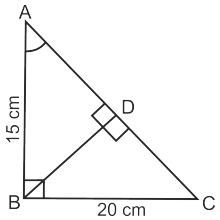
Sol.252.(d)



the angle between the radius and the tangent will always be exactly 90°

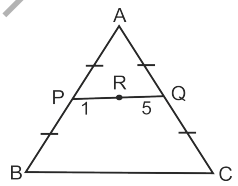
$(KE)^2 = (17)^2 - (8)^2 \Rightarrow (KE)^2$ = 289 - 64
$(KE)^2$ = 225 ⇒ KE = 15 cm
Area of Δ KET = $\frac{1}{2}$ × 15 × 8 = 60 sq .cm
Area of Δ KIT = area of Δ KET (both triangle are congruent)
So the Area of quadrilateral TEKI = 60 × 2 = 120 sq .cm

Sol.253.(b)



By pythagorean : -
AC = $\sqrt{(15)^2 + (20)^2}$
AC = $\sqrt{225 + 400} \Rightarrow$ AC = 25 cm
Property of right angle Δ :-
AB × BC = BD × AC
15 × 20 = BD × 25 ⇒ BD = 12 cm

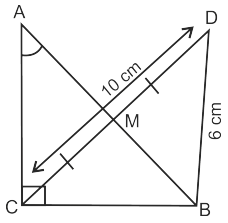
Sol.254.(a)



According to the question,
(PR) 1 unit = 6 cm
(PQ) 6 units = 36 cm
Hence, BC = 36 × 2 = 72 cm (∵$\frac{BC}{2}$ = PQ)

Sol.255.(d) Let the measure of smallest and largest angle be $x°$ and y°
And the 3rd angle be $z°$
According to the question,
$x° + 42°$ = y°.....(i)
$x° + 24°$ = z°.....(ii)
On adding the e.q . (i) and (ii) we get,
$x° + 42° + x° + 24°$ = y° + z°
$2x°$ + 66° = y° + z°
Then, sum of all angle
$x°$ + $2x°$ + 66° = 180° (∵ $x°$+ y°+ z° = 180°)
$3x°$ = 180° - 66° ⇒ $x°$ = $\frac{114}{3}$ = 38°

Sol.256.(b)



CM = $\frac{10}{2}$ = 5 cm

Sol.257.(b)
Formula:- Lengths of the transverse common tangent = $\sqrt{d^2 - (R + r)^2}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Lengths of the direct common tangent

$= \sqrt{d^2 - (R - r)^2}$

Required ratio = $\sqrt{(80)^2 - (35 + 25)^2} : \sqrt{(80)^2 - (35 - 25)^2}$

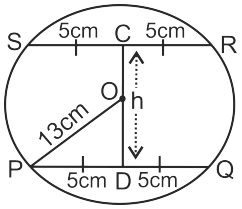
$= \sqrt{(80)^2 - (60)^2} : \sqrt{(80)^2 - (10)^2}$

$= \sqrt{140 \times 20} : \sqrt{90 \times 70}$

$= \sqrt{7 \times 20 \times 20} : \sqrt{7 \times 9 \times 100}$

$= 20\sqrt{7} : 30\sqrt{7} = 2 : 3$

Sol.258.(c)



In the right angle ΔODP

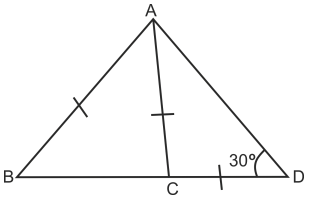
OD = $\sqrt{(OP)^2 - (PD)^2} = \sqrt{(13)^2 - (5)^2}$

$= \sqrt{169 - 25} = \sqrt{144}$ = 12 cm

Now, CD = 2OD = 24 cm

Hence, h = 24 cm

Sol.259.(a)



∠CAD = 30° (∵ AC = CD)

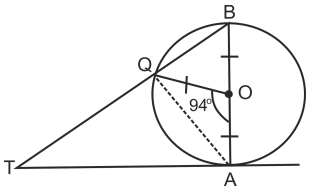
So, ∠ACD = 180° - (30° + 30°) = 120°

Then, ∠ACB = 180° - 120° = 60°

∠ABC = 60° (∵ AC = AB)

Hence, the angles of the triangle is 60°, 60°, 60°

Sol.260.(b)



∠AQB = 90° (angle subtended by a diameter on any point of a circle is always 90°)

So, ∠TQA = 90°

∠OAQ = $\frac{180° - 94°}{2}$ = 43°

∠QAT = 90° - 43° = 47°

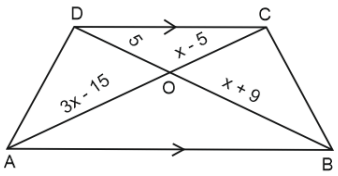
In ΔTQA,

∠QTA = 180° - (90° + 47°)

∠QTA = 180° - 137° = 43°

Required angle(∠ATQ) = 43°

Sol.261.(c)



In trapezium ABCD,

The diagonals of a trapezium divide each other proportionally,

$\Rightarrow \frac{AO}{OC} = \frac{OB}{OD} \Rightarrow \frac{3x - 15}{x - 5} = \frac{x + 9}{5}$

$\Rightarrow 15x - 75 = x^2 + 9x - 5x - 45$

$\Rightarrow x^2 + 4x - 15x + 75 - 45 = 0$

$\Rightarrow x^2 - 11x + 30 = 0$ .....(i)

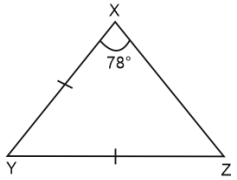
On solving the eqn. (i), we get

$\Rightarrow x = 5$ or 6

Now,

$(x_1^2 + x_2^2) = (5)^2 + (6)^2 = 25 + 36 = 61$

Sol.262.(a)



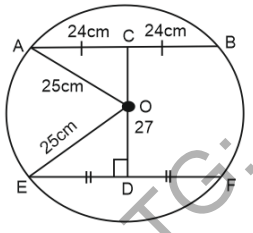
In ΔXYZ,

⇒ ∠X + ∠Y + ∠Z = 180°

⇒ 78° + ∠Y + 78° = 180°(∠X = ∠Z)

⇒ ∠Y = 180 - 156° ⇒ ∠Y = 24°

Sol.263.(c)



Applying pythagorean theorem in the right angle Δ ACO

$OC^2 = AO^2 - AC^2$

$OC^2 = (25)^2 - (24)^2 = 49$ OC = 7 cm

Now, OD = CD - OC = 27 - 7 = 20 cm

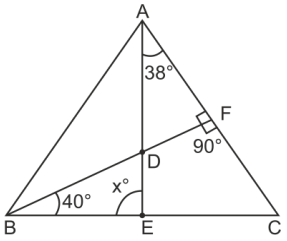
Applying pythagorean theorem in the right angle Δ ODE

$ED^2 = OE^2 - OD^2$

$ED^2 = (25)^2 - (20)^2 = 225$ ⇒ ED = 15 cm

So, the length of chord (EF)= 15 × 2= 30 cm

Sol.264.(a)



In the right angle Δ AFD,

38° + 90° + ∠ADF = 180° ⇒ ∠ADF = 52°

Now, ∠ADF = ∠BDE = 52° [vertically opposite angle]

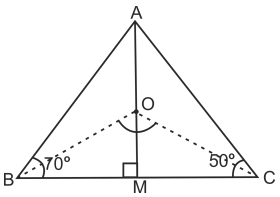
In the Δ BDE

40° + 52° + ∠BED = 180° ⇒ ∠BED = 88°

Sol.265.(d) Length of arc = $\frac{\theta}{360} \times 2\pi r$

$= \frac{120}{360} \times 2 \times \frac{22}{7} \times 7 = \frac{44}{3}$ cm

Sol.266.(a)

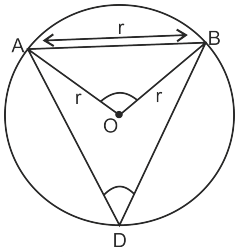


∠BAC = 180° - ∠B − ∠C

= 180° - 120° = 60°

∠BOC = 90° + $\frac{\angle BAC}{2}$ = 90° + $\frac{60°}{2}$ = 120°

Sol.267.(a)



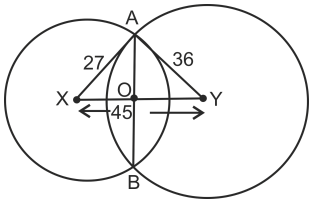
ΔAOB is an equilateral triangle.

So, ∠AOB = 60° (∵ all angle of equilateral triangle is 60°)

And ∠ADB = 30° (∵ The angle subtended by an arc at the center is twice the angle subtended at the circumference of the circle)

Hence, the required angle will be 60° and 30°

Sol.268.(d)



Δ AXY is right angled as [tangent (AY)⊥ radius (XA)]

Now, in right angled Δ AXY

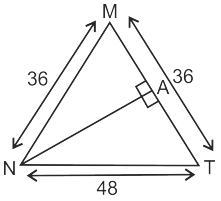
XA × AY = OA × XY

27 × 36 = OA × 45 ⇒ OA = 21.6 cm

AB = 2 × OA = 2 × 21.6 = 43.2 cm

Hence, length of common chord (AB) = 43.2 cm

Sol.269.(b)



Area of isosceles triangle = $\frac{a}{4}\sqrt{4b^2 - a^2}$

$= \frac{1}{2}$ × base × height(NA)

$\Rightarrow \frac{48}{4}\sqrt{4(36)^2 - (48)^2} = \frac{1}{2} \times 36 \times$ height

$\Rightarrow 12\sqrt{5184 - 2304} = 18 \times$ height

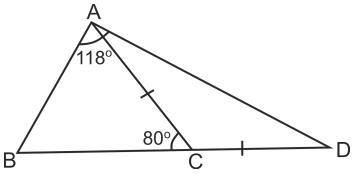
$\Rightarrow 12 \times 24\sqrt{5} = 18 \times$ height

Height = $\frac{12 \times 24\sqrt{5}}{18} = 16\sqrt{5}$ cm

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.270.(c)



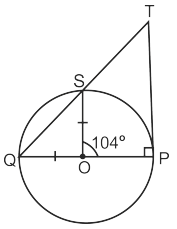
∠ACD = 180 - 80 = 100° [sum of angles at one side of linear line is 180°]
Side, AC = CD
Then, ∠CAD = ∠ADC
In Δ CAD
2∠CAD + 100° = 180°
∠CAD = 40°
Now, ∠BAC = 118 - 40 = 78°
In Δ ABC
∠BAC + ∠ACB + ∠CBA = 180°
78° + 80° + ∠ABC = 180° ⇒ ∠ABC = 22°

Sol.271.(b) **Concept :-** ratio of the area of similar triangles is equal to the square of corresponding sides.
Now, smallest side of Δ ABC (3x) = 15 unit
x = 5 unit
So, other sides of Δ ABC
4x = 20 unit , 5x = 25 unit
As, (15,20, 25) are the pythagorean triplet
So, Δ ABC is right angle triangle
Area of Δ ABC = $\frac{1}{2}$ × 15 × 20
= 150 square unit
According to question,
Area of Δ DEF = $\frac{1}{2}$ × 150 = 75 square unit
So, $\frac{Ar(\Delta DEF)}{Ar(\Delta ABC)} = \frac{(x)^2}{(25)^2}$
$\frac{75}{150} = \frac{(x)^2}{(25)^2} \Rightarrow x^2 = \frac{(25)^2}{2} \Rightarrow x = \frac{25}{\sqrt{2}}$
Hence, largest side of ΔDEF (x) = $\frac{25}{\sqrt{2}}$ unit

Sol.272.(c) Smallest side = x
Then, hypotenuse = $2x + 6$
And, third side = $2x + 4$
Take x = 10 m
Then, sides of right angle triangle
= 10 , 24 and 26 m (pythagorean triplet)
So, area of triangle = $\frac{1}{2}$ × 10 × 24 = 120 m

Sol.273.(d) Let angles of the triangles be $2x$, $4x$ and $6x$
$2x + 4x + 6x = 180°$
$12x = 180° \Rightarrow x = 15°$
Angles of triangle = 30° , 60° , 90°
Ratio of sides = 1 : $\sqrt{3}$: 2
Since, one angle is 90° so, triangle is right angled
Now, circumradius of right angle triangle
= $\frac{hypotenuse}{2}$
$\frac{hypotenuse}{2}$ = 12 ⇒ hypotenuse = 24 cm
Now, 2 unit = 24 cm , 1 unit = 12 cm
Other sides be 12 cm, 12$\sqrt{3}$ cm
Hence, sides are 12 cm, 12$\sqrt{3}$ cm, 24 cm

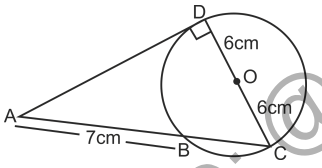
Sol.274.(d)



In Δ SOQ
∠QSO + ∠SQO = 104° [exterior angle is equal to sum of opposite interior angle]
2∠SQO = 104° [opposite angle of same side (OS = OQ = Radius)]
∠SQO = 52°
Now, in right angle Δ TPQ
52° + 90° + ∠PTQ = 180° ⇒ ∠PTQ = 38°

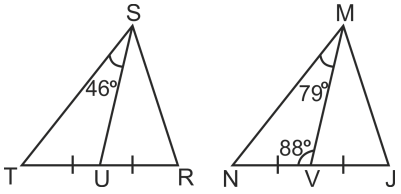
Sol.275.(c) △XYZ ~ △PQR
$\frac{perimeter\ of\ \triangle XYZ}{perimeter\ of\ \triangle PQR} = \frac{XY}{PQ}$
$\frac{XY}{3.6} = \frac{16}{9}$ ⇒ XY = $\frac{64}{10}$ = $6\frac{2}{5}$

Sol.276.(a)



Let BC = x
In Δ ADC
$AC^2 = AD^2 + CD^2$ (pythagoras theorem)
$(7 + x)^2 = AD^2 + (12)^2$
$AD^2 = (7 + x)^2 - (12)^2$ -----(i)
$AD^2 = 7(7 + x)$ ---- (ii) [∵ AD^2 = AB × AC]
Now
$(7 + x)^2 - (12)^2 = 7(7 + x)$
$x^2 + 7x - 144 = 0$
$x^2 + 16x - 9x - 144 = 0$
$x(x + 16) - 9(x + 16) = 0$
$(x - 9)(x + 16) = 0$
x = 9 , -16 (∵ side cannot be negative)
x = 9
AC = AB + BC = 7 + 9 = 16 cm

Sol.277.(a)



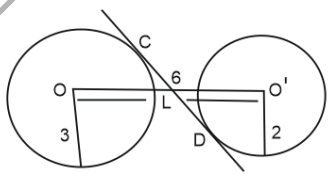
∠STU = 180° - (46° + 88°) = 46°
∠SRT = 180° - (46° + 79°) = 55°
⇒ $\frac{7}{11}$∠SRT = $\frac{7}{11}$ × 55° = 35°

Sol.278.(b) **Concept :-** if any triangle has three sides x, y and z
Then, (x + y) > z > (x - y)
According to question,
(25 - 19) < y < (19 + 25)
6 < y < 44

Sol.279.(a)
(6 , 8 , 10) are the pythagorean triplet
So, area of triangle = $\frac{1}{2}$ × 6 × 8 = 24 cm^2

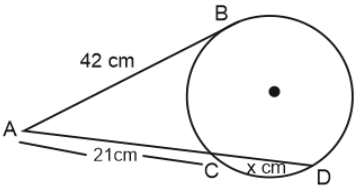
Sol.280.(d) Let initial angles are 3x + 17°, 4x + 17° and 7x + 17°
Then, 14x + 51° = 180°
14x = 129° ⇒ x = $\frac{129°}{14}$
Largest angle (7x + 17) = 7 × $\frac{129°}{14}$ + 17
= $\frac{163°}{2}$ ⇒ $\frac{163°}{2} \times \frac{\pi}{180} = \frac{163\pi}{360}$ radian.

Sol.281.(d) **Concept used :** For maximum distance between the centres of the circle, we need to draw the transverse common tangent .
For the minimum distance between the centres of the circle , we need to draw the direct common tangent.



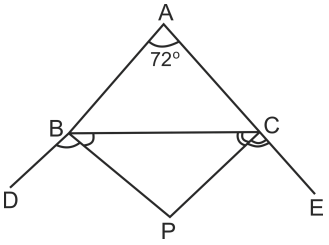
Let the maximum distance between the centres be 'L'
Transverse common tangent
= $\sqrt{L^2 - (R + r)^2}$
6 = $\sqrt{L^2 - (3 + 2)^2} = \sqrt{L^2 - 5^2}$
36 = L^2 - 25 ⇒ 61 = L^2 ⇒ L = $\sqrt{61}$ Units

Sol.282.(d)



$(AB)^2$ = AC × AD
42 × 42 = 21 × (21 + x)
84 = 21 + x ⇒ x = 63
Required ratio = 42 : 63 = 2 : 3

Sol.283.(b)

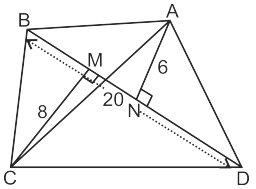


We know that,
∠CPB = 90° - $\frac{72°}{2}$ = 90° - 36° = 54°

Sol.284.(a)

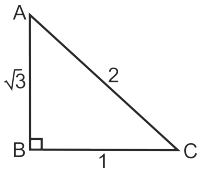
Search on TG: @apna_pdf

Search on Telegram @apna_pdf



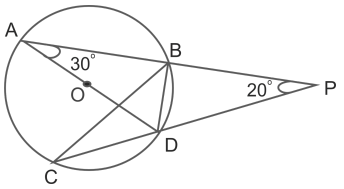
Area of quadrilateral ABCD
= ar(△ABD) + ar(BCD)
= $\frac{1}{2}$(CM + AN) × BD
= $\frac{1}{2}$(8 + 6) × 20 = 140 cm^2

Sol.285.(c) ATQ, we get given triangle ;



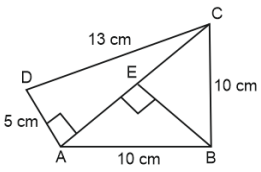
tan∠ACB = $\frac{\sqrt{3}}{1}$
tan∠ACB = tan 60° ⇒ ∠ACB = 60°

Sol.286.(d)



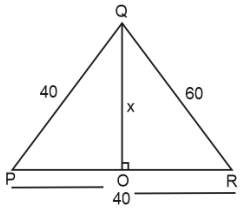
∠DAB = ∠DCB = 30°(angles in same segment are equal)
∠ABD = 90° (angle in semicircle)
Then, ∠DBP = 90°
In ΔBDP, ∠PDB = 180° - (90° + 20°) = 70°
Now, in △BCD,∠BDP is exterior angle. So, we have ;
∠DCB + ∠DBC = ∠BDP
30° + ∠DBC = 70°
∠DBC = 70° - 30° = 40°

Sol.287.(a)



△DAC is right triangle. Then, AC
= $\sqrt{13^2 - 5^2}$ = $\sqrt{144}$ = 12 cm
AE = EC = 6 cm (△BCE ≅ △BAE)
Now, △BEC is right triangle. Then, BE
= $\sqrt{10^2 - 6^2}$ = $\sqrt{64}$ = 8 cm
Area of quadrilateral = area of (△ABC) + area of (△ADC)
= $\frac{1}{2}$ × BE × AC + $\frac{1}{2}$ × AD × AC
= $\frac{1}{2}$ × AC(BE + AD) = $\frac{1}{2}$ × 12(8 + 5)
= 78 cm^2

Sol.288.(c)

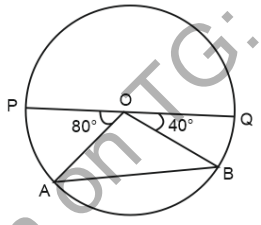


Semiperimeter(s) = $\frac{40 + 40 + 60}{2}$ = $\frac{140}{2}$
= 70 cm
Using Heron's formula, Area of triangle
= $\sqrt{s(s-a)(s-b)(s-c)}$
= $\sqrt{70(70-40)(70-40)(70-60)}$
= $\sqrt{70\times30\times30\times10}$ = $\sqrt{90000 \times 7}$ = 300$\sqrt{7}$
Also, area of triangle = $\frac{1}{2}$ × x × 40 = 20x
Now, 20x = 300$\sqrt{7}$ ⇒ x = 15$\sqrt{7}$ cm

Sol.289.(a) Option (a) is not true as "There is no circle passing through any three points in any plane".

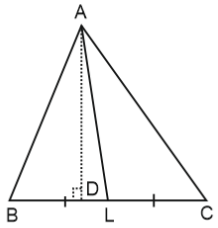
Sol.290.(d) According to the question,
$\frac{area\ of\ \Delta ABC}{area\ of\ \Delta EDF}$ = $\frac{(BC)^2}{(DF)^2}$
$\frac{1}{4}$ = $\frac{8^2}{(DF)^2}$ ⇒ $(DF)^2$ = 64 × 4 = 256
DF = 16 cm

Sol.291.(d)



$\angle POA + \angle AOB + \angle QOB = 180^\circ$
$80^\circ + \angle AOB + 40^\circ = 180^\circ \Rightarrow \angle AOB = 60^\circ$

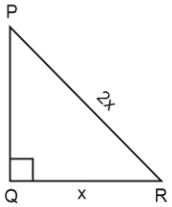
Sol.292.(c) Let AD be the height of ΔABC



Area of ΔABL = $\frac{1}{2}$ × Base × Height
15 = $\frac{1}{2}$ × BL × AD
30 = BL × AD … (i)
Area of ΔACL = $\frac{1}{2}$ × Base × Height
= $\frac{1}{2}$ × LC × AD
= $\frac{1}{2}$ × BL × AD … (L is the midpoint of BC ∵ BL = LC)
= $\frac{1}{2}$ × 30 … [from (i)]
= 15 cm^2

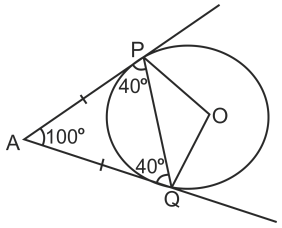
Area of ΔABC
= Area of ΔABL + Area of ΔACL
= 15 + 15 = 30

Sol.293.(a)



Using pythagoras theorem
$PQ^2 = PR^2 - QR^2 = 4x^2 - x^2 = 3x^2$
$PQ = x\sqrt{3}$
Area of triangle = 600
$\frac{1}{2}$ × QR × PQ = 600
$\frac{1}{2} \times x \times x\sqrt{3} = 600 \Rightarrow x^2 = \frac{1200}{\sqrt{3}}$
$x^2 = 400\sqrt{3} \Rightarrow x^2 = 400 \times 1.73$
$x^2 = 692 \Rightarrow x = 26.30$
Difference between hypotenuse and base ($2x - x = x$) = 26.30

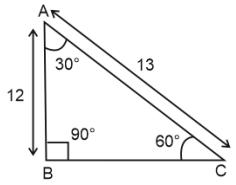
Sol.294.(d) Theorem : Tangents drawn from an external point to a circle are equal.



As we know, ∠PAQ + ∠POQ = 180°
∠POQ = 180° - 100° = 80°

Sol.295.(b) Length of the arc of circle
= $\frac{72°}{360°}$ × 2 × $\frac{22}{7}$ × 35 = 44 cm

Sol.296.(b)



It forms a triplet of 5, 12, 13
Hence, BC = 5 cm

Sol.297.(b) Since FG is the mid-point of equilateral triangle,
So, FG will be median
Median of equilateral triangle
= $\frac{\sqrt{3} \times side}{2}$ = $\frac{\sqrt{3} \times 12}{2}$ = 6$\sqrt{3}$ cm

Sol.298.(b) B and D
A triangle can have two acute angles and a triangle can have one obtuse angle also.

Sol.299.(a) An obtuse triangle is a

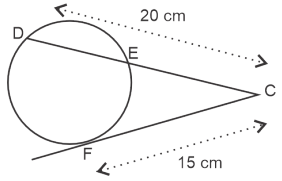
Search on TG: @apna_pdf

Search on Telegram @apna_pdf

triangle with one angle greater than 90°.

Sol.300.(a) Concept : In any triangle the sum of any two sides is always greater than the third side.
Case 1 - taking 2 cm, 5 cm, 7 cm, as side 2 + 5 = 7 which is equal to the third side. Hence, no triangle can be formed.
Case 2 - taking 2 cm, 5 cm, 8 cm, as side 2 + 5 < 8. Hence, no triangle can be formed.
Case 3 - taking 5 cm, 7 cm, 8 cm, as side 5 + 7 = 12 > 8. Hence, triangles can be formed.
Case 4 - taking 2 cm, 7 cm, 8 cm, as side 2 + 7 = 9 > 8. Hence, triangles can be formed.
Hence, triangle can be formed in case 3 and 4 only.

Sol.301.(d)

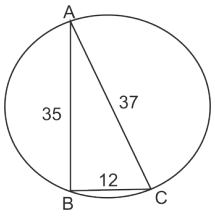


$CF^2 = CD \times CE$
$15^2 = 20 \times CE$
$CE = \frac{225}{20} = 11.25$
Hence, DE = 20 - 11.25 = 8.75 cm

Sol.302.(d) AB = 3.8 cm
BC = 6 cm
CA < BC - AB
< 6 - 3.8
< 2.2 cm
On checking the option we can see that only option (d) cannot be the side of the scalene triangle.

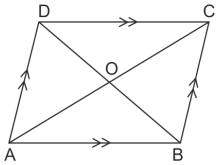
Sol.303.(d) We know that:
An isosceles triangle has two equal angles.
And sum of three angles of a triangle = 180°
Let each of the other two angles = x°.
⇒ x° + x° + 42° = 180°
⇒ 2x° = 180° - 42°
⇒ 2x° = 138° ⇒ x° = 69°

Sol.304.(c)



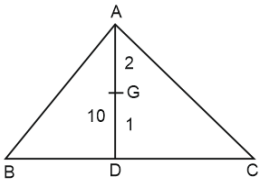
Circumradius of the triangle
$= \frac{hypotenuse}{2} = \frac{37}{2} = 18.5$ cm

Sol.305.(b)



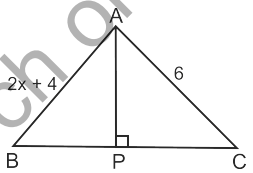
Option (a) ΔAOB ≅ ΔCOD
In ΔAOB and ΔCOD, AB ∥ CD
∠BAO = ∠DCO (alternate interior angle)
∠ABO = ∠CDO (alternate interior angle)
∠AOB = ∠COD (vertically opposite angle)
So, ΔAOB ≅ ΔCOD (true)
Similarly,
Option (c) ΔABC ≅ ΔADC (true)
Option (d) ΔBOC ≅ ΔAOD (true)
But,
Option (b) ΔAOD ≅ ΔCOD (false)
Both triangles angles are not equal to each other because AD does not parallel to CD.
Therefore, the correct answer is option (b)

Sol.306.(d)



We know
Centroid divides the median in 2 : 1.
GD = 1 → 10
AG = 10 × 2 = 20
AD = AG + GD = 20 + 10 = 30 cm

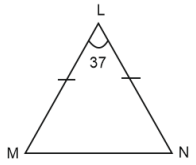
Sol.307.(c)



Given P is the mid point of BC
⇒ BP = PC
We know
In an equilateral triangle, AP ⊥ BC if and only if P is the mid point of BC.
Hence, ABC is an equilateral triangle.
⇒ AB = BC = CA
⇒ $2x + 4 = 6 \Rightarrow 2x = 2 \Rightarrow x = 1$

Sol.308.(c) Given,
AC = BD ⇒ BC = AD
AB is common.
Hence, by SSS rule
Both triangles ΔABC and ΔBAD are congruent.
⇒ ΔABC ≅ ΔBAD

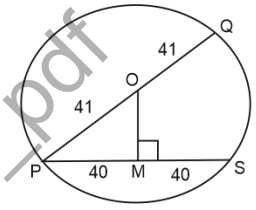
Sol.309.(c)



Since LM = LN
⇒ ∠LMN = ∠LNM = x (say)
And ∠L + ∠M + ∠N = 180°
⇒ 37 + x + x = 180°
⇒ 2x = 180° - 37° = 143°
$\Rightarrow x = \frac{143°}{2} = 71.5°$

Sol.310.(a) As we know, $P^2 + B^2 = H^2$
$(x^2-1)^2 + (2x)^2 = (x^2 + 1)^2$
$x^4 + 1 - 2x^2 + 4x^2 = (x^2 + 1)^2$
$x^4 + 2x^2 + 1 = (x^2 + 1)^2$
$(x^2 + 1)^2 = (x^2 + 1)^2$
LHS = RHS
So, hypotenuse = $x^2 + 1$

Sol.311.(b) Concept used :
The perpendicular distance from centre of circle to the chord bisects the chord.



In △OPM, we have ;
$OM = \sqrt{41^2 - 40^2} = \sqrt{1681 - 1600}$
$= \sqrt{81} = 9$ cm

Sol.312.(d) As we know, sum of the angle of triangle is 180°
9+11+16 = 36 unit → 180°
Then, (16 - 9) = 7 unit → $\frac{180°}{36} \times 7 = 35°$

Sol.313.(b) In △ABC and ΔPQR,
AB = PQ = 7 cm
BC = QR = 8 cm
AC = PR = 9 cm
Then, ΔABC ≅ ΔPQR (by SSS rule)

Sol.314.(a)
In the triangle the sum of two sides is always greater than the third side.

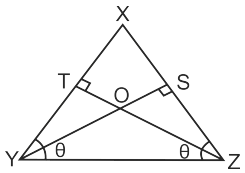
Sol.315.(d) Area of two congruent triangles are always equal.
Hence,
Area of ΔPQR = Area of ΔABC = 225 cm^2

Sol.316.(b) As we know, Sum of the angle of triangle = 180°
$(18x + 6°) + (10x + 30°) + (15x + 15°)$
= 180°
$43x + 51° = 180°$
$43x = 129 \Rightarrow x = 3$
So, $18x + 6° = 18 \times 3 + 6 = 60°$, $10x + 30° = 10 \times 3 + 30 = 60°$, $15x + 15° = 15 \times 3 + 15 = 60°$
Therefore, the triangle is equilateral .

Sol.317.(d) According to the question, we have given triangle

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

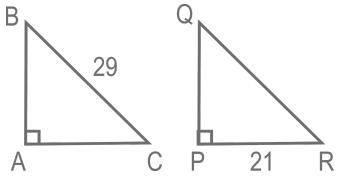


∠XYZ = ∠XZY = θ (angles opposite to equal side)
In △TYZ, ∠TZY = 90° - θ
In △SYZ, ∠SYZ = 90° - θ
⇒ ∠TZA = ∠SYZ
Now, In △TYZ and △SZY, we have ;
∠TYZ = ∠SZY
YZ = YZ (common)
∠TZA = ∠SYZ
So, △TYZ ≅ △SZY (By ASA rule)
Then, ZT = YS

Sol.318.(d) In the ΔABC,
As we know,
AC + AB > BC > AC - AB
13 + 9 > BC > 13 - 9
22 > BC > 4
From the above option, we get BC = 20 cm

Sol.319.(b) From the given option, option (b) is the correct one.
As in ΔPQR and ΔABC,
∠A = ∠P (given)
AC = PR (given)
AB = PQ
Then, ΔPQR ≅ ΔABC (by SAS rule)

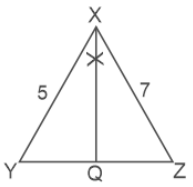
Sol.320.(c)



These two triangles are congruent. So length of corresponding sides is equal
AB = PQ, AC = PR, BC = QR
AB = $\sqrt{BC^2 - AC^2}$,
AB = $\sqrt{29^2 - 21^2}$ = 20 cm

Sol.321.(a)
Given that ΔABC is similar to ΔPQR
So, corresponding sides and angles are equal
$\angle A = \angle P, \angle B = \angle Q$ and $\angle C = \angle R$
$\because \angle B$ = 180° - (85° + 58°) = 37°
$\therefore \angle Q$ = 37°

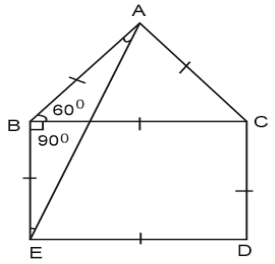
Sol.322.(a)



According to angle bisector theorem,
YQ : QZ = XY : XZ
∴ YQ : QZ = 5 : 7

Sol.323.(a) Let the measure of first two angels = $3x$ and $7x$
∴ Measure of third angle = $10x$
Sum of all three angles of a triangle = 180°
$3x + 7x + 10x = 180°$
$\therefore x = 9°$
Hence smallest angle = $3x = 27°$

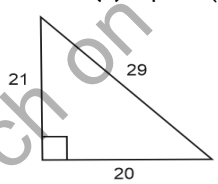
Sol.324.(a)



In △ABE, ∠BAE = ∠AEB = x° (Angles opposite to equal sides are equal)
Now, 150° + 2x = 180°
2x = 180° - 150° = 30°
x = 15°
Then, ∠EAB + 3∠AEB = x + 3x = 4x
= 4 × 15° = 60°

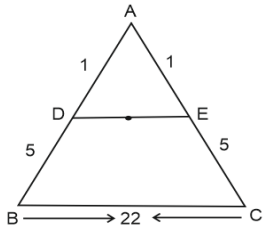
Sol.325.(d) As we know, the longest chord of a circle is its diameter.
Diameter ≥ 20.5
2r ≥ 20.5
r ≥ 10.25
So, the radius (r) of the circle must be r ≥ 10.25

Sol.326.(d) triplet : (20, 21, 29)



Given, sum of the other two sides
= 41 = (20 + 21)
Now, difference between the two sides
= (21 - 20) = 1 cm

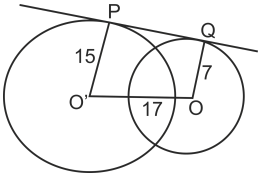
Sol.327.(a)



△ABC ~ △ADE
Let the length of DE = x
$\frac{AD}{AB} = \frac{x}{22} \Rightarrow \frac{1}{6} = \frac{x}{22}$
(Length of DE) x = 3.67 cm

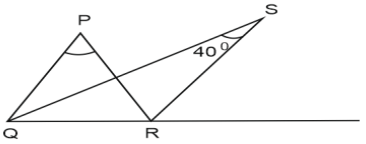
Sol.328.(a) According to the question,
45° = 22 cm
(Perimeter of circle) 360° = $\frac{22}{45}$ × 360
= 176 cm
Perimeter of circle = 2πr
2 × $\frac{22}{7}$ × r = 176
(radius) r = 28 cm

Sol.329.(a)



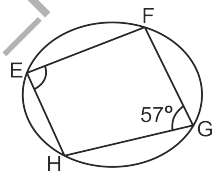
Length of PQ = $\sqrt{17^2 - (15 - 7)^2}$ = 15cm

Sol.330.(a)



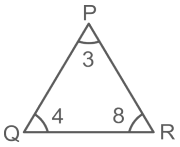
∠P = 2 × 40 = 80°

Sol.331.(c) Sum of opposite angles of cyclic quadrilateral is 180°



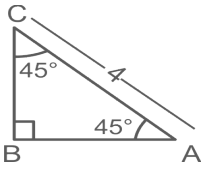
∠HEF = 180 - 57 = 123°

Sol.332.(d) The side facing the larger angle will be larger and the side facing the smaller angle will be smaller.



So we can say that QR is the shortest side and PQ is the longest side.

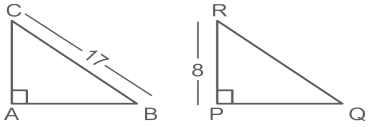
Sol.333.(b)



90°, 45°, 45° = $\sqrt{2}$: 1 : 1
(Length of AC) $\sqrt{2}$ unit = 4 cm
(Length of BC) 1 unit = $\frac{4}{\sqrt{2}}$ = $2\sqrt{2}$ cm

Sol.334.(d) According to the question,
Sine rule = $\frac{1}{2}$absinθ (By using the formula)
Area of triangle = $\frac{1}{2}$ × 4 × 5 × $\frac{1}{\sqrt{2}}$ = $5\sqrt{2}$

Sol.335.(d)

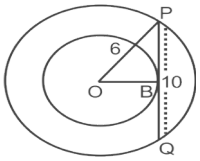


Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Pythagorean triples (8, 15, 17)
And ΔABC and ΔPQR are the congruent triangles so the length of AB will be 15

Sol.336.(a)

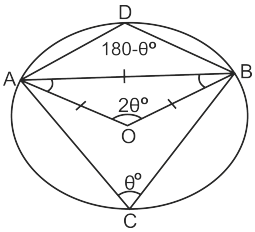


Length of PB = $\frac{10}{2}$ = 5 cm

length of radius of inner circle

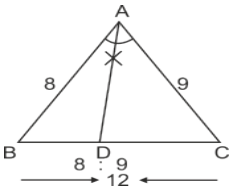
= $\sqrt{6^2 - 5^2}$ = $\sqrt{11}$ cm

Sol.337.(b)



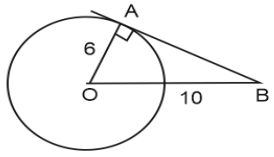
Here ΔAOB forms an equilateral triangle
Therefore, 2θ = 60°
and $\angle C$ = θ = 30°
$\angle D$ = 180 - θ = 150°
Required difference = $\angle D$ - $\angle C$
= 150° - 30° = 120°

Sol.338.(a)



Angle bisector theorem :- an angle bisector of an angle of a triangle divides the opposite side in two segments that are proportional to the other two sides of the triangle.
Length of shorter segment (BD) =
12 × $\frac{8}{(8+9)}$ = $\frac{96}{17}$ = 5$\frac{11}{17}$ cm

Sol.339.(d)



Angle between tangents and radius is always 90° .
Pythagorean triplet :- (6 , 8 , 10)
So , the length of AB = 8 cm

Sol.340.(c)
Sum of all angles of a triangle = 180°
Only one options (c) is possible i.e. 60° , 40° and 80°

Sol.341.(c) $\Delta MNO \sim \Delta XYZ$

So , $\frac{ar.\Delta MNO}{ar.\Delta XYZ} = \frac{(9)^2}{(4)^2}$

$\frac{243}{ar.\Delta XYZ} = \frac{81}{16} \Rightarrow ar.\ \Delta XYZ$ = 48 cm^2

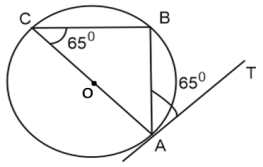
Sol.342.(a)

Length of the arc = $\frac{\theta}{360°}$ × 2πr

= $\frac{90°}{360°}$ × 2 × $\frac{22}{7}$ × 14

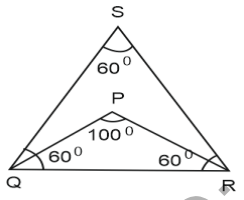
= $\frac{1}{4}$ × 2 × $\frac{22}{7}$ × 14 = 22 cm

Sol.343.(a)



Alternate segment theorem :-
In any circle, the angle between a chord and a tangent through one of the end points of the chord is equal to the angle made by the same chord in the alternate segment.

Sol.344.(d)



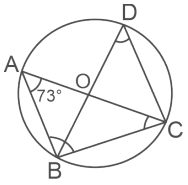
QS = SR
So , ∠PQR = ∠PRQ = 40°
PQ = PR
So , ∠SQR = ∠SRQ = 60°
Now , ∠SRP = 60° – 40° = 20°

Sol.345.(a) Condition to form triangle :-
$(a - b) < c < (a + b)$
Only one option is satisfying the condition i.e.
8 , 6 , 9 ⇒ $(8 - 6) < 9 < (8 + 6)$
⇒ $(2) < 9 < (14)$

Sol.346.(c)
Using exterior angle property :-
2x° + 4x + 15° = 9x – 15°
3x = 30° ⇒ x = 10°

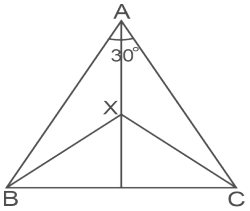
Sol.347.(a)
∠P = ∠F = 52° , ∠Q = ∠E = 74° and
∠R = ∠D = 54°
So , $\Delta PQR \sim \Delta FED$

Sol.348.(b)



Angles made by the same arc , anywhere at the circumference are equal .
∠BAC = ∠BDC = 73°
In ΔABC ,
∠BAC + ∠ACB + ∠ABC = 180°
∠ACB + ∠ABC = 180° – 73° = 107°

Sol.349.(c)



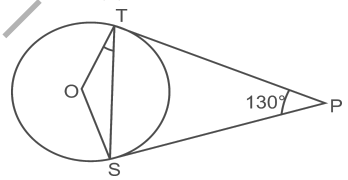
We know that :-
∠BXC = 90° + $\frac{\angle BAC}{2}$ = 90° + 15° = 105°

Sol.350.(c) $\frac{ar.\Delta RMN}{ar.\Delta RST} = (\frac{1}{(1+3)})^2 = \frac{1}{16}$

Now , $\frac{ar.\Delta RMN}{ar.\square MNST} = \frac{1}{(16-1)} = \frac{1}{15}$

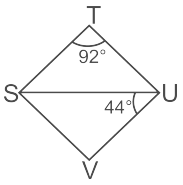
Sol.351.(b) Angle = 30° : 60° : 90°
Side = 1 : $\sqrt{3}$: 2
Here , $\sqrt{3}$ units = 6 cm
So , length of tangents (1 unit) = 2$\sqrt{3}$

Sol.352.(c)



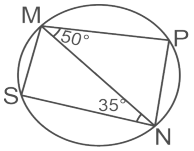
∠TOS + ∠TPS = 180°
⇒ $\angle TOS$ = 180° - 130°
⇒ $\angle TOS$ = 50°
Now, In ΔOTS , OT = OS (radius)
∠OTS + ∠TSO + ∠TOS = 180°
⇒ $\angle OTS$ + $\angle TSO$ = 180° - 50°
⇒ $\angle OTS$ + $\angle TSO$ = 130°
[$\angle OTS$ = $\angle TSO$]
⇒ $\angle OTS$ = $\frac{130°}{2}$ = 65°

Sol.353.(d)



∠STU = ∠SVU = 92° .....(opposite angle)
∠SUV = ∠TSU = 44° ....(alternate angle)
So , 4∠SVU – 3∠TSU = 368° – 132° = 236°

Sol.354.(d)



$\angle SMN$ = 180° – (90° + 35°) = 55°
$\angle MNP$ = 180° – (90° + 50°) = 40°
Now , $\angle PMS - \angle PNS$
= (55° + 50°) – (40° + 35°) = 30°

Sol.355.(c)
$\frac{perimeter\ of\ \Delta ABC}{perimeter\ of\ \Delta PQR} = \frac{AB}{PQ}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Perimeter of $\Delta PQR = 45 \times \frac{18}{12}$

$= \frac{135}{2} = 67.5$ cm

Sol.356.(a) $\frac{ar.\Delta ABC}{ar.\Delta DEF} = \frac{(AB)^2}{(DE)^2}$

$\frac{ar.\Delta ABC}{ar.\Delta DEF} = \frac{(\sqrt{3})^2}{(\sqrt{5})^2} \Rightarrow \frac{90}{ar.\Delta DEF} = \frac{3}{5}$

$ar.\Delta DEF = 150\ cm^2$

Sol.357.(a)

Length of arc $= \frac{22.5}{360} \times 2 \times \frac{22}{7} \times 21$

$= \frac{22 \times 21}{8 \times 7} = 8.25$ cm

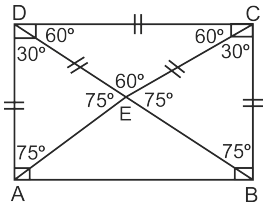
Sol.358.(d) Required obtuse angle
$= 180° - (2 \times 28.5°) = 123°$

Sol.359.(c) $\Delta ABC \sim \Delta PQR$
$\angle B = \angle Q$, $\angle C = \angle R$
Thus , $\angle A = \angle P$
But triangles are not congruent because Sides are not equal.

Sol.360.(a) P + Q + R = 180° ....(sum of all angle of triangle)
Here , 2R − P = Q − R
3R = P + Q
3R = 180° − R ⇒ 4R = 180° ⇒ R = 45°

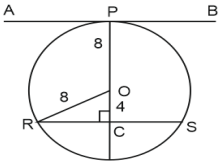
Sol.361.(a) Longest chord of the circle is its diameter .
So length of longest chord = 2 × 8 = 16 cm

Sol.362.(b)



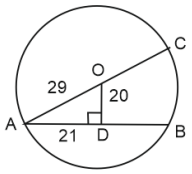
ΔDEC is equilateral so all angles are equal to 60°.
All angles of the square are equal to 90° .
So ,
$\angle ADE = \angle BCE = 30°$
In ΔADE, AD = DE
So , $\angle DAE = \angle DEA = 75°$
In ΔCEB, CE = CB
So , $\angle CEB = \angle CBE = 75°$
Now ,
$\angle DEC + \angle CEB + \angle AEB + \angle EAD = 360°$
$\angle AEB = 360° - (60° + 75° + 75°)$
$\angle AEB = 150°$

Sol.363.(d)



Length of PC = 12 cm ...(given)
PO = OR = OQ = radius = 8 cm
So , OC = 12 − 8 = 4 cm
Now , in ΔRCO
RC = $\sqrt{(8)^2 - (4)^2} = 4\sqrt{3}$ cm
RS = 2RC = $8\sqrt{3}$ cm

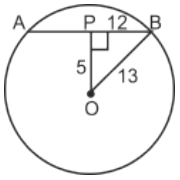
Sol.364.(a)



Perpendicular from the centre of the circle to the chord bisect the chord.
Pythagorean triplets :- (20,21,29)
So , length of chord = 2 × 21 = 42 cm

Sol.365.(a)
RT × TS = PT × TQ
8 × 8 = PT × 4 ⇒ PT = 16
Diameter = PT + TQ = 16 + 4 = 20 cm

Sol.366.(b)



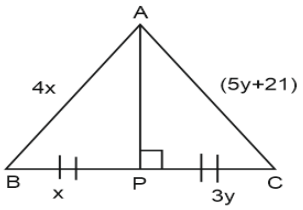
Pythagorean triplets :- (5, 12, 13)
So , radius = 13 cm

Sol.367.(d)
Pythagorean triplets :- (20, 21, 29)
So , perimeter of triangle = 20 + 21 + 29
= 70 cm

Sol.368.(c) $\angle A + \angle B + \angle C = 180°$
$(5x - 60°) + (2x + 40°) + (3x - 80°) = 180°$
$(10x) = 280° \Rightarrow x = 28°$
Now , $\angle A = (5x - 60°) = 140° - 60° = 80°$

Sol.369.(c) Exterior angle = sum of two opposite interior angle of triangle
= 35° + 65° = 100°

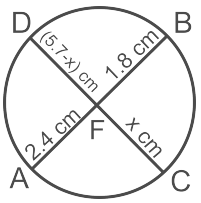
Sol.370.(c)



Using angle bisector theorem :-
$\frac{4x}{5y+21} = \frac{x}{3y}$
$12y = 5y + 21 \Rightarrow y = 3$
Median and altitude of an isosceles triangle is same.
So , BP = PC $\Rightarrow x = 3y = 9$
Now , (x + y) = 9 + 3 =12

Sol.371.(c)
Largest chord of the circle is diameter .

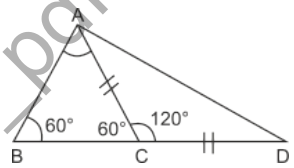
Sol.372.(b)



AF × BF = CF × DF
$2.4 \times 1.8 = x \times (5.7 - x)$
$4.8 \times 0.9 = x \times (5.7 - x)$
$0.9 \times (5.7 - 0.9) = x \times (5.7 - x)$
Longest of two line segments = 4.8 cm

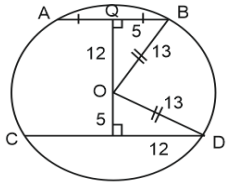
Sol.373.(d)
Pythagorean triplets : - (5, 12, 13)
$\Delta ABC \cong \Delta PQR$
So , $\angle A = \angle P = 90°$
and BC = QR = 13 cm
AC = PR = 12 cm
Then AB = PQ = 5 cm

Sol.374.(a)



$\angle ACB + \angle ACD = 180°$ ....(linear pair)
$\Rightarrow \angle ACD = 120°$
$\angle CAD = \angle ADC$ .....(AC = CD)
In ΔACD ,
$\angle CAD + \angle ADC + \angle ACD = 180°$
$2 \times \angle CAD = 60 \Rightarrow \angle CAD = 30°$

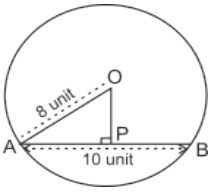
Sol.375.(c)
Pythagorean triplets :- (5, 12, 13)



Distance between the chords
= 12 + 5 = 17 cm

Sol.376.(b) PQ = $(4x) \times 6$ = 24 cm
Using mid-point theorem :-
BC = 2PQ = 48 cm

Sol.377.(a)



Required distance = $\sqrt{(8)^2 - (5)^2}$
$= \sqrt{64 - 25} = \sqrt{39}$

Sol.378.(b) $84° = (\frac{22 \times 84}{7 \times 180})^c$

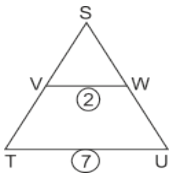
Now , θ(in radian) = $\frac{l}{r}$

$r = \frac{22 \times 7 \times 180}{22 \times 84} = \frac{180}{12} = 15$ cm

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.379.(c)

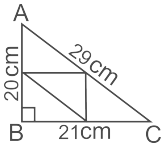


$\frac{ar.\Delta SVW}{ar.\Delta STU} = \frac{(VW)^2}{(TU)^2} = \frac{4}{49}$

So , $ar.\ \square VWUT$ = 49 − 4 = 45

Required ratio :- 45 : 49

Sol.380.(b)



Required area = $\frac{1}{4} \times (\frac{1}{2} \times 20 \times 21)$

$= \frac{210}{4} = 52\frac{1}{2}\ cm^2$

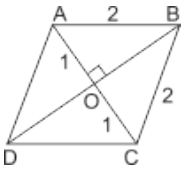
Sol.381.(a)

Given triangles are similar , so

∠A = ∠P , ∠B = ∠Q and ∠C = ∠R

∠C = ∠R = 180° − (35° + 65°) = 80°

Sol.382.(d) Let side of rhombus = 2 units



In ΔAOB ,

OB = $\sqrt{(2)^2 - (1)^2} = \sqrt{3}$

Diagonal (DB) = 2 × OB = $2\sqrt{3}$

Required ratio : - AC : DB = 2 : $2\sqrt{3}$

= 1 : $\sqrt{3}$

Sol.383.(c) $8\angle A : 6\angle B : 3\angle C$

$\angle A : \angle B : \angle C$ = 3 : 4 : 8

15 units = 180° ⇒ 1 unit = 12°

$\angle A$ = 36° , $\angle B$ = 48° and $\angle C$ = 96°

Sol.384.(d)

Given triangles are similar , so

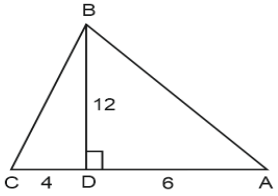
∠L = ∠P , ∠M = ∠Q and ∠N = ∠R

∠M = ∠Q = 180° − (40° + 80°) = 60°

$\frac{LM}{LN} = \frac{PQ}{PR} \Rightarrow \frac{6}{8} = \frac{7.5}{PR}$

PR = $\frac{8 \times 7.5}{6}$ = 10 cm

Sol.385.(c)



Area of $\Delta ABC = \frac{1}{2} \times (4 + 6) \times 12 = 60\ cm^2$

Sol.386.(c) $\Delta PQR \cong \Delta MNY$, So

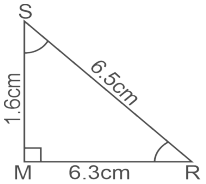
∠P = ∠M = 72° , ∠Q = ∠N = 55° and

∠R = ∠Y = 180° − (72° + 55°) = 53°

PQ = MN = 8 cm

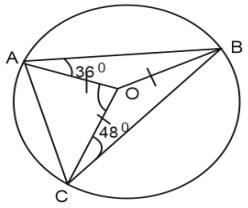
Sol.387.(c)

Pythagorean triplets : (16 , 63 , 65)



Hypotenuse = 6.5 cm

Sol.388.(d)



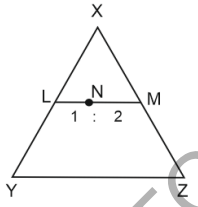
As per figure,

∠BAO = ∠ABO and ∠BCO = ∠OBC

Then , ∠ABC = 36 + 48 = 84°

Therefore, ∠AOC = 2∠ABC = 168°

Sol.389.(a)

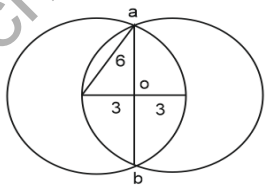


LN (1 unit) = 5 cm

Then (LM) 3 units = 5 × 3 = 15 cm

Value of YZ = 15 × 2 = 30 cm

Sol.390.(b)

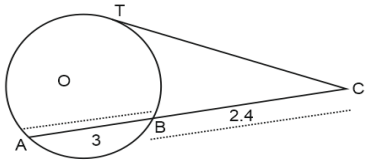


Length of ao = $\sqrt{6^2 - 3^2} = 3\sqrt{3}$

So the length of ab (chord) = 2 × $3\sqrt{3}$

= $6\sqrt{3}$ cm

Sol.391.(b)



TC^2 = CB × AB

TC^2 = 2.4 × (5.4) = 12.96

$TC = \sqrt{12.96}$ = 3.6 cm

Sol.392.(b) According to the question,

$\frac{area\ of\ \Delta\ TUV}{area\ of\ \Delta\ PQR} = \frac{(TU)^2}{(PQ)^2}$

$\frac{18}{32} = \frac{6 \times 6}{(PQ)^2} \Rightarrow (PQ)^2 = 64$

PQ = 8 cm

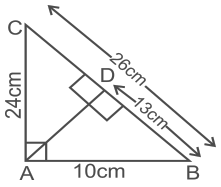
Sol.393.(d)

Inradius of equilateral Δ = $\frac{side}{2\sqrt{3}}$

circumradius of equilateral Δ = $\frac{side}{\sqrt{3}}$

Required ratio = 1 : 2

Sol.394.(a)



ΔCAB and ΔADB is similar

$\frac{26}{10} = \frac{24}{AD} \Rightarrow$ AD = $\frac{240}{26}$ = 9.23

Sol.395.(c) As per figure ,

∠ADC = 180 − (∠DCA + ∠DAC)

= 180 − (50 + 30) = 100°

now, ∠ADB = 180 − ∠ADC = 80°

Sol.396.(c) We know that

LY × LX = LQ × LP

4 × (4 + x) = 6 × 16 ⇒ x = 20

Sol.397.(a)

As we know, area of arc = $\frac{1}{2} \times l \times r$

According to the question,

$\frac{132}{360} \times \pi \times r^2 = \frac{1}{2} \times 33\ \pi \times r$

Radius $(r) = \frac{90}{2}$ = 45 cm

Sol.398.(b)

(x - 15)° , (x + 45)° and (x + 60)°

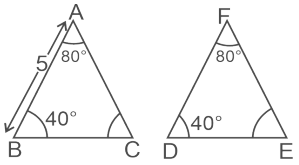
(x - 15)° + (x + 45)° + (x + 60)° = 180°

3x + 90° = 180° ⇒ x = 30°

So, angles = 15° , 75° and 90°

Hence the triangle is a right angle triangle.

Sol.399.(d)



According to the question,

DF = 5 cm and

$\angle E$ = 180° − (40 + 80) = 60°

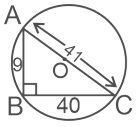
Sol.400.(c) According to the question,

2y + 40° + 5y − 60° + 3y − 80° = 180°

10y = 180° + 100° = 280°

y = 28°

Sol.401.(a)



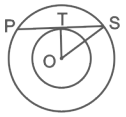
Search on TG: @apna_pdf

Search on Telegram @apna_pdf

As we know that (9, 40, 41) be the triplets
So, circum - radius of the triangle
$= \frac{hypotenuse}{2} = \frac{41}{2} = 20\frac{1}{2}$ cm

Sol.402.(d)
ΔXYZ and ΔPQR are similar triangle
So, $\frac{perimeter\ of\ \Delta XYZ}{perimeter\ of\ \Delta PQR} = \frac{XY}{PQ}$
$\frac{62}{42} = \frac{XY}{21} \Rightarrow XY = 31$cm

Sol.403.(b)



Angle b/w tangent and radius is always 90° , and a perpendicular line from the centre to chord , bisect the chord .
In ΔOTS ,
$OS^2 = OT^2 + TS^2 \Rightarrow TS^2 = 100 - 36 = 64$
TS = 8 cm and PS = 2 × TS = 16 cm

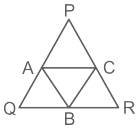
Sol.404.(c) A line which intersects a circle at two distinct points is chord.
While tangent touches a circle only at one point.

Sol.405.(c) According to the question,
△XYZ ≅ △LMR
∴ XY = LM , YZ = MR and XZ = LR
2m + 1 = 5 ⇒ m = 2
2P + 2 = 8 ⇒ P = 3
$2x - 1 = 7 \Rightarrow x = 4$
Hence , m + x + p = 2 + 3 + 4 = 9

Sol.406.(c)
Let the length of third side of triangle = x
The 3rd side of the triangle is always greater than the difference of the other two sides
and less than the sum of the other two sides.
Then , (42 - 30) < x < (42 + 30) = 12 < x < 72

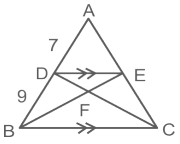
Sol.407.(a) By checking the option,
Radius is the longest chord of a circle (wrong)
Diameter is the longest chord of a circle .

Sol.408.(d) **Theorem :** Area of the Triangle formed by Joining the Middle Points of the Sides of a Triangle is Equal to One-fourth Area of the given Triangle.



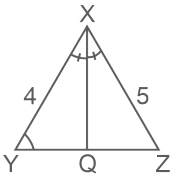
According to question,
Required area $\Delta ABC = \frac{32}{4} = 8\ cm^2$

Sol.409.(c)



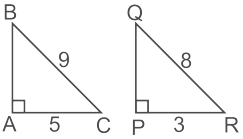
By using thales theorem ,
$\frac{AD}{AB} = \frac{DE}{BC} \Rightarrow \frac{DE}{BC} = \frac{7}{16}$
So, $ar.(\Delta DEF) : ar.(\Delta CBF)$
$= 7^2 : 16^2 = 49 : 256$

Sol.410.(d)



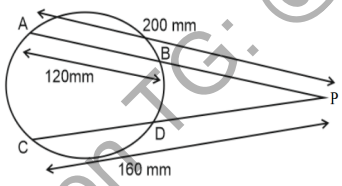
The angle bisector of a triangle proportional to the other two sides of the triangle.
$\frac{XY}{XZ} = \frac{YQ}{QZ} \Rightarrow \frac{YQ}{QZ} = \frac{4}{5}$

Sol.411.(b)



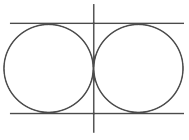
Here, in ΔABC and ΔPQR ,
∠A = ∠P = 90°
BC ≠ QR
AC ≠ PR
So, ΔABC ≢ ΔPQR

Sol.412.(c)



Chord AB and Chord CD , when produced meet at point P outside the circle.
PB = PA - AB = 200 - 120 = 80 mm
By using secant theorem , we get
PB × PA = PD × PC ⇒ 80 × 200 = PD × 160
PD = $\frac{80 \times 200}{160}$ = 100 mm
Now, CD = CP − PD = 160 − 100 = 60 mm

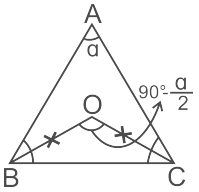
Sol.413.(c)



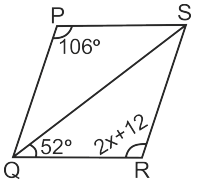
When two circles touch each other externally , then maximum 3 common tangents can be drawn.

Sol.414.(a) ΔABC ~ ΔPQR
Then ,
$\frac{AB}{PQ} = \frac{BC}{QR} = \frac{CA}{RP}$
$\frac{4}{6} = \frac{BC}{9}$ ⇒ BC = 6
Again , $\frac{4}{6} = \frac{CA}{12}$ ⇒ CA = 8
Now , perimeter of ΔABC = AB + BC + CA
= 4 + 6 + 8 = 18 cm

Sol.415.(b) Clearly, The angle formed by any side at the incentre is always 90° more than the angle at the opposite vertex is **False** statement.

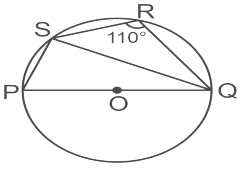


Sol.416.(b)



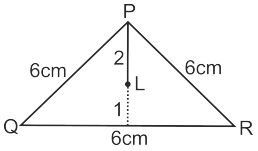
In the given figure, ΔQPS ≅ ΔSRQ
So, ∠P = ∠R ⇒ 106°
Now, in $\Delta\ QRS$
∠SQR + ∠R + ∠RSQ = 180°
52° + 106° + ∠RSQ = 180°
∠RSQ = 22°
Now, ∠RQS = ∠PSQ = 52° {alternate angle}
Hence, ∠PSR = ∠PSQ + ∠RSQ = 52° + 22° = 74°

Sol.417.(c)



According to the figure,
∠SRQ + ∠SPQ =180° {cyclic quadrilateral}
So, 110° + ∠SPQ = 180° ⇒ ∠SPQ = 70°
Now, ∠PSQ = 90°
In ΔPSQ
∠PQS = 180° − (90 + 70)° = 20°

Sol.418.(a)



PL = $\frac{side}{\sqrt{3}} = \frac{6}{\sqrt{3}} = 2\sqrt{3}$ cm

Sol.419.(c) According to question,
$\left(\frac{BC}{DE}\right)^2 = \frac{ar.(\Delta ABC)}{ar.(\Delta ADE)}$
$\frac{64}{36} = \frac{ar.(\Delta ABC)}{90}$
Area of ΔABC = $\frac{90 \times 64}{36}$ = 160 cm^2

Sol.420.(d) Length of an arc
$= \frac{angle\ of\ arc\ at\ centre}{360°} \times \pi \times$ diameter

Sol.421.(d)
Length of common transverse tangent
$= \sqrt{d^2 - (r_1 + r_2)^2}$

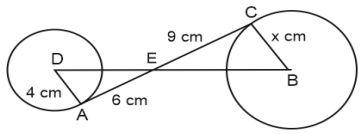
Sol.422.(b) Three sides of two triangles

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

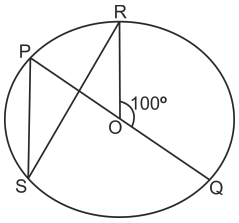
are 4 , 5 and 6 cm respectively.
So, The area of these triangles will always be same .
Hence , Option 'b' is incorrect .

Sol.423.(a)



$\Delta DAE \approx \Delta BCE$
∠DAE = ∠ BCE = 90°
∠DEA = ∠ BEC = vertically opposite angle
So , $\frac{DA}{BC} = \frac{AE}{CE} \Rightarrow \frac{4}{x} = \frac{6}{9} \Rightarrow x = 6$ cm

Sol.424.(c)



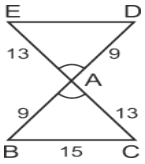
∠POR + ∠QOR = 180°
∠POR = 180° − 100° = 80°
Now ,
Angle subtended by the arc at the circumference of the circle is half of the angle
subtended by the same arc at the centre.
∠POR = 2 × ∠PSR
∠PSR = 40°

Sol.425.(d)
Pythagoras triplets :- (12, 16, 20)
Using hit and trial method ,
AC = 12 cm , BC = 16 cm and AB = 20 cm
Inradius = $\frac{16+12-20}{2}$ = 4 cm ....(satisfy)

Sol.426.(a) For the obtuse angle ,
$a^2 + b^2 < c^2$
So, by the option 'a'
$(15)^2 + (62)^2 < (64)^2$
225 + 3844 < 4096
4069 < 4096 {satisfy}

Sol.427.(d) According to question,
$x + y + (y + 10) = 180°$
$x + 2y = 170°$ .....(1)
$2x - 4y = 20° \Rightarrow x - 2y = 10°$ .....(2)
By solving both equations, we get
$x = \frac{170° + 10°}{2} = 90°$
So, triangle ABC is a right angled triangle.

Sol.428.(d)

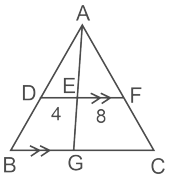


In △EAD and △CAB
AE = AC (given) , AD = AB (given)
∠EAD = ∠CAB (vertical opposite angles are equal)
△EAD ≅△CAB (By SAS rule)
ED = BC = 15 cm

Sol.429.(d) As we know , Sum of the three altitudes of a triangle is always less than the sum of its side.
AL + BM + CN < AB + BC + CA.

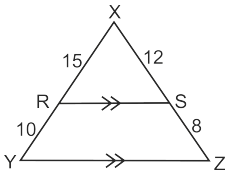
Sol.430.(c) The sum of two sides is always greater than the third side.

Sol.431.(d)



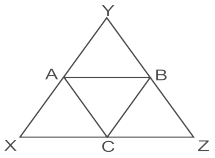
As D and F are the mid- points of side AB and AC respectively .
So using midpoint theorem ,
DF ∥ BC and BC = 2 × DF
BC = 2 × (8 + 4) = 24 cm

Sol.432.(c)



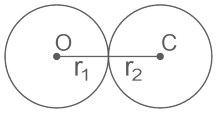
$\frac{XR}{XY} = \frac{XS}{XZ} \Rightarrow \frac{15}{25} = \frac{12}{20} \Rightarrow \frac{3}{5} = \frac{3}{5}$
So , RS ∥ YZ and $\Delta XRS \sim \Delta XYZ$
Using thales theorem ,
$\frac{XR}{XY} = \frac{RS}{YZ} = \frac{15}{25}$
$\frac{RS}{YZ} = \frac{3}{5} \Rightarrow RS = \frac{3}{5} \times YZ$

Sol.433.(a) A triangle made by joining midpoints of the original triangle divides the area into four equal parts.
According to question,



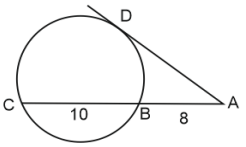
Area of ΔABC = $\frac{Area\ of\ \Delta XYZ}{4}$
= $\frac{8464}{4}$ = 2116 cm^2

Sol.434.(b)



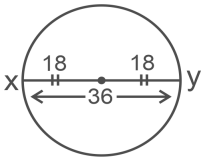
When two circles touches each other externally , Then
Distance between their centre is equal to the sum of their radii .
OC = $r_1 + r_2$

Sol.435.(d)



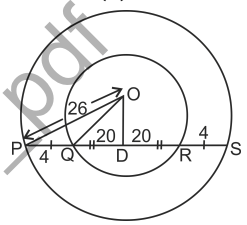
Tangent - secant theorem :-
$(AD)^2$ = AB × AC
AD = $\sqrt{8 \times 18}$ = 12 cm.

Sol.436.(b) Only the diameter of a circle can substends 180° with the centre of the circle .



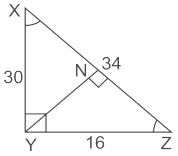
Radius of the circle = $\frac{36}{2}$ = 18cm

Sol.437.(b)



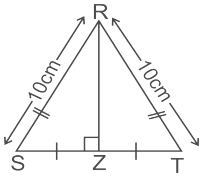
In the △POD
OD = $\sqrt{(26)^2 - (24)^2}$ = 10
Now, in △QOD = OQ = $\sqrt{(20)^2 + (10)^2}$
= $\sqrt{500}$ = $10\sqrt{5}$ cm
Therefore, x = $10\sqrt{5}$ cm

Sol.438.(d) Triplets :- (8 , 15 , 17) × 2 = (16 , 30 , 34) are used.



Length of YN = $\frac{Perpendicular \times Base}{Hypotenuse}$
YN = $\frac{30 \times 16}{34} = \frac{240}{17}$

Sol.439.(b)



Given triangle is an isosceles triangle , as In an isosceles triangle,
Both the median and altitude are the same. So , RS = RT = 10 cm

Sol.440.(b) According to the question,
L = 24 + B ⇒ B = L - 24
Perimeter of the sheet ⇒ 2(L + B) = 128
⇒ 2(L + L - 24) = 128 ⇒ L = 44 cm

Sol.441.(c)
Semiperimeter of the triangle (s)

Search on TG : @apna_pdf

Search on Telegram @apna_pdf

$= \frac{12+9+9}{2}$ = 15cm

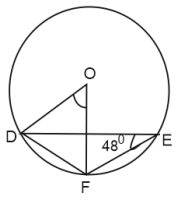
Circumradius of the triangle

$= \frac{abc}{4 \times area\ of\ triangle}$

$= \frac{12 \times 9 \times 9}{4\sqrt{15(15-12)(15-9)(15-9)}}$

$= \frac{3\times9\times9}{\sqrt{15(3)(6)(6)}} = \frac{27}{2\sqrt{5}} = \frac{27\sqrt{5}}{2\sqrt{5}\times\sqrt{5}} = \frac{27\sqrt{5}}{10}$

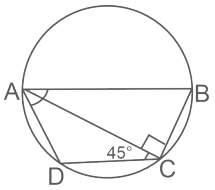
Sol.442.(b)



Angle made by arc at the the center is twice to the angle made by same arc at circumference

Therefore, ∠DOF = 2∠DEF = 96°

Sol.443.(b)



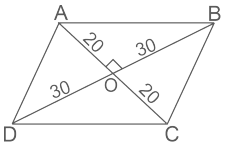
In cyclic quadrilateral ABCD

∠DCB = ∠DCA + ∠ACB = 135°

And ∠DAB + ∠DCB = 180°

Therefore, ∠DAB = (180 - 135) = 45°

Sol.444.(c)



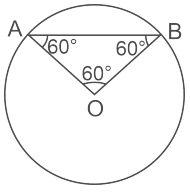
Length of the diagonal is 40cm and 60cm

Then, in ΔAOB

AB = $\sqrt{(20)^2 + (30)^2} = \sqrt{1300} = 10\sqrt{13}$ cm

So, the side of rhombus = $10\sqrt{13}$ cm

Sol.445.(b)

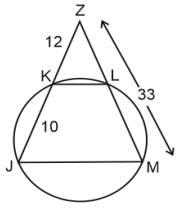


Let , AB is a chord which is equal to the radius AO and BO .

Thus , ΔAOB is a equilateral triangle ,

So $\angle AOB$ = 60°

Sol.446.(b)

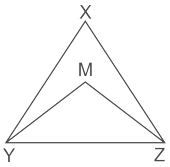


Using secant theorem :-

ZK × ZJ = ZL × ZM

12 × 22 = ZL × 33 ⇒ ZL = 8 cm.

Sol.447.(a)



Let ∠X = a, ∠M = b

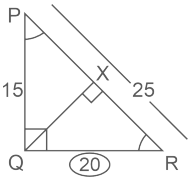
a + b = 150° ⇒ b = 150° - a

Incenter = 90° + $\frac{\angle a}{2}$

150°– a = 90° + $\frac{a}{2}$

60° = a + $\frac{a}{2}$ ⇒ 3a = 120° ⇒ a = 40°

Sol.448.(d)



Using pythagoras theorem ,

QR = $\sqrt{(25)^2 - (15)^2}$

QR = 20 cm.

In a right angle triangle ,

PQ^2 = PX × PR .....e.q .(1)

QR^2 = RX × PR .....e.q .(2)

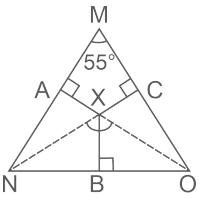
On dividing e.q .(1) and e.q .(2) , we get

$\frac{PQ^2}{QR^2} = \frac{PX}{RX} \Rightarrow \frac{PX}{RX} = \frac{9}{16}$

Sol.449.(b) $\frac{Perimeter\ of\ \Delta PQR}{Perimeter\ of\ \Delta UVW} = \frac{PQ}{UV}$

$\frac{120}{240} = \frac{30}{UV}$ ⇒ UV = 60cm

Sol.450.(b)



All perpendicular bisectors of a triangle concur at one point called circumcenter as a center of its circumscribing circle.

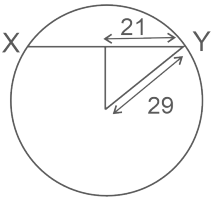
So the $\angle NXO$ = 2 × $\angle NMO$

$\angle NXO$ = 2 × 55° =110°

Sol.451.(b)

Circumference of a circle = 2πr

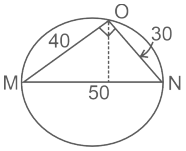
⇒ 58π = 2πr ⇒ r = 29



Triplet = (20, 21, 29)

distance of this chord XY from the centre = 20 cm

Sol.452.(b) Triplets :- (30 , 40 , 50)

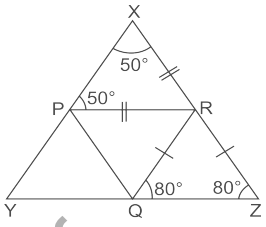


Circumradius of right angle triangle

$= \frac{hypotenuse}{2}$ = 25 cm

Circumference of the circle (2πr) = 50π cm

Sol.453.(a)



In ΔXPR , XR = PR

So , $\angle XPR = \angle RXP$ = 50°

Then ∠ XRP = 80°

In ΔRQZ , QR = ZR

So , $\angle RQZ = \angle RZQ$ = 80°

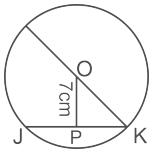
Then ∠ QRZ = 20°

Now,

$\angle XRP + \angle PRQ + \angle QRZ$ = 180°

$\angle PRQ$ = 180° – (80° + 20°) = 80°

Sol.454.(c)



Diameter = 50 cm ,

Radius (OK) = $\frac{50}{2}$ = 25cm

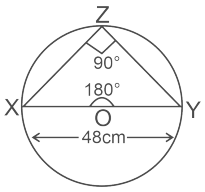
Using pythagoras theorem;

PK = $\sqrt{(OK)^2 - (OP)^2} = \sqrt{(25)^2 - (7)^2}$

PK = 24 cm

So, Length of chord = 24 × 2 = 48 cm

Sol.455.(d)



According to the questions ,

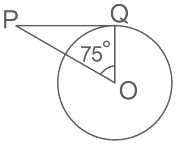
x° + 2x° = 270°

x° = 90° .....diameter of the circle makes right angle with the circumference .

Now, the chord is nothing else but the diameter of the circle.

Length of diameter = 24 × 2 = 48 cm

Sol.456.(a)



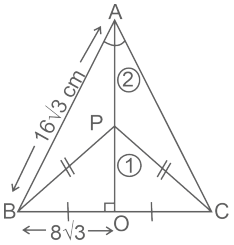
Search on Tg: @apna_pdf

Search on Telegram @apna_pdf

Tangent theorem :- The tangent always touches the circle at a point. It is perpendicular (90°) to the radius of the circle at the point of tangent.
∠OPQ = 180°– (∠PQO + ∠POQ)
∠OPQ = 180° – (90° + 75°) ⇒ ∠OPQ = 15°

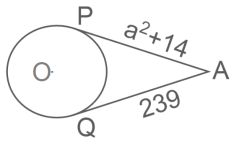
Sol.457.(c) Semi perimeter of the triangle (s) = $\frac{9+6+5}{2}$ = 10 cm
circumradius of the scalene triangle
= $\frac{abc}{4\Delta}$ = $\frac{270}{4\times\sqrt{10(1)(4)(5)}}$
= $\frac{270\times\sqrt{2}}{4\times5\times2\sqrt{2}\times\sqrt{2}}$ = $\frac{27\sqrt{2}}{8}$ cm

Sol.458.(a)



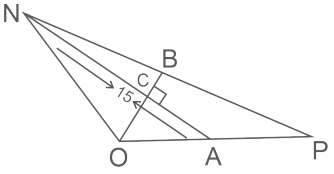
Using pythagoras theorem in ΔAOB;
AO = $\sqrt{AB^2-OB^2}$ = $\sqrt{(16\sqrt{3})^2-(8\sqrt{3})^2}$
= 24 cm
Centroid divides the median in 2 : 1
So , Length of PO = 24 × $\frac{1}{3}$ = 8 cm.

Sol.459.(c)



Tangents on the circle by the point outside the circle is always be same
Therefore, AP = AQ ⇒ a² + 14 = 239
a² = 225 ⇒ a = 15

Sol.460.(a)

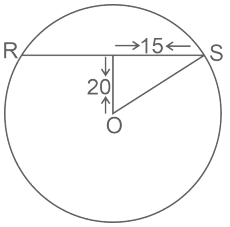


Centroid divide the median 2 : 1 so the value of CA = 5 cm
And the value of OC = 10 cm
ΔOCA, is a right angle triangle so,
$5^2 + 10^2 = OA^2$ ⇒ OA = 5√5 cm

Sol.461.(c) Length of the arc = $\frac{60°}{360°}$ × 2πr
= $\frac{1}{3}$ × $\frac{22}{7}$ × 7 = $\frac{22}{3}$ units.

Sol.462.(d) Ratio of angle = 20 : 11 : 5
$20x + 11x + 5x = 180° \Rightarrow x = 5$
Largest angle of $\Delta XYZ = 20x = 20 \times 5 = 100°$

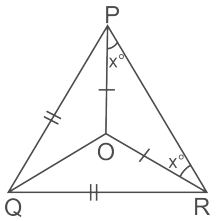
Sol.463.(d)



Triplet = (15,20,25)
So the value of radius(OS) = 25cm
Diameter of the circle = radius × 2
= 25 × 2 = 50 cm

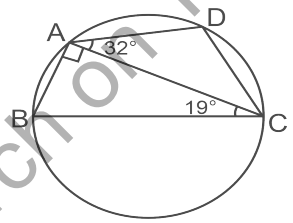
Sol.464.(b) Rules for formation of triangle = sum of any two sides must be greater than the third side.
Here, AB + BC = AC
So , no triangle can be formed . and
Thus no circle will be passed from the given points A , B and C.

Sol.465.(b)



PQ = QR
Clearly , ΔPOR is an isosceles triangle.
PQ = QR , PO = RO and OQ common side.
Clearly , ΔPQO is congruent to ΔRQO.

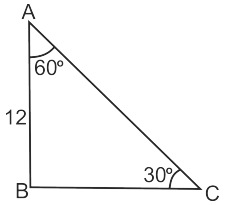
Sol.466.(d)



Angle made by the diameter at the circumference of the circle is equal to 90°.
So , ∠BAC = 90°
Now ,
Sum of the opposite angle of the cyclic quadrilateral is 180°.
∠BAD + ∠BCD = 180°
$(90° + 32°) + 19° + \angle ACD = 180°$
∠ACD = 39°

Sol.467.(c)
Number of diagonals = $\frac{n(n-3)}{2}$
External angle = $\frac{360°}{n}$
18° = $\frac{360°}{n}$ ⇒ n = 20
Number of diagonals = $\frac{20\times17}{2}$ = 170

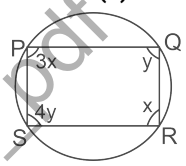
Sol.468.(d)



Angle → 30° : 60° : 90°
Side → 1 : √3 : 2
According to the questions ,
1 unit = 12 cm
√3 units = 12√3 cm

Sol.469.(b)
Sum of interior angles = $(n-2)\times180°$
2700° = $(n-2)\times180° \Rightarrow n = 17$
Number of diagonals = $\frac{n(n-3)}{2}$
= $\frac{17\times14}{2}$ = 119.

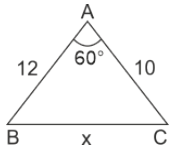
Sol.470.(d)



Sum of Opposite Angles of cyclic Quadrilateral = 180°
$\angle P + \angle R = 180°$
$\Rightarrow 3x + x = 180° \Rightarrow x = 45°$
Similarly , $y = 36°$
$\angle S + \angle R$ = 144° + 45° = 189°

Sol.471.(d)
Circumference of circle1 = 198
$2\pi r_1 = 198$
r_1 = $\frac{63}{2}$ = 31.5 cm
Circumference of circle 2 = 352
$\Rightarrow 2\pi r_2 = 352 \Rightarrow r_2 = \frac{112}{2}$ = 56 cm
Now. r_2 - r_1 = 56 - 31.5 = 24.5 cm

Sol.472.(d)



Cos A = $\frac{AB^2+AC^2-BC^2}{2\times AB\times AC}$
Cos 60° = $\frac{12^2+10^2-x^2}{2\times12\times10} \Rightarrow \frac{1}{2} = \frac{244-x^2}{240}$
$\Rightarrow x^2$ = 244 - 120 = 124 ⇒ x = 11.13 cm

Sol.473.(c) Given that ΔABC and ΔDEF are similar Triangle ,
Then ,
$\frac{AB}{DE} = \frac{BC}{EF} = \frac{CA}{FD} = \frac{\sqrt{ar.\Delta ABC}}{\sqrt{ar.\Delta DEF}}$
According to question ,
$\sqrt{\frac{x^2}{y^2}} = \frac{BC}{a} \Rightarrow$ BC = $\frac{ax}{y}$

Search on TG: @apna_pdf

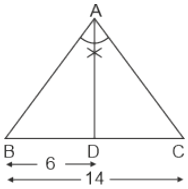
Search on Telegram @apna_pdf

Sol.474.(c) Sum of All angle of triangle is always 180°

$(x - 46)° + (x + 96)° + 8x° = 180°$

10x° = 180° - 50° ⇒ 2x° = 26°

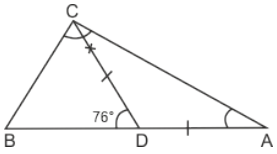
Sol.475.(a)



Using Angle bisector Property :-

$\frac{AB}{AC} = \frac{BD}{DC} \Rightarrow \frac{AB}{AC} = \frac{6}{8} \Rightarrow \frac{AB}{AC} = \frac{3}{4}$

Sol.476.(d) Exterior angle of a triangle is equal to Sum of two opposite interior angles.



In ΔCDA

$\angle DCA = \angle DAC$ .....(DC = DA)

∠DCA + ∠DAC = 76° .....(exterior angle)

x° + x° = 76° ⇒ x° = 38°

Now, $\angle DCA = \angle DCB = 38°$ ..... (CD is angle bisector of ∠C)

Now , In ΔCBD

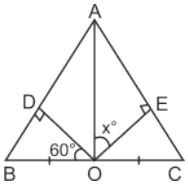
$\angle DCB + \angle CBD + \angle BDC$ = 180°

⇒ 38° + $\angle CBD$ + 76° = 180°⇒ $\angle CBD$ = 66°

Sol.477.(c) ΔABC is isosceles triangle having side AB = Side AC ,

and AO is median then ,

$\angle AOB = \angle AOC$ = 90°



In ΔBDO, ∠DBO = 180° - 90°- 60° = 30°

∠DBO = ∠ECO = 30° (Isosceles triangle)

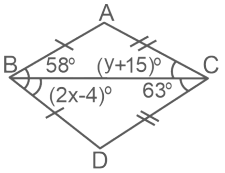
In ΔECO,

∠EOC = 180° - 90°- 30° = 60°

$\angle AOE = \angle AOC$ - ∠EOC .....($\angle AOC$ = 90°)

= 90° - 60° = 30°

Sol.478.(b)



In the given figure ,

$\Delta ABC \cong \Delta DBC$

As AB = BD , AC = CD and BC is common in both triangles .

Then , $\angle ACB = \angle BCD$ ⇒ y +15° = 63°

⇒ y = 48°

And $\angle ABC = \angle CBD$ = (2x-4)°

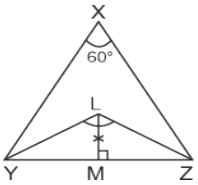
$\angle ABC + \angle CBD$ = 58° .....(given)

(2x- 4)°+ (2x - 4)° = 58° ⇒ x = 16.5°

Now, 2x + 5y = 2 × 16.5° + 5 × 48°

= 33° + 240° = 273°

Sol.479.(a)



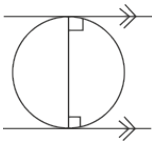
$\angle YLZ = 2 \times \angle YXZ$ .....(circumcenter)

$\angle YLZ = 2 \times 60°$ = 120°

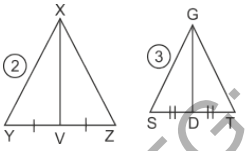
$\triangle YLZ$ is an isosceles triangle in which LM is perpendicular which works as angle bisector, median as well as altitude.

$\angle YLM = \angle MLZ = \frac{1}{2} \times \angle YLZ$ = 60°

Sol.480.(c) Tangents drawn at the end of the diameter of a circle are always parallel to each other.



Sol.481.(a)



If two triangles are similar then the ratio of their corresponding sides are equal.

If , $\Delta XYZ \sim \Delta GST$

Then $\frac{XY}{GS} = \frac{YZ}{ST}$ .....eq .(1)

YV = $\frac{YZ}{2}$ and SD = $\frac{ST}{2}$ .....eq .(2)

Putting the value of eq .(2) in eq .(1) , we get

$\frac{XY}{GS} = \frac{2YV}{2SD} = \frac{2}{3} \Rightarrow (\frac{YV}{SD})^2 = \frac{4}{9}$

Sol.482.(c)

$\angle A - \angle B = 45°$ ....(given)

$\angle B = \angle A - 45°$ ....eq .(1)

$\angle B - \angle C = 15°$ .....(given)

$\angle C = \angle B - 15°$ ....eq .(2)

Putting the value of $\angle B$ in eq .(2)

$\angle C = (\angle A - 45°) - 15°$

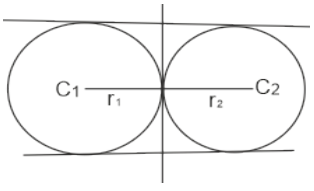
$= \angle A - 60°$ ....eq .(3)

$\angle A + \angle B + \angle C$ = 180° (sum of all angle of triangle)

$\angle A + (\angle A - 45°) + (\angle A - 60°)$ = 180°

$\angle A = 95°$

Sol.483.(c)



$r_1 + r_2 = C_1C_2$ ....(given)

When , sum of radius is equal to distance between their centers , then the circle touches each other externally then no. of Common tangents are three.

Sol.484.(a)

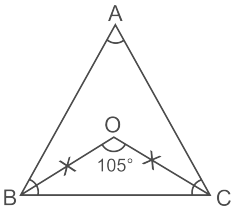
Let , a , b and c be the sides of a triangle

Then :- $(a + b) \succ c \succ (a - b)$

Perimeter of the triangle is equal to 13.

Possible triangle are five having sides (1,6,6) , (2,5,6) , (3,5,5) , (3,4,6) and (4,4,5)

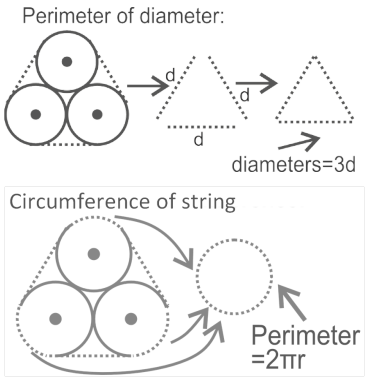
Sol.485.(d)



$\angle BOC = 90° + \frac{\angle BAC}{2}$ ...(angle bisector property) ⇒ $\frac{\angle BAC}{2}$ = 105° - 90°

⇒ $\angle BAC$ = 30°

Sol.486.(a)



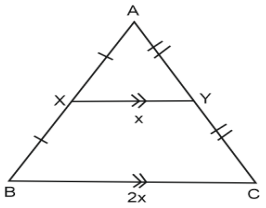
Now, the length of string = 3d + 2πr

Where d = diameter of the circles

The length of string = 3 × 8 + 2π × 4

= 24 + 8π

Sol.487.(d)



Let , the length of BC is '2x' then , the length of XY be 'x' ....(Midpoint theorem)

Now, According to the question ,

BC + XY = 24 cm

⇒ 2x + x = 24 cm ⇒x = 8 cm

⇒ BC = 16 cm and XY = 8 cm

Then , BC - XY = 8 cm

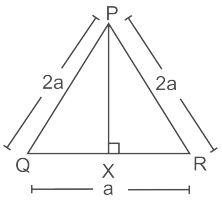
Sol.488.(a)

The number of parallel tangents of a circle with a given tangent is always 1.

Sol.489.(d)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf



In an isosceles triangle , perpendicular drawn on the base from the opposite vertex bisect the base.

QX = XR = $\frac{a}{2}$

In right angle triangle PQX,

PX = $\sqrt{(2a)^2 - (\frac{a}{2})^2} = \sqrt{\frac{15a^2}{4}}$

$= \frac{\sqrt{15}\,a}{2}$

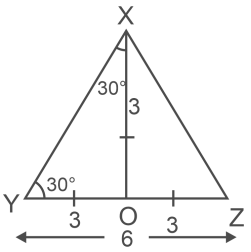
Sol.490.(d) Given, height of the equilateral triangle = 9 $\sqrt{3}\ cm$

⇒ Height = $\frac{\sqrt{3}}{2} \times side$

$\Rightarrow \frac{\sqrt{3}}{2} \times side = 9\sqrt{3} \Rightarrow side = 18\ cm$

Now, Area of the equilateral triangle = $\frac{\sqrt{3}}{4} \times side^2 = \frac{\sqrt{3}}{4} \times 18 \times 18 = 81\sqrt{3}\ cm^2$

Sol.491.(c)



InΔXYO

OX = OY = 3 cm

∠XYO = ∠OXY = 30°.....(because OX = OY)

Sol.492.(c)

Height of the equilateral triangle

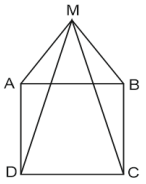
$= \frac{\sqrt{3}}{2} \times side \Rightarrow \frac{\sqrt{3}}{2} \times side = 6\sqrt{3}$

$\Rightarrow side = 12\ m$

So, perimeter of equilateral triangle

= 3 × 12 = 36 m

Sol.493.(d)



ABCD is a square and △MAB is an equilateral triangle.

Then, AB = MB = AM = AD = CD = BC

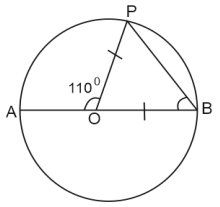
So, ∠ADM +∠AMD + ∠MAD = 180°

⇒ 2x + (90 + 60)° = 180°

⇒ 2x = 180° - 150° ⇒ 2x = 30° ⇒ x = 15°

So, ∠MDC = 90 - 15 = 75°

Sol.494.(d)



∠AOP = 110° then,

∠OBP = $\frac{110°}{2}$ = 55°

{Angle subtended by two points at circumference of the circle is half of the angle subtended by the same two points at centre of the circle}

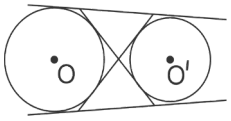
Sol.495.(a) In ΔDEF, we have :

∠D = 180° - (85° + 40°) = 55°

Now, In ΔABC and ΔDEF; ∠A = ∠D = 55°, AC = DF, AB = DE

So, ΔABC ≅ ΔDEF (by SAS rule)

Sol.496.(b) According to question, we have following figure :



Clearly, we can see that the number of common tangents = 4

Sol.497.(c) Since, $l \parallel m$. then,

∠c = 110° (corresponding angles)

∠a + ∠c = 180° (linear pair of angles is always supplementary)

So, ∠a = 180°- 110° = 70°

Now, ∠b is the exterior angle of the triangle formed in the given figure :

∠a + 40° = ∠b (exterior angle property)

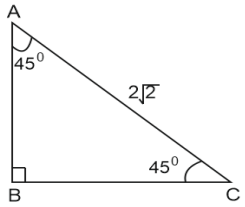
70° + 40° = ∠b ⇒ ∠b = 110°

Sol.498.(c)

The area of the sector = $\frac{\theta°}{360°}\pi r^2$

= $\frac{40°}{360°}$ π × 6 × 6 = 4π cm^2

Sol.499.(b)

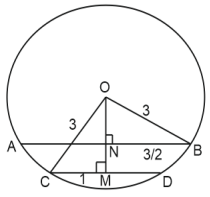


In △ABC, we have :

cos 45° = $\frac{BC}{2\sqrt{2}}$

$\frac{1}{\sqrt{2}} = \frac{BC}{2\sqrt{2}}$ ⇒ BC = 2 cm

Sol.500.(b)



Since, the perpendicular distance from the center to the chord bisects the chord.

So, NB = $\frac{3}{2}$ cm and CM = $\frac{2}{2}$ = 1 cm

In △ONB, we have,

ON = $\sqrt{3^2 - (\frac{3}{2})^2} = \sqrt{\frac{27}{4}} = \frac{3\sqrt{3}}{2}$

In △OCM, we have,

OM = $\sqrt{3^2 - 1} = \sqrt{8} = 2\sqrt{2}$

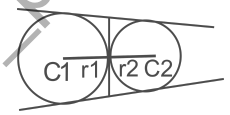
So, the ⊥ distance between the two chords = $2\sqrt{2} - \frac{3\sqrt{3}}{2} = \frac{4\sqrt{2}-3\sqrt{3}}{2}$ cm

Sol.501.(c) Formula for changing degree into radian = (degree × $\frac{\pi}{180}$)

The length of tree = $\frac{44}{(18 \times \frac{\pi}{180})}$

= $\frac{44 \times 70}{22}$ = 140 m

Sol.502.(d) According to the question, we have following figure :



Clearly, we can see that number of common tangents = 3

Sol.503.(b) ASA congruence rule of triangles : If two angles and their included side of one triangle are equal to two corresponding angles and included side of another triangle, then those triangles are congruent.

Sol.504.(a)

$\frac{area\ of\ (\triangle 1)}{area\ of\ (\triangle 2)} = \frac{(height\ of\ \triangle 1)^2}{(height\ of\ \triangle 1)^2}$

$\Rightarrow \frac{x^2}{y^2} = \frac{(h1)^2}{(h2)^2} \Rightarrow \frac{h1}{h2} = \sqrt{\frac{x^2}{y^2}} = \frac{x}{y}$

Sol.505.(c) As we know, the hour hand moves by 30° every 1 hour.

So, angle formed , in 4 hours

= 30 × 4 = 120°

So, area of sector formed

= $\frac{120}{360} \times \frac{22}{7} \times 6 \times 6 = \frac{264}{7}$ = 37.71 cm^2

Sol.506.(c)

Let the height of triangle be 'h' cm

According to question

Area of parallelogram = Area of triangle

12 × 28 = $\frac{1}{2}$ × 28 × h ⇒ h = 24 cm

Sol.507.(d)

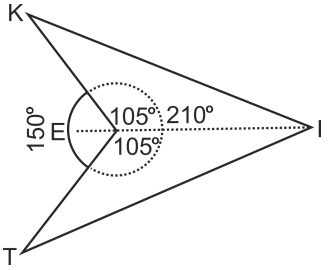
On observing the given options, we find that statement (d)is incorrect as it says that the perpendicular distance from the centre of a circle increases when the length of a chord increases.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.508.(d) Since, △ABC ≅ △PQR. then, ∠A =∠P, ∠B =∠Q and ∠C =∠R.
According to question,
x + 60 = 85 - 4x
5x = 85 - 60 = 25°
⇒ x = $\frac{25}{5}$ = 5°
So, ∠ABC = (x + 60)°= 5 + 60 = 65°

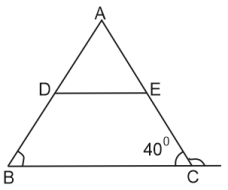
Sol.509.(c)



KI = IT, KE = ET and side IE is common
So, $\Delta KIE \cong \Delta TIE$
Therefore, $\angle KEI = \angle TEI$
∠KET = 150° (Given)
∠KET + ∠KEI + ∠TEI = 360°
So, ∠TEI = $\frac{360-150}{2}$ = 105°

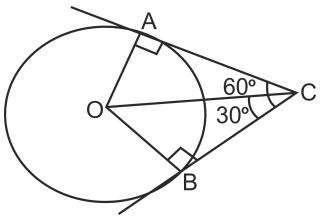
Sol.510.(a) Area of equilateral triangle
= $\frac{\sqrt{3}}{4} \times 6^2 = 9\sqrt{3}$ square unit
Area of quadrant = $\frac{1}{4} \times \frac{22}{7} \times 1^2$
= $\frac{11}{14}$ square unit
Area of shaded portion
= $9\sqrt{3} - (\frac{9\sqrt{3}}{2} + \frac{11}{14}) = \frac{9\sqrt{3}}{2} - \frac{11}{14}$
= $\frac{1}{2}(9\sqrt{3} - \frac{11}{7})$ square unit

Sol.511.(c)



△ADE ~ △ABC (by AAA) [$since,\ DE \parallel BC$]
So, ∠ADE = ∠ABC, ∠AED = ∠ACB and ∠DAE = ∠BAC
∠AED = ∠ACB = 40° (corresponding angle) ⇒ In △ADE,
m∠DAE + m∠ADE= 180- ∠AED
⇒ m∠DAE + m∠ADE = 180°- 40° = 140°

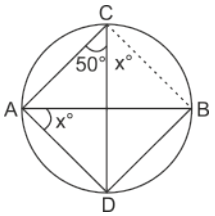
Sol.512.(b)



△AOC ≅ △BOC (by RHS)
In △AOC , we have:
Tan30° = $\frac{AO}{AC} = \frac{3}{AC}$
⇒ $\frac{1}{\sqrt{3}} = \frac{3}{AC}$ ⇒ AC = $3\sqrt{3}$ cm
So,the length of each tangent = $3\sqrt{3}$ cm

Sol.513.(a)
In △ORT ~ △PST (By AAA rule)
So, $\frac{OR}{PS} = \frac{RT}{ST}$ ⇒ $\frac{10}{x} = \frac{16}{24}$
⇒ x = $\frac{10 \times 24}{16}$ = 15 cm

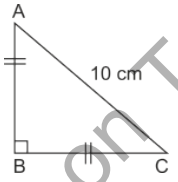
Sol.514.(a)



$\angle DAB = \angle DCB$ = x°.....(angle drawn by the same arc DB)
and AB is a diameter so $\angle ACB$ = 90°
= 50° + x° = 90° ⇒ x° = 40°

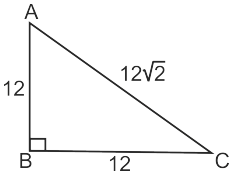
Sol.515.(c) Angle subtended at the centre of the circle(θ) = $(\frac{19}{30})^c$
= $(\frac{19}{30}) \times \frac{180 \times 7}{22} = \frac{798}{22}$ = 36.27°

Sol.516.(d)



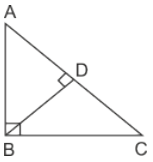
Let the equal sides of the isosceles triangle be x cm.
By pythagoras theorem,$x^2 + x^2 = 10^2$
⇒ $2x^2 = 100 \Rightarrow x = \sqrt{50} = 5\sqrt{2}$
Hence, the other two sides of the triangle are $5\sqrt{2}$ and $5\sqrt{2}$.

Sol.517.(b)



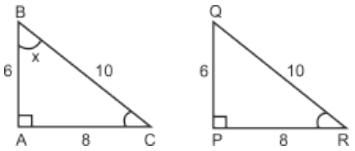
Since, ABC is an isosceles triangle. Then, AB = BC = 12 cm
Using pythagoras theorem , we have AC
= $\sqrt{12^2 + 12^2} = \sqrt{144 + 144} = \sqrt{288}$
= $12\sqrt{2}$ cm
Circumradius = $\frac{12\sqrt{2}}{2} = 6\sqrt{2}$ cm
Inradius = $\frac{P+B-H}{2}$
= $\frac{12+12-12\sqrt{2}}{2} = \frac{24-12\sqrt{2}}{2}$
= 6 (2 - $\sqrt{2}$)
So, the required ratio = 6(2 - $\sqrt{2}$) : $6\sqrt{2}$
= (2 - $\sqrt{2}$) : $\sqrt{2}$

Sol.518.(a) According to the question,



When in a right angled ΔABC, BD ⊥ AC, then BD^2 = AD × DC

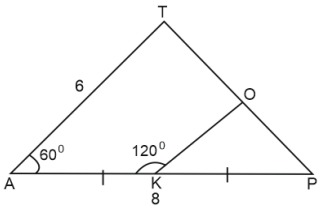
Sol.519.(c) According to the question,



ΔBAC is congruent to ΔQPR because AB = PQ, BC = QR and AC = PR (SSS rule)
And values 6, 8 and 10 are triplets. So, both triangles are right angled triangles with ∠A = ∠P = 90°
∠ACB = 90 - x
So, value of ∠PRQ = ∠ACB = (90 - x) degree

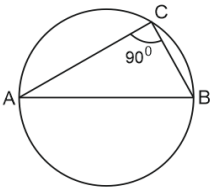
Sol.520.(b) $x^2 + y^2 > z^2$, where z is the longest side and x, y are the two smaller sides.
The triangle formed here is an acute angled triangle as the square of the longest side is less than the sum of the squares of the other two smaller sides.

Sol.521.(a)



Since,
∠TAP + ∠OKA = 60° + 120° = 180°
(pair of interior angles on the same side of transversal is supplementary)
So,
OK ∥ AT and also K is the midpoint of AP.
⇒ OK = $\frac{AT}{2}$ ....(Mid point theorem)
So, OK = $\frac{6}{2}$ = 3 cm

Sol.522.(a)



Given, radius of the circle = 5 units
Theorem used :- When angles subtended at the circumference of a circle from the two end points of a chord is 90° , then

Search on TG: @apna_pdf

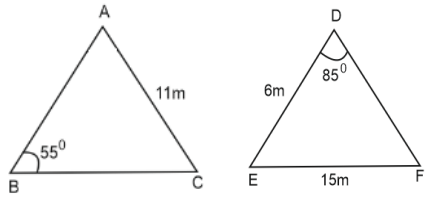
Search on Telegram @apna_pdf

that chord is act as the diameter of the circle.
Length of the chord AB = 2 × 5 = 10 units

Sol.523.(a)
△MAN ≅ △CPT (given) ⇒ ∠A = ∠P
40 = 6y + 16 , 24 = 6y , y = $\frac{24}{6}$ = 4
Also, ∠M = ∠C , 75 = $\frac{x}{2}$, x = 75 × 2 = 150
So, x - 5y = 150 - 5 × 4 = 150 - 20 = 130

Sol.524.(b) In the given triangle ,
$\frac{4}{2} = \frac{10}{5}$ = 2
and one angle of each triangle is equal to 35°.
so, $\triangle_1 \sim \triangle_2$ (by SAS rule)
⇒ 2 = $\frac{6}{s}$; s = $\frac{6}{2}$ = 3

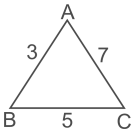
Sol.525.(b)



ΔABC is congruent to ΔDEF. So, $\angle B = \angle E = 55°$, AB = DE = 6m
BC = EF = 15m , Perimeter of ΔABC
= 11 + 6 + 15 = 32m ,
In ΔDEF, $\angle D + \angle E + \angle F = 180°$ (Sum of angles of a triangle is always 180°)
⇒ 85° + 55° + $\angle F$ = 180°
⇒ $\angle F$ = 40°

Sol.526.(c) The longest chord of a circle is the diameter itself.
And diameter = 2 × radius
So, the longest chord of a circle is equal to two times of radius.

Sol.527.(a)



Using cosine law,
$5^2 + 3^2 - 7^2$ = 2 × 3 × 5 cosB
25 + 9 - 49 = 30 cosB
- 15 = 30 cosB
cosB = - $\frac{1}{2}$ = cos(180 - 60)
Angle B = 120°

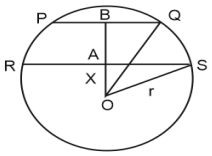
Sol.528.(b) Since, △ABC ~ △PQR,
$\frac{AB}{PQ} = \frac{BC}{QR} \Rightarrow \frac{AB}{6.25} = \frac{5}{12.5}$
AB = $\frac{5 \times 6.25}{12.5}$ = 2.5 cm

Sol.529.(a)
Circumradius of equilateral triangle
= $\frac{side}{\sqrt{3}}$ ⇒ 18 = $\frac{side}{\sqrt{3}}$ ⇒ Side = $18\sqrt{3}$ cm
In radius of equilateral triangle
= $\frac{18\sqrt{3}}{2\sqrt{3}}$ = 9 cm
Short Trick : The ratio of inradius and circumradius of an equilateral triangle = 1 : 2

Sol.530.(d) Area of quadrilateral ABCD
= $\frac{1}{2}$ × AC (DE + BF)
= $\frac{1}{2}$ × 10 × (3 + 5) = 5 × 8 = 40 cm^2

Sol.531.(d) Radius of the circle = $\frac{l}{\theta}$,
where l is arc of circle and θ is the angle in radian
R = $\frac{15}{24 \times \frac{\pi}{180°}} = \frac{225}{2\pi}$ cm
Circumference of the circle
= 2 × π × $\frac{225}{2\pi}$ = 225 cm

Sol.532.(c)



BQ = $\frac{PQ}{2} = \frac{10}{2}$ = 5 cm , AS = $\frac{RS}{2} = \frac{24}{2}$
= 12 cm , AB = 7 cm , OQ = OS = r
In △BOQ,
$OB^2 + BQ^2 = OQ^2$
$(7 + x)^2 + 5^2 = r^2$ ..... (1)
In △OAS,
$OA^2 + AS^2 = OS^2$
⇒ $x^2 + 12^2 = r^2$ ..... (2)
From equation (1) and (2) We get,
$(7 + x)^2 + 5^2 = x^2 + 12^2$
$49 + x^2 + 14x + 25 = x^2 + 144$
74 + 14x = 144
⇒ 14x = 70 ⇒ x = 5 cm
Now putting x = 5 in equation (2)
$r^2 = 5^2 + 12^2$ = 169 ⇒ r = 13 cm

Sol.533.(b) Since,
$\frac{PX}{ER} = \frac{ZX}{RF} = \frac{PZ}{EF}$
so, △PXZ ~ △ERF

Sol.534.(c) On Checking the options , we get △ABC ≠ △JKL
For, △ABC to be congruent to △JKL we should have,
AB = JK = 3.6 cm , BC = LJ = 4 cm ,
∠A = ∠J = 52.4° but here ∠B = ∠J = 52.4°, which is not possible.

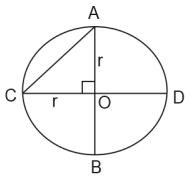
Sol.535.(c) Let base of right angles triangle = 10 cm
Area of triangle = $\frac{1}{2}$ × base × height
42 = $\frac{1}{2}$ × 10 × Height
Height = $\frac{42 \times 2}{10}$ = 8.4 cm
So, the length of other side that contain right angle = 8.4 cm

Sol.536.(d)
Area of square = 21 × 21 = 441 cm^2
Length of the side of square = diameter of the circle
Area of circle = $\frac{22}{7} \times \frac{21}{2} \times \frac{21}{2}$
= $\frac{693}{2}$ = 346.5 cm^2
So, the area of non- shaded region
= 441 - 346.5 = 94.5 cm^2

Sol.537.(a) In this figure we can clearly see five squares of side 3 cm is formed when a line is produced
So,
area of shaded region = 5 × 3^2 = 45 cm^2

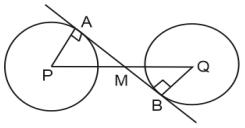
Sol.538.(c)
Area of the square = $a^2 = 20^2$ = 400
Radius of circle = half of the side of square = 10 cm
Area of the circle = πr^2
= 3.14 × 10 × 10 = 314
Area of shaded region = 400 - 314
= 86 cm^2.

Sol.539.(b)



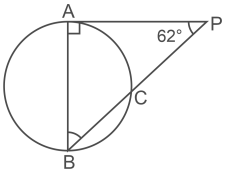
AO = CO = r
In △AOC,
AC = $\sqrt{r^2 + r^2} = \sqrt{2}$ r = $\sqrt{2} \times \frac{AB}{2} = \frac{AB}{\sqrt{2}}$

Sol.540.(a)



△AMP ~ △BMQ (by AAA property)
So, $\frac{PM}{MQ} = \frac{PA}{BQ} \Rightarrow \frac{PM}{MQ} = \frac{4}{6} = \frac{2}{3}$
Hence the required ratio = 2 : 3

Sol.541.(c)



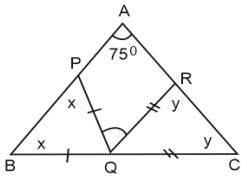
The tangent is perpendicular to the diameter.
∠A = 90°,
Now ∠ABP + ∠APB = 90°

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

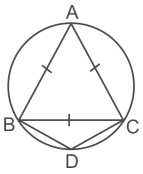
∠ABP + 62° = 90° ⇒ ∠ABP = 28°

Sol.542.(b)



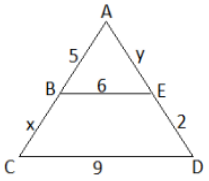
As BQ = PQ, ∠BPQ = ∠ PBQ = x,
As QC = QR, ∠QRC = ∠QCR = y,
In triangle ABC, 75 + x + y = 180.
⇒ x + y = 105
In △PQB and △RQC ,
x + x + ∠PQB + y + y + ∠RQC = 360
2(x + y) + ∠PQB + ∠RQC = 360
210 + ∠PQB + ∠RQC = 360
∠PQB + ∠RQC = 150.
Now as BC is a straight line,
∠PQB + ∠RQC + ∠PQR = 180
∠PQR = 180 - 150 = 30°
Short trick :-
∠PQR = 180° - 2 × ∠BAC
= 180° - 2 × 75° = 30°

Sol.543.(c)



Triangle ABC is equilateral triangle, so ∠A = ∠B = ∠C = 60°
∠ABC + ∠CBD + ∠ACB + ∠BCD (in cyclic quadrilateral sum of opposite angles = 180°)
60° + 40° + 60° + ∠BCD = 180°
∠BCD = 20°

Sol.544.(a) Let AE = y and BC = x



In ΔABE and ΔACD, $\overline{BE} \parallel \overline{CD}$

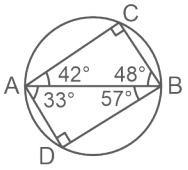
So, $\frac{AB}{AC} = \frac{BE}{CD} \Rightarrow \frac{5}{5+x} = \frac{6}{9}$

45 = 30 + 6x ⇒ x = 2.5

Also, $\frac{AE}{AD} = \frac{BE}{CD} \Rightarrow \frac{y}{y+2} = \frac{6}{9}$

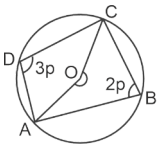
9y = 6y + 12 ⇒ 3y = 12 ⇒ y = 4

Sol.545.(b) As AB is the diameter,
∠C = ∠D = 90°
∠BAD = 90° − ∠DBA = 90° − 57° = 33°
∠CBA = 90° − ∠CAB = 90° − 42° = 48°



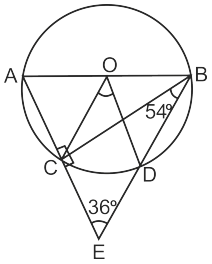
∠CAD = ∠BAD + ∠CAB = 33° + 42° = 75°
∠CBD = ∠DBA + ∠CBA = 57° + 48° = 105°

Sol.546.(d)
As ABCD is a cyclic quadrilateral,



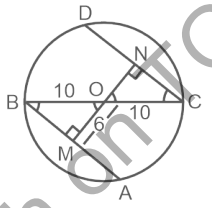
∠B + ∠D = 180°
2p + 3p = 180° ⇒ 5p = 180°⇒ p = 36°
∠ABC = 2p = 72°
∠AOC = 2 × 72 = 144°
Reflex ∠AOC = 360° − 144° = 216°

Sol.547.(d)



Construction : Join CB.
As AB is diameter we have ∠ACB = ∠BCE = 90°
∠EBC = 90° − ∠AEB = 90° − 36° = 54°
∠DOC = 2∠EBC = 2 × 54 = 108°
(As ∠EBC is made by arc CD at circumference while ∠DOC is angle made by it on centre.)

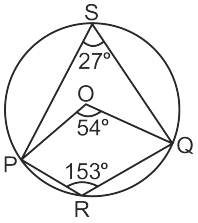
Sol.548.(d)



radius = $\frac{20}{2}$ = 10 cm.
As AB∥CD, ∠MBO = ∠NCO and ∠BOM = ∠CON (vertically opposite angles)
BO = CO = 10 (radius)
So, by ASA congruency ΔBOM ≅ ΔCON
Now, by c.p.c.t., ON = OM = 6 cm
And ∠OMB = ∠ONC = 90°

NC = $\sqrt{10^2 - 6^2}$ = 8 cm
CD = 2 × NC = 16 cm

Sol.549.(d)



Let S be any point on the circumference.

∠PSQ = $\frac{1}{2}$ × ∠POQ = 27°

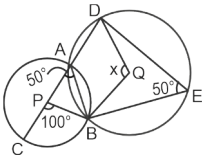
∠PSQ + ∠PRQ
= 180° (cyclic quadrilateral)
∠PRQ = 180° − 27° = 153°

Sol.550.(c) According to the question,

$\frac{ar(\Delta ABC)}{ar(\Delta QPR)} = \frac{64}{169} \Rightarrow (\frac{AC}{PR})^2 = \frac{64}{169}$

$\frac{AC}{PR} = \frac{8}{13} \Rightarrow \frac{16}{PR} = \frac{8}{13} \Rightarrow PR$ = 26 cm

Sol.551.(d)



Construction : we take a point E on the arc such that ABED is a cyclic quadrilateral.

∠PAB = $\frac{1}{2}$∠BPC (angle subtended at arc is half the angle subtended at the centre.)

∠PAB = $\frac{1}{2}$ × 100° = 50°

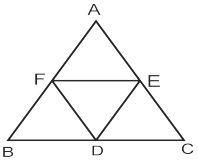
∠BED = ∠PAB = 50° (external angle property of cyclic quadrilateral)
∠BQD = 2∠BED (angle subtended at centre)
∠BQD = 2 × 50° = 100°

Sol.552.(c) Let AB = y, so BC = y − 4 and AC = y − 2
Perimeter of ΔABC = AB + BC + AC
32 = y + y − 4 + y − 2 ⇒ 32 = 3y − 6

3y = 38 ⇒ y = $\frac{38}{3}$

So, AC = y − 2 = $\frac{38}{3}$ − 2 = $\frac{32}{3}$ cm

Sol.553.(c) ΔABC
BC = 14.4 cm , CA = 15.2 cm and AB = 12.4 cm
As we know D,E,F are mid points of sides of triangle



So perimeter of Δ DEF is half of perimeter of Δ ABC
And Also FE∥ BC , FD∥ AC , DE ∥ AB
= $\frac{14.4 + 15.2 + 12.4}{2}$ = 21 cm

Sol.554.(c) QP = 14.4 cm
Δ ABC ~ Δ QPR

$\frac{AB}{QP} = \frac{BC}{PR} = \frac{AC}{QR} = \sqrt{\frac{Area\ of\ \Delta ABC}{Area\ of\ \Delta PQR}}$

$\frac{AB}{QP} = \sqrt{\frac{Area\ of\ \Delta ABC}{Area\ of\ \Delta PQR}}$

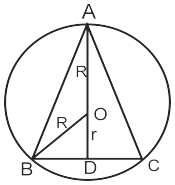
$\frac{AB}{14.4} = \sqrt{\frac{121}{64}}$

AB = 14.4 × $\frac{11}{8}$ = 1.8 × 11 = 19.8 cm

Sol.555.(a) perpendicular to the base of a triangle from circumcenter is inradius

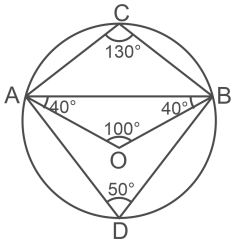
Search on TG: @apna_pdf

Search on Telegram @apna_pdf



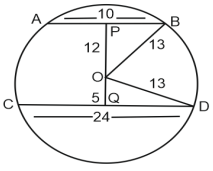
Given r = 3.2 cm
So In equilateral triangle
R : r : height : side
2 : 1 : 3 : $2\sqrt{3}$
1 unit = 3.2 cm
Height = 3 units = 9.6 cm

Sol.556.(b)



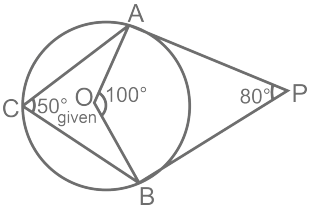
In Δ ABO
⇒∠ABO = 40°
⇒ ∠BAO = ∠ABO = 40° [sides are equal (radius of a circle)]
∠AOB = 180° – 40° – 40° = 100°
Let point D on major arc
∠ADB = $\frac{1}{2}$∠AOB ⇒ $\frac{1}{2}$ × 100° = 50° ……..(angle at circumference is half of angle at circle by common arc AB)
∠ACB = 180° – 50° = 130° (opposite angle of cyclic quadrilateral)

Sol.557.(b)



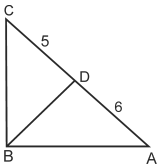
Here we have to use pythagoras triplet of (5, 12, 13) in both the right angle triangle
In Δ OQD it is right angle at Q ……(perpendicular from center divides chord in two equal parts)
QD = $\frac{1}{2}$ × CD ⇒ QD = $\frac{1}{2}$ × 24 = 12 cm
So by pythagoras triplet of (5, 12, 13)
OQ = 5 cm
Now OP = PQ – OQ = 17 – 5 = 12cm
Now in ΔOBP by pythagoras triplet of (5, 12, 13)
Two sides are 12 and 13 so PB = 5 and AB = 2 × PB = 10cm
Difference between the length of CD and AB = 24 – 10 = 14 cm

Sol.558.(c)



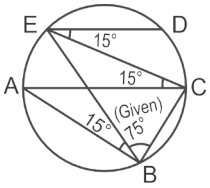
∠ACB = 50°…..(given)
∠AOB = 2 × 50° = 100° …..(angle at center is double of angle at circumference)
∠A = ∠B = 90° ……(point of contact of tangents makes 90°)
Now in quadrilateral AOBP
∠A + ∠B + ∠AOB + ∠P = 360°
∠P = 360° - 90° - 90° - 100° = 80°

Sol.559.(b)



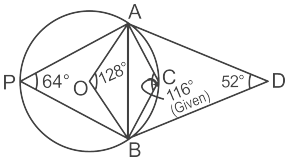
Given : If AD = 6 cm, CD = 5cm
And BD ⊥ AC
BD² = AD × CD
BD² = 6 × 5 ⇒ BD = $\sqrt{30}$
in Δ BDA applying pythagoras theorem
AB² = $AD^2 + BD^2$ = 6² + $(\sqrt{30})^2$ = 66
So, $AB^2 + BD^2$ = 66 + 30 = 96 cm²

Sol.560.(d)



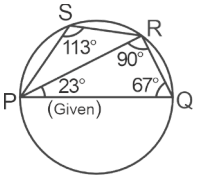
Given: AC is a diameter
AC ∥ ED and ∠CBE = 75°
Now ,∠ABC = 90°…. (AC is diameter)
∠ABE = 90° - 75° = 15°
∠ACE = ∠ABE = 15° ……(angle on circumference by same arc AE)
∠CED = ∠ACE = 15° ……(alternate opposite angle of parallel lines are equal)

Sol.561.(d)



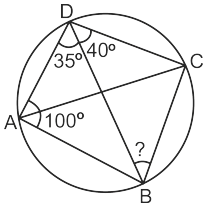
Given that
∠ACB = 116°
Now, ∠P = 180° - 116° = 64°……. Opposite angle of cyclic quadrilateral
∠AOB = 2 × ∠64° = 128°…… angle on center is twice of angle at circumference
In Quadrilateral AOBD ,
∠A = 90°, ∠ B = 90° …… angle at point of contact of tangent to center is 90°
∠A + ∠ B + ∠ ADB + ∠AOB = 360°
∠ ADB = 360° - 90° - 90° -128° = 52°

Sol.562.(a) In Δ PRQ ,
Given , PQ is a diameter , ∠RPQ = 23°



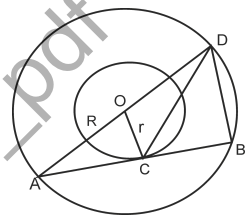
∠PRQ = 90° ……(PQ is diameter)
∠RQP = 180° - 23° - 90° = 67°
Now ∠PSR = 180° - 67° = 113° …..(sum of opposite angles of cyclic quadrilateral is 180°)

Sol.563.(b) Given that , ∠DAB = 100°
∠CDB = 40°



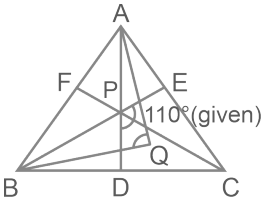
So $\angle CAB$ = ∠CDB = 40°…..(angle on circumference by same arc BC)
∠DAC = ∠DAB - ∠CAB = 100° - 40°
= 60° ∠DBC = $\angle DAC$ = 60° …….(angle on circumference by same arc DC)

Sol.564.(d)



In figure above ⇒ r = 16 , R = 26
In Δ OCA,
$\angle OCA = 90°$, AC = CB = $\sqrt{R^2 - r^2}$
= $\sqrt{26^2 - 16^2}$ = $\sqrt{420}$
In Δ OCA and Δ DBA , ∠A is common
∠OCA = ∠DBA = 90°
So, Δ OCA ~ Δ DBA
$\frac{OA}{AD} = \frac{OC}{DB}$ ⇒ $\frac{1}{2} = \frac{16}{DB}$ ⇒ DB = 32
Now in Δ DBC ; ∠ DBC = 90°
Pythagoras theorem
CD = $\sqrt{CB^2 + DB^2}$
= $\sqrt{(\sqrt{420})^2 + 32^2} = \sqrt{1444} = 38\ cm$
Short trick :- ⇒ In Δ OCA,
$\angle OCA = 90°$, AC = CB = $\sqrt{R^2 - r^2}$
= $\sqrt{26^2 - 16^2}$ = $\sqrt{420}$
Using apollonius theorem,
⇒ $AC^2 + CD^2 = 2(AO^2 + OC^2)$
⇒ $420 + CD^2 = 2(26^2 + 16^2)$
CD^2 = 2 × 932 - 420 = 1864 - 420
⇒ CD = 38 cm

Sol.565.(d)
In Δ ABC as shown in figure below
AD⊥BC , BE⊥AC
Now in quadrilateral DPEC
∠ D = 90°(perpendicular) , ∠DPE = 110°,
∠ E = 90° (perpendicular)
∠ C = 360° - 90° - 110° - 90° = 70°



Search on TG: @apna_pdf

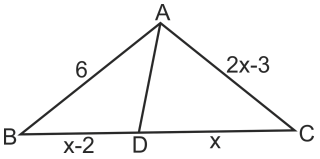
Search on Telegram @apna_pdf

Now in Δ ABC

$\angle AQB = 90° + \frac{1}{2}\angle ACB$

$= 90° + \frac{1}{2} \times 70° = 90° + 35° = 125°$

Sol.566.(a)



As shown in given figure in question AD bisects ∠BAC

So,

$\frac{AB}{AC} = \frac{BD}{DC}$

$\Rightarrow \frac{6}{2x-3} = \frac{x-2}{x}$

⇒ 6x = 2x² - 4x - 3x + 6

⇒ 0 = 2x² - 4x - 3x - 6x + 6

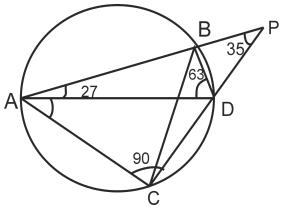
⇒ 0 = 2x² - 13x + 6 ⇒ 0 = 2x² - 12x - x + 6

⇒ 0 = 2x(x - 6) -1(x - 6) ⇒ 0 = (2x - 1)(x - 6)

⇒ x = $\frac{1}{2}$, 6 ⇒ x = $\frac{1}{2}$ is not possible because BD = x - 2 will become negative

So x = 6 and BD = x - 2 = 6 - 2 = 4

Sol.567.(a)



In Δ APC ,

∠PCA = 90° .....(AD is diameter)

∠ BAC + ∠P + ∠PCA = 180°

∠ BAC = 180° - ∠P - ∠PCA

∠ BAC = 180° - 35° - 90° = 55°

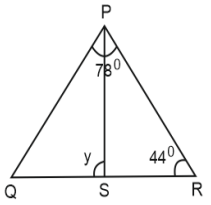
∠ BAC = ∠ BAD + ∠ DAC = 55°

∠ BAD + ∠ DAC = 55°

∠ DAC = 55° - 27° = 28°

Now ∠ DAC = ∠ DBC ..... (angle from same arc CD) ∠ DBC = 28°

Sol.568.(b)



∠PQR + ∠PRQ + ∠QPR = 180°

According to the question,

∠PQR + 44° + 78° = 180°

∠PQR = 180° – 122° = 58°

∠PQS + ∠QPS = ∠PSR

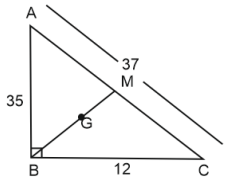
58° + $\frac{1}{2}$ ∠PSR = ∠PSR

$\frac{1}{2}$ ∠PSR = 58° ⇒ ∠PSR = 116°

⇒ ∠PSR + ∠PSQ = 180°

⇒ 116° + ∠PSQ = 180° ⇒ ∠PSQ = 64°

Sol.569.(a)



The sides of ΔABC are triplets, so ΔABC is right angle triangle with ∠B = 90°

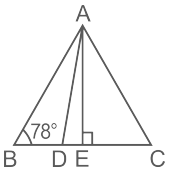
G is the centroid and let M be the mid-point of AC, so BM becomes median.

BM = $\frac{1}{2}$ AC = $\frac{37}{2}$

BG : GM = 2 : 1 (We know)

So, BG = $\frac{2}{3}$ BM = $\frac{2}{3} \times \frac{37}{2}$ = 12.3 cm

Sol.570.(c)



As we know,

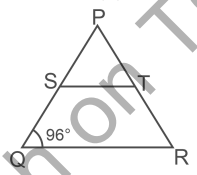
$\frac{1}{2}$ (∠ABC – ∠ACB) = ∠DAE

⇒ $\frac{1}{2}$ (78° – ∠ACB) = 24°

78° – ∠ACB = 48°

∠ACB = 78° – 48° = 30°

Sol.571.(c)



In ΔPQR,

PS × PR = PQ × PT

$\frac{PS}{PQ} = \frac{PT}{PR}$

So, ∠PST = ∠PQR and ∠PTS = ∠PRQ

So, △PST ~ △PQR

⇒ ∠Q = ∠PST = 96°

⇒ ∠PST = ∠PRQ + 34°

⇒ 96° = ∠PRQ + 34° ⇒ ∠PRQ = 62°

⇒ ∠PQR + ∠PRQ + ∠QPR = 180°

⇒ 96° + 62° + ∠QPR = 180°

∠QPR = 180° – (62° + 96°)

= 180° – 158° = 22°

Sol.572.(b)

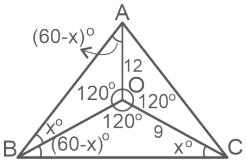
∠AOB + ∠BOC + ∠COA = 360°

So, ∠AOB = ∠BOC = ∠COA = 120°

∠ABO = x, ∠OAB = 60 - x = ∠OBC,

∠OBC + ∠OCB = 60°

(60 - x) + ∠OCB = 60° ⇒ ∠OCB = x



In ΔBAO and ΔCBO

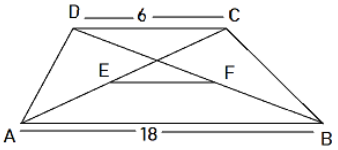
∠ABO = ∠BCO and ∠AOB = ∠BOC

So, $\Delta BAO \sim \Delta CBO$

$\Rightarrow \frac{OB}{OC} = \frac{AO}{OB}, \Rightarrow (OB)^2 = AO \times OC$

$\Rightarrow (OB)^2 = 12 \times 9 = 108 \Rightarrow OB = 6\sqrt{3}$ cm

Sol.573.(c)



In a trapezium, Line formed by joining midpoints of diagonal

= $\frac{1}{2}$ × (difference of parallel sides)

EF = $\frac{1}{2} \times (AB - CD)$

= $\frac{1}{2} \times (18 - 6)$ = 6 cm.

Sol.574.(c) Let number of sides of polygon A_1 = n

So, (n – 2) × 180 = 1080 ⇒ n = 8

In polygon A_2,

Each interior angle + Each exterior angle = 180°

(Each exterior angle + 132°) + Each exterior angle = 180°

2 (Each exterior angle) = 48°

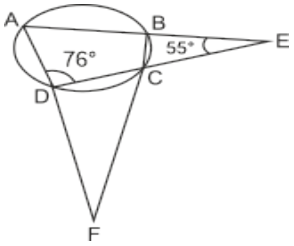
Each exterior angle = 24°

So, number of sides of polygon A_2

= $\frac{360}{Each\ exterior\ angle} = \frac{360}{24}$ = 15

So, total sides = 8 + 15 = 23

Sol.575.(d)



In ΔADE,

∠EAD = 180° – (55° + 76°)

= 180° – 131° = 49°

As ❑ ABCD is cyclic quadrilateral,

so ∠ABC = 180° – ∠ADC = 180° – 76°

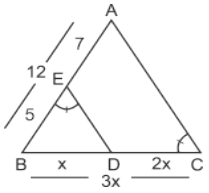
= 104°

So, in ΔABF,

∠AFB = 180° – (49° + 104°)

= 180° – 153° = 27°

Sol.576.(c)



Let BD = x and CD = 2x

Here, Δ ABC ~ Δ DBE (∵ ∠DEB = ∠ACB

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

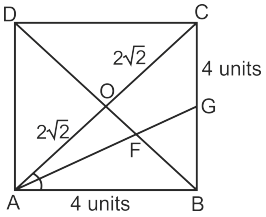
and ∠ABC = ∠DBE)

So, $\frac{AB}{DB} = \frac{BC}{BE} \Rightarrow \frac{12}{x} = \frac{3x}{5} \Rightarrow x^2 = 20$

$\Rightarrow x = 2\sqrt{5}$ cm

So, BC = 3x = $3(2\sqrt{5}) = 6\sqrt{5}$ cm

Sol.577.(a)



Let the side of square be 4 units,

Diagonal AC = BD = $4\sqrt{2}$ units

OB = $\frac{1}{2} \times BD = 2\sqrt{2}$ units

By interior angle bisector theorem in ΔAOB

$\frac{OF}{FB} = \frac{AO}{AB} = \frac{1}{\sqrt{2}}$

OF = $\frac{1}{1+\sqrt{2}} \times OB = \frac{1}{1+\sqrt{2}} \times 2\sqrt{2}$

By interior angle bisector theorem in ΔACB

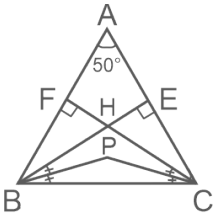
$\frac{CG}{GB} = \frac{AC}{AB} = \frac{\sqrt{2}}{1}$

CG = $\frac{\sqrt{2}}{1+\sqrt{2}} \times BC = \frac{\sqrt{2}}{1+\sqrt{2}} \times 4$

OF : CG = $\frac{1}{1+\sqrt{2}} \times 2\sqrt{2} : \frac{\sqrt{2}}{1+\sqrt{2}} \times 4$

= 1 : 2

Sol.578.(a)



Here point H is orthocentre,

so ∠BHC + ∠BAC = 180°

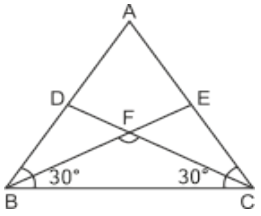
∠BHC + 50° = 180° ⇒ ∠BHC = 130°

In above figure, point P is incentre,

so ∠BPC = 90° + $\frac{\angle BHC}{2}$

= 90° + $\frac{130°}{2}$ = 90° + 65° = 155°

Sol.579.(a)



Let D and E be midpoints of AB and AC, then AD = EC is satisfied

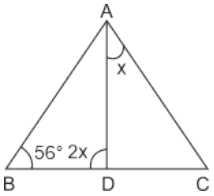
F is centroid of ΔABC,

(in equilateral triangle centroid and incentre are same.)

F is incentre, so ∠BFC = 90° + $\frac{\angle A}{2}$

= 90 + $\frac{60}{2}$ = 120°

Sol.580.(a)



In ΔABC, ∠BAC + ∠ABC + ∠ACB = 180°

70° + 56° + ∠ACB = 180°

so, ∠ACB = 180° − 126° = 54°

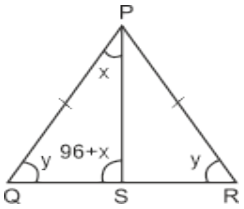
∠ADB = ∠DAC + ∠ACB (exterior angle is sum of two interior opposite angle)

⇒ 2x = x + 54° ⇒ x = 54°

So, in ΔADC, ∠ADC = 180 − (54 + 54)

= 180 − 108 = 72°

Sol.581. (c)



Let ∠QPS = x

so, ∠PSQ = 96° + x , and let ∠PQR = ∠PRQ = y

In ΔPQR, ∠PQR + ∠PRQ + ∠QPR = 180°

So, y + y + 132 = 180°

2y = 48° ⇒ y = 24°

In ΔPQS, x + y + (96° + x) = 180°

2x + 24° + 96° = 180°

⇒ 2x = 60° ⇒ x = 30°

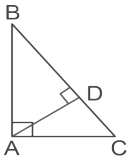
So,

∠PSR = 180° − ∠PSQ

= 180° − (96° + x) = 180° − (96° + 30°)

= 180° − 126° = 54°

Sol.582.(b)



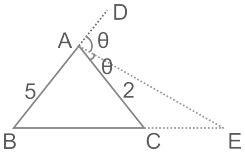
In right angle Δ BAC, where ∠A = 90° and line AD perpendicular to line BC

then $AB^2 = BD \times BC$

$AB = \sqrt{BD \times BC}$

So mean proportional between BD and BC = $\sqrt{BD \times BC} = AB$

Sol.583.(c)

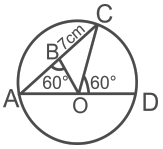


As AE is the external angle bisector so it divide the opposite sides in the ratio of the corresponding sides

Therefore,

$\frac{AB}{AC} = \frac{BE}{CE} \Rightarrow \frac{5}{2} = \frac{CE+9}{CE} \Rightarrow$ CE = 6 cm

Sol.584.(a)



∠DAC = $\frac{1}{2}$ of ∠DOC = 30°

In ΔAOB , ∠AOB = 90°

∠AOB + ∠BOC + ∠COD = 180°

So, ∠BOC = 30°

And ∠OBC = 180° - 60° = 120°

So ΔBOC is a triangle with angle 120° , 30° and 30°

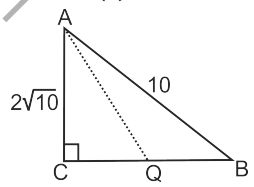
And it has sides in the ratio $\sqrt{3}$, 1, 1

As 1 unit (OB) side = 7cm So side BC = 7cm

Short trick :-

Remember, in such type of questions OB = BC = (given value)

Sol.585.(a)



Applying pythagoras theorem in ΔABC,

$AB^2 - AC^2 = CB^2$

CB = $\sqrt{100 - 40} = 2\sqrt{15}$

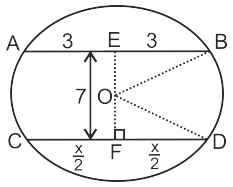
CQ = $\frac{1}{2}$ CB = $\sqrt{15}$

Applying pythagoras theorem in ΔACQ

$AQ^2 = AC^2 + CQ^2$

$AQ^2 = 40 + 15 \Rightarrow AQ = \sqrt{55}$cm

Sol.586.(b)



As, EB = $\frac{AB}{2}$ = 3cm

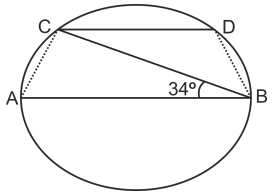
In ΔOEB

OE = $\sqrt{5^2 - 3^2}$ = 4cm ⇒ OF = 7 - 4 = 3cm

In ΔOFD

FD = $\sqrt{5^2 - 3^2} = 4cm$, So CD = 8 cm

Sol.587.(d)



In ΔACB, ∠C = 90°

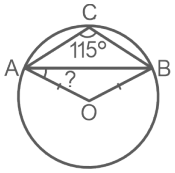
So, ∠A = 90° - 34° = 56°

Search on TG : @apna_pdf

Search on Telegram @apna_pdf

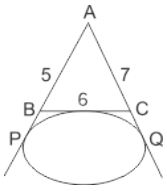
ABDC is a cyclic quadrilateral
∠D +∠A = 180° , ∠D = 124°
As CD = BD So, ∠DBC = ∠DCB
∠DBC = $\frac{1}{2}$ × 56° = 28°

Sol.588.(c)



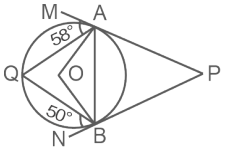
OA = OB radius of same circle.
On minor arc AB, ∠ACB = 115° then major ∠AOB = 230°
So, ∠AOB = 360° - 230° = 130°
In △OAB
(OA = OB)
∠OAB = $\frac{180-130}{2}$ = 25°

Sol.589.(c)



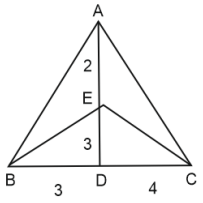
As, AQ = AP then Let CQ = x
According to question (length of two tangent from a same point is equal)
7 + x = 5 + (6 - x) ⇒ 7 + x = 11 - x
x = 2 , So AQ = 9cm
Short trick :-
Length of tangents
= $\frac{1}{2}$ × (perimeter of triangle)
AP = AQ = $\frac{1}{2}$ × (5 + 6 + 7) = 9 cm

Sol.590.(c)



∠QAM = ∠QBA = 58° (alternate segment)
∠QBN = ∠QAB = 50°(alternate segment)
∠AQB = 180° - 58° - 50° = 72°
∠AOB = 2 × 72° = 144°
∠APB = 180° - 144° = 36°

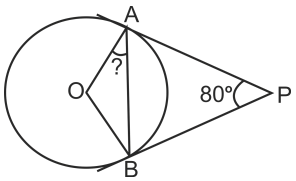
Sol.591.(c)



$\frac{Area\ of\ ADC}{Area\ of\ ABD}$ = $\frac{4x}{3x}$ (triangles with same height)
⇒ 3x = 5 unit ⇒ x = $\frac{5}{3}$ unit
$Area\ of\ ADC$ = 4x = 4 × $\frac{5}{3}$ = $\frac{20}{3}$ unit

$\frac{Area\ of\ ACE}{Area\ of\ ECD}$ = $\frac{2y}{3y}$ (Triangles with the same base) ⇒ 5 y = $\frac{20}{3}$ unit
$Area\ of\ ECD$ = 3y = 4 unit
$\frac{Area\ of\ ECD}{Area\ of\ ABE}$ = $\frac{4}{2}$ = 2 : 1

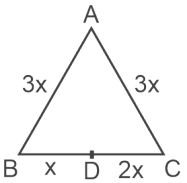
Sol.592.(b)



∠AOB = 180° - 80° = 100°
∠OAB +∠OBA = 180° - 100° = 80° ,
(∠OAB = ∠OBA) ⇒ ∠OAB = 40°

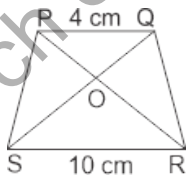
Sol.593.(c)
$\frac{Area\ of\ \Delta ABC}{Area\ of\ \Delta DEF} = (\frac{height\ of\ \Delta ABC}{height\ of\ \Delta DEF})^2$
$\sqrt{\frac{100}{81}} = \frac{x}{6.3} \Rightarrow \frac{10}{9} = \frac{x}{6.3}$ ⇒ x = 7 cm

Sol.594.(d)



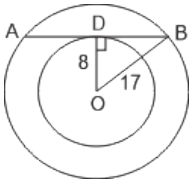
Let BC = 3x ⇒ BD = x, DC = 2x
In an equilateral triangle.
As we know, $AD^2 = BC^2 - BD \times DC$
⇒ $25 \times 7 = 9x^2 - 2x^2 \Rightarrow x^2 = 25 \Rightarrow x = 5$
Side of the triangle = 3 × 5 =15

Sol.595.(a)



ΔPOQ ~ΔSOR
area(ΔPOQ) : area(ΔSOR)
= $PQ^2 : SR^2$ = 16 : 100 = 4 : 25

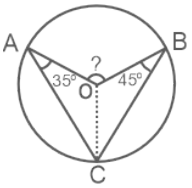
Sol.596.(a)



In triangle DOB (∠D is of 90°)
$DB^2 = \sqrt{17^2 - 8^2} = 15^2$
DB = 15 cm
So, AB = 30cm

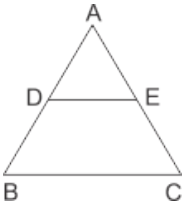
Sol.597.(c) Hypotenuse = $\sqrt{12^2 + 5^2}$= 13
Inradius = $\frac{P+B-H}{2}$ = $\frac{12+5-13}{2}$ = 2

Sol.598.(d)



∠OCA = ∠OAC = 35°
∠OCB = ∠OBC = 45°
∠ACB = 35° + 45° = 80°
∠AOB = 2 × 80° = 160°

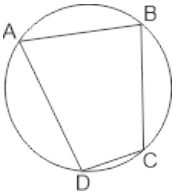
Sol.599.(c)



DE ∥ BC
△ADE ~△ABC
$\frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC} = \frac{1}{2}$
AD = AE = DE = 1 unit
AB = AC = BC = 2 unit
CE = AC - AE = 1 unit
AD + CE + BC = 30 cm
4 unit = 30 cm
1 unit = 7.5 cm
Perimeter of BCED = DB + DE + EC + BC
= 5 unit = 37.5 cm

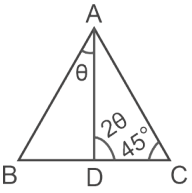
Sol.600.(b)
Three angles are (60° - d), 60°, (60° + d)
Difference between largest and smallest angle = 2d
⇒ 2d = 50°⇒ d = 25°
Largest angle = 60° + 25° = 85°

Sol.601.(c)



Let ∠C = x then ∠A = 3x
And ∠B = y then ∠D = 2y
∠A + ∠C = 180° so, ∠C = 45°
∠B + ∠D = 180° so, ∠D = 120°
Required difference = 120° - 45° = 75°

Sol.602.(a)

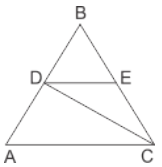


Let ∠BAD = θ , ∠ADC = 2θ
∠C = 45°, ∠BAC = 77°
∠ABC = 180° - 77° - 45° = 58°
58° + θ = 2θ (By external angle theorem)
θ = 58°, ∠ADB = 180° - 116° = 64°

Sol.603.(c)

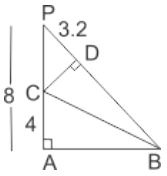
Search on TG: @apna_pdf

Search on Telegram @apna_pdf



BE = EC (E is midpoint of CB)
In ΔCBD, E is the midpoint of BC so it divides the triangle into two equal areas
So, Area of ΔBDE = Area of ΔDEC = 8
Hence, Area of ΔBCD = 8 + 8=16
Now, In ΔABC , D is the mid point of AB so it divides ΔABC in two equal areas.
So, Area of ΔBCD = Area of ΔADC = 16
So, Area of ADEC = Area of ΔADC + Area of ΔDEC = 16 + 8 = 24 cm^2

Sol.604.(d)

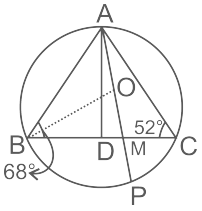


$\Delta APB \sim \Delta DPC$ (∠P is common and ∠D and ∠A are of 90°)
$\frac{PD}{PC} = \frac{PA}{PB}$ ⇒ PB = $\frac{8 \times 4}{3.2}$ = 10
BD = PB - DB = 10 - 3.2 = 6.8

Sol.605.(d) In a cyclic quadrilateral, the sum of opposite angles is equal to 180°.
∠A + ∠C = 180°, ∠B + ∠D = 180°
x° + 2x° = 180° ⇒ 3x° = 180° ⇒ x° = 60°
5y° + y° = 180°⇒ 6y° = 180° ⇒ y° = 30°
(3x - y) = 180 - 30 = 150°

Sol.606.(a) Let AB = x, then AC = 2x + 4 and BC = 3x - 4
According to the question,
x + 2x + 4 + 3x - 4 = 60 ⇒ x = 10
AB = 10, AC = 24, BC = 26
It is a right angle triangle,
Area = $\frac{1}{2} \times 24 \times 10$ = 120 cm^2

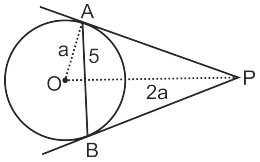
Sol.607.(b)



∠BAC = 180° - 68° - 52° = 60°
In triangle DAC,
∠DAC = 180° - 90° - 52° = 38°
Now, join OB
∠AOB = 2 × ∠C = 104°
∠OAB = OBA = $\frac{180 - 104}{2}$ = 38°
Now, ∠BAD = 180° - 90° - 68° = 22°
∠DAP = 38° - 22° = 16°
Short trick :-
∠DAP = ∠B - ∠C = 68° - 52° = 16°

Sol.608.(a) Area of equilateral triangle
= $\frac{\sqrt{3}}{4} \times a^2 = 9\sqrt{3} \Rightarrow a^2 = 36 \Rightarrow$ a = 6

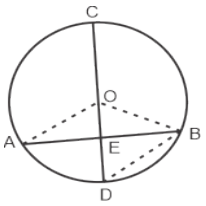
Sol.609.(a)



In ΔOAP, ∠A is of 90°
So, PA = $\sqrt{3}$a
Area of the ΔOAP ⇒
$\frac{1}{2} \times a \times \sqrt{3}a = \frac{1}{2} \times 2a \times 5 \Rightarrow \frac{\sqrt{3}}{2}a = 5$
⇒ a = $\frac{10}{\sqrt{3}}$, So $\sqrt{3}$a = 10cm.

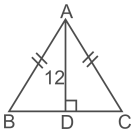
Sol.610.(b) $\frac{AB}{DF} = \frac{BC}{DE} = \frac{AC}{EF}$
Write it as $\frac{BA}{DF} = \frac{BC}{DE} = \frac{CA}{EF}$
On comparing the corresponding terms
ΔBCA ~ ΔDEF

Sol.611.(a)



∠AOD = 42°, ∠BOC = 104°
∠ABD = $\frac{1}{2}$∠AOD (Angle subtended by an arc at the circumference is half of angle subtended at the center)
∠ABD = 21° , ∠BDC = $\frac{1}{2}$∠BOC = 52°
∠AED = ∠ABD + ∠BDC = 73° (External angle theorem)

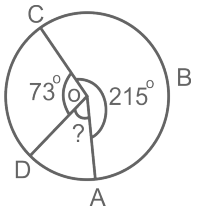
Sol.612.(c)



Let AB = AC = x
We know, In an isosceles triangle, perpendicular, median and angle bisector are the same line. and AD is median also.
Let, BD = DC = a
a + a + x + x = 36
2(x + a) = 36 ⇒ x + a = 18
Triangle ADC is a right angled triangle,
AD = 12 cm (given)
Go through hit and trial
x = 13 and a = 5 (because it makes a triplet) BD = DC = 5 cm and BC = 10 cm

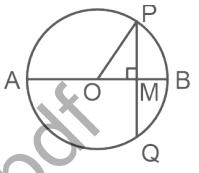
Sol.613.(d) Circumradius(R) = 12.5
It means, Hypotenuse = 25 cm
Inradius(r) = 3 cm
We know, 7, 24 and 25 are triplets.
So , Area of triangle = $\frac{1}{2} \times 7 \times 24$ = 84
Short trick :-
Area = r^2 + 2Rr
= 9 + 2 × 12.5 × 3 = 9 + 75 = 84 cm^2

Sol.614.(d)



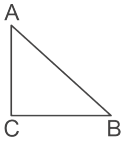
Let , o is the centre of circle .
$\angle AOC$ = 215° and $\angle DOC$ = 73°
Now,
$\angle AOC + \angle DOC + \angle DOA$ = 360°
$\angle DOA$ = 360° - 288° = 72°

Sol.615.(d)



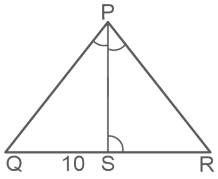
AB = 18 , AM = $\frac{5}{9} \times 18$ = 10, AO = 9
OM = 10 - 9 = 1 cm
In triangle OMP
PM = $\sqrt{OP^2 - OM^2} = \sqrt{81 - 1}$ =4$\sqrt{5}$
PQ = 2 × 4$\sqrt{5}$ = 8$\sqrt{5}$ cm

Sol.616.(c)



We know that a right angle isosceles triangle has ratio of its side as 1 : 1 : $\sqrt{2}$
Let, sides of right angle isosceles triangle = a, a, $\sqrt{2}$a
So perimeter = a(2 + $\sqrt{2}$) = 15($\sqrt{2}$ + 1)
⇒ a$\sqrt{2}$($\sqrt{2}$ + 1) = 15($\sqrt{2}$ + 1) ⇒ a = $\frac{15}{\sqrt{2}}$
So, Area = $\frac{1}{2} \times a \times a$
⇒ $\frac{1}{2} \times \frac{15}{\sqrt{2}} \times \frac{15}{\sqrt{2}} = \frac{225}{4}$ = 56.25

Sol.617.(b)

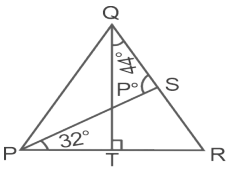


QS = 10 cm, QR = 18 cm
SR = (18 - 10) cm = 8 cm
In △PQR and △SPR
∠QPR = ∠PSR , ∠PRQ = ∠PRS
△PQR ~ △SPR
$\frac{PR}{QR} = \frac{SR}{PR} \Rightarrow PR^2$= 8 ×18 ⇒ PR = 12

Sol.618.(d)

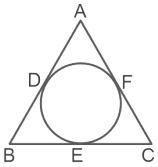
Search on TG: @apna_pdf

Search on Telegram @apna_pdf



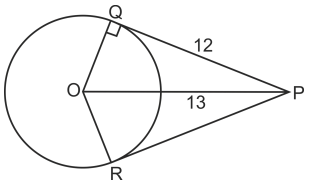
∠ QRT = 180° - (90° + 44°)
∠ QRT = 46°
P = ∠ QRT + ∠SPR = 32° + 46° = 78°

Sol.619.(d)



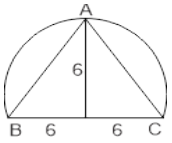
AD = AF (Tangents from any point to circle are equal)
DB = BE and EC = FC
Perimeter of ABC = 12 + 8 + 10 = 30 cm
Semi perimeter of ABC = 15 cm
AD = (15 - BC) = 15 - 8 = 7
CE = (15 - AB) = (15 - 12) = 3
Ratio = 7 : 3

Sol.620.(d)



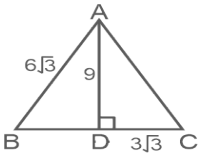
In right angled triangle PQO
OQ = $\sqrt{PO^2 - PQ^2}$ = $\sqrt{13^2 - 12^2}$ = 5
Area of triangle PQO
= $\frac{1}{2}$ × PQ × OQ = 30
area of the quadrilateral PQOR =
2 × Area of triangle PQO = 60

Sol.621.(a)



Area of the largest triangle
= $\frac{1}{2}$ × 12 × 6 = 36 cm²

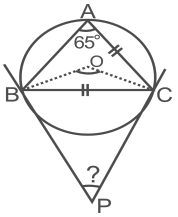
Sol.622.(d)



In ΔADC , tanA = $\frac{3\sqrt{3}}{9}$ = $\frac{1}{\sqrt{3}}$
∠DAC = 30° ⇒ In ΔABD,
cosA = $\frac{9}{6\sqrt{3}}$ = $\frac{\sqrt{3}}{2}$
∠BAD = 30° ⇒ ∠BAC = 30° + 30° = 60°
Alternate method :-
BD² = (6√3)² - 9² ⇒ BD = 3√3 = DC
BC = 3√3 + 3√3 = 6√3

In triangle BAC, AD works as a median because it divides BC into two equal parts, that means AB = AC. But here the length of all sides are equal.
I.e AB = BC = AC
So, triangle ABC is an equilateral triangle.
Therefore, ∠BAC = 60°

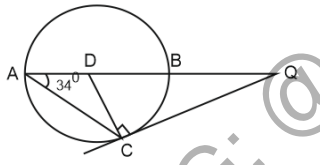
Sol.623.(b)



∠COB = 2 × 65° = 130°(Angle at centre is double the angle on major arc)
In the quadrilateral OCPB(∠C and ∠B are of 90°) ⇒ ∠BPC = 180° - 130° = 50°

Sol.624.(b) Concept : Equating area on both the sides of the triangl
$\frac{1}{2} \times 9.6 \times 12 = \frac{1}{2} \times 12.8 \times h$
⇒ h = 9 m

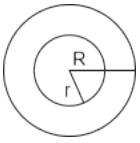
Sol.625.(c)



∠DCQ = 90° (angle made by tangent from the center is always 90°)
∠DAC = ∠DCA = 34° ⇒ ∠QDC = 68°
∠CQA = 180° - 68° - 90° = 22°

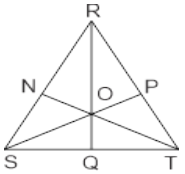
Sol.626.(a) perimeter of an isosceles triangle = 360 cm
Let the equal side be 'a' cm and its base is (a - 30) cm.
Now, a + a + a - 30 = 360 , a = 130 cm
s = $\frac{360}{2}$ = 180
Area of the triangle
= $\sqrt{180 \times 50 \times 50 \times 80} = 6000\ cm^2$
= $\frac{6000}{10000} = 0.6\ m^2$

Sol.627.(b)



Let 'R' is the radius of a big circle and 'r' is the radius of a small circle.
R + r = 286 .....(i) (given)
πR² - πr² = 50336 .....(given)
⇒ $\frac{22}{7}$(R² - r²) = 50336 ⇒ (R - r) (R + r)
= 2288 × 7 ⇒ (R - r) = $\frac{2288}{286}$ × 7
= 56 .....(ii)
By solving equ^n (i) and (ii)
(R + r) + (R - r) = 286 + 56 = 342
R = 171, r = 115

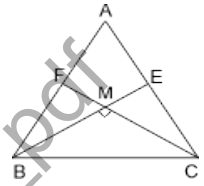
Sol.628.(c)



Median divides a triangle into 6 equal triangles.
6 unit = 48 ⇒ 2 unit = 16
area of quadrilateral SQON = 16 cm²

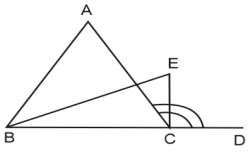
Sol.629.(d) Let radius of new ground = R
$\pi(42^2 + 35^2) = \pi R^2$
⇒ R = $\sqrt{2989}$ m

Sol.630.(b)



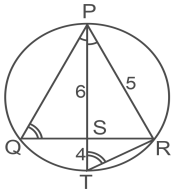
We know,
Centroid divides median in 2 : 1
BM = 6 cm, ME = 3 cm
CM = $\frac{26}{3}$, MF = $\frac{13}{3}$
Area of ΔABC = 3 × Area of ΔMBC
= 3 × $\frac{1}{2}$ × 6 × $\frac{26}{3}$ = 78 cm²

Sol.631.(b) Short-Trick:



∠BAC = 2 × 35° = 70°
In triangle ABC ⇒ ∠ABC = ∠ACB
= $\frac{1}{2}$ (180° - 70°) = 55°

Sol.632.(b)

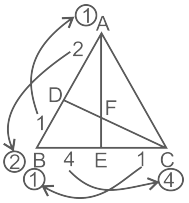


In △PQS and △PTR
∠PQS = ∠PTR
∠QPS = TPR
△PQS ~△PTR
$\frac{PQ}{PT} = \frac{PS}{PR} \Rightarrow \frac{PQ}{10} = \frac{6}{5}$ ⇒ PQ = 12 cm
Short trick:-
$PQ \times PR + PT \times ST = PT^2$
⇒ PQ × 5 + 10 × 4 = 10 × 10
⇒ 5PQ = 60 ⇒ PQ = 12

Sol.633.(c) Short-Trick:

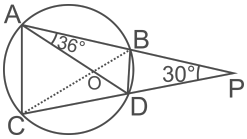
Search on TG: @apna_pdf

Search on Telegram @apna_pdf



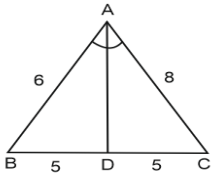
By mass point geometry
DF = 8 unit, FC = 3 unit
FD : FC = 8 : 3

Sol.634.(c) ∠DAP = 36° (given),
∠APC = 30° (given)



∠ ADC = ∠ DAP + ∠DPA (exterior angle property)
∠ ADC = 66°
∠ACD = 90° (Angle subtended by the diameter at the circumference of the circle is 90°) ⇒ In triangle ACD
∠CAD = 180° - (90° + 66°) = 24°
∠CBD = ∠ CAD = 24° (Angle at the circumference of the circle by same chord are equal)

Sol.635.(d)



As we can see (6, 8, 10) is a pythagorean triplet so Triangle BAC is right angled at A so median AD drawn to BC will be equal to BD
AD = BD = DC(median theorem) always holds in a right angled triangle

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Algebra

Important Formulas:-

- $(a+b)^2 = a^2 + b^2 + 2ab$
- $(a-b)^2 = a^2 + b^2 - 2ab$
- $(a+b)^2 + (a-b)^2 = 2(a^2+b^2)$
- $(a+b)^2 - (a-b)^2 = 4ab$
- $(a+b)^2 - 4ab = (a-b)^2$
- $a^2 - b^2 = (a+b)(a-b)$
- $a^4 - b^4 = (a^2+b^2)(a+b)(a-b)$
- $a^2 + \frac{1}{a^2} = (a+\frac{1}{a})^2 - 2$

  $= (a-\frac{1}{a})^2 + 2$
- $a^2 + b^2 + c^2 - ab - bc - ca =$

  $\frac{1}{2}\{(a-b)^2 + (b-c)^2 + (c-a)^2\}$

  If $a = b = c = k$ then,

  $a^2 + b^2 + c^2 = ab + bc + ca$,
- $(a+b)^3 = a^3 + b^3 + 3ab(a+b)$
- $(a-b)^3 = a^3 - b^3 - 3ab(a-b)$
- $a^3 + b^3 = (a+b)(a^2+b^2-ab)$
- $a^3 - b^3 = (a-b)(a^2+b^2+ab)$
- $a^3 + \frac{1}{a^3} = \left(a+\frac{1}{a}\right)^3 - 3\left(a+\frac{1}{a}\right)$
- $a^3 - \frac{1}{a^3} = \left(a-\frac{1}{a}\right)^3 + 3\left(a-\frac{1}{a}\right)$
- $a^3 + b^3 + c^3 - 3abc = (a+b+c)$

  $(a^2+b^2+c^2-ab-bc-ca)$

  Or, $\frac{1}{2}(a+b+c)\{(a-b)^2 + (b-c)^2$

  $+ (c-a)^2\}$ Or,

  $(a+b+c)[(a+b+c)^2 - 3(ab+bc+ca)]$

  Or, $\frac{1}{2}(a+b+c)$

  $\left[3(a^2+b^2+c^2) - (a+b+c)^2\right]$
- If $(a+b+c) = 0$, then

  $a^3 + b^3 + c^3 = 3abc$
- If $(a-b-c) = 0$, then

  $a^3 - b^3 - c^3 = 3abc$
- If $(a+b-c) = 0$, then

  $a^3 + b^3 - c^3 = -3abc$
- If $a^3 + b^3 + c^3 = 3abc$,

  then either a = b = c or a + b + c = 0
- $(a+b+c)^2 =$

  $a^2 + b^2 + c^2 + 2(ab+bc+ac)$
- $(a+b+c)^3 = a^3 + b^3 + c^3 +$

  $3(a+b)(b+c)(a+c)$
- $a^4 + a^2b^2 + b^4 = (a^2+ab+b^2)$

  (a^2-ab+b^2)
- If $(x^2+y^2+z^2) = 0$,

  then $x = 0, y = 0, z = 0$
- If $x + \frac{1}{x} = a$, then $x^3 + \frac{1}{x^3} = a^3 - 3a$
- If $x - \frac{1}{x} = a$, then $x^3 - \frac{1}{x^3} = a^3 + 3a$
- If $x + \frac{1}{x} = a$, then $x^2 + \frac{1}{x^2} = a^2 - 2$
- If $x - \frac{1}{x} = a$, then $x^2 + \frac{1}{x^2} = a^2 + 2$
- If $x + \frac{1}{x} = a$, then $x - \frac{1}{x} = \sqrt{a^2 - 4}$
- If $x - \frac{1}{x} = a$, then $x + \frac{1}{x} = \sqrt{a^2 + 4}$
- If $x + \frac{1}{x} = a$, then

  $x^2 - \frac{1}{x^2} = a\sqrt{a^2 - 4}$
- If $x - \frac{1}{x} = a$, then

  $x^2 - \frac{1}{x^2} = a\sqrt{a^2 + 4}$
- If $x + \frac{1}{x} = a$, then

  $x^4 + \frac{1}{x^4} = (a^2 - 2)^2 - 2$
- If $x - \frac{1}{x} = a$, then

  $x^4 + \frac{1}{x^4} = (a^2 + 2)^2 - 2$
- If $x + \frac{1}{x} = a$, then

  $x^5 + \frac{1}{x^5} = (x^2 + \frac{1}{x^2})(x^3 + \frac{1}{x^3}) - (x + \frac{1}{x})$
- If $x - \frac{1}{x} = a$, then

  $x^5 - \frac{1}{x^5} = (x^2 + \frac{1}{x^2})(x^3 - \frac{1}{x^3}) - (x - \frac{1}{x})$
- If $x + \frac{1}{x} = \pm\sqrt{3}$, then $x^6 = -1$
- If $x + \frac{1}{x} = 1$, then $x^3 = -1$
- If $x + \frac{1}{x} = -1$, then $x^3 = 1$
- If $x + \frac{1}{x} = 2$, then $x = 1$, similarly if

  $x + \frac{1}{x} = -2$, then $x = -1$

Some Special Case :-

- if $a^2 - ab + b^2 = 0$ then $a^3 + b^3 = 0$
- if $\frac{1}{a} - \frac{1}{b} = \frac{1}{a-b}$ then $a^3 + b^3 = 0$
- if $\frac{1}{b} + \frac{1}{a} = \frac{1}{a+b}$ then $a^3 - b^3 = 0$
- if $\frac{a}{b} + \frac{b}{a} = -1$ then $a^3 - b^3 = 0$
- if $\frac{a}{b} + \frac{b}{a} = 1$ then $a^3 + b^3 = 0$
- if $a^2 + a + 1 = 0$ then $a^3 - 1 = 0$ or $a^3 = 1$
- if $ab(a+b) = 1$ then $\frac{1}{a^3 b^3} - a^3 - b^3 = 3$

- Dividendo – Componendo rule:

  If $\frac{a}{b} = \frac{c}{d}$ then, $\frac{a+b}{a-b} = \frac{c+d}{c-d}$

  If $\frac{a+b}{a-b} = \frac{a}{b}$ then $\frac{c}{d} = \frac{c+d}{c-d}$
- If $(x-a)^2 + (y-b)^2 + (z-c)^2 = 0$

then by putting $x = a, y = b, z = c$ in an expression we can find the value of the expression.

- If $x + y = a$, then xy will be maximum when $x = y$.
- If $xy = a$, then $(x+y)$ will be minimum when $x = y = \sqrt{a}$

Law of Indices :

(1) $a^m \times a^n = a^{m+n}$ (2) $\frac{a^m}{a^n} = a^{m-n}$

(3) $(a^m)^n = a^{mn}$ (4) $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$

(5) $a^0 = 1$ (6) $a^{\frac{1}{n}} = \sqrt[n]{a}$

If a is negative number and n is an odd number then $(-a)^n = -a^n$

Laws of surds :

(1). $\sqrt[n]{a} = a^{\frac{1}{n}}$

(2). $\sqrt[n]{a} \times \sqrt[n]{b} = \sqrt[n]{ab}$

(3). $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$

(4). $\sqrt[m]{\sqrt[n]{a}} = \sqrt[mn]{a}$

(5). $(\sqrt[n]{a})^m = \sqrt[n]{a^m}$

Ex.1. If $3\sqrt{5}$ is given, find out the rationalizing factor.

Sol : $3\sqrt{5} \times \sqrt{5} = 3 \times 5 = 15$, so the rationalizing factor of $3\sqrt{5}$ is $\sqrt{5}$.

Rules for making a perfect square :

1. Middle term = $\pm\sqrt{First\ term \times Third\ term}$
2. First term = $\frac{(Middle\ term)^2}{4 \times Third\ term}$
3. Third term = $\frac{(Middle\ term)^2}{4 \times First\ term}$

Quadratic and cubic equation :

- For quadratic equation : $ax^2 + bx + c = 0$, then

  Sum of its zeros $(\alpha + \beta) = -\frac{b}{a}$

  Product of its zeros $(\alpha\beta) = \frac{c}{a}$

  where, α amd β are roots of a

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

given quadratic equation.

- **For cubic equation :**
  $ax^3 + bx^2 + cx + d = 0$, then
  Sum of its zeros $(\alpha+\beta+\gamma) = -\frac{b}{a}$
  Product of its zeros $(\alpha\beta\gamma) = -\frac{d}{a}$
  Sum of its zeros taken two at a time $(\alpha\beta + \beta\gamma + \gamma\alpha) = \frac{c}{a}$
  where α, β and γ are roots of a given cubic equation.

Types of solution and their conditions :-

Types of solutions	Conditions
Unique solutions	$\frac{a1}{a2} \neq \frac{b1}{b2}$
No solutions	$\frac{a1}{a2} = \frac{b1}{b2} \neq \frac{c1}{c2}$
Infinite number of solutions	$\frac{a1}{a2} = \frac{b1}{b2} = \frac{c1}{c2}$

Variety Questions

Q.1. If $x = \sqrt{6} + 2$ and $y = \sqrt{6} - 2$, then what is the value of $(\frac{x}{y} + \frac{y}{x})^2 - 3$?
SSC CGL 26/09/2024 (2nd Shift)
(a) 42 (b) 97 (c) 35 (d) 22

Q.2. 'x' varies directly with the cube of 'y' and inversely with the square of 'z'. If $x = \frac{1}{36}$ when y = 2 and z = 3, then what is the value of 800x when y = 3 and z = 5 ?
SSC CGL 25/09/2024 (3rd Shift)
(a) $\frac{9}{800}$ (b) 27 (c) $\frac{800}{9}$ (d) 9

Q.3. If 0.4x + 0.16y = 1.7 and 0.3x + 0.12y = 3.4, then which of the following is correct?
SSC CGL 11/09/2024 (2nd Shift)
(a) The system has finitely many solutions but not unique.
(b) The system has infinitely many solutions.
(c) The system has no solution.
(d) The system has unique solution.

Q.4. If the equations 4x + (k − 2)y + 3 = 0 and (k − 2)x + 9y − 5 = 0 (k > 0) are parallel, then find the value of $k^2 + 6$.
SSC CGL 09/09/2024 (3rd Shift)
(a) 68 (b) 70 (c) 72 (d) 64

Q.5. If the polynomial $(2x^3 + ax^2 + 3x - 5)$ and $(x^3 + x^2 - 2x + a)$ leave the same remainder when divided by $(x-2)$, find the remainder.
SSC CPO 28/06/2024 (3rd Shift)
(a) 4 (b) 3 (c) 2 (d) 5

Q.6. Simplify the following expression: $(x + y)(x - y)(x^2 + y^2)(x^4 + y^4)(x^8 + y^8)(x^{16} + y^{16})$
Graduate Level 26/06/2024 (Shift - 3)
(a) $x^{32} - y^{32}$ (b) $x^{128} - y^{128}$
(c) $x^{64} - y^{64}$ (d) $x^{256} - y^{28}$

Q.7. If $x^4 + y^4 = x^2y^2$, then the value of $x^6 + y^6$ is :
SSC CPO 04/10/2023 (1st Shift)
(a) 1 (b) 3 (c) 2 (d) 0

Q.8. If $ax + by = 1$ and $bx + ay = \frac{2ab}{a^2 + b^2}$, then the value of x (in terms of a and b) is:
SSC CHSL 11/08/2023 (4th Shift)
(a) $\frac{2b}{a^2 + b^2}$ (b) $\frac{a}{a^2 + b^2}$
(c) $\frac{b}{a^2 + b^2}$ (d) $\frac{2a}{a^2 + b^2}$

Q.9. If $x = (7 + 3\sqrt{5})$ then find the value of $x^2 + \frac{1}{x^2}$
SSC CHSL 09/08/2023 (4th Shift)
(a) $\frac{580 + 315\sqrt{5}}{8}$ (b) $\frac{799 + 328\sqrt{5}}{8}$
(c) $\frac{799 + 315\sqrt{5}}{12}$ (d) $\frac{799 + 315\sqrt{5}}{8}$

Q.10. If $x^2 - 11x + 1 = 0$ what is the value of $x^8 - 14159x^4 + 11$?
SSC CHSL 08/08/2023 (1st Shift)
(a) 9 (b) 10 (c) 12 (d) 11

Q.11. Simplify:
$$\frac{(1-m)^3 + (m-n)^3 + (n-1)^3}{12(1-m)(m-n)(n-1)} = ?$$
SSC CHSL 07/08/2023 (3rd Shift)
(a) $\frac{1}{2}$ (b) $\frac{2}{3}$ (c) $\frac{3}{2}$ (d) $\frac{1}{4}$

Q.12. For what positive value of k, the equation $3x^2 + 2kx + 3 = 0$ has real and equal roots?
SSC CHSL 07/08/2023 (2nd Shift)
(a) 12 (b) 1 (c) 3 (d) 9

Q.13. Simplify the following expression.
$$\frac{(a^2 + b^2 - c^2)^2 - (a^2 - b^2 + c^2)^2}{b^2 - c^2}$$
SSC CHSL 04/08/2023 (4th Shift)
(a) $3a^2$ (b) $4a^2$ (c) $5a^2$ (d) $2a^2$

Q.14. Find the value of $(a^3 + b^3 + c^3 - 3abc)$, where a = 335, b = 215 and c = 180.
SSC CHSL 04/08/2023 (3rd Shift)
(a) 14472250 (b) 15421320
(c) 14502230 (d) 15452630

Q.15. Simplify the expression :
$$\frac{(u-v)^3 + (v-w)^3 + (w-u)^3}{(u^2 - v^2)^3 + (v^2 - w^2)^3 + (w^2 - u^2)^3}$$
SSC CHSL 04/08/2023 (1st Shift)
(a) $\frac{1}{(u+v)(v+w)(w+u)}$ (b) 1
(c) $\frac{3}{(u+v)(v+w)(w+u)}$ (d) 0

Q.16. If $x^3 = 270 + y^3$ and x = (6 + y), then What is the value of (x + y)?
(given that x > 0 andy > 0)
SSC CHSL 03/08/2023 (4th Shift)
(a) $2\sqrt{3}$ (b) $\sqrt{3}$ (c) $4\sqrt{3}$ (d) $4\sqrt{2}$

Q.17. If p + q + r = 0 , then what is the simplified value of the expression
$$\left(\frac{p^2}{p^2 - qr} + \frac{q^2}{q^2 - pr} + \frac{r^2}{r^2 - pq}\right)$$
SSC CHSL 03/08/2023 (2nd Shift)
(a) 0 (b) 2 (c) 1 (d) − 1

Q.18. If $(x + \frac{1}{x}) = 5\sqrt{2}$, and x > 1, what is the value of $(x^6 - \frac{1}{x^6})$?
SSC CHSL 02/08/2023 (2nd Shift)
(a) $22970\sqrt{23}$ (b) $23030\sqrt{23}$
(c) $23060\sqrt{23}$ (d) $22960\sqrt{23}$

Q.19. The difference between the cubes of two given natural numbers is 6272, while the positive difference between the two given numbers is 8. What is the sum of the cubes of the two given numbers?
SSC CGL 27/07/2023 (1st shift)
(a) 9728 (b) 9684 (c) 8000 (d) 9600

Q.20. If a = 101, b = 102 and c = 103, then $a^2 + b^2 + c^2 - ab - bc - ca$ = _____.
SSC CGL 24/07/2023 (1st shift)
(a) 2 (b) 4 (c) 3 (d) 6

Q.21. If $(x + \frac{1}{x}) = 5$, and x > 1, what is the value of $(x^8 - \frac{1}{x^8})$?
SSC CGL 18/07/2023 (3rd shift)
(a) $60605\sqrt{21}$ (b) $60615\sqrt{21}$
(c) $60705\sqrt{21}$ (d) $60725\sqrt{21}$

Q.22. If $X - \frac{1}{X} = -6$, What will be the value of $X^5 - \frac{1}{X^5}$?
SSC CGL 18/07/2023 (2nd shift)
(a) − 8898 (b) − 8896
(c) − 8886 (d) − 8892

Q.23. If $(x^2 + \frac{1}{x^2}) = 7$, and 0 < x < 1, find the value of $x^2 - \frac{1}{x^2}$.
SSC CGL 17/07/2023 (1st shift)
(a) $3\sqrt{5}$ (b) $4\sqrt{3}$ (c) $-4\sqrt{3}$ (d) $-3\sqrt{5}$

Q.24. If x > 0, and $x^4 + \frac{1}{x^4} = 254$, what is

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

the value of $x^5 + \frac{1}{x^5}$?
SSC CGL 14/07/2023 (4th shift)
(a) $717\sqrt{2}$ (b) $723\sqrt{2}$ (c) $720\sqrt{2}$ (d) $726\sqrt{2}$

Q.25. If $\frac{2x}{x+2} + \frac{1}{2x+4} - \frac{12-x}{2x^2+4x} = a + \frac{b}{x}$, where a and b are integers, then the value of ab = _____ .
Graduate Level 27/06/2023 (Shift - 4)
(a) 3 (b) - 6 (c) 6 (d) - 3

Q.26. If $6^X = 3^Y = 2^z$, then what is the value of $\frac{1}{y} + \frac{1}{z} - \frac{1}{x}$?
SSC CHSL 20/03/2023 (2nd Shift)
(a) 1 (b) 0 (c) 3 (d) 6

Q.27. For what value of m will the system of equations 17x + my + 102 = 0 and 23x + 299y + 138 = 0 have an infinite number of solutions?
SSC CGL Tier II (02/03/2023)
(a) 221 (b) 223 (c) 220 (d) 219

Q.28. If a + b + c = 5, $a^3 + b^3 + c^3 = 85$ and abc = 25, then find the value of $a^2 + b^2 + c^2 - ab - bc - ca$.
SSC CGL 13/12/2022 (4th Shift)
(a) 2 (b) 4 (c) 6 (d) 8

Q.29. If α , β are the roots of $6x^2 + 13x + 7 = 0$, then the equation whose roots are α^2, β^2 is:
SSC CGL 12/12/2022 (4th Shift)
(a) $36x^2 - 87x + 49 = 0$
(b) $36x^2 - 85x + 49 = 0$
(c) $36x^2 - 85x - 49 = 0$
(d) $36x^2 + 87x - 49 = 0$

Q.30. If x = 222, y = 223 and z = 224, then find the value of $x^3 + y^3 + z^3 - 3xyz$.
SSC CGL 12/12/2022 (4th Shift)
(a) 2007 (b) 2004 (c) 2006 (d) 2005

Q.31. What is the value of
$(K - \frac{1}{K})(K^2 + \frac{1}{K^2})(K^4 + \frac{1}{K^4})(K^8 + \frac{1}{K^8})(K^{16} + \frac{1}{K^{16}})(K^{32} + \frac{1}{K^{32}})$?
SSC CGL 06/12/2022 (3rd Shift)
(a) $\frac{K^{64} - \frac{1}{K^{64}}}{K + \frac{1}{K}}$ (b) $\frac{K^{32} - \frac{1}{K^{32}}}{K - \frac{1}{K}}$
(c) $\frac{K^{32} - \frac{1}{K^{32}}}{K + \frac{1}{K}}$ (d) $\frac{K^{32} + \frac{1}{K^{32}}}{K + \frac{1}{K}}$

Q.32. Which of the following statements is correct ?
I. The value of $100^2 - 99^2 + 98^2 - 97^2 + 96^2 - 95^2 + 94^2 - 93^2 + ... + 2^2 - 1^2$ is 5050.
II. If $8x + \frac{8}{x} = -16$ and x < 0, then the value of $x^{197} + x^{-197}$ is 2.
SSC CGL 02/12/2022 (4th Shift)
(a) Only I (b) Only II
(c) Both I and II (d) Neither I nor II

Q.33. If $mx^m - nx^n = 0$ then what is the value of $\frac{1}{x^m + x^n} + \frac{1}{x^m - x^n}$ in terms of x^n ?
SSC CHSL 24/05/2022 (Morning)
(a) $\frac{2mn}{x^n(n^2 + m^2)}$ (b) $\frac{2m}{x^n(m^2 - n^2)}$
(c) $\frac{2mn}{x^n(n^2 - m^2)}$ (d) $\frac{2mn}{x^n(m^2 - n^2)}$

Q.34. $a^2 + b^2 = 25$, $x^2 + y^2 = 17$ and ax + by = 8 then find the value of (ay - bx)
SSC CHSL 13/4/2021 (Afternoon)
(a) 33 (b) 25 (c) 21 (d) 19

Q.35. If $2 = x + \frac{1}{1 + \frac{1}{5 + \frac{1}{2}}}$, then the value of x is equal to:
SSC CGL Tier II (18/11/2020)
(a) $\frac{14}{13}$ (b) 1 (c) $\frac{15}{13}$ (d) $\frac{13}{15}$

Q.36. If $x^3 + 2x^2 - ax - b$ is exactly divisible by $(x^2 - 1)$, then the values of a and b are:
SSC CHSL 21/10/2020 (Afternoon)
(a) a = -1, and b = 2 (b) a = 1 and b = -2
(c) a = 1 and b = 2 (d) a = 2 and b = 2

Q.37. If $x = \sqrt[3]{5} + 2$, then the value of $x^3 - 6x^2 + 12x - 12$ is equal to:
SSC CHSL 21/10/2020 (Morning)
(a) 0 (b) 2 (c) 1 (d) - 1

Q.38. (ax + by) is a factor of:
SSC CHSL 16/10/2020 (Afternoon)
(a) $a^2x^2 + 2ab - b^2y^2$
(b) $a^2x^2 + 2abxy + b^2y^2$
(c) $a^2x^3 + 2abx + b^2y^2x$
(d) $a^2x^2 + 2ab + b^2y^2$

Q.39. If 'a' is a natural number, then $(7a^2 + 7a)$ is always divisible by:
SSC CHSL 16/10/2020 (Morning shift)
(a) 7 and 14 both (b) 7 only
(c) 14 only (d) 21 only

Q.40. The value of $(a^{\frac{2}{3}} + 2a^{\frac{1}{2}} + 3a^{\frac{1}{3}} + 2a^{\frac{1}{6}} + 1)(a^{\frac{1}{3}} - 2a^{\frac{1}{6}} + 1) - a^{\frac{1}{2}}(a^{\frac{1}{2}} - 2)$, when a = 7, is:
SSC CHSL 13/10/2020 (Morning)
(a) 7 (b) 0 (c) 1 (d) $\sqrt{7}$

Q.41. If a + b + c + d = 2, then the maximum value of –
(1 + a)(1 + b)(1 + c) (1 + d)
SSC CHSL 18/03/2020 (Afternoon)
(a) $\frac{91}{9}$ (b) $\frac{81}{16}$ (c) $\frac{63}{22}$ (d) $\frac{54}{13}$

Q.42. The coefficient of x^2 in $(2x + y)^3$ is:
SSC CGL 05/03/2020 (Evening)
(a) $12y^2$ (b) 12 (c) 12y (d) 8

Q.43. If $x^{2a} = y^{2b} = z^{2c} \neq 0$ and $x^2 = yz$, then the value of $\frac{ab + bc + ca}{bc}$ is:
SSC CGL 03/03/2020 (Morning)
(a) 3 (b) 3ac (c) 3bc (d) 3ab

Q.44. If x = 5.51, y = 5.52 and z = 5.57, then what is the value of $x^3 + y^3 + z^3 - 3xyz$?
SSC CPO 11/12/2019 (Evening)
(a) 5.146 (b) 51.46
(c) 0.05146 (d) 0.5146

Q.45.
The value of $\frac{1}{\sqrt{7 - 4\sqrt{3}}}$ is closest to:
SSC CPO 09/12/2019 (Evening)
(a) 4.1 (b) 4.2 (c) 1.2 (d) 3.7

Q.46. If (2x + 3y + 4)(2x +3y - 5) is equivalent to $(ax^2 + by^2 + 2hxy + 2gx + 2fy + c)$, then what is the value of {(g + f - c)/abh}
SSC CPO 09/12/2019 (Morning)
(a) $\frac{35}{432}$ (b) $\frac{19}{108}$ (c) $\frac{19}{316}$ (d) $\frac{37}{216}$

Q.47. $(4x^3y - 6x^2y^2 + 4xy^3 - y^4)$ can be expressed as:
SSC CPO 09/12/2019 (Morning)
(a) $(x - y)^4 - x^4$ (b) $(x + y)^4 - y^4$
(c) $(x + y)^4 - x^4$ (d) $x^4 - (x - y)^4$

Q.48. Let $x = \sqrt[6]{27} - \sqrt{6\frac{3}{4}}$ and $y = \frac{\sqrt{45} + \sqrt{605} + \sqrt{245}}{\sqrt{80} + \sqrt{125}}$, then the value of $x^2 + y^2$ is :
SSC CGL TIER II (13/09/2019)
(a) $\frac{223}{36}$ (b) $\frac{221}{36}$ (c) $\frac{221}{9}$ (d) $\frac{227}{9}$

Q.49. If $\sqrt{86 - 60\sqrt{2}} = a - b\sqrt{2}$, then what will be the value of $\sqrt{a^2 + b^2}$, correct to one decimal place ?
SSC CGL TIER II (11/09/2019)
(a) 8.4 (b) 8.2 (c) 7.8 (d) 7.2

Q.50. If $a = \sqrt{8} - \sqrt{7}$ and $a = \frac{1}{b}$, then $\frac{a^2 + b^2 - 3ab}{a^2 + ab + b^2}$ is equal to :
SSC CHSL 11/07/2019 (Evening)
(a) $\frac{27}{31}$ (b) $\frac{27}{32}$ (c) $\frac{29}{33}$ (d) $\frac{29}{31}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.51. If (a + b + 4){ab + 4(a + b)} - 4ab = 0, a ≠ - 4, b ≠ - 4, then, $\{\frac{1}{(a+b+4)^{117}} - 2^{-234}\}$ is equal to :
SSC CHSL 11/07/ 2019 (Afternoon)
(a) $\frac{1}{4^{117}}$ (b) $\frac{1}{2^{117}}$ (c) $-\frac{1}{2^{234}}$ (d) 0

Q.52. $(x + y)^{\frac{1}{3}} + (z + y)^{\frac{1}{3}} = -(x + z)^{\frac{1}{3}}$ then $(x^3 + y^3 + z^3)$ can be expressed as :
SSC CHSL 10/07/2019 (Morning)
(a) $\frac{1}{8}$xyz
(b) (x + y)(y + z)(z + x)
(c) $\frac{3}{8}$(x + y)(y + z)(z + x)
(d) 3xyz

Q.53. The value of the expression $\frac{1}{4}\{(a+\frac{1}{a})^2 - (a-\frac{1}{a})^2\}$ is :
SSC CHSL 09/07/2019 (Evening)
(a) $\frac{1}{2}$ (b) $\frac{1}{4}$ (c) 1 (d) 4

Q.54. If $3^{\sqrt[4]{x}} + 4^{\sqrt[4]{x}} = 5^{\sqrt[4]{x}}$, then the value of x is :
SSC CHSL 08/07/2019 (Morning)
(a) 4 (b) 2 (c) 8 (d) 16

Q.55. If x = 2 - $\sqrt{3}$ then the value of $x^3 - x^{-3}$ is :
SSC CHSL 05/07/2019 (Evening)
(a) -30$\sqrt{3}$ (b) 30$\sqrt{3}$ (c) -30$\sqrt{2}$ (d) 30$\sqrt{2}$

Q.56. If x ≠ - 1, 2 and 5, then the simplified value of $\{\frac{2(x^3-8)}{x^2-x-2} \times \frac{x^2+2x+1}{x^2-4x-5}\} \div \frac{x^2+2x+4}{3x-15}$ is equal to :
SSC CHSL 03/07/2019 (Afternoon)
(a) $\frac{1}{6}$ (b) 6 (c) $\frac{3}{2}$ (d) $\frac{2}{3}$

Q.57. If x is real, and $x^4 - 5x^2 - 1 = 0$, then the value of $(x^6 - 3x^2 + \frac{3}{x^2} - \frac{1}{x^6} + 1)$ is :
SSC CHSL 03/07/2019 (Morning)
(a) 126 (b) 110 (c) 116 (d) 96

Q.58. If x + y = 7 and xy = 10, then the value of $\frac{1}{x^3} + \frac{1}{y^3}$ is:
SSC CHSL 01/07/2019 (Evening)
(a) 0.543 (b) 0.131 (c) 0.133 (d) 0.453

Q.59. If $(3x - 1)^3 + (4x - 3)^3 + (2x + 1)^3$ = 3(3x - 1)(4x - 3)(2x + 1) and x ≠ $\frac{1}{3}$ then x = ?
SSC CGL 10/06/2019 (Evening)
(a) $\frac{1}{2}$ (b) 2 (c) $\frac{1}{4}$ (d) 1

Q.60. If x + y + z = 0 , then the value of $(x^2 + y^2 + z^2) \div (z^2 - xy)$ is :
SSC CGL 10/06/2019 (Morning)
(a) 1 (b) 2 (c) - 2 (d) - 1

Q.61. If x^2- 3x - 1 = 0 , then the value of (x^2+ 8x - 1)$(x^3 + x^{-1})^{-1}$ is :
SSC CGL 07/06/2019 (Afternoon)
(a) $\frac{3}{8}$ (b) 8 (c) 1 (d) 3

Q.62. If x = 2 - p , then $x^3 + 6xp + p^3$, is equal to :
SSC CGL 07/06/2019 (Morning)
(a) 12 (b) 6 (c) 8 (d) 4

Q.63. If $2x^2 + y^2$ + 6x - 2xy + 9 = 0, then the value of $4x^3 - y^3 + x^2y^2$ is :
SSC CGL 06/06/2019 (Afternoon)
(a) 0 (b) 9 (c) - 3 (d) - 9

Q.64. If ab + bc + ca = 8 and $a^2 + b^2 + c^2$ = 20, then a possible value of $\frac{1}{2}$(a + b + c) [$(a - b)^2$ + $(b - c)^2$ + $(c - a)^2$] is :
SSC CGL 06/06/2019 (Morning)
(a) 72 (b) 56 (c) 84 (d) 80

Q.65. If x + y = 1 and xy(xy - 2) = 12, then the value of $x^4 + y^4$ is:
SSC CGL 04/06/2019 (Evening)
(a) 19 (b) 25 (c) 20 (d) 23

Q.66. If $16x^2 + 9y^2 + 4z^2 = 24$(x - y + z) - 61, then the value of (xy + 2z) is :
SSC CGL 04/06/2019 (Afternoon)
(a) 1 (b) 2 (c) 3 (d) 5

Q.67. If $(5\sqrt{5}x^3 - 81\sqrt{3}y^3) \div \sqrt{5}x - 3\sqrt{3}y = Ax^2 + By^2 + Cxy$, then the value of (6A + B - $\sqrt{15}C$) is :
SSC CGL 04/06/2019 (Morning)
(a) 10 (b) 9 (c) 15 (d) 12

Q.68. If x + y + z = 19, $x^2 + y^2 + z^2 = 133$ and xz = y^2, then the difference between z and x is :
SSC CGL 04/06/2019 (Morning)
(a) 5 (b) 3 (c) 6 (d) 4

Q.69. If $x^4 + x^{-4} = 194$, $x > 0$ then the value of $(x - 2)^2$ is :
SSC CGL 04/06/2019 (Morning)
(a) 1 (b) 6 (c) 2 (d) 3

Q.70. If roots of x^2 - 4x + a = 0 are equal, then a = ?
SSC CPO 16/03/2019 (Evening)
(a) - 4 (b) 4 (c) 8 (d) -8

Practice Questions

SSC CGL 2024 Tier - 1

Q.71. Simplify $\frac{x^3+15x^2+75x+125}{x^2-25}$(x - 5)
SSC CGL 09/09/2024 (1st Shift)
(a) x^2+ 25 (b) x^2+ 5x + 25
(c) x^2 + 10x + 25 (d) x^2- 25

Q.72. Which of the following can be the value of k, if $\frac{(88 \div 8 \times k - 3 \times 3)}{(6^2 - 7 \times 5 + k^2)}$ = 1 ?
SSC CGL 09/09/2024 (1st Shift)
(a) 1, 10 (b) 4, 7 (c) 3, 10 (d) 2, 7

Q.73. Let a + b = 2c, then which of the following expressions is true?
SSC CGL 09/09/2024 (3rd Shift)
(a) a^2 + 2ac = b^2 + 2bc
(b) a^2 - 2bc = b^2 - 2ac
(c) a^2 + 2bc = b^2 + 2ac
(d) a^2 - ac = b^2 - bc

Q.74. If x, y and z are positive numbers and x + y + z = 1, then the least value of $\frac{1}{x} + \frac{1}{y} + \frac{1}{z}$ is :
SSC CGL 09/09/2024 (3rd Shift)
(a) 7 (b) 5 (c) 9 (d) 11

Q.75. If a + $\frac{1}{a}$ = 12, then find the value of $a^2 + \frac{1}{a^2}$.
SSC CGL 10/09/2024 (1st Shift)
(a) 144 (b) 146 (c) 142 (d) 140

Q.76. If the sum of three numbers is 18 and the sum of their squares is 36, then find the difference between the sum of their cubes and three times of their product.
SSC CGL 10/09/2024 (1st Shift)
(a) 1449 (b) −1944 (c) −1494 (d) 4149

Q.77. Find the values of x, y and z, so as to satisfy the equations given below:
x + y + z = 12; x + y -z = 6; x - y + z = 4
SSC CGL 10/09/2024 (2nd Shift)
(a) x = 5, y = 4, z = - 3
(b) x = 5, y =- 4, z = 3
(c) x = 5, y = 4, z = 3
(d) x = 5, y = - 4, z = - 3

Q.78. If $\sqrt{x} + \frac{1}{\sqrt{x}}$ = 7, then the value of x + $\frac{1}{x}$ is equal to:
SSC CGL 10/09/2024 (2nd Shift)
(a) 47 (b) 49 (c) 51 (d) 45

Q.79. If $x^2 + y^2$ = 280 and xy = 120, then find the value of $\frac{x-y}{x+y}$.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 10/09/2024 (3rd Shift)
(a) $\frac{1}{\sqrt{13}}$ (b) $\sqrt{15}$ (c) $\sqrt{13}$ (d) $\frac{1}{\sqrt{15}}$

Q.80. For what value of k will the lines $2x + 7ky - 8 = 0$ and $x + y - 9 = 0$ have no solution ?
SSC CGL 10/09/2024 (3rd Shift)
(a) $\frac{2}{7}$ (b) $\frac{9}{7}$ (c) $\frac{8}{9}$ (d) $\frac{1}{2}$

Q.81. If $x + \frac{1}{x} = 2\sqrt{10}$, where x > 1, then the value of $(x^3 - \frac{1}{x^3})$ is:
SSC CGL 11/09/2024 (1st Shift)
(a) 221 (b) 234 (c) 198 (d) 216

Q.82. Solve the given set of three equations to get the value of the unknowns:
x + 2z = 3
x + 2y + 3z = 5
3x - 5z = -13
SSC CGL 11/09/2024 (1st Shift)
(a) x = 0,y = -1,z = 2 (b) x = -1,y = 0,z = 2
(c) x = -1,y = 2,z = 0 (d) x = 2,y = 0,z = -1

Q.83. If $x + \frac{1}{9x} = 3$, then the value of $9x^2 + \frac{1}{9x^2}$ is:
SSC CGL 11/09/2024 (3rd Shift)
(a) 87 (b) 81 (c) 77 (d) 79

Q.84. Let $t = \frac{2}{5}$, then the value of the expression $t^3 + (\frac{3}{5})^3 + \frac{9}{5}t$ is:
SSC CGL 12/09/2024 (1st Shift)
(a) $\frac{1}{5}$ (b) 1 (c) 2 (d) $\frac{1}{2}$

Q.85. If $x + \frac{1}{x} = 15$, then the value of $\frac{7x^2 - 9x + 7}{x^2 - x + 1}$ is :
SSC CGL 12/09/2024 (1st Shift)
(a) $-\frac{48}{7}$ (b) $-\frac{22}{7}$ (c) $\frac{48}{7}$ (d) $\frac{22}{7}$

Q.86. For the following equations, what are the values of a and b to have infinitely many solutions?
ax + by = 2
3x - (5 - 2a)y = 6
SSC CGL 12/09/2024 (2nd Shift)
(a) a = - 1, b = - 1 (b) a = - 1, b = 1
(c) a = 1, b = - 1 (d) a = 1, b = 1

Q.87. If m + n = 24, then $(m - 16)^3 + (n - 8)^3$ is _____.
SSC CGL 12/09/2024 (2nd Shift)
(a) 0 (b) 40 (c) 576 (d) 320

Q.88. Which of the following is the sum of the values of a and b if the equations 2x + y = a, 8x + by = 12 have infinite solutions?
SSC CGL 12/09/2024 (3rd Shift)
(a) 16 (b) 9 (c) 7 (d) 18

Q.89. If $a^2 + b^2 + c^2 = 2(a + c - 1)$, then the value of $a^3 + b^3 + c^3$ = ?
SSC CGL 12/09/2024 (3rd Shift)
(a) 0 (b) 2 (c) 4 (d) 1

Q.90. Find the values of x, y and z, so as to satisfy the equations given below:
5x − 3y + 7z = 22; 3x − 5y − 2z = − 46; 2x − 2y + 5z = 24
SSC CGL 12/09/2024 (3rd Shift)
(a) x = − 5, y = 3, z = − 8
(b) x = 5, y = − 8, z = 3
(c) x = − 5, y = 3, z = 8
(d) x = − 5, y = − 3, z = 8

Q.91. The solution of the following equations is:
5x + 4y - 8z = 1
7x - 9y + z = - 1
2x + 3y - 4z = 1
SSC CGL 13/09/2024 (1st Shift)
(a) x = - 1,y = 1,z = 1 (b) x = 1,y = 1,z = 1
(c) x = 1,y = - 1,z = 1 (d) x = 1,y = 1,z = - 1

Q.92. Let a + b = 1, then the value of $(\frac{1}{a^2} + \frac{1}{b^2} + \frac{2}{ab})$ is:
SSC CGL 13/09/2024 (2nd Shift)
(a) $\frac{1}{a^2b^2}$ (b) $\frac{1}{ab}$ (c) $\frac{1}{a^2b}$ (d) $\frac{1}{ab^2}$

Q.93. For which of the following values of a and b do the given equations, have no solution?
x - ay = 2 - a
(1 - a)x + 6y = a + b
SSC CGL 13/09/2024 (2nd Shift)
(a) a = -3, b ≠ 1 (b) a = 3, b ≠-1
(c) a = -3, b ≠ -1 (d) a = 3, b ≠ 1

Q.94. If m = a secA and y = b tan A then find the value of $b^2m^2 - a^2y^2 + \frac{a^2y^2}{b^2m^2} + \cos^2 A$.
SSC CGL 13/09/2024 (3rd Shift)
(a) $a^2 b^2$ (b) $1 - a^2 b^2$
(c) $a^2b^2 + 2$ (d) $a^2b^2 + 1$

Q.95. For what value of k, the system of equations $kx - 15y + 7 = 0$ and $7x - 21y - 19 = 0$ has NO solution?
SSC CGL 17/09/2024 (1st Shift)
(a) 5 (b) 12 (c) 25 (d) 6

Q.96. If $X > 1$ and $x^2 + \frac{1}{x^2} = 83$, then $x^3 - \frac{1}{x^3}$ is:
SSC CGL 17/09/2024 (1st Shift)
(a) 884 (b) 876 (c) 754 (d) 756

Q.97. If x is an integer such that $x + \frac{1}{x} = \frac{65}{8}$, then find the value of $x - \frac{1}{x}$.
SSC CGL 17/09/2024 (3rd Shift)
(a) $\frac{63}{6}$ (b) $\frac{63}{8}$ (c) $\frac{36}{8}$ (d) $\frac{32}{6}$

Q.98. The sum of five consecutive numbers is 80. Find the largest number.
SSC CGL 18/09/2024 (1st Shift)
(a) 18 (b) 15 (c) 19 (d) 14

Q.99. If $x = 7 - 4\sqrt{3}$, then find the value of $(x^2 + \frac{1}{x^2})$.
SSC CGL 18/09/2024 (1st Shift)
(a) 188 (b) 194 (c) 186 (d) 196

Q.100. If the system of the following equations has the value of the variables as three consecutive integers, then the value of a is ____.
x - y + z = 2a x + 4y - 2z = 3(4 - a)
2x - 3y + 4z = 6 - 2a
SSC CGL 18/09/2024 (1st Shift)
(a) 2 (b) 4 (c) 1 (d) 3

Q.101. If $x + \frac{1}{x} = 2$, then find the value of $(x^{2723} + \frac{1}{x^{3356}})$.
SSC CGL 18/09/2024 (2nd Shift)
(a) 1 (b) 2 (c) 0 (d) -1

Q.102. If 3a + 2b = 27 and $27a^3 + 8b^3 = 1458$, then find 2ab.
SSC CGL 18/09/2024 (3rd Shift)
(a) 72 (b) 70 (c) 77 (d) 75

Q.103. If $(a + \frac{1}{a}) = 7\sqrt{3}$ then what is the value of $(a^6 + a^{-6})$?
SSC CGL 19/09/2024 (1st Shift)
(a) 3048190 (b) 3048542
(c) 3048132 (d) 3048625

Q.104. If $(x + \frac{1}{x}) = 7$, x > 0. The positive value of $(x - \frac{1}{x})$ is :
SSC CGL 19/09/2024 (2nd Shift)
(a) $5\sqrt{4}$ (b) $5\sqrt{5}$ (c) $3\sqrt{5}$ (d) $4\sqrt{5}$

Q.105. For the equations $ax + (a^2 + 1)y = 4$ and $4x + ay = a^2$, which of the following statements is TRUE ?
SSC CGL 19/09/2024 (3rd Shift)
(a) If a = 6, then $x = \frac{325}{28}$, $y = -\frac{25}{28}$ are the solutions.
(b) If a = 6, then x = 48, y = 4 are the solutions.
(c) If a = -12, then $x = \frac{325}{28}$, $y = -\frac{25}{28}$ are

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

the solutions.
(d) If a = -12, then x = 48, y = 4 are the solutions

Q.106. If a + b + c = 0, then the value of ($a^2 + b^2 + 2ab$) is equal to:
SSC CGL 23/09/2024 (2nd Shift)
(a) c^2 (b) - c^2 (c) c (d) - c

Q.107. Let $3t - \frac{1}{3t} = 3$, then which of the following expressions has the value equal to 12 ?
SSC CGL 23/09/2024 (3rd Shift)
(a) $9t^2 + \frac{1}{9t^2} + 2$ (b) $9t^2 + \frac{1}{9t^2} - 2$
(c) $9t^2 + \frac{1}{9t^2} + 1$ (d) $9t^2 + \frac{1}{9t^2}$

Q.108. If 3x + 2y = 10 and 2xy = 7, then find the value of 3x - 2y (if 3x – 2y > 0).
SSC CGL 23/09/2024 (3rd Shift)
(a) 4 (b) 10 (c) 8 (d) 6

Q.109. What conclusion can be drawn about the solution of the following system of linear equations in two variables:
$3x + 2y = 7$, $2x + 3y = 7$
SSC CGL 24/09/2024 (1st Shift)
(a) No solution
(b) Unique solution
(c) Infinite solutions
(d) More than two solution

Q.110. Simplify the following expression.
$(3x + 17 - 2y)(3x - 17 - 2y)$
SSC CGL 24/09/2024 (1st Shift)
(a) $9x^2 - 12xy + 4y^2 + 289$
(b) $9x^2 + 12xy + 4y^2 - 289$
(c) $9x^2 - 12xy + 4y^2 - 289$
(d) $9x^2 - 6xy + 4y^2 - 289$

Q.111. If a + b = c, then the expression $a^3 + b^3 - c^3 + 3abc$ will be equal to:
SSC CGL 24/09/2024 (3rd Shift)
(a) 0 (b) 3 (c) 2 (d) 1

Q.112. If $a^3 + \frac{1}{a^3} = 2$ (a > 0), then the value of $a + \frac{1}{a}$ is:
SSC CGL 25/09/2024 (1st Shift)
(a) 1 (b) 3 (c) 2 (d) 4

Q.113. If $x^2 + 7x + 8 = 0$, then find the value of $\frac{4x}{x^2 - 5x + 8}$
SSC CGL 25/09/2024 (1st Shift)
(a) $\frac{1}{2}$ (b) $\frac{-1}{4}$ (c) $\frac{-1}{3}$ (d) $\frac{1}{6}$

Q.114. Find the values of 'a' and 'b' for which the system of equations 3x + y = 3 and (a - b)x + (a + b)y = 3a + b - 3 has infinite solutions.
SSC CGL 25/09/2024 (1st Shift)
(a) a = 3, b = - $\frac{2}{3}$ (b) a = - $\frac{3}{2}$, b = 2
(c) a = 3, b = - $\frac{3}{2}$ (d) a = 2, b = - $\frac{3}{2}$

Q.115. The value of $(x + y)^2 + (x - y)^2$ is equal to :
SSC CGL 25/09/2024 (2nd Shift)
(a) $2(x + y)^2$ (b) $2(x^2 + y^2)$
(c) $(2x + 2y)^2$ (d) 4xy

Q.116. Find the value of 'k' for which the system of equations 4x + 6y = 7 and 6x + (k + 4)y - 21=0 has a unique solution.
SSC CGL 25/09/2024 (2nd Shift)
(a) k = 5 (b) k ≠ 5 (c) k = 7 (d) k ≠ 7

Q.117. If $a^2 + b^2 = 148$ and ab = 54, then find the value of $\frac{a+b}{a-b}$.
SSC CGL 25/09/2024 (3rd Shift)
(a) $\frac{8}{\sqrt{10}}$ (b) $\frac{2}{\sqrt{10}}$ (c) $8\sqrt{7}$ (d) $5\sqrt{3}$

Q.118. Given a linear equation in two variables: 5x + 7y - 8 = 0, which of the following linear equations, along with the given equation, forms a system of linear equations having no solution?
SSC CGL 26/09/2024 (1st Shift)
(a) 5x + 7y - 16 = 0 (b) 7x + 5y - 8 = 0
(c) 5x - 7y - 8 = 0 (d) 10x + 14y - 16 = 0

Q.119. If 2a - b = 3 and $8a^3 - b^3 = 999$, then find the value of $4a^2 - b^2$?
SSC CGL 26/09/2024 (2nd Shift)
(a) 63 (b) 65 (c) 61 (d) 67

SSC CHSL 2024 Tier - 1

Q.120. There are 160 multiple choice questions in a test. 4 marks are allotted for a correct answer and 1 mark is deducted for a wrong answer or un-attempted question from the total score of correct answers. If a candidate scored 400 marks in the test, how many questions did he answer correctly?
SSC CHSL 03/07/2024 (4th Shift)
(a) 110 (b) 112 (c) 115 (d) 120

Q.121. Find the remainder, when we divide $2x^3 - 3x^2 + 6x - 4$ by 2x - 3.
SSC CHSL 04/07/2024 (3rd Shift)
(a) 6 (b) - 6 (c) 5 (d) - 5

Q.122. If A = $\frac{9}{16} \div \frac{25}{36}$, B = 9 ÷ [(16 ÷ 25) ÷ 36], C = [9 ÷ (16 ÷ 25)] ÷ 36, D = (9 ÷ 16)÷ (25 ÷ 36) then which of the following is true?
SSC CHSL 10/07/2024 (2nd Shift)
(a) B and D are equal.
(b) A and B are equal.
(c) C and D are equal.
(d) A and D are equal.

Q.123. If A = 60 [$\frac{6}{25} \div (\frac{16}{15}$ of $\frac{3}{8}) + 5 - (1 - 2\frac{1}{12})$] then the sum of the digits of A is:
SSC CHSL 10/07/2024 (2nd Shift)
(a) 3 (b) 7 (c) 5 (d) 6

Q.124. If 640 ÷ 8 + 930 ÷ 15 – k + 32 × 5 = 1104 ÷ 16 × 148 ÷ 37, then the value of k is:
SSC CHSL 11/07/2024 (3rd Shift)
(a) 276 (b) 26 (c) 35 (d) 302

Q.125. For what value of k (k > 0) will the lines 5x + ky – 2 = 0 and (k + 1)x + 4y + 7 = 0 be parallel ?
SSC CHSL 10/07/2024 (4th Shift)
(a) 2 (b) 5 (c) 3 (d) 4

Q.126. If $\frac{15}{8}$ + [{$\frac{4}{5}$ of $\frac{5}{12} \div (1\frac{1}{15})$} × $1\frac{7}{12}$ is expressed in the form of $\frac{a}{b}$ Where a and b are integers and relatively prime to each other, the value 4b - a is :
SSC CHSL 11/07/2024 (4th Shift)
(a) 164 (b) 313 (c) 189 (d) 225

SSC CPO 2024 Tier - 1

Q.127. If the sum of two numbers x and y is 12 and their product is 27, then find the sum of their cubes.
SSC CPO 27/06/2024 (1st Shift)
(a) 657 (b) 576 (c) 765 (d) 756

Q.128. The sum of two numbers x and y (where x is greater than y) is equal to four times of their difference. Find the value of $\frac{5xy}{3(x^2 - y^2)}$
SSC CPO 27/06/2024 (1st Shift)
(a) $\frac{25}{16}$ (b) 16 (c) $2\frac{3}{16}$ (d) 25

Q.129. If $x + y + z = 1$, $xy + yz + zx = -1$ and $xyz = -1$, then $(x^3 + y^3 + z^3)$ is equal to _____ .
SSC CPO 27/06/2024 (1st Shift)
(a) 0 (b) 1 (c) 2 (d) 3

Q.130. If α + β + γ = 0, then $\frac{3\beta^2 + \alpha^2 + \gamma^2}{2\beta^2 - \alpha\gamma}$ = ?
SSC CPO 27/06/2024 (2nd Shift)
(a) $\frac{1}{2}$ (b) 1 (c) 2 (d) $\frac{1}{4}$

Q.131. If $x = 3y + 4$, then what is the value of $(x^3 - 27y^3 - 36xy)$?
SSC CPO 27/06/2024 (2nd Shift)
(a) 27 (b) 64 (c) 1 (d) 8

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.132. If $x + \frac{1}{x} = 2$ then find the value of $(x^4 + \frac{4}{(x)^4})(x^3 - \frac{4}{(x)^3})$.
SSC CPO 27/06/2024 (3rd Shift)
(a) - 15 (b) 15 (c) -10 (d) 10

Q.133. If $16x^4 + \frac{1}{16x^4} = 14159$, then find the value of $2x + \frac{1}{2x}$
SSC CPO 27/06/2024 (3rd Shift)
(a) 9 (b) 11 (c) 12 (d) 15

Q.134. If a + 2b + 3c = 0, then what is the value of $(a^3 + 8b^3 + 27c^3)$?
SSC CPO 28/06/2024 (1st Shift)
(a) 18 abc (b) 12 abc (c) 0 (d) 6 abc

Q.135. If x = 110, y = 111, z = 112, then find the value of $x^3 + y^3 + z^3 - 3xyz$.
SSC CPO 28/06/2024 (1st Shift)
(a) 999 (b) 991 (c) 997 (d) 995

Q.136. If $(a - 18)^2 + (b - 12)^2 + (c - 6)^2 = 0$, then find the value of $(a + b + c)^{\frac{1}{2}}$.
SSC CPO 28/06/2024 (2nd Shift)
(a) ± 3 (b) ± 6 (c) ± 4 (d) ± 2

Q.137. The sum of two numbers is 28 and the sum of their squares is 528. Find the square root of the product of both the numbers.
SSC CPO 28/06/2024 (2nd Shift)
(a) $8\sqrt{2}$ (b) $2\sqrt{2}$ (c) $4\sqrt{2}$ (d) $6\sqrt{2}$

Q.138. If $\frac{a}{b} + \frac{b}{a} = 1$, $a \neq 0$, $b \neq 0$ then find the value of $\frac{a^3 + b^3}{3ab}$
SSC CPO 28/06/2024 (3rd Shift)
(a) 3 (b) 0 (c) 2 (d) -3

Q.139. If $x = 11$, then the value of $(x^5 - 12x^4 + 12x^3 - 12x^2 + 12x - 1)$
SSC CPO 28/06/2024 (3rd Shift)
(a) 10 (b) 8 (c) 9 (d) 14

Q.140. If a + b + c = 15 and ab + bc + ca = 35 then find the value of $a^3 + b^3 + c^3 - 3abc$.
SSC CPO 29/06/2024 (1st Shift)
(a) 2100 (b) 1500 (c) 1200 (d) 1800

Q.141. What must be added to $(x^3 - 3x^2 + 4x - 75)$ to obtain a polynomial that is exactly divisible by (x − 5) ?
SSC CPO 29/06/2024 (1st Shift)
(a) 5 (b) 6 (c) 4 (d) 2

Q.142. If a + b + c = 13 and ab + bc + ca = 22, then the value of $a^3 + b^3 + c^3 - 3abc$ is _____.
SSC CPO 29/06/2024 (2nd Shift)
(a) 1911 (b) 1225 (c) 1625 (d) 1339

Q.143. If $x^2 + 4y^2 + 2x + 1 = 0$, then find the value of $x^{39} + y^{36}$
SSC CPO 29/06/2024 (2nd Shift)
(a) -1 (b) -2 (c) 2 (d) 1

Q.144. If $x^2 - 6x - 1 = 0$, then find the value of $x^2 + \frac{1}{x^2} - 8$.
SSC CPO 29/06/2024 (3rd Shift)
(a) 30 (b) 32 (c) 28 (d) 34

Q.145. If 2a + 2b + c = 0, then find the value of $\frac{4a^2 + 4b^2 + 4c^2}{5c^2 - 8ab}$
SSC CPO 29/06/2024 (3rd Shift)
(a) - 1 (b) $-2\sqrt{3}$ (c) 1 (d) $2\sqrt{3}$

Q.146. If $a = (\sqrt{2} - 1)^{\frac{1}{3}}$, then the value of $(a - \frac{1}{a})^3 + 3(a - \frac{1}{a})$ is:
SSC CPO 29/06/2024 (3rd Shift)
(a) 2 (b) -2 (c) $\sqrt{2}$ (d) $-\sqrt{2}$

SSC Selection Post (Phase - XII)

Q.147. If $x^3 = 184 + y^3$ and x = 4 + y, then the value of (x + y) is (given that x > 0 and y > 0):
Higher Secondary 21/06/2024 (Shift - 2)
(a) $-2\sqrt{11}$ (b) $2\sqrt{14}$ (c) $-2\sqrt{14}$ (d) $2\sqrt{11}$

Q.148. Simplify the following.
$(x - 3y)^3 + 27(y^3 - xy^2)$
Higher Secondary 21/06/2024 (Shift - 2)
(a) $x^3 - 3x^2y$
(b) $x^3 - 27y^3 - 9x^2y$
(c) $x^3 - 27y^3 - 9x^2y + 27xy^2 + 27y^2 - 27y^2$
(d) $x^3 - 9x^2y$

Q.149. If $x^2 + y^2 + z^2 = xy + yz + zx$, then the value of $(\frac{17x^4 + 9y^4 + 16z^4}{8x^2y^2 + 6y^2z^2 + 10z^2x^2})$ is:
Higher Secondary 24/06/2024 (Shift - 2)
(a) 2.00 (b) 3.25 (c) 2.50 (d) 1.75

Q.150. If for a non-zero x, $7x^2 + 5x + 7 = 0$, then the $x^3 + \frac{1}{x^3}$ is _____ .
Higher Secondary 24/06/2024 (Shift - 2)
(a) $\frac{343}{610}$ (b) $\frac{420}{343}$ (c) $\frac{610}{420}$ (d) $\frac{610}{343}$

Q.151. Simplify the following expression.
$49a^2 + 70ab + 25b^2$
Higher Secondary 26/06/2024 (Shift - 2)
(a) $(5a + 7b)^2$ (b) $(5a - 7b)^2$
(c) $(7a - 5b)^2$ (d) $(7a + 5b)^2$

Q.152. If x + y = 10 and xy = 12, find the value of $x^2 - xy + y^2$
Graduate Level 21/06/2024 (Shift - 3)
(a) 74 (b) 82 (c) 64 (d) 78

Q.153. If $(x - \frac{1}{x-1}) = 3$, then the value of $(x - 1)^2 + \frac{1}{(x-1)^2}$ is:
Graduate Level 24/06/2024 (Shift - 3)
(a) 3 (b) 5 (c) 6 (d) 4

Q.154. If p = 106, q = 105 and r = 104, then value of $p^2 + q^2 + r^2 - pq - qr - rp$ is:
Graduate Level 25/06/2024 (Shift - 3)
(a) 0 (b) 1 (c) 2 (d) 3

Q.155. If $\sqrt{1 + \frac{x^3}{9}} = 5$, then the value of x is equal to:
Graduate Level 26/06/2024 (Shift - 3)
(a) 9 (b) 8 (c) 6 (d) 4

Q.156. If $x + \frac{1}{x} = 15$, then the value of $(x^2 + \frac{1}{x^2})$ is:
Graduate Level 26/06/2024 (Shift - 3)
(a) 225 (b) 223 (c) 17 (d) 13

SSC CHSL 2023 Tier - 2

Q.157. If (a − 2b) = 8 and 2ab = 9, then find the value of (a + 2b).
SSC CHSL Tier II (02/11/2023)
(a) 12 (b) 6 (c) 10 (d) 8

Q.158. A and B each have a certain number of oranges. A says to B, "If you give me 10 of your oranges, I will have twice the number of oranges left with you." B replies, "If you give me 10 of your oranges, I will have the same number of oranges left with you." Find the number of oranges that A has.
SSC CHSL Tier II (02/11/2023)
(a) 65 (b) 50 (c) 55 (d) 70

SSC CPO 2023 Tier - 1

Q.159. If $\frac{x}{y} + \frac{y}{x} = 1$ and $x + y = 2$, then the value of $x^3 + y^3$ is:
SSC CPO 03/10/2023 (1st Shift)
(a) 0 (b) 1 (c) 3 (d) 2

Q.160. If $\frac{A}{L} + \frac{M}{B} = 1$ and $\frac{B}{M} + \frac{N}{C} = 1$, then the value of $\frac{L}{A} + \frac{C}{N}$ is :
SSC CPO 03/10/2023 (2nd Shift)
(a) 1 (b) $\frac{B}{M}$ (c) $\frac{M}{B}$ (d) 0

Q.161. If $a \propto b$, $b \propto \frac{1}{c}$ and $c \propto d$, then the relation between a and b is :
SSC CPO 03/10/2023 (2nd Shift)
(a) $a \propto \sqrt{d}$ (b) $a \propto d$ (c) $a \propto \frac{1}{d}$ (d) $a \propto d^2$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.162. If A + $\frac{1}{1+\frac{1}{2+\frac{1}{3}}} = \frac{9}{10}$, then the value of A is:
SSC CPO 03/10/2023 (3rd Shift)
(a) $\frac{3}{10}$ (b) $\frac{2}{5}$ (c) $\frac{1}{10}$ (d) $\frac{1}{5}$

Q.163. If $x(5 - \frac{2}{x}) = \frac{5}{x}$, then the value of $x^2 + \frac{1}{x^2}$ is:
SSC CPO 03/10/2023 (3rd Shift)
(a) $\frac{54}{23}$ (b) $\frac{53}{28}$ (c) $\frac{53}{27}$ (d) $\frac{54}{25}$

Q.164. The value of
$\frac{(157 \times 157) + (157 \times 133) + (133 \times 133)}{(157 \times 157 \times 157) - (133 \times 133 \times 133)}$
is :
SSC CPO 04/10/2023 (2nd Shift)
(a) 24 (b) $\frac{1}{290}$ (c) 290 (d) $\frac{1}{24}$

Q.165. Simplify the given expression.
$\frac{(3.254 \times 3.254 \times 3.254) - (0.746 \times 0.746 \times 0.746)}{(3.254 \times 3.254) + (0.746 \times 0.746) + (3.254 \times 0.746)}$
SSC CPO 04/10/2023 (2nd Shift)
(a) 2.508 (b) 4.508 (c) 2.146 (d) 3.156

Q.166. The value of $\frac{a^2-(b-c)^2}{(a+c)^2-b^2} + \frac{b^2-(a-c)^2}{(a+b)^2-c^2} + \frac{c^2-(a-b)^2}{(b+c)^2-a^2}$ is :
SSC CPO 04/10/2023 (3rd Shift)
(a) 3 (b) −1 (c) 1 (d) 2

Q.167. Simplify the given expression.
$(1+x)^3 + (1-x)^3 + (-2)^3$
SSC CPO 04/10/2023 (3rd Shift)
(a) $3(1 - x^2)$ (b) $6(1 - x^2)$
(c) $-6(1 - x^2)$ (d) $-3(1 - x^2)$

Q.168. Simplify the given expression.
$(1-2x)^2 - (1+2x)^2$
SSC CPO 05/10/2023 (1st Shift)
(a) $-8x$ (b) $8x$
(c) $2 + 8x^2$ (d) $-(2 + 8x^2)$

Q.169. If a + b + c = 5 and ab + bc + ca = 7, then the value of $a^3 + b^3 + c^3 - 3abc$ is:
SSC CPO 05/10/2023 (1st Shift)
(a) 20 (b) 25 (c) 15 (d) 30

Q.170. Simplify the given expression.(x - 2y)(y - 3x) + (x + y)(x - y) + (x - 3y)(2x + y)
SSC CPO 05/10/2023 (3rd Shift)
(a) 2x(x - 3y) (b) 2y(x + 3y)
(c) 2x(x + 3y) (d) 2y(x - 3y)

SSC MTS 2023 Tier - 1

Q.171. If (x - 2) is a factor of ($2x^2$ + 12kx - 25k), then what is the value of k?
SSC MTS 01/09/2023 (2nd Shift)
(a) 2 (b) 8 (c) 4 (d) 6

SSC CHSL 2023 Tier - 1

Q.172. If $2x + \frac{2}{x} = 5$, then the value of ($x^3 + \frac{1}{x^3} + 2$) will be :
SSC CHSL 02/08/2023 (1st Shift)
(a) $\frac{81}{11}$ (b) $\frac{81}{7}$ (c) $\frac{71}{8}$ (d) $\frac{81}{8}$

Q.173. If (a - b) = 9 and $(a^3 - b^3)$ = 4401, find the value of ab.
SSC CHSL 02/08/2023 (2nd Shift)
(a) 190 (b) 112 (c) 162 (d) 136

Q.174. If $(a + \frac{1}{a}) = 6$, then what is the value of $\frac{3}{4}(a^2 + \frac{1}{a^2})$?
SSC CHSL 02/08/2023 (2nd Shift)
(a) 22.5 (b) 34 (c) 25.5 (d) 36

Q.175. If $a = \frac{1}{a-\sqrt{6}}$ $(a > 0)$, then the value of $(a + \frac{1}{a})$ is :
SSC CHSL 02/08/2023 (3rd Shift)
(a) $\sqrt{6}$ (b) $\sqrt{10}$ (c) $\sqrt{15}$ (d) $\sqrt{7}$

Q.176. If $\sqrt{\frac{a}{b}} = \frac{8}{3} + \sqrt{\frac{b}{a}}$ $and\ (a+b) = 30$, then what is the value of ab ?
SSC CHSL 03/08/2023 (1st Shift)
(a) 64 (b) 28 (c) 81 (d) 36

Q.177. If $2x + 3y = 9$, and $xy = 3$, what is $8x^3 + 27y^3$?
SSC CHSL 03/08/2023 (1st Shift)
(a) 235 (b) 244 (c) 243 (d) 234

Q.178. If $a^2 + \frac{1}{a^2} = \frac{7}{3}$, then what is the value of $(a^3 - \frac{1}{a^3})$?
SSC CHSL 03/08/2023 (3rd Shift)
(a) $\frac{5}{3\sqrt{3}}$ (b) $\frac{10}{3\sqrt{3}}$ (c) $\frac{7}{3\sqrt{3}}$ (d) $\frac{8}{3\sqrt{3}}$

Q.179. If a + b = 10 and $a^2 + b^2 = 58$, find the value of ab.
SSC CHSL 03/08/2023 (3rd Shift)
(a) 24 (b) 27 (c) 30 (d) 21

Q.180. If (a + b + c) ≠ 0, then (a + b + c) ($a^2 + b^2 + c^2$- ab - bc - ca) is equal to:
SSC CHSL 03/08/2023 (4th Shift)
(a) $a^3 + b^3 - c^3 - 3abc$ (b) $a^3 - b^3 + c^3 - 3abc$
(c) $a^3 + b^3 + c^3 - 3abc$ (d) $a^3 + b^3 + c^3 + 3abc$

Q.181. If 2a + 3b = 14 and 2a - 3b = 10, then find the value of 'ab'.
SSC CHSL 03/08/2023 (4th Shift)
(a) 5 (b) 3 (c) 4 (d) 2

Q.182. If $\sqrt{\frac{a}{b}} = \frac{8}{3} - \sqrt{\frac{b}{a}}$ and a - b = 10 then the value of ab is :
SSC CHSL 04/08/2023 (2nd Shift)
(a) $32\frac{1}{7}$ (b) $32\frac{3}{7}$ (c) $32\frac{4}{7}$ (d) $32\frac{2}{7}$

Q.183. Which of the following is an identity ?
SSC CHSL 04/08/2023 (2nd Shift)
(a) $(a - b)^2 = a^2 - b^2$
(b) $(a + b)^2 = a^2 + b^2 + 2ab$
(c) $(a + b)^2 = a^2 + b^2$
(d) $(a - b)^2 = a^2 - b^2 - 2ab$

Q.184. If $x + \frac{2}{x} = 1$ then the value of $\frac{x^2+7x+2}{x^2+13x+2}$ is:
SSC CHSL 04/08/2023 (2nd Shift)
(a) $\frac{5}{7}$ (b) $\frac{3}{7}$ (c) $\frac{4}{7}$ (d) $\frac{2}{7}$

Q.185. If $(x + \frac{1}{x}) = 7$ and $x > 1$, what is the value of $(x^3 - \frac{1}{x^3})$?
SSC CHSL 04/08/2023 (3rd Shift)
(a) $174\sqrt{5}$ (b) $164\sqrt{5}$ (c) $154\sqrt{5}$ (d) $144\sqrt{5}$

Q.186. If $(y - \frac{1}{y}) = 9$, find the value of $(y^3 - \frac{1}{y^3})$
SSC CHSL 04/08/2023 (3rd Shift)
(a) 766 (b) 756 (c) 702 (d) 729

Q.187. If 2x + 3y = 4 and $4x^2 + 9y^2 = 64$, then what is the value of $8x^3 + 27y^3$.
SSC CHSL 04/08/2023 (4th Shift)
(a) 253 (b) 235 (c) 352 (d) 325

Q.188. If a + b + c = 15 and ab + bc + ca = 22, then find the value of $a^2 + b^2 + c^2$.
SSC CHSL 07/08/2023 (1st Shift)
(a) 131 (b) 141 (c) 161 (d) 181

Q.189. Simplify the following expression.
{[(x - 5)(x - 1)] - [(9x - 5)(9x - 1)]} ÷ 16x
SSC CHSL 07/08/2023 (1st Shift)
(a) $2x(5x - 3)$ (b) $-(5x - 3)$
(c) $x(5x - 3)$ (d) $-6x(5x - 3)$

Q.190. If $x + \frac{1}{x} = 2$, then find the value of $x^{1823} + \frac{1}{x^{1929}}$
SSC CHSL 07/08/2023 (1st Shift)
(a) 2 (b) 1 (c) 0 (d) -1

Q.191. The algebraic expression $2x^2$ - 32 is equal to_____.
SSC CHSL 07/08/2023 (2nd Shift)
(a) $2(x - 4)^2$ (b) (x + 4)(x - 4)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(c) $2(x + 4)^2$ (d) $2(x + 4)(x - 4)$

Q.192. If $(x - \frac{1}{X}) = 0.4$, and x>0, what is the value of $(x^2 + \frac{1}{x^2})$?
SSC CHSL 07/08/2023 (2nd Shift)
(a) 4.16 (b) 3.32 (c) 1.84 (d) 2.16

Q.193. If $(x + \frac{1}{x}) = 5$, then the value of $(x^5 + \frac{1}{x^5})$ is:
SSC CHSL 07/08/2023 (2nd Shift)
(a) 2535 (b) 2540 (c) 2515 (d) 2525

Q.194. If $x^2 + y^2 + z^2 = 628$ and xy + yz + zx = 24, then find the value of (x + y + z).
SSC CHSL 07/08/2023 (3rd Shift)
(a) 22 (b) 28 (c) 26 (d) 24

Q.195. if $x + \frac{1}{x} = -1$, then the value of $x^{15} + \frac{1}{x^{15}}$ will be:
SSC CHSL 07/08/2023 (3rd Shift)
(a) 3 (b) 2 (c) -1 (d) 0

Q.196. Simplify the following expression.
$$\frac{x^3 + y^3 + z^3 - 3xyz}{(x-y)^2 + (y-z)^2 + (z-x)^2}$$
SSC CHSL 07/08/2023 (4th Shift)
(a) $\frac{1}{3}(x + y + z)$ (b) $(x + y + z)$
(c) $\frac{1}{4}(x + y + z)$ (d) $\frac{1}{2}(x + y + z)$

Q.197. If $(x - \frac{1}{x-2}) = 7$, then the value of $(x - 2)^3 - \frac{1}{(x-2)^3}$ is:
SSC CHSL 07/08/2023 (4th Shift)
(a) 130 (b) 115 (c) 140 (d) 125

Q.198. If a + b + c = 16, ab + bc + ac = 81, what is the value of $a^2 + b^2 + c^2$
SSC CHSL 08/08/2023 (1st Shift)
(a) 94 (b) 98 (c) 89 (d) 87

Q.199. Simplify the following expression
$(a + b + c)^2 - (a - b + c)^2 + 4ac$
SSC CHSL 08/08/2023 (1st Shift)
(a) 4(bc + ac) (b) 2(ab + bc + ac)
(c) 4(ab + bc + ac) (d) 4(bc + ab)

Q.200. If $x^2 - 5\sqrt{5}x + 1 = 0$, and x > 0, what is the value of $(x^3 - \frac{1}{x^3})$?
SSC CHSL 08/08/2023 (2nd Shift)
(a) 1331 (b) 1364 (c) 1296 (d) 1244

Q.201. If $x^4 + \frac{1}{x^4} = 194$, $x > 0$, then find the value of $x^3 + \frac{1}{x^3} + x + \frac{1}{x}$.
SSC CHSL 08/08/2023 (3rd Shift)
(a) 76 (b) 66 (c) 56 (d) 46

Q.202. If a + b + c = 5 and $a^2 + b^2 + c^2 = 15$, then find the value of $a^3 + b^3 + c^3 - 3abc - 27$.
SSC CHSL 08/08/2023 (3rd Shift)
(a) 23 (b) 27 (c) 25 (d) 21

Q.203. If $x^2 + y^2 = 427$ and xy = 202, then find the value of $\frac{x+y}{x-y}$.
SSC CHSL 08/08/2023 (3rd Shift)
(a) $\sqrt{\frac{835}{23}}$ (b) $\sqrt{\frac{830}{29}}$
(c) $\sqrt{\frac{831}{23}}$ (d) $\sqrt{\frac{830}{23}}$

Q.204. The algebraic expression $4x^2 - y^2 + 6y - 9$ is equal to_____ .
SSC CHSL 09/08/2023 (1st Shift)
(a) (2x + y - 3)(2x - y + 3)
(b) (2x - y - 3)(2x - y + 3)
(c) $(2x + y - 3)^2$
(d) $(2x + y + 3)^2$

Q.205. If $x = (\sqrt{6} - 1)^{\frac{1}{3}}$, then the value of $(x - \frac{1}{x})^3 + 3(x - \frac{1}{x})$ is:
SSC CHSL 09/08/2023 (1st Shift)
(a) $\frac{2\sqrt{6}-6}{5}$ (b) $\frac{4\sqrt{6}-6}{5}$
(c) $\frac{4\sqrt{6}-6}{3}$ (d) $\frac{4\sqrt{3}-6}{5}$

Q.206. If (a + b + c) = 17, and $(a^2 + b^2 + c^2) = 101$, find the value of $(a - b)^2 + (b - c)^2 + (c - a)^2$.
SSC CHSL 09/08/2023 (2nd Shift)
(a) 12 (b) 14 (c) 10 (d) 16

Q.207. If $\frac{x^2+1}{x} = 5$, then find the value of $x^4 + \frac{1}{x^4} - 36$.
SSC CHSL 09/08/2023 (2nd Shift)
(a) 491 (b) 149 (c) 419 (d) 194

Q.208. If $a^2 + b^2 + c^2 = ab + bc + ca$, then the value of $\frac{11a^4 + 13b^4 + 15c^4}{16a^2b^2 + 19b^2c^2 + 17c^2a^2}$ is:
SSC CHSL 09/08/2023 (3rd Shift)
(a) $1\frac{1}{3}$ (b) $\frac{1}{4}$ (c) $\frac{3}{4}$ (d) $1\frac{3}{4}$

Q.209. Simplify the expression: $(c + d)^2 - (c - d)^2$
SSC CHSL 09/08/2023 (3rd Shift)
(a) 4cd (b) $(c^2 + d^2)$ (c) $2(c^2 + d^2)$ (d) 2cd

Q.210. Which of the following expressions is equal to the expression $\frac{x^2 - 3x + 2}{x^2 - 4}$?
SSC CHSL 09/08/2023 (4th Shift)
(a) $\frac{x+1}{x-2}$ (b) $\frac{x-1}{x+2}$
(c) $\frac{x+1}{x+2}$ (d) $\frac{x-1}{x-2}$

Q.211. If $(l + m + n) = 0$, then what will be the value of $(\frac{l^2}{mn} + \frac{m^2}{nl} + \frac{n^2}{lm})^2$?
SSC CHSL 10/08/2023 (2nd Shift)
(a) 9 (b) 16 (c) 4 (d) 1

Q.212. If $2x + 5y = 15$ and $xy = 6$, then the value of $4x^2 + 25y^2$ is _____.
SSC CHSL 10/08/2023 (3rd Shift)
(a) 105 (b) 95 (c) 100 (d) 90

Q.213. If $x^2 - \sqrt{9.76}\,x + 1 = 0$ and $x > 1$, the value of $(x^3 - \frac{1}{x^3})$is :
SSC CHSL 10/08/2023 (3rd Shift)
(a) 21.042 (b) 24.024
(c) 21.024 (d) 24.042

Q.214. If $(5a + \frac{4}{a} - 2) = 13$ and a > 0, what is the value of $(25a^2 + \frac{16}{a^2})$?
SSC CHSL 10/08/2023 (4th Shift)
(a) 158 (b) 157 (c) 185 (d) 175

Q.215. Simplify the given expression.
$$\frac{(x^3 - y^3)(x+y)}{x^2 + xy + y^2}$$
SSC CHSL 10/08/2023 (4th Shift)
(a) x - y (b) $x^2 - y^2$ (c) x + y (d) $x^2 + y^2$

Q.216. If (a + b + c) = 17, and $(a^2 + b^2 + c^2) = 115$, find the value of $(a + b)^2 + (b + c)^2 + (c + a)^2$.
SSC CHSL 11/08/2023 (2nd Shift)
(a) 402 (b) 408 (c) 394 (d) 404

Q.217. Simplify :
$(2a - 3b - c)^2 - (a + 2b + c)^2$
SSC CHSL 11/08/2023 (2nd Shift)
(a) $3a^2 + 5b^2 - 16ab + 2bc - 8ac$
(b) $3a^2 + 5b^2 - 8ab + 2bc - 6ac$
(c) $3a^2 + 5b^2 - 16ab - 6ac$
(d) $3a^2 + 5b^2 - 16ab + 2bc - 6ac$

Q.218. If $x^2 - 3.2x + 1 = 0$ and $x > 1$, the value of $(x^2 - \frac{1}{x^2})$ is :
SSC CHSL 11/08/2023 (3rd Shift)
(a) $16.8\sqrt{0.39}$ (b) $12.8\sqrt{0.39}$
(c) $16.8\sqrt{0.32}$ (d) $12.8\sqrt{0.32}$

Q.219. If $x^2 + y^2 + z^2 = 2(x + z - 1)$, then the value of $x^3 + y^3 + z^3$ is equal to :
SSC CHSL 11/08/2023 (3rd Shift)
(a) 6 (b) 1 (c) 2 (d) 8

Q.220. If x + 3y = 6, what is the value of

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$x^3 + 27y^3 + 54xy$?
SSC CHSL 14/08/2023 (1st Shift)
(a) 264 (b) 258 (c) 216 (d) 220

Q.221. If p + q = 12 and pq = 14, then find the value of $p^2 - pq + q^2$.
SSC CHSL 14/08/2023 (3rd Shift)
(a) 192 (b) 181 (c) 102 (d) 144

Q.222. Simplify the given expression, $\frac{(x+3)^3+(x-3)^3}{x^2+27}$
SSC CHSL 14/08/2023 (3rd Shift)
(a) 3x (b) x (c) 4x (d) 2x

Q.223. Simplify the expression:
$\frac{1}{8}[\frac{1}{b-1} - \frac{1}{b+1} - \frac{2}{b^2+1} - \frac{4}{b^4+1}]$
SSC CHSL 14/08/2023 (4th Shift)
(a) $\frac{1}{b^8-1}$ (b) $\frac{8}{b^8+1}$
(c) $\frac{8}{b^8-1}$ (d) $\frac{1}{b^8+1}$

Q.224. If (d + e + f) = 14, $(d^2 + e^2 + f^2) = 96$, then find the value of (de + ef + fd).
SSC CHSL 17/08/2023 (1st Shift)
(a) 75 (b) 25 (c) 50 (d) 100

Q.225. If $g = (2 - \sqrt{3})$, what will be the value of $(g^3 - \frac{1}{g^3})$?
SSC CHSL 17/08/2023 (1st Shift)
(a) $-30\sqrt{3}$ (b) 52 (c) $30\sqrt{3}$ (d) -52

Q.226. Simplify the expression:
$(2x + 13 - y)(2x - 13 - y)$
SSC CHSL 17/08/2023 (1st Shift)
(a) $4x^2 - y^2 - 4xy - 169$
(b) $4x^2 + y^2 + 4xy - 169$
(c) $4x^2 + y^2 - 4xy - 169$
(d) $4x^2 + y^2 - 4xy + 169$

Q.227. Simplify:
$(3x - 2y)(3x + 2y)(9x^2 + 4y^2)$
SSC CHSL 17/08/2023 (2nd Shift)
(a) $81x^4 + 16y^4$ (b) $81y^4 - 16x^4$
(c) $81y^4 + 16x^4$ (d) $81x^4 - 16y^4$

Q.228. Simply the given expression :
(5p + 3q) (5p - 3q).
SSC CHSL 17/08/2023 (2nd Shift)
(a) $25p^2 - 9q^2 + 30pq$ (b) $25p^2 - 9q^2$
(c) $25p^2 + 9q^2$ (d) $25p^2 + 9q^2 - 30pq$

Q.229. If $p^2 - 4p - 1 = 0$, then the value of $p^2 + 3p + \frac{1}{p^2} - \frac{3}{p}$ is :
SSC CHSL 17/08/2023 (2nd Shift)
(a) 40 (b) 50 (c) 65 (d) 30

Q.230. If 3x - 2y= 3 and xy = 9, then find the value of 3x + 2y.
SSC CHSL 17/08/2023 (4th Shift)
(a) 16 (b) 13 (c) 14 (d) 15

Q.231. If px + qy= 1 and qx + py = $\frac{2pq}{p^2+q^2}$, then $(x^2 + y^2)(p^2 + q^2)$ is equal to:
SSC CHSL 17/08/2023 (4th Shift)
(a) 2 (b) 3 (c) 0 (d) 1

SSC CGL 2023 Tier - 1

Q.232. If $7b - \frac{1}{4b} = 7$, then what is the value of $16b^2 + \frac{1}{49b^2}$?
SSC CGL 14/07/2023 (1st shift)
(a) $\frac{80}{49}$ (b) $\frac{104}{7}$ (c) $\frac{120}{7}$ (d) $\frac{7}{2}$

Q.233. What is the value of $(3x^3 + 5x^2y + 12xy^2 + 7y^3)$, when x = - 4 and y = - 1?
SSC CGL 14/07/2023 (1st shift)
(a) - 329 (b) -359 (c) - 361 (d) - 327

Q.234. If (a + b + c) = 16, and $(a^2 + b^2 + c^2) = 90$, find the value of (ab + bc + ca).
SSC CGL 14/07/2023 (1st shift)
(a) 84 (b) 83 (c) 82 (d) 81

Q.235. What is the value of $a^3 + b^3 + c^3$, if (a + b + c) = 0 ?
SSC CGL 14/07/2023 (2nd shift)
(a) $a^2 + b^2 + c^2 - 3abc$
(b) 0
(c) 3abc
(d) $a^2 + b^2 + c^2 - ab - bc - ca$

Q.236. If $x + \frac{1}{x} = 7$, then the value of $x^6 + \frac{1}{x^6}$ is:
SSC CGL 14/07/2023 (3rd shift)
(a) 113682 (b) 103682
(c) 103882 (d) 103862

Q.237. If a = 17, b = 13, then find the value of the expression $(a^3 - b^3 - 3a^2b + 3ab^2)$.
SSC CGL 14/07/2023 (4th shift)
(a) - 64 (b) - 27000 (c) 27000 (d) 64

Q.238. Simplify, $\frac{x^4 - 2x^2 + 1}{x^2 - 2x + 1}$.
SSC CGL 17/07/2023 (2nd shift)
(a) $x^2 - 2x + 1$ (b) $x^2 + 2x + 2$
(c) $x^2 + 2x + 1$ (d) $x^2 + x + 1$

Q.239. If $(x - \frac{1}{x}) = \sqrt{6}$, and x > 1, what is the value of $(x^8 - \frac{1}{x^8})$?
SSC CGL 17/07/2023 (2nd shift)
(a) $1024\sqrt{15}$ (b) $992\sqrt{15}$
(c) $998\sqrt{15}$ (d) $1012\sqrt{15}$

Q.240. What is the value of the given expression?
$(a + b + c)^2 - a^2 - b^2 - c^2$
SSC CGL 17/07/2023 (3rd shift)
(a) 2abc (b) 2(ab + bc + ca)
(c) 2(a + b + c) (d) 2ab + bc - 2ca

Q.241. What is the value of $\frac{X}{Y}$ if $\frac{X-5Y}{X+5Y} = \frac{7}{13}$.
SSC CGL 17/07/2023 (4th shift)
(a) $\frac{23}{7}$ (b) $\frac{24}{9}$ (c) $\frac{50}{3}$ (d) $\frac{100}{7}$

Q.242. The cube of the difference between two given natural numbers is 1728, while the product of these two given numbers is 108. Find the positive difference between the cubes of these two given numbers.
SSC CGL 18/07/2023 (1st shift)
(a) 4104 (b) 5616 (c) 2160 (d) 5626

Q.243. If $(a + b + c) = 19$, and $(a^2 + b^2 + c^2) = 155$, find the value of $(a - b)^2 + (b - c)^2 + (c - a)^2$.
SSC CGL 18/07/2023 (2nd shift)
(a) 104 (b) 108 (c) 100 (d) 98

Q.244. If $a^2 + b^2 + c^2 = ab + bc + ac$, then the value of $\frac{11a^4 + 13b^4 + 17c^4}{17a^2b^2 + 9b^2c^2 + 15c^2a^2}$ is:
SSC CGL 18/07/2023 (3rd shift)
(a) 1 (b) 2 (c) 11 (d) 4

Q.245. The square of the difference between two given natural numbers is 324, while the product of these two given numbers is 144. Find the positive difference between the squares of these two given numbers.
SSC CGL 18/07/2023 (3rd shift)
(a) 630 (b) 540 (c) 450 (d) 360

Q.246. If p = $\frac{\sqrt{2}+1}{\sqrt{2}-1}$ and q = $\frac{\sqrt{2}-1}{\sqrt{2}+1}$ then find the value of $\frac{p^2}{q} + \frac{q^2}{p}$
SSC CGL 18/07/2023 (4th shift)
(a) 200 (b) 196 (c) 198 (d) 188

Q.247. If $(x + \frac{1}{x}) = 2\sqrt{2}$, and $x > 1$, what is the value of $(x^6 - \frac{1}{x^6})$?
SSC CGL 19/07/2023 (1st shift)
(a) $140\sqrt{2}$ (b) $116\sqrt{2}$ (c) $144\sqrt{2}$ (d) $128\sqrt{2}$

Q.248. If (a + b + c) = 12 , and $(a^2 + b^2 + c^2) = 50$, find the value of $(a^3 + b^3 + c^3 - 3abc)$.
SSC CGL 19/07/2023 (2nd shift)
(a) 36 (b) 24 (c) 42 (d) 48

Q.249. If $(3y - \frac{3}{y}) = 5$, find the value of

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$(y^2 + \frac{1}{y^2})$.
SSC CGL 19/07/2023 (2nd shift)
(a) $\frac{47}{9}$ (b) $\frac{49}{9}$ (c) $\frac{41}{9}$ (d) $\frac{43}{9}$

Q.250. If $x^2 - 7x + 1 = 0$, and $0 < x < 1$, what is the value of $x^2 - \frac{1}{x^2}$?
SSC CGL 19/07/2023 (3rd shift)
(a) $21\sqrt{5}$ (b) $-21\sqrt{5}$ (c) $28\sqrt{5}$ (d) $-28\sqrt{5}$

Q.251. If $(x + \frac{1}{x}) = 2$, then $x^7 + \frac{1}{x^{117}} =$ _____ .
SSC CGL 19/07/2023 (4th shift)
(a) 1 (b) 2 (c) 4 (d) 3

Q.252. If (a + b + c) = 20, and $a^2 + b^2 + c^2 = 152$, find the value of $a^3 + b^3 + c^3 - 3abc$.
SSC CGL 19/07/2023 (4th shift)
(a) 560 (b) 640 (c) 480 (d) 720

Q.253. Simplify the expression $\frac{l^2 - m^2}{(l+m)^2}$, provided $(l + m) \neq 0$.
SSC CGL 20/07/2023 (1st shift)
(a) $\frac{(l+m)}{(l-m)}$ (b) $\frac{(l-m)}{(l+m)}$ (c) 0 (d) 1

Q.254. If x > 0 and $x^4 + \frac{1}{x^4} = 142$, what is the value of $x^7 + \frac{1}{x^7}$?
SSC CGL 20/07/2023 (2nd shift)
(a) $1561\sqrt{14}$ (b) $1563\sqrt{14}$
(c) $1560\sqrt{14}$ (d) $1562\sqrt{14}$

Q.255. If a + b + c = 7, ab + bc + ca = 11 and abc = -1, then $a^3 + b^3 + c^3$ is equal to:
SSC CGL 20/07/2023 (3rd shift)
(a) 101 (b) 107 (c) 109 (d) 111

Q.256. If $(x - \frac{1}{x}) = 6$, and x > 0, find the value of $(x^2 - \frac{1}{x^2})$.
SSC CGL 20/07/2023 (4th shift)
(a) $12\sqrt{10}$ (b) $18\sqrt{10}$ (c) $24\sqrt{2}$ (d) $24\sqrt{10}$

Q.257. If $(x + \frac{1}{x}) = 3\sqrt{2}$, and x > 1, what is the value of $(x^8 - \frac{1}{x^8})$?
SSC CGL 20/07/2023 (4th shift)
(a) $24364\sqrt{7}$ (b) $24384\sqrt{11}$
(c) $24384\sqrt{7}$ (d) $12192\sqrt{7}$

Q.258. What is the value of $(\frac{1}{a} - \frac{1}{b} - \frac{1}{c})$ if, $\frac{2a-5}{a} - \frac{4b-5}{b} + \frac{6c+5}{c} = 0$?
SSC CGL 21/07/2023 (2nd shift)
(a) $\frac{4}{5}$ (b) $-\frac{8}{5}$ (c) $\frac{2}{5}$ (d) $-\frac{12}{5}$

Q.259. Simplify the following expression.
$[(1 + P)(1 + P^2)(1 + P^4)(1 + P^8)(1 + P^{16})(1 - P) - 1]$
SSC CGL 21/07/2023 (3rd shift)
(a) $-P^{32}$ (b) P^{32} (c) $(1 + P^{32})$ (d) $(1 - P^{32})$

Q.260. If x and y are positive numbers such that x - y = 5 and xy = 150, then the value of (x + y) is:
SSC CGL 21/07/2023 (3rd shift)
(a) 45 (b) 25 (c) 35 (d) 15

Q.261. If (a - b) = 1 then what is the value of $(a^3 - b^3)$?
SSC CGL 21/07/2023 (4th shift)
(a) $a^2 + ab + b^2$ (b) $(a + b)^2 + 3ab$
(c) $a^2 - ab + b^2$ (d) $a^2 + 2ab + b^2$

Q.262. If $(x^2 + \frac{1}{x^2}) = 18$, and x > 0, what is the value of $(x^3 + \frac{1}{x^3})$?
SSC CGL 21/07/2023 (4th shift)
(a) $36\sqrt{5}$ (b) $40\sqrt{5}$ (c) $46\sqrt{5}$ (d) $34\sqrt{5}$

Q.263. The value of $\frac{p^2 - (q-r)^2}{(p+r)^2 - q^2} + \frac{q^2 - (p-r)^2}{(p+q)^2 - r^2} + \frac{r^2 - (p-q)^2}{(q+r)^2 - p^2}$
SSC CGL 24/07/2023 (1st shift)
(a) 1 (b) 2 (c) 0 (d) 3

Q.264. If $\frac{a}{b} = \frac{7}{6}$, then find the value of the expression $\frac{6a + 13b}{6a - 13b}$.
SSC CGL 24/07/2023 (3rd shift)
(a) $-\frac{3}{10}$ (b) $\frac{10}{3}$ (c) $-\frac{10}{3}$ (d) $\frac{3}{10}$

Q.265. Simplify $\frac{1}{2+2p} + \frac{1}{2+2q} + \frac{1}{2+2r}$, where $p = \frac{x}{y+z}$, $q = \frac{y}{z+x}$ and $r = \frac{z}{x+y}$.
SSC CGL 24/07/2023 (4th shift)
(a) 1 (b) x + y + z (c) 2 (d) $\frac{1}{2}$

Q.266. If $(y - \frac{1}{y}) = 4$, find the value of $(y^6 + \frac{1}{y^6})$.
SSC CGL 25/07/2023 (1st shift)
(a) 5774 (b) 4096 (c) 5776 (d) 5778

Q.267. If $x^2 - 15x + 1 = 0$, what is the value of $x^4 - 223x^2 + 6$?
SSC CGL 25/07/2023 (1st shift)
(a) 9 (b) 5 (c) 6 (d) 0

Q.268. If $p + q + r = pqr = \frac{1}{p} + \frac{1}{q} + \frac{1}{r} = 1$, then find $p^3 + q^3 + r^3$.
SSC CGL 25/07/2023 (2nd shift)
(a) 1 (b) - 1 (c) 5 (d) - 5

Q.269. Simplify $\frac{256x^4 - 16y^4}{(80x^2 - 20y^2)(16x^2 + 4y^2)}$
SSC CGL 25/07/2023 (2nd shift)
(a) 5 (b) $\frac{1}{20}$ (c) $\frac{1}{5}$ (d) $\frac{2}{5}$

Q.270. If $7a - \frac{7}{a} + 4 = 0$, then find $a^3 - \frac{1}{a^3} - 1$.
SSC CGL 25/07/2023 (2nd shift)
(a) $\frac{-995}{343}$ (b) $\frac{-875}{248}$ (c) $\frac{-694}{315}$ (d) $\frac{-765}{262}$

Q.271. Simplify the expression $\frac{s^2 + t^2 + 2st - u^2}{s^2 - t^2 - 2tu - u^2}$, provided (s + t + u) ≠ 0.
SSC CGL 25/07/2023 (4th shift)
(a) $\frac{s+t-u}{s-t-u}$ (b) $\frac{s+t+u}{s-t+u}$
(c) $\frac{s-t-u}{s+t-u}$ (d) $\frac{s-t+u}{s+t+u}$

Q.272. If $x^2 - 8x - 1 = 0$, what is the value of $x^2 + \frac{1}{x^2}$?
SSC CGL 26/07/2023 (1st shift)
(a) 68 (b) 62 (c) 64 (d) 66

Q.273. If $(x^2 + \frac{1}{x^2}) = 6$, and $0 < x < 1$, what is the value of $x^4 - \frac{1}{x^4}$?
SSC CGL 26/07/2023 (1st shift)
(a) $24\sqrt{2}$ (b) $-24\sqrt{2}$
(c) $-12\sqrt{10}$ (d) $12\sqrt{10}$

Q.274. If $x = \frac{1}{x-3}$, $(x > 0)$, then the value of $x + \frac{1}{x}$ is:
SSC CGL 26/07/2023 (1st shift)
(a) $\sqrt{11}$ (b) $\sqrt{17}$ (c) $\sqrt{15}$ (d) $\sqrt{13}$

Q.275. If $x + \frac{1}{x} = 1$, then the value of $\frac{x^2 + 7x + 1}{x^2 + 11x + 1} = ?$
SSC CGL 26/07/2023 (2nd shift)
(a) $\frac{3}{4}$ (b) $\frac{2}{3}$ (c) $\frac{1}{3}$ (d) $\frac{1}{4}$

Q.276. If $(x + \frac{1}{x}) = \sqrt{6}$, and $x > 1$, what is the value of $(x^8 - \frac{1}{x^8})$?
SSC CGL 26/07/2023 (3rd shift)
(a) $120\sqrt{3}$ (b) $128\sqrt{3}$ (c) $112\sqrt{3}$ (d) $108\sqrt{3}$

Q.277. If b = 5, determine the value of an expression $(\frac{5}{b} + 5b)(\frac{25}{b^2} - 25 + 25b^2)$ using an identity.

Search on TG : @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 26/07/2023 (3rd shift)
(a) 25726 (b) 15626 (c) 15438 (d) 25636

Q.278. If $(x - \frac{1}{x}) = 10$, what is the value of $(x^4 + \frac{1}{x^4})$?
SSC CGL 26/07/2023 (3rd shift)
(a) 10404 (b) 10402 (c) 10406 (d) 10400

Q.279. Expand and simplify the algebraic expression: $(x - 5)^2 + (x + 3)^2 + 4x$
SSC CGL 26/07/2023 (4th shift)
(a) $2(x^2 - 17)$ (b) $2(x^2 + 17)$
(c) $(x^2 + 17)$ (d) $2(x^2 - 5x + 17)$

Q.280. If 2x + 3y = 16 and xy = 9, then find $8x^3 + 27y^3$.
SSC CGL 27/07/2023 (1st shift)
(a) 1980 (b) 2980 (c) 1504 (d) 2189

Q.281. If x + y = 25 and xy = 20, then find the value of $x^3 + y^3$.
SSC CGL 27/07/2023 (1st shift)
(a) 13152 (b) 13125 (c) 14125 (d) 14152

Q.282. If $x^2 - \frac{1}{x^2} = 4\sqrt{2}$ what is the value of $x^4 - \frac{1}{x^4}$?
SSC CGL 27/07/2023 (2nd shift)
(a) $16\sqrt{2}$ (b) $8\sqrt{2}$ (c) $24\sqrt{2}$ (d) $32\sqrt{2}$

SSC Selection Post (Phase - XI)

Q.283. If $(x^2 + \frac{1}{x^2}) = 18$, and x > 1, what is the value of $(x^3 - \frac{1}{x^3})$?
Graduate Level 27/06/2023 (Shift - 4)
(a) 52 (b) 76 (c) 80 (d) 64

Q.284. What is the solution to the following system of linear equations?
3x - 9y + 4z = 5
2x + 7y + z = 12
3x - z = 0
Graduate Level 28/06/2023 (Shift - 3)
(a) $x = \frac{143}{150}$, $y = \frac{31}{37}$, $z = \frac{143}{50}$
(b) $x = \frac{143}{150}$, $y = \frac{31}{30}$, $z = \frac{143}{50}$
(c) $x = \frac{137}{150}$, $y = \frac{31}{30}$, $z = \frac{143}{50}$
(d) $x = \frac{143}{150}$, $y = \frac{31}{30}$, $z = \frac{143}{51}$

Q.285. If 2a + b = 10 and 2ab = 9, then one of the values of 2a - b is:
Graduate Level 28/06/2023 (Shift - 3)
(a) 8 (b) 4 (c) 6 (d) 10

Q.286. If x > 1, and $x^2 + \frac{1}{x^2} = 2\sqrt{5}$, what is the value of $x^4 - \frac{1}{x^4}$?
Graduate Level 28/06/2023 (Shift - 3)
(a) $4\sqrt{5}$ (b) $4\sqrt{30}$ (c) $8\sqrt{5}$ (d) $8\sqrt{6}$

Q.287. If $x > 1$, and $x^4 + \frac{1}{x^4} = 79$, what is the value of $x - \frac{1}{x}$?
Graduate Level 30/06/2023 (Shift - 1)
(a) $2\sqrt{2}$ (b) $\sqrt{7}$ (c) $\sqrt{11}$ (d) $\sqrt{10}$

Q.288. If $x + y = \sqrt{13}$ and $x - y = \sqrt{11}$, then the value of $xy(x^2 + y^2)$ is:
Graduate Level 30/06/2023 (Shift - 1)
(a) 10 (b) 6 (c) $\sqrt{6}$ (d) $\sqrt{10}$

Q.289. If ab + bc + ca = 0, then find the value of $\frac{1}{a^2 - bc} + \frac{1}{b^2 - ca} + \frac{1}{c^2 - ab}$.
Graduate Level 30/06/2023 (Shift - 1)
(a) 0 (b) $\frac{1}{abc}$ (c) 1 (d) ab

Q.290. A varies directly with B. When A = 52, B = 91. Find the value of A when B = 126.
Higher Secondary 27/06/2023 (Shift - 3)
(a) 76 (b) 84 (c) 72 (d) 70

Q.291. For what value of q does the system of equations 38x + qy + 171 = 0 and 46x + 414y + 207 = 0 have infinite number of solutions?
Higher Secondary 28/06/2023 (Shift - 2)
(a) 380 (b) 345 (c) 342 (d) 350

Q.292. If x = 14, y = 15 and z = 17, then the value of $x^3 + y^3 + z^3 - 3xyz$ is:
Higher Secondary 28/06/2023 (Shift - 2)
(a) 333 (b) 322 (c) 312 (d) 222

Q.293. For what value of p does the system of equations 18x + 36y + 45 = 0 and px - 54y + 67 = 0 have no solution?
Higher Secondary 30/06/2023 (Shift - 2)
(a) 54 (b) – 27 (c) – 36 (d) 27

Q.294. Solve $(\frac{9}{8} + \frac{8}{9})^2 - (\frac{9}{8} - \frac{8}{9})^2$.
Higher Secondary 30/06/2023 (Shift - 2)
(a) 4 (b) 1 (c) 8 (d) 2

SSC CHSL 2022 Tier - 1

Q.295. What is the value of
$\frac{1 + x^2}{1 - x} \div \frac{1 - x^4}{x - 1} \times \frac{x(1 - x)}{(1 + x)}$?
SSC CHSL 09/03/2023 (1st Shift)
(a) $\frac{-x}{1 + 2x^2}$ (b) $\frac{-x}{1 + x}$
(c) $\frac{-x}{(1 + x)^2}$ (d) $\frac{-x}{1 + x^2}$

Q.296. If $K + \frac{1}{K} - 2 = 0$ and K > 0, then what is the value of $K^{17} + \frac{1}{K^{12}}$?
SSC CHSL 09/03/2023 (2nd Shift)
(a) 2 (b) 1 (c) 0 (d) 12

Q.297. If $a^4 + \frac{1}{a^4} = 194$, then what is the value of $\frac{a^6 + 1}{a^3}$?
SSC CHSL 09/03/2023 (4th Shift)
(a) 46 (b) 50 (c) 52 (d) 48

Q.298. What is the value of (a - b)(b + a)($a^2 + b^2$)($2b^4 + 2a^4$) ?
SSC CHSL 10/03/2023 (1st Shift)
(a) $a^4 - b^4$ (b) $a^8 - b^8$
(c) $2(a^8 - b^8)$ (d) $\frac{(a^8 - b^8)}{2}$

Q.299. If $\frac{(15)^3 + (4)^3}{(15^2 + 4^2 - k)} = 19$, then what is the value of K?
SSC CHSL 10/03/2023 (3rd Shift)
(a) – 60 (b) 120 (c) 60 (d) – 120

Q.300. If $x^2 + \frac{1}{x^2} = 38$, then what is the value of $x - \frac{1}{x}$?
SSC CHSL 10/03/2023 (3rd Shift)
(a) 6 (b) 7 (c) 8 (d) 10

Q.301. Find the value of $p^3 - r^3$. if p + r = 21, and pr = 38.
SSC CHSL 10/03/2023 (4th Shift)
(a) 6538 (b) 6113 (c) 6102 (d) 6851

Q.302. What is the value of
(a + b + c) {$(a - b)^2 + (b - c)^2 + (c - a)^2$} ?
SSC CHSL 13/03/2023 (1st Shift)
(a) $2a^3 + 2b^3 + 2c^3$
(b) $2a^3 + 2b^3 + 2c^3 - 6abc$
(c) 3abc
(d) 6abc

Q.303. If $x + \frac{1}{x} = -2$, then what is the value of $x^7 + x^{-7} + x^2 + x^{-2}$ (x < 0)
SSC CHSL 13/03/2023 (1st Shift)
(a) 4 (b) 2 (c) 1 (d) 0

Q.304. What is the value of $\frac{4x^2 + 9y^2 + 12xy}{144}$?
SSC CHSL 13/03/2023 (2nd Shift)
(a) $(\frac{x}{6} + \frac{y}{4})^2$ (b) $(\frac{x}{3} + y)^2$
(c) $(\frac{x}{3} + \frac{y}{4})^2$ (d) $(\frac{x}{4} + \frac{y}{6})^2$

Q.305. What is the expansion of $(a - 4)^3$?
SSC CHSL 13/03/2023 (3rd Shift)
(a) $a^3 - 12a^2 + 48a + 64$
(b) $a^3 + 12a^2 + 48a + 64$
(c) $a^3 - 12a^2 + 48a - 64$
(d) $a^3 + 12a^2 + 48a - 64$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.306. If x - y = 8 and 8xy = 8, then what is the value of $2x^3 - 2y^3$?
SSC CHSL 13/03/2023 (4th Shift)
(a) 536 (b) 1092 (c) 1072 (d) 1608

Q.307. If $a^3 = b^3 + 988$ and a - b = 4, then what is the value of $2a^2 + 2ab + 2b^2$?
SSC CHSL 14/03/2023 (1st Shift)
(a) 516 (b) 494 (c) 500 (d) 247

Q.308. If $a^3 + 3a^2 + 3a = 63$, then the value of $a^2 + 2a$ is:
SSC CHSL 14/03/2023 (2nd Shift)
(a) 22 (b) 19 (c) 15 (d) 8

Q.309. If a + b + c = 6 and $a^2 + b^2 + c^2 = 40$. then what is the value of $a^3 + b^3 + c^3 - 3abc$?
SSC CHSL 14/03/2023 (3rd Shift)
(a) 212 (b) 252 (c) 232 (d) 206

Q.310. If 9a + 9b + 9c = 81 and 4ab + 4bc + 4ca = 160, then what is the value of $6a^2 + 6b^2 + 6c^2$?
SSC CHSL 14/03/2023 (4th Shift)
(a) 1 (b) 3 (c) 4 (d) 6

Q.311. If $N + \frac{1}{N} = \sqrt{3}$, then find the value of $N^6 + \frac{1}{N^6} + 11$.
SSC CHSL 15/03/2023 (1st Shift)
(a) - 11 (b) 9 (c) - 2 (d) 11

Q.312. What is the value of $\frac{(a+b)^2 - (a-b)^2}{ab}$?
SSC CHSL 15/03/2023 (1st Shift)
(a) 1 (b) 4 (c) 8 (d) 2

Q.313. What is the value of $(a - b)^3 - a^3 + b^3$?
SSC CHSL 15/03/2023 (2nd Shift)
(a) 3ab(a - b) (b) - 3ab(a + b)
(c) 3ab(a + b) (d) - 3ab(a - b)

Q.314. Compute the expression $(299)^2$ using algebraic identities.
SSC CHSL 15/03/2023 (2nd Shift)
(a) 89301 (b) 89402 (c) 88401 (d) 89401

Q.315. What is the value of $(k - \frac{1}{k})(k^2 + \frac{1}{k^2})(k^4 + \frac{1}{k^4})(k^8 + \frac{1}{k^8})(k^{16} + \frac{1}{k^{16}})$
SSC CHSL 15/03/2023 (2nd Shift)
(a) $k^{64} - \frac{1}{k^{64}}$ (b) $\frac{k^{32} - \frac{1}{k^{32}}}{k - \frac{1}{k}}$
(c) $(k^{32} - \frac{1}{k^{32}})$ (d) $\frac{k^{32} - \frac{1}{k^{32}}}{k + \frac{1}{k}}$

Q.316. If $x + \frac{1}{x} = \frac{K}{2}$, then what is the value of $\frac{x^8 + 1}{x^4}$?
SSC CHSL 16/03/2023 (1st Shift)
(a) $\frac{K^4 - 16K^2 + 32}{16}$ (b) $\frac{K^4 - 8K^2 + 36}{32}$
(c) $\frac{K^4 - 8K^2 - 32}{16}$ (d) $\frac{K^4 - 8K^2 + 32}{16}$

Q.317. If (p - q) = 6, (r - q) = 5 and (r - p) = 3, then find the value of $(p^3 + q^3 + r^3 - 3pqr)/(p + q + r)$.
SSC CHSL 16/03/2023 (2nd Shift)
(a) 35 (b) 45 (c) 30 (d) 40

Q.318. If $A + \frac{1}{A} = -1$, then find the value of $\frac{A^6 + A^3 - 1}{A^9 + A^3 - 1}$?
SSC CHSL 16/03/2023 (3rd Shift)
(a) 0 (b) - 1 (c) 2 (d) 1

Q.319. If $(x + 1)^2 + (x + 2)^2 = 16$, then what is the value of $4x^2 + 12x + 40$?
SSC CHSL 16/03/2023 (3rd Shift)
(a) 52 (b) 62 (c) 56 (d) 74

Q.320. What is the value of $a^2 + 4b^2 + 9c^2 - 4ab + 12bc - 6ca$?
SSC CHSL 16/03/2023 (4th Shift)
(a) $(a + 2b - 3c)^2$ (b) $(2a - b - 3c)^2$
(c) $(2b - a - 3c)^2$ (d) $(a - 2b - 3c)^2$

Q.321. If a + b + c = 1, ab + bc + ca = − 1 and abc = − 1, then what is the value $a^3 + b^3 + c^3$?
SSC CHSL 17/03/2023 (3rd Shift)
(a) 3 (b) 5 (c) 2 (d) 1

Q.322. What is the value of $(a + b)^3 - a^3 - b^3$?
SSC CHSL 17/03/2023 (3rd Shift)
(a) 3ab(a − b) (b) − 3ab(a − b)
(c) 3ab(a + b) (d) − 3ab(a + b)

Q.323. If $\frac{1}{(x-2)} + x = 8$, then what is the value of $\frac{1}{(x-2)^2} + (x - 2)^2$?
SSC CHSL 17/03/2023 (4th Shift)
(a) 38 (b) 36 (c) 40 (d) 34

Q.324. What is the value of
$\frac{1+X}{1-X^2} \div \frac{1+X}{1-X^4} - \frac{1-X^4}{1-X} \times \frac{1+X}{1-X^2}$?
SSC CHSL 20/03/2023 (3rd Shift)
(a) $\frac{2X(1+X^2)}{(1-X)}$ (b) $\frac{2X(1+X^2)}{(X-1)}$
(c) $(1 - X^2)$ (d) $(1 + X^2)$

Q.325. If x + y + z = 0, then what is the value of $\frac{x}{(yz)^2} + \frac{y}{(xz)^2} + \frac{z}{(xy)^2}$?
SSC CHSL 21/03/2023 (1st Shift)
(a) $\frac{xyz}{3}$ (b) $\frac{3}{xyz}$ (c) xyz (d) $\frac{1}{xyz}$

Q.326. If $\frac{K}{K^2 - 2K + 1} = \frac{1}{6}$, then what is the value of $\frac{1}{K^3} + K^3$?
SSC CHSL 21/03/2023 (2nd Shift)
(a) 472 (b) 492 (c) 512 (d) 488

Q.327. If $(x - \frac{1}{x} = 4)$, then what is the value of $(x^6 + \frac{1}{x^6})$?
SSC CHSL 21/03/2023 (4th Shift)
(a) 4689 (b) 4786 (c) 5832 (d) 5778

SSC CGL 2022 Tier - 2

Q.328. For what value of m will the system of equations 18x - 72y + 13 = 0 and 7x - my - 17 = 0 have no solution?
SSC CGL Tier II (06/03/2023)
(a) 28 (b) 24 (c) 9 (d) 12

Q.329. If $2^x + 3^y = 17$ and $2^{x+2} - 3^{y+1} = 5$, then:
SSC CGL Tier II (07/03/2023)
(a) x = 1, y = 3 (b) x = 3, y = 3
(c) x = 3, y = 2 (d) x = 1, y = 2

SSC CGL 2022 Tier - 1

Q.330. If $x^2 - 5x + 1 = 0$, then the value of $\frac{x^6 + x^4 + x^2 + 1}{5x^3}$.
SSC CGL 01/12/2022 (1st Shift)
(a) 30 (b) 25 (c) 23 (d) 28

Q.331. x is a negative number such that $k + k^{-1} = -2$, then what is the value of $\frac{k^2 + 4k - 2}{k^2 + k - 5}$?
SSC CGL 01/12/2022 (2nd Shift)
(a) 7 (b) 1 (c) - 7 (d) - 1

Q.332. If $(x + \frac{1}{x}) = 5\sqrt{2}$, then what is the value of $(x^4 + x^{-4})$?
SSC CGL 01/12/2022 (2nd Shift)
(a) 2542 (b) 2650 (c) 2452 (d) 2302

Q.333. If a + b = 11 and ab = 35, then what is the value of $(a^4 + b^4)$?
SSC CGL 01/12/2022 (3rd Shift)
(a) 151 (b) 261 (c) 124 (d) 102

Q.334. If x + y = 36, then find $(x - 27)^3 + (y - 9)^3$.
SSC CGL 01/12/2022 (3rd Shift)
(a) 1 (b) 81 (c) 2y (d) 0

Q.335. If $\frac{a^2 + b^2 + c^2 - 1024}{ab - bc - ca} = -2$ and

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

a + b = 5c, where c > 0, then the value of c is _____.
SSC CGL 01/12/2022 (4th Shift)
(a) 8 (b) 4 (c) 12 (d) 5

Q.336. If x = $\frac{\sqrt{5}-2}{\sqrt{5}+2}$, then the value of $x^2 + x^{-2}$ is:
SSC CGL 02/12/2022 (1st Shift)
(a) 350 (b) 345 (c) 284 (d) 322

Q.337. Simplify $\frac{x^2+2x+y^2}{x^3-5x^2}$ if x + $\frac{y^2}{x}$ = 5
SSC CGL 02/12/2022 (2nd Shift)
(a) $\frac{5}{y^2}$ (b) $\frac{7}{y^2}$ (c) - $\frac{5}{y^2}$ (d) - $\frac{7}{y^2}$

Q.338. If x + $\frac{1}{x}$ = 8, then find the value of $\frac{5}{x^2-8x+2}$?
SSC CGL 02/12/2022 (4th Shift)
(a) 3 (b) 4 (c) 0 (d) 5

Q.339. If ($4a + \frac{5}{a}$ + 5) = 14, what is the value of ($16a^2 + \frac{25}{a^2}$) ?
SSC CGL 03/12/2022 (1st Shift)
(a) 25 (b) 36 (c) 41 (d) 40

Q.340. If x - $\frac{1}{x}$ = 13 then, what will be the value of $x^4 + \frac{1}{x^4}$?
SSC CGL 03/12/2022 (1st Shift)
(a) 28561 (b) 29243 (c) 27887 (d) 29239

Q.341. The factors of $x^4 + x^2 + 25$ are:
SSC CGL 03/12/2022 (1st Shift)
(a) $(x^2 + 3x - 5)(x^2 - 3x + 5)$
(b) $(x^2 + 3x + 5)(x^2 - 3x + 5)$
(c) $(x^2 - 3x + 5)(x^2 - 3x + 5)$
(d) $(x^2 + 3x + 5)(x^2 + 3x + 5)$

Q.342. If x = 3 + $2\sqrt{2}$, x > 0, then the value of $\sqrt{x}$ - $\frac{1}{\sqrt{x}}$ is:
SSC CGL 03/12/2022 (2nd Shift)
(a) 1 (b) $\sqrt{2}$ (c) 2 (d) $2\sqrt{2}$

Q.343. If x + $\frac{1}{x}$ = - 2, then what is the value of $x^{17} + x^{-17} + x^{12} + x^{-12}$? (x < 0)
SSC CGL 03/12/2022 (2nd Shift)
(a) - 2 (b) - 1 (c) 1 (d) 0

Q.344. (mx + n) is a factor of:
SSC CGL 03/12/2022 (4th Shift)
(a) $m^2 x^2 + 2nx + n^2$ (b) $m^2 x^2 + 2mnx + n^2$
(c) $m^2 x^2 + 2mx + n^2$ (d) $m^2 x^2 + 2mn + n^2$

Q.345. If x + y + z = 0, then what is the value of $\frac{x^2}{(yz)} + \frac{y^2}{(xz)} + \frac{z^2}{(xy)}$?
SSC CGL 03/12/2022 (4th Shift)
(a) 1 (b) 0 (c) 2 (d) 3

Q.346. What is the possible value of (a + b + c) − 3 , if $a^2 + b^2 + c^2 = 9$ and ab + bc + ca = 8 ?
SSC CGL 03/12/2022 (4th Shift)
(a) 5 (b) 3 (c) 9 (d) 2

Q.347. If a − b = 2 and $a^3 - b^3 = 80$, then what will be the value of ab?
SSC CGL 05/12/2022 (2nd Shift)
(a) 12 (b) − 24 (c) 24 (d) − 12

Q.348. If $\frac{1}{x^2+a^2} = x^2 - a^2$, then the value of x is:
SSC CGL 05/12/2022 (2nd Shift)
(a) $(1-a^4)^{\frac{1}{4}}$ (b) a
(c) $(a^4-1)^{\frac{1}{4}}$ (d) $(a^4+1)^{\frac{1}{4}}$

Q.349. Which of the following statement is correct ?
I. The value of $100^2 - 99^2 + 98^2 - 97^2 + 96^2 - 95^2 + 94^2 - 93^2 + \ldots\ldots + 22^2 - 21^2$ is 4840.
II. The value of $(k^2 + \frac{1}{k^2})(k - \frac{1}{k})(k^4 + \frac{1}{k^4})(k + \frac{1}{k})(k^4 - \frac{1}{k^4})$ is $k^{16} - \frac{1}{k^{16}}$.
SSC CGL 05/12/2022 (2nd Shift)
(a) Neither I nor II (b) Only II
(c) Only I (d) Both I and II

Q.350. Select the correct algebraic expression.
SSC CGL 05/12/2022 (3rd Shift)
(a) ab − a − b + 1 = (a − 1) (b − 1)
(b) ab + a − b + 1 = (1 − a) (1 − b) (1 − a) (1 + b)
(c) ab − a − b + 1 = (1 − a) (b − 1)
(d) ab − a − b + 1 = (a − 1) (1 − b)

Q.351. If $x^2 + y^2 + z^2 = xy + yz + zx$ and x = 1, then find the value of $\frac{10x^4+5y^4+7z^4}{13x^2y^2+6y^2z^2+3z^2x^2}$.
SSC CGL 05/12/2022 (4th Shift)
(a) 2 (b) 0 (c) - 1 (d) 1

Q.352. If x^2 - 2xy = 84 and x - y = -10, then the value of y is:
SSC CGL 05/12/2022 (4th Shift)
(a) 2 (b) 1 (c) 4 (d) 3

Q.353. If $x + \frac{1}{x}$ = 1, then the value of $x^{12} + x^9 + x^6 + x^3 + 1$ is:
SSC CGL 06/12/2022 (1st Shift)
(a) 1 (b) - 1 (c) 0 (d) - 2

Q.354. If $\frac{a}{b} + \frac{b}{a}$ = 1 and a + b = 2, then the value of $a^3 + b^3$ is:
SSC CGL 06/12/2022 (2nd Shift)
(a) 0 (b) 3 (c) 1 (d) 2

Q.355. If $4x^2 + y^2 = 40$ and xy = 6, find the positive value of 2x + y.
SSC CGL 06/12/2022 (2nd Shift)
(a) 8 (b) 6 (c) 5 (d) 4

Q.356. If 2a + 3b = 10 and ab = 3, then find the value of $4a^2 + 9b^2$.
SSC CGL 06/12/2022 (3rd Shift)
(a) 60 (b) 62 (c) 64 (d) 66

Q.357. If (4x - 7y) = 11 and xy = 8, what is the value of $16x^2 + 49y^2$, given that x and y are positive numbers ?
SSC CGL 06/12/2022 (3rd Shift)
(a) 596 (b) 484 (c) 569 (d) 448

Q.358. If $mx^m - nx^n = 0$, then what is the value of $\frac{1}{x^m+x^n} + \frac{1}{x^m-x^n}$ terms of x^n is:
SSC CGL 06/12/2022 (4th Shift)
Where x, m, n > 0
(a) $\frac{2mn}{\{(n^2+m^2)\}}$ (b) $\frac{2mn}{\{x^n(m^2-n^2)\}}$
(c) $\frac{-2mn}{\{x^n(m^2+n^2)\}}$ (d) $\frac{2mn}{\{x^n(n^2-m^2)\}}$

Q.359. If, for a non-zero x, $5x^2 + 7x + 5 = 0$ then the value of $x^3 + \frac{1}{x^3}$ is:
SSC CGL 06/12/2022 (4th Shift)
(a) $\frac{496}{125}$ (b) $\frac{532}{343}$ (c) $\frac{125}{532}$ (d) $\frac{182}{125}$

Q.360. If $x^2 + y^2 + 2y + 4x + 5 = 0$, then $\frac{(x+y)}{(x-y)}$ =_____.
SSC CGL 07/12/2022 (1st Shift)
(a) - 3 (b) $\frac{1}{3}$ (c) -1 (d) 3

Q.361. The value of $\frac{(x-y)^3+(y-z)^3+(z-x)^3}{6(x-y)(y-z)(z-x)}$ where x ≠ y ≠ z is equal to:
SSC CGL 07/12/2022 (1st Shift)
(a) $\frac{1}{4}$ (b) $\frac{1}{2}$ (c) $\frac{1}{3}$ (d) $\frac{1}{9}$

Q.362. If k + $\frac{1}{k}$ + 2 = 0 and K < 0, then what is the value of $k^{10} + \frac{1}{k^{11}}$?
SSC CGL 07/12/2022 (2nd Shift)
(a) 1 (b) 0 (c) − 1 (d) 2

Q.363. 3[a - $\frac{1}{a}$] + [a - $\frac{1}{a}$]^3 = ?
SSC CGL 07/12/2022 (2nd Shift)
(a) $a^2 - \frac{1}{a^3}$ (b) $a^3 - \frac{1}{a^3}$
(c) $a^3 + \frac{1}{a^3}$ (d) $a^2 - \frac{1}{a^2}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.364. If $x^4 + \frac{1}{x^4} = 194$ and $x^3 + \frac{1}{x^3} = ?$
SSC CGL 07/12/2022 (3rd Shift)
(a) 52 (b) 58 (c) 76 (d) 67

Q.365. $(a + 1)^2 + (a + 2)^2 = 16$ then what is the value of $40 + 12a + 4a^2$?
SSC CGL 07/12/2022 (4th Shift)
(a) 56 (b) 62 (c) 74 (d) 52

Q.366. Which of the following statements is correct ?
I. If $K + \frac{1}{K} = 12$, then $K^2 + \frac{1}{K^2} = 142$
II. The value of $(K^2 + \frac{1}{K^2})(K - \frac{1}{K})(K^4 + \frac{1}{K^4})(K + \frac{1}{K})$ is $K^{16} - \frac{1}{K^{16}}$
SSC CGL 07/12/2022 (4th Shift)
(a) Only I (b) Neither I nor II
(c) Both I and II (d) Only II

Q.367. Find the remainder when we divide $3x^4 - 2x^2 + 4x - 1$ by $2x - 1$.
SSC CGL 07/12/2022 (4th Shift)
(a) 2 (b) 3 (c) $\frac{11}{16}$ (d) $\frac{15}{16}$

Q.368. What is the value of $(a + b)^2 - (a - b)^2$?
SSC CGL 08/12/2022 (1st Shift)
(a) $2(a^2 + b^2)$ (b) $4(a^2 + b^2)$ (c) 8ab (d) 4ab

Q.369. If m and n are two positive real numbers such that $9m^2 + n^2 = 40$ and $mn = 4$, then the value of $3m + n$ is:
SSC CGL 08/12/2022 (1st Shift)
(a) 160 (b) 64 (c) 10 (d) 8

Q.370. The factors of $x^2 + 4y^2 + 4y - 4xy - 2x - 8$ are:
SSC CGL 08/12/2022 (1st Shift)
(a) $(x - 2y - 4)(x - 2y + 2)$
(b) $(x^2 - 2y - 4)(x^2 - 2y + 2)$
(c) $(x + 2y - 4)(x + 2y + 2)$
(d) $(x^2 - 2y - 4)(x^2 + 2y + 2)$

Q.371. If $y = 1 + \sqrt{3} + \sqrt{4}$, then the value of $2y^4 - 8y^3 - 6y^2 + 28y - 84$ is:
SSC CGL 08/12/2022 (2nd Shift)
(a) $40\sqrt{3}$ (b) $80\sqrt{3}$ (c) $20\sqrt{3}$ (d) $60\sqrt{3}$

Q.372. If $x = \frac{\sqrt{5} - \sqrt{4}}{\sqrt{5} + \sqrt{4}}$ and $y = \frac{\sqrt{5} + \sqrt{4}}{\sqrt{5} - \sqrt{4}}$ then the value of $\frac{x^2 - xy + y^2}{x^2 + xy + y^2}$?
SSC CGL 08/12/2022 (2nd Shift)
(a) $\frac{361}{363}$ (b) $\frac{341}{343}$ (c) $\frac{384}{387}$ (d) $\frac{321}{323}$

Q.373. If $\frac{2p}{p^2 - 5p + 1} = \frac{1}{10}$, $p \neq 0$, then the value of $(p + \frac{1}{p})$ is :
SSC CGL 08/12/2022 (2nd Shift)
(a) 10 (b) 25 (c) 1 (d) 15

Q.374. Which of the following will satisfy $a^2 = b^2 + (ab)^2$ for the values a and b ?
SSC CGL 08/12/2022 (3rd Shift)
(a) a = sin x , b = cot x
(b) a = cos x , b = tan x
(c) a = cot x , b = cos x
(d) a = sin x , b = tan x

Q.375. If abc = 5, what is the value of $\left(\frac{1}{1 + a + b^{-1}} + \frac{1}{1 + b + 5c^{-1}} + \frac{1}{1 + \frac{c}{5} + a^{-1}}\right)$?
SSC CGL 08/12/2022 (3rd Shift)
(a) 5 (b) 1 (c) $\frac{1}{5}$ (d) (a + b + c)

Q.376. If $4(z + 7)(2z - 1) = Az^2 + Bz + C$, then the value of A + B + C is:
SSC CGL 08/12/2022 (3rd Shift)
(a) 28 (b) 32 (c) 74 (d) 81

Q.377. Factorize the following expression: $p^3 + 27$
SSC CGL 08/12/2022 (3rd Shift)
(a) $(p - 3)(p^2 - 3p + 9)$
(b) $(p + 3)(p^2 + 3p + 9)$
(c) $(p + 3)(p^2 - 3p + 9)$
(d) $(p + 3)(p^2 - 3p - 9)$

Q.378. What is the value of $a^2 + b^2 + c^2$, if $a + b + c = 9$ and $ab + bc + ca = 23$?
SSC CGL 08/12/2022 (4th Shift)
(a) 22 (b) 32 (c) 49 (d) 35

Q.379. If $x + \frac{1}{x} = 2\sqrt{5}$ where $x > 1$, then the value of $x^3 - \frac{1}{x^3}$ is :
SSC CGL 08/12/2022 (4th Shift)
(a) 82 (b) 76 (c) 86 (d) 78

Q.380. If x + y + z = 0, then the value of $\frac{x^2}{yz} + \frac{y^2}{zx} + \frac{z^2}{xy}$ is:
SSC CGL 09/12/2022 (1st Shift)
(a) 3 (b) 1 (c) 0 (d) 2

Q.381. What is the value of $(a + b)^3 - a^3 + b^3$?
SSC CGL 09/12/2022 (1st Shift)
(a) $-3ab(a - b) + 2b^3$ (b) $3ab(a + b) + 2b^3$
(c) $3ab(a - b)\ b^3$ (d) $-3ab(a + b) + b^3$

Q.382. If $x^2 + \frac{1}{x^2} = 66$, the value of $x - \frac{1}{x}$ is .
SSC CGL 09/12/2022 (2nd Shift)
(a) 10 (b) 8 (c) 9 (d) 6

Q.383. If $P - \frac{1}{P} = 6$, then what is the value of $P^4 + \frac{1}{P^4}$?
SSC CGL 09/12/2022 (3rd Shift)
(a) 1562 (b) 1432 (c) 1442 (d) 1444

Q.384. Simplify $x^4 - 15x^3 + 15x^2 - 15x + 40$; given x = 14.
SSC CGL 09/12/2022 (3rd Shift)
(a) 0 (b) 40 (c) 14 (d) 26

Q.385. If $y + \frac{1}{y} = 11$, then the value of $y^3 - \frac{1}{y^3}$ is :
SSC CGL 09/12/2022 (4th Shift)
(a) $345\sqrt{13}$ (b) $360\sqrt{13}$
(c) $352\sqrt{13}$ (d) $368\sqrt{13}$

Q.386. If $(x - \frac{1}{x})^2 = 12$, what is the value of $(x^2 - \frac{1}{x^2})$, given that x > 0 ?
SSC CGL 09/12/2022 (4th Shift)
(a) $6\sqrt{2}$ (b) $8\sqrt{3}$ (c) $6\sqrt{3}$ (d) $8\sqrt{2}$

Q.387. $a^3 + b^3 + c^3 = 3abc$ if _____.
SSC CGL 09/12/2022 (4th Shift)
(a) a + b + c = - 3 (b) a + b + c = 0
(c) a + b + c = 1 (d) a + b + c = - 1

Q.388. If $m + \frac{1}{m - 2} = 4$, then find the value of $(m - 2)^2 + \frac{1}{(m - 2)^2}$.
SSC CGL 12/12/2022 (1st Shift)
(a) - 2 (b) 4 (c) 0 (d) 2

Q.389. If $5x - \frac{5}{x} + 6 = 0$, then $x^2 + \frac{1}{x^2}$ is
SSC CGL 12/12/2022 (1st Shift)
(a) $\frac{86}{25}$ (b) $\frac{43}{12}$ (c) $\frac{81}{10}$ (d) $\frac{86}{11}$

Q.390. If a = 26 and b = 22, then the value of $\frac{a^3 - b^3}{a^2 - b^2} - \frac{3ab}{a + b}$ is _____.
SSC CGL 12/12/2022 (1st Shift)
(a) $\frac{5}{3}$ (b) $\frac{13}{11}$ (c) $\frac{1}{3}$ (d) $\frac{11}{13}$

Q.391. What is the value of $a^2 + b^2 + c^2 - 2ab - 2bc + 2ca$?
SSC CGL 12/12/2022 (2nd Shift)
(a) $(2a + b + c)^2$ (b) $(a - b + c)^2$
(c) $(a - b - 2c)^2$ (d) $(a + 2b - c)^2$

Q.392. If $\frac{x}{8} + \frac{8}{x} = 1$, then the value of x^3 is:
SSC CGL 12/12/2022 (2nd Shift)
(a) - 256 (b) - 512 (c) 256 (d) 512

Q.393. If p = 8.15, q = 9.06 and r = −17.21, then the value of $p^3 + q^3 + r^3 - 3pqr$ is:
SSC CGL 12/12/2022 (3rd Shift)
(a) − 3.81 (b) − 5.62 (c) 4.75 (d) 0

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.394. If $x^4 + \frac{16}{x^4} = 15617$, x > 0, then find the value of $x + \frac{2}{x}$.
SSC CGL 12/12/2022 (3rd Shift)
(a) $\sqrt{121}$ (b) $\sqrt{129}$ (c) $\sqrt{123}$ (d) $\sqrt{127}$

Q.395. If x + y + z = 0 and $x^2 + y^2 + z^2 = 40$, then what is the value of xy + yz + zx ?
SSC CGL 12/12/2022 (4th Shift)
(a) - 20 (b) 5 (c) - 5 (d) - 10

Q.396. Which of the following statement is correct ?
I. If x = 12, y = - 2 and z = - 10, then $x^3 + y^3 + z^3 = 360$.
II. If x + y = 48 and 4xy = 128, then $4x^2 + 4y^2 = 4480$.
SSC CGL 13/12/2022 (1st Shift)
(a) Neither I nor II (b) Only I
(c) Both I and II (d) Only II

Q.397. if $x + \frac{1}{x} = 6$, then find the value of $\frac{3x}{2x^2 - 5x + 2}$.
SSC CGL 13/12/2022 (1st Shift)
(a) 1 (b) $\frac{3}{7}$ (c) $\frac{2}{3}$ (d) 0

Q.398. If 2p + q = 19 and $8p^3 + q^3 = 361$, then find the value of pq .
SSC CGL 13/12/2022 (2nd Shift)
(a) 56 (b) 59 (c) 58 (d) 57

Q.399. If $\frac{a}{b} + \frac{b}{a} = -1$ and a - b = 2, then the value of $a^3 - b^3$ is:
SSC CGL 13/12/2022 (3rd Shift)
(a) 0 (b) $\frac{1}{2}$ (c) 1 (d) - 1

Q.400. If $x = 2 - 2^{\frac{1}{3}} + 2^{\frac{2}{3}}$ then find the value of $x^3 - 6x^2 + 18x$.
SSC CGL 13/12/2022 (4th Shift)
(a) 40 (b) 33 (c) 45 (d) 22

Q.401. If a = − 12, b = − 6 and c = 18, then what is the value of $\frac{2abc}{9}$.
SSC CGL 13/12/2022 (4th Shift)
(a) 554 (b) 288 (c) - 288 (d) 144

SSC CPO 2022 Tier - 1

Q.402. If $x^4 + x^{-4} = 47$, x > 0, then what is the value of $x + \frac{1}{x} - 2$?
SSC CPO 09/11/2022 (Morning)
(a) 1 (b) 0 (c) 5 (d) 3

Q.403. The value of $\frac{(x-y)^3 + (y-z)^3 + (z-x)^3}{(x^2-y^2)^3 + (y^2-z^2)^3 + (z^2-x^2)^3}$ where x ≠ y ≠ z, is :
SSC CPO 09/11/2022 (Afternoon)
(a) 0 (b) $\frac{1}{(x+y+z)}$
(c) $\frac{1}{(x+y)(y+z)(z+x)}$ (d) 1

Q.404. If a + b + c = 10 ; $a^2 + b^2 + c^2 = 38$, what is the value of $(a - b)^2 + (b - c)^2 + (c - a)^2$?
SSC CPO 09/11/2022 (Afternoon)
(a) 15 (b) 12 (c) 14 (d) 13

Q.405. If $16y^2 - k = (4y + \frac{3}{2})(4y - \frac{3}{2})$, then the value of k is:
SSC CPO 09/11/2022 (Evening)
(a) $\frac{9}{4}$ (b) $\frac{11}{4}$ (c) $\frac{6}{4}$ (d) $\frac{7}{4}$

Q.406. The value of $\frac{\{(m^2+n^2)(m-n) - (m-n)^3\}}{(m^2n - mn^2)}$ is:
SSC CPO 09/11/2022 (Evening)
(a) m + n (b) m − n (c) 2 (d) $\frac{m}{n}$

Q.407. If x + y + z = 8, and $x^2 + y^2 + z^2 = 20$ then the value of $x^3 + y^3 + z^3 - 3xyz$ is _____.
SSC CPO 09/11/2022 (Evening)
(a) 16 (b) 10 (c) 15 (d) − 16

Q.408. If $\{(1 \div x) \times (x^3 - 2x^2) + (4^3 \div 2^5) \times x\} \div 25 = 1$, then the possible values of x is/are:
SSC CPO 09/11/2022 (Evening)
(a) − 5 (b) 5 (c) 0 (d) Both 5 and - 5

Q.409. The simplified form of $(7x + 4y)^2 + (7x - 4y)^2$ is:
SSC CPO 10/11/2022 (Morning)
(a) $98x^2 + 32y^2$ (b) $98x^2 + 32y^2 - 5xy$
(c) $32x^2 + 98y^2$ (d) $98x^2 - 32y^2$

Q.410. What are the values of x and y, respectively, from the following equations?
6x + 7y = 5xy
10y - 4x = 4xy
SSC CPO 10/11/2022 (Morning)
(a) 3 and 4 (b) 4 and 5
(c) 2 and 4 (d) 2 and 5

Q.411. If x + y = 10, 2xy = 48 and x > y, then find 2x - y.
SSC CPO 10/11/2022 (Morning)
(a) 6 (b) 8 (c) 4 (d) 3

Q.412. If $a^2 + b^2 + 1 = 2a$, then the value of $a^4 + b^7$ is:
SSC CPO 10/11/2022 (Afternoon)
(a) 1 (b) 0 (c) 2 (d) 4

Q.413. If a,b,c are all non - zero and a + b + c = 0 , find the value of $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}$?
SSC CPO 10/11/2022 (Afternoon)
(a) 3 (b) 4 (c) 1 (d) $\frac{1}{2}$

Q.414. Simplify: $(x + y)^3 - (x - y)^3 - 6y(x^2 - y^2)$
SSC CPO 10/11/2022 (Evening)
(a) $8y^3$ (b) x^3 (c) $8x^3$ (d) y^3

Q.415. If $x^2 + 6x + 1 = 0$ then the value of $(x + 6)^3 + \frac{1}{(x+6)^3} = ?$
SSC CPO 10/11/2022 (Evening)
(a) 245 (b) 216 (c) 186 (d) 198

Q.416. If a, b and c are positive integers such that $a^2 + b^2 = 82$ and $b^2 + c^2 = 65$, then the value of 2a + 7b - 3c is:
SSC CPO 11/11/2022 (Morning)
(a) 2 (b) 5 (c) 49 (d) 1

Q.417. If x(x - 5) = - 1, then the value of $x^3(x^3 - 110) = ?$
SSC CPO 11/11/2022 (Morning)
(a) 0 (b) - 1 (c) 1 (d) 2

Q.418. If $a + \frac{1}{a} = p^2$, then find $a^2 + \frac{1}{a^2}$.
SSC CPO 11/11/2022 (Afternoon)
(a) $p^2 - 2$ (b) $p^2 + 2$ (c) $p^4 - 2$ (d) $p^4 + 2$

Q.419. If a = - 9.6, b = 4.44 and c = 5.16, then the value of $a^3 + b^3 + c^3 - 3abc$ is:
SSC CPO 11/11/2022 (Afternoon)
(a) 0 (b) - 1 (c) 2 (d) 1

Q.420. If $\sqrt{1 + \frac{x}{529}} = \frac{24}{23}$, then the value of x is:
SSC CPO 11/11/2022 (Afternoon)
(a) 15 (b) 27 (c) 47 (d) 30

Q.421. If the equation $k(21x^2 + 24) + rx + (14x^2 - 9) = 0$ and $k(7x^2 + 8) + px + (2x^2 - 3) = 0$ have both roots common, then the value of $\frac{p}{r}$ is:
SSC CPO 11/11/2022 (Evening)
(a) $\frac{1}{3}$ (b) $\frac{2}{5}$ (c) $\frac{4}{3}$ (d) $\frac{7}{5}$

SSC CGL 2021 Tier - 2

Q.422. What is the value of $\frac{\sqrt{7}+\sqrt{5}}{\sqrt{7}-\sqrt{5}} \div \frac{\sqrt{14}+\sqrt{10}}{\sqrt{14}-\sqrt{10}} + \frac{\sqrt{10}}{\sqrt{5}}$?
SSC CGL Tier II (08/08/2022)
(a) $\sqrt{2} + 2$ (b) $2\sqrt{2} + 2$
(c) $\sqrt{2} + 1$ (d) $2\sqrt{2} + 1$

Q.423. If $(x + \frac{1}{x})^2 = 3$, then what is the value of $x^6 + x^{-6}$?
SSC CGL Tier II (08/08/2022)
(a) 6 (b) 2 (c) - 6 (d) - 2

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.424. What is the solution of the following equations?
2X + 3Y = 12 and 3X - 2Y = 5
SSC CGL Tier II (08/08/2022)
(a) X = 3, Y = 2 (b) X = 2, Y = 3
(c) X = - 2, Y = 3 (d) X = 3, Y = - 2

Q.425. If xy = - 6 and $x^3 + y^3 = 19$ (x and y are integers), then what is the value of $\frac{1}{x^{-1}} + \frac{1}{y^{-1}}$?
SSC CGL Tier II (08/08/2022)
(a) - 1 (b) - 2 (c) 1 (d) 2

SSC Selection Post (Phase - X)

Q.426. if $2^x = 3^y = 6^z$, then $\frac{1}{x} + \frac{1}{y} - \frac{1}{z}$ is equal to :
Graduate Level 01/08/2022 (Shift - 4)
(a) 1 (b) $-\frac{1}{2}$ (c) 0 (d) $\frac{3}{2}$

Q.427. If (a + b) = $\sqrt{11}$ and (a - b) = $\sqrt{7}$ then find the value of $a^2b^2(a^2 + b^2)$.
Graduate Level 01/08/2022 (Shift - 4)
(a) 11 (b) 7 (c) 5 (d) 9

Q.428. If arithmetic and geometric mean of x and y is 8 and $3\sqrt{7}$, respectively, then the value of $x^3 + y^3$ is :
Graduate Level 01/08/2022 (Shift - 4)
(a) 1072 (b) 945 (c) 559 (d) 855

Q.429. The algebraic expression $25x^2 + 16y^2 + 9z^2 - 40xy + 24yz - 30zx$ is equal to:
Graduate Level 02/08/2022 (Shift - 3)
(a) (4y + 3z - 5x)(4x + 5y - 3z)
(b) (4y - 3z - 5x)(4x + 5y + 3z)
(c) $(4y + 3z - 5x)^2$
(d) $(4y - 3z - 5x)^2$

Q.430. If xy = 6 and $x^2y + xy^2 + x + y = 63$, then the value of $x^2 + y^2$ is:
Graduate Level 02/08/2022 (Shift - 3)
(a) 69 (b) 59 (c) 70 (d) 79

Q.431. Factorize the given algebraic expression. $x^3 + 27y^3 + 64z^3 - 36xyz$
Graduate Level 02/08/2022 (Shift - 3)
(a) $(x - 3y - 4z)(x^2 + 9y^2 + 16z^2 - 3xy - 12yz - 4xz)$
(b) $(x + 3y + 4z)(x^2 + 9y^2 + 16z^2 - 3xy - 12yz - 4xz)$
(c) $(x + 3y + 4z)(x^2 + 9y^2 + 16z^2 - 12xy - 3yz - 4xz)$
(d) $(x + 3y + 4z)(x^2 + 9y^2 + 16z^2 + 3xy + 12yz + 4xz)$

Q.432. Simplify $(5x + 4y)^2 + (5x - 4y)^2$
Graduate Level 03/08/2022 (Shift - 3)
(a) $32x^2 + 50y^2$ (b) $50x^2 + 32y^2$
(c) - 80xy (d) 80xy

Q.433. What must be subtracted from $x^3 - 3x^2y + 3xy^2 - y^3$ to get $x^3 - y^3$?
Graduate Level 04/08/2022 (Shift - 2)
(a) $-3x^2y + 3xy^2$ (b) $3x^2y - 3xy^2$
(c) $x^3 - y^3$ (d) $-x^3 + y^3$

Q.434. If a - b = 10 and ab = 4, then the value of $a^3 - b^3 + 4(a + b)^2$ is:
Graduate Level 04/08/2022 (Shift - 2)
(a) 1500 (b) 1584 (c) 1280 (d) 1623

Q.435. Find the value of $a^2 + b^2 + c^2 - 2ab + 2ac - 2bc$, if a = x + y, b = x - y and c = 2x - 1.
Graduate Level 04/08/2022 (Shift - 4)
(a) $(x - y - 1)^2$ (b) 0
(c) $(2x + 2y - 1)^2$ (d) $(2x - 2y - 1)^2$

Q.436. If $y + \frac{1}{y} = \sqrt{5}$, then the value of $y^6 + \frac{1}{y^6}$ is:
Graduate Level 05/08/2022 (Shift - 3)
(a) 18 (b) 15 (c) 10 (d) 12

Q.437. If $P = \frac{x^2 - 100}{x^2 - 16}$ and $Q = \frac{x + 10}{x - 4}$, then the value of $\frac{P}{Q}$ is:
Graduate Level 05/08/2022 (Shift - 3)
(a) $\frac{x + 10}{x + 4}$ (b) $\frac{x - 10}{x + 4}$
(c) $\frac{x + 10}{x - 4}$ (d) $\frac{x - 10}{x - 4}$

Q.438. If $\frac{a}{2} = \frac{b}{3} = \frac{c}{4} = \frac{2a - 3b + 5c}{k}$, then find the value of K.
Higher Secondary 01/08/2022 (Shift - 3)
(a) 15 (b) 18 (c) 10 (d) 12

Q.439. if $\frac{x - 1}{x} = 5$, then the value of $1 + \frac{1}{x^2}$ is:
Higher Secondary 03/08/2022 (Shift - 4)
(a) 16 (b) 18 (c) 17 (d) 27

Q.440. If $2x + \frac{1}{3x} = 12$, find $9x^2 + \frac{1}{4x^2}$.
Higher Secondary 04/08/2022 (Shift - 3)
(a) 142 (b) 324 (c) 321 (d) 327

Q.441. What is the value of x . if $\frac{4}{x} - \frac{3}{2x} = 20$?
Higher Secondary 05/08/2022 (Shift - 2)
(a) $\frac{1}{4}$ (b) 8 (c) $\frac{1}{8}$ (d) 4

Q.442. If x - y = 5 and $x^3 - y^3 = 520$, then the value of xy is :
Higher Secondary 05/08/2022 (Shift - 2)
(a) $\frac{79}{3}$ (b) $\frac{36}{5}$ (c) $\frac{34}{3}$ (d) $\frac{76}{5}$

SSC CHSL 2021 Tier - 1

Q.443. If x + y + z = 0, then what will be the value of $(\frac{x^2}{yz}) + (\frac{y^2}{zx}) + (\frac{z^2}{xy})$?
SSC CHSL 24/05/2022 (Morning)
(a) $\frac{3(x^2 + y^2 + z^2)}{xyz}$ (b) $x^2 + y^2 + z^2$
(c) $\frac{x^2y^2z^2}{x}$ (d) 3

Q.444. If 2a + b = 10, 2ab = 9, and 2a > b, then find the value of 2a – b.
SSC CHSL 24/05/2022 (Afternoon)
(a) 12 (b) 6 (c) 8 (d) 10

Q.445. If a + b = 12 and ab = 35, find the value of $a^4 + b^4 - 10^3$?
SSC CHSL 24/05/2022 (Afternoon)
(a) 2226 (b) 2026 (c) 2126 (d) 1226

Q.446. If a + 2b = 27 and $a^3 + 8b^3 = 5427$, then find the value of 2ab
SSC CHSL 24/05/2022 (Evening)
(a) 176 (b) 156 (c) 172 (d) 149

Q.447. If $x^2 = b - ax$ and $x^3(x^3 + c) = d$, then which of the following can be the values of c and d ?
SSC CHSL 25/05/2022 (Morning)
(a) $c = a^3 - 3ab$ and $d = b^3$
(b) $c = -a^3 - 3ab$ and $d = b^3$
(c) $c = a^3 + 3ab$ and $d = b^3$
(d) $c = a^3 + 3ab$ and $d = -b^3$

Q.448. If $x + y + z = 0$, then find the value of $x^3 + y^3 + z^3 - 3xyz$.
SSC CHSL 25/05/2022 (Afternoon)
(a) 1 (b) $x^3 + y^3 + z^3$ (c) 0 (d) 3xyz

Q.449. If $r + \frac{64}{r} = 16$, then the value of $r^4 + \frac{1}{r^3}$ is _____.
SSC CHSL 25/05/2022 (Evening)
(a) $4096\frac{1}{512}$ (b) 512
(c) $512\frac{1}{4096}$ (d) 4096

Q.450. If p = 11, then the value of $p(p^2 + 3p + 3)$ is:
SSC CHSL 25/05/2022 (Evening)
(a) 1629 (b) 1225 (c) 1727 (d) 1111

Q.451. If $\frac{X^2}{y^2} + \frac{y^2}{X^2} = 7$, A possible of $\frac{X^3}{y^3} + \frac{y^3}{X^3}$ is:
SSC CHSL 26/05/2022 (Morning)
(a) 18 (b) 15 (c) 16 (d) 17

Q.452. If $a^2 - 4a + 1 = 0$, then the value

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

of $a^2 + a + \frac{1}{a} + \frac{1}{a^2}$ is :
SSC CHSL 26/05/2022 (Afternoon)
(a) 10 (b) 1 (c) 18 (d) 16

Q.453. If $(x - \frac{1}{x}) = \frac{7}{3}$, what is the value of $(x^3 - \frac{1}{x^3})$?
SSC CHSL 26/05/2022 (Afternoon)
(a) $19\frac{20}{27}$ (b) $19\frac{19}{27}$ (c) $19\frac{7}{9}$ (d) $19\frac{2}{3}$

Q.454. If $(x + \frac{1}{x}) = \frac{11}{5}$, what is the value of $(x^3 + \frac{1}{x^3})$?
SSC CHSL 26/05/2022 (Evening)
(a) $4\frac{6}{125}$ (b) $5\frac{101}{125}$
(c) $10\frac{81}{125}$ (d) $17\frac{31}{125}$

Q.455. If $1 + x^2 + x^4 = 585$ and $1 - x + x^2 = 65$, then find the value of $1 + x + x^2$.
SSC CHSL 26/05/2022 (Evening)
(a) 8 (b) 7 (c) 6 (d) 9

Q.456. If a = 2022 , b = 2021 and c = 2020 , then value of $a^2 + b^2 + c^2 - ab - bc - ca$ is :
SSC CHSL 26/05/2022 (Evening)
(a) 2 (b) 4 (c) 3 (d) 1

Q.457. If $x^2 + 4y^2 = 40, xy = 6$, and x > 2y, then the value of x - 2y is:
SSC CHSL 27/05/2022 (Morning)
(a) 1 (b) 3 (c) 2 (d) 4

Q.458. If $x^2 - 8x + 1 = 0$, what is the value of $x^8 - 3842x^4 + 1$?
SSC CHSL 27/05/2022 (Evening)
(a) – 1 (b) 0 (c) 2 (d) 1

Q.459. $144x^2 - 36x + \frac{9}{4}$ can be expressed as the square of _____.
SSC CHSL 27/05/2022 (Evening)
(a) $14x - \frac{3}{2}$ (b) $12x - \frac{9}{4}$
(c) $12x - \frac{3}{2}$ (d) $12x - 9$

Q.460. The sum of two numbers is 17 and their product is 34. Find the sum of their squares.
SSC CHSL 30/05/2022 (Morning)
(a) 224 (b) 221 (c) 225 (d) 222

Q.461. If $8x^3 + 27y^3 + 64z^3 = 72xyz$, then the relation between x, y and z can be :
SSC CHSL 30/05/2022 (Morning)
(a) 2x + 3y = – 4z (b) 2x + y + z = 0
(c) 2x – 3y + 4z = 0 (d) 2x + 3y = 4z

Q.462. The value of $\frac{[(5.4)^3 - 0.064]}{[(5.4)^2 + 2.16 + 0.16]}$ is _____ .
SSC CHSL 30/05/2022 (Morning)
(a) 5 (b) 7 (c) 3 (d) 1

Q.463. If x = 9, then the value of $x^5 - 10x^4 + 10x^3 - 10x^2 + 10x - 1$ is :
SSC CHSL 30/05/2022 (Afternoon)
(a) 10 (b) 8 (c) 9 (d) 1

Q.464. If $p^3 + 3p^2 + 3p = 26$, then the value of $p^2 + 2p$ is ?
SSC CHSL 30/05/2022 (Evening)
(a) 8 (b) 12 (c) 10 (d) 15

Q.465. If $\frac{a}{b} + \frac{b}{a} = -1, a \neq 0, b \neq 0$, then the value of $6(a^3 - b^3)$ is:
SSC CHSL 31/05/2022 (Morning)
(a) 6 (b) 3 (c) 0 (d) 1

Q.466. If $p^4 = 4354 - \frac{1}{p^4}$, then the value of $p^3 - \frac{1}{p^3}$ can be :
SSC CHSL 31/05/2022 (Morning)
(a) 536 (b) 436 (c) 416 (d) 516

Q.467. If x + y = 14, then the value of $x^3 + y^3 + 42xy$ is:
SSC CHSL 31/05/2022 (Morning)
(a) 2744 (b) 2644 (c) 2742 (d) 2714

Q.468. If x = 5t and $y = \frac{1}{3}(t + 1)$, then the value of t for which x = 3y is:
SSC CHSL 31/05/2022 (Afternoon)
(a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{1}{4}$ (d) $\frac{1}{5}$

Q.469. If x > 0 and $x^4 + \frac{1}{x^4} = 2207$, what is the value of $(x^5 + \frac{1}{x^5})$?
SSC CHSL 31/05/2022 (Afternoon)
(a) 15127 (b) 15134 (c) 15141 (d) 15130

Q.470. $(2x + 3y + 4z)(4x^2 + 9y^2 + 16z^2 - 6xy - 12yz - 8xz) = ?$
SSC CHSL 31/05/2022 (Afternoon)
(a) $8x^3 + 27y^3 + 64z^3 + 72xyz$
(b) $8x^3 + 27y^3 + 64z^3 - 72xyz$
(c) $8x^3 + 27y^3 - 64z^3 + 72xyz$
(d) $8x^3 - 27y^3 - 64z^3 - 72xyz$

Q.471. Simplify :
$3ab \times (a + b)^{-1} \times (a^{-1} + b^{-1})$
SSC CHSL 31/05/2022 (Evening)
(a) $\frac{1}{(a+b)}$ (b) 1 (c) (a + b) (d) 3

Q.472. If $x^4 + \frac{1}{x^4} = 14159$, then a possible value of $x + \frac{1}{x}$ is:
SSC CHSL 31/05/2022 (Evening)
(a) 69 (b) 121 (c) 81 (d) 11

Q.473. If $8x^2 + 9x + 8 = 0$, then the value of $x^3 + \frac{1}{x^3}$ is :
SSC CHSL 01/06/2022 (Morning)
(a) $\frac{999}{212}$ (b) $\frac{199}{212}$ (c) $\frac{999}{512}$ (d) $\frac{199}{512}$

Q.474. Expand $x^2 + 2x + 3$ about $x = -2$
SSC CHSL 01/06/2022 (Afternoon)
(a) $(x - 2)^2 - 2(x + 2) + 3$
(b) $(x + 2)^2 - 2(x + 2) + 3$
(c) $(x + 2)^2 + 2(x + 2) + 3$
(d) $(x - 2)^2 - 2(x - 2) - 3$

Q.475. If a + b = 2c then the value of $\frac{a}{a-c} + \frac{c}{b-c}$ is
SSC CHSL 01/06/2022 (Afternoon)
(a) $\frac{1}{2}$ (b) 1 (c) 0 (d) - 1

Q.476. If $x + y + z = 25$, $x^3 + y^3 + z^3 = 85$ and $xyz = 20$, then find the value of $x^2 + y^2 + z^2 - xy - yz - zx$.
SSC CHSL 01/06/2022 (Evening)
(a) 2 (b) 1 (c) 4 (d) 3

Q.477. Which among the below options can be a square root of ?
$(x^2 - 14x + 49)(x^2 + 6x + 9)$
SSC CHSL 02/06/2022 (Afternoon)
(a) (x - 4)(x + 9) (b) (x - 1)(x + 17)
(c) (x - 7)(x + 3) (d) (x - 3)(x + 8)

Q.478. If $(x^3 + y^3)^{\frac{2}{3}} = (x^2 + y^2)$, then the value of $\frac{x^2 + y^2}{xy}$ $x \neq 0, y \neq 0$, is:
SSC CHSL 02/06/2022 (Afternoon)
(a) $\frac{2}{3}$ (b) $x^2 + y$ (c) 1 (d) $x + y^2$

Q.479. The factors of $a^2 - 1 - 2x - x^2$ are _____ .
SSC CHSL 02/06/2022 (Evening)
(a) (a - x - 1)(a - x - 1)
(b) (a + 1 + x)(a - 1 - x)
(c) (a - x + 1)(a - x + 1)
(d) (a - x + 1)(a - x - 1)

Q.480. If $x - 2y = 3$ and $2xy = 5$, then find the value of $(x + 2y)^2$
SSC CHSL 03/06/2022 (Morning)
(a) 29 (b) 27 (c) 30 (d) 28

Q.481. If $a^2 + b^2 + \frac{1}{a^2} + \frac{1}{b^2} = 4$, a ≠ 0, b ≠ 0, then the value of $a^4 + b^4$ is:
SSC CHSL 03/06/2022 (Morning)
(a) 32 (b) 256 (c) 64 (d) 2

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.482. If a + b + c = 0 , then find the value of $\frac{a^2+b^2+c^2}{a^2-bc}$
SSC CHSL 03/06/2022 (Afternoon)
(a) – 1 (b) 1 (c) 2 (d) – 2

Q.483. If a - b = 3 and a^3- b^3= 999 , then find the value of a^2-b^2
SSC CHSL 03/06/2022 (Afternoon)
(a) 60 (b) 62 (c) 64 (d) 63

Q.484. If $(a-1)^2+(b+2)^2+(c-1)^2$ = 0 , then the value of $a^2+b^2+c^2$
SSC CHSL 06/06/2022 (Morning)
(a) 6 (b) 0 (c) 2 (d) 1

Q.485. $16a^2$ + $4b^2$ + $9c^2$ - 16ab + 12bc - 24ca = ?
SSC CHSL 06/06/2022 (Afternoon)
(a) $(4a-2b+3c)^2$ (b) $(4a-2b-3c)^2$
(c) $(4a+2b-3c)^2$ (d) $(4a+2b+3c)^2$

Q.486. If p = 38, then the value of p(p^2+ 3p + 3) is _____.
SSC CHSL 06/06/2022 (Evening)
(a) 39313 (b) 59319 (c) 39318 (d) 59318

Q.487. If a + b = $\sqrt{7}$ and a - b = $\sqrt{5}$, then the value of 8ab $(a^2+b^2)-(a-b)^2$
SSC CHSL 07/06/2022 (Morning)
(a) 19 (b) 23 (c) 27 (d) 21

Q.488. If P(x) = $(x^3-8)(x+1)$ and Q(x) = $(x^3+1)(x-2)$
the LCM of P(x) and Q(x) is:
SSC CHSL 07/06/2022 (Afternoon)
(a) $(x^2+2x+4)(x^2+4x+1)$
(b) $(x+1)(x-2)(x^2+2x+4)(x^2-x+1)$
(c) $(x+1)^2(x-2)^2(x^2+2x+4)(x^2+4x+1)$
(d) $(x-2)(x+1)$

Q.489. If x + y + z = 0, then find the value of $\frac{x^2}{x^2-yz}+\frac{y^2}{y^2-xz}+\frac{z^2}{z^2-xy}$
SSC CHSL 07/06/2022 (Evening)
(a) 2 (b) 1 (c) 3 (d) 0

Q.490. If $x=\sqrt{10}+\sqrt{11}$, y = $\sqrt{10}-\sqrt{11}$, then value of $7x^2-50xy+7y^2$_____.
SSC CHSL 08/06/2022 (Morning)
(a) 344 (b) 704 (c) 1360 (d) 386

Q.491. What is the value of the following expression?
$2^2(\frac{x^a}{x^b})^{(a+b)} \times 3^2(\frac{x^b}{x^c})^{(b+c)} \times 6^{-2}(\frac{x^c}{x^a})^{(a+c)}$
SSC CHSL 08/06/2022 (Afternoon)
(a) 1 (b) 0 (c) 4 (d) 9

Q.492. If $x-\frac{1}{x}$ = 11 and x > 0, what is the value of $(x^2-\frac{1}{x^2})$?
SSC CHSL 08/06/2022 (Afternoon)
(a) - 11√123 (b) 55√5
(c) 11√123 (d) - 55√5

Q.493. If px^3+x^2+3x+q is exactly divisible by (x + 2) and (x - 2), then the values of p and q are:
SSC CHSL 08/06/2022 (Evening)
(a) $p=-\frac{3}{4}$ and q = 4
(b) $p=\frac{3}{4}$ and q = 4
(c) $p=\frac{3}{4}$ and q = - 4
(d) $p=-\frac{3}{4}$ and q = - 4

Q.494. If $x^3+y^3=416$ and x + y = 8, then find x^4+y^4
SSC CHSL 08/06/2022 (Evening)
(a) 3002 (b) 3204 (c) 3004 (d) 3104

Q.495. If 2z = x + y, then the value of $\frac{x}{x-z}+\frac{y}{y-z}$
SSC CHSL 09/06/2022 (Morning)
(a) 0 (b) 1 (c) 2 (d) 5

Q.496. If (ab + bc + ca) = 0, then what is the value of
$(\frac{1}{a^2-bc}+\frac{1}{b^2-ac}+\frac{1}{c^2-ab})$?
SSC CHSL 09/06/2022 (Morning)
(a) 2 (b) 0 (c) 1 (d) a + b + c

Q.497. If (x + 2) and (x - 3) are the factors of $x^2+k_1x+k_2$, then :
SSC CHSL 09/06/2022 (Afternoon)
(a) k_1 = 1 and k_2 = -6 (b) k_1 = -1 and k_2 = -6
(c) k_1 = -1 and k_2 = 6 (d) k_1 = 1 and k_2 = 6

Q.498. If $k+\frac{1}{k}$ = 2, find the value of 8k× k × k
SSC CHSL 09/06/2022 (Afternoon)
(a) 8 (b) 1 (c) 4 (d) 2

Q.499. For what value(s) of k will the expression $p+\frac{1}{9}\sqrt{p}+k^2$ be a perfect square ?
SSC CHSL 10/06/2022 (Afternoon)
(a) $k=\pm\frac{1}{8}$ (b) $k=\pm\frac{1}{9}$
(c) $k=\pm\frac{1}{21}$ (d) $k=\pm\frac{1}{18}$

SSC CGL 2021 Tier - 1

Q.500. If x + y + 3 = 0, then find the value of $x^3+y^3-9xy+9$.
SSC CGL 11/04/2022 (Morning)
(a) – 18 (b) – 36 (c) 18 (d) 36

Q.501. If $(4x+2y)^3+(4x-2y)^3$ = 16 (Ax^3+Bxy^2), then what is the value of $\frac{1}{2}(\sqrt{A^2+B^2})$?
SSC CGL 11/04/2022 (Afternoon)
(a) 8 (b) 3 (c) 5 (d) 7

Q.502. If x = 4 + $\sqrt{15}$, what is the value of $(x^2+\frac{1}{x^2})$?
SSC CGL 11/04/2022 (Evening)
(a) 48 (b) 54 (c) 72 (d) 62

Q.503. If x + y + z = 11, xy + yz + zx = – 6, and $x^3+y^3+z^3$ = 1604, then the value of xyz is:
SSC CGL 12/04/2022 (Morning)
(a) 25 (b) 4 (c) 1 (d) 5

Q.504. If $a^2+b^2+49c^2+18=2(b-28c-a)$ then the value of (a + b - 7c) is
SSC CGL 12/04/2022 (Afternoon)
(a) 4 (b) 3 (c) 2 (d) 1

Q.505. If $8k^6+15k^3-2=0$, then the positive value of $(k+\frac{1}{k})$ is:
SSC CGL 12/04/2022 (Evening)
(a) $2\frac{1}{2}$ (b) $2\frac{1}{8}$ (c) $8\frac{1}{2}$ (d) $8\frac{1}{8}$

Q.506. If x - y + z = 0 then find the value of $\frac{y^2}{2xz}-\frac{x^2}{2yz}-\frac{z^2}{2xy}$
SSC CGL 12/04/2022 (Evening)
(a) $\frac{3}{2}$ (b) $\frac{1}{2}$ (c) - 6 (d) $\frac{-3}{2}$

Q.507. If $2\sqrt{2}x^3-3\sqrt{3}y^3=(\sqrt{2}x-\sqrt{3}y)(Ax^2-Bxy+Cy^2)$, then the value of $(A^2+B^2+C^2)$ is:
SSC CGL 13/04/2022 (Afternoon)
(a) 16 (b) 11 (c) 19 (d) 18

Q.508. If $x+y+z=18, xyz=81$ and $xy+yz+zx=90$, then find the value of $\sqrt[4]{x^3+y^3+z^3+xyz}$
SSC CGL 13/04/2022 (Afternoon)
(a) 6 (b) 12 (c) 9 (d) 10

Q.509. If a + b - c = 5 and ab - bc - ac = 10, then find the value of $a^2+b^2+c^2$
SSC CGL 18/04/2022 (Morning)
(a) 40 (b) 5 (c) 45 (d) 15

Q.510. If $\sqrt{x}-\frac{1}{\sqrt{x}}=\sqrt{3}$, then what is the value of $x^4+\frac{1}{x^4}$?
SSC CGL 18/4/2022 (Evening)
(a) 531 (b) 721 (c) 623 (d) 527

Q.511. If a^3+b^3 = 218 and a + b = 2, then

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

the value of √(1 - ab) is:
SSC CGL 19/4/2022 (Morning)
(a) 5 (b) 3 (c) 4 (d) 6

Q.512. If x^2 - 5x - 1 = 0, what is the value of $\frac{x^6 - x^4 + x^2 - 1}{x^3}$?
SSC CGL 19/04/2022 (Afternoon)
(a) 145 (b) 140 (c) 130 (d) 135

Q.513. If $(x + y)^3 - (x - y)^3 - 3y(2x^2 - 3y^2) = ky^3$ then find the value of k
SSC CGL 19/4/2022 (Evening)
(a) 10.5 (b) 8 (c) 11 (d) 10

Q.514. If $\sqrt{x} - \frac{1}{\sqrt{x}} = \sqrt{5}$, x ≠ 0 then what is the value of $\frac{(x^4 + \frac{1}{x^2})}{(x^2 + 1)}$.
SSC CGL 20/04/2022 (Afternoon)
(a) 42 (b) 44 (c) 48 (d) 46

Q.515. If a + b + c = 6 , $a^2 + b^2 + c^2$ = 32, and $a^3 + b^3 + c^3$ = 189, then the value of 4abc is :
SSC CGL 20/04/2022 (Evening)
(a) 12 (b) 16 (c) 9 (d) 8

Q.516. If $x^4 - 79x^2 + 1 = 0$, then a value of $x + x^{-1}$ can be :
SSC CGL 21/04/2022 (Afternoon)
(a) 9 (b) 5 (c) 7 (d) 8

Q.517. If 4x - 3y = 12 and xy = 5, the find the value of $\frac{16x^2 + 9y^2}{8}$
SSC CGL 21/04/2022 (Evening)
(a) 33 (b) 18 (c) 3 (d) 44

Q.518. If $(a + \frac{1}{a} + 3)^2 = 16$, where a is a non - zero real number, then find the value of $a^2 + \frac{1}{a^2}$.
SSC CGL 21/04/2022 (Evening)
(a) 3 (b) 47 (c) 49 (d) 7

SSC CGL 2020 Tier - 2

Q.519. If a + b + c = 1,ab + bc + ca = − 22 and abc = − 40, then what is the value of $a^3 + b^3 + c^3$?
SSC CGL Tier II (29/01/2022)
(a) - 51 (b) 27 (c) 67 (d) - 53

Q.520. If $2x^2 + 5x + 1 = 0$, then one of the values of $x - \frac{1}{2x}$ is:
SSC CGL Tier II (29/01/2022)
(a) $\frac{\sqrt{13}}{2}$ (b) $\frac{\sqrt{17}}{2}$ (c) $\frac{5}{2}$ (d) $\frac{13}{2}$

Q.521. $\frac{22\sqrt{2}}{4\sqrt{2} - \sqrt{3 + \sqrt{5}}}$ = a + $\sqrt{5}\,b$, with a, b > 0,then what is the value of (ab) : (a + b) ?
SSC CGL Tier II (29/01/2022)
(a) 7 : 8 (b) 4 : 7 (c) 7 : 4 (d) 8 : 7

Q.522. If 2x - y = 2 and xy = $\frac{3}{2}$, then what is the value of $x^3 - \frac{y^3}{8}$?
SSC CGL Tier II (29/01/2022)
(a) $\frac{13}{4}$ (b) $-\frac{5}{4}$ (c) $\frac{9}{2}$ (d) $\frac{5}{2}$

Q.523. If x = $\sqrt{1 + \frac{\sqrt{3}}{2}} - \sqrt{1 - \frac{\sqrt{3}}{2}}$ then the value of $\frac{\sqrt{3} - x}{\sqrt{3} + x}$ is:
(corrected to two decimal places)
SSC CGL Tier II (29/01/2022)
(a) 0.25 (b) 0.19 (c) 0.27 (d) 0.17

Q.524. If $x^2 - \sqrt{7}x + 1 = 0$, then what is the value of $x^5 + \frac{1}{x^5}$?
SSC CGL Tier II (29/01/2022)
(a) $25\sqrt{7}$ (b) $21\sqrt{7}$ (c) $27\sqrt{7}$ (d) $19\sqrt{7}$

Q.525. If x = 32.5, y = 34.6 and z = 30.9, then the value of $x^3 + y^3 + z^3$ - 3xyz is 0.98k, where k is equal to:
SSC CGL Tier II (03/02/2022)
(a) 1,033 (b) 933 (c) 1,026 (d) 921

Q.526. If $x + \frac{1}{x}$ = 3, x ≠ 0 , then the value of $x^7 + \frac{1}{x^7}$ is:
SSC CGL Tier II (03/02/2022)
(a) 749 (b) 843 (c) 746 (d) 849

Q.527. If $x^4 + y^4 + x^2y^2 = 17\frac{1}{16}$ and $x^2 - xy + y^2 = 5\frac{1}{4}$, then one of the values of (x - y) is:
SSC CGL Tier II (03/02/2022)
(a) $\frac{5}{2}$ (b) $\frac{3}{4}$ (c) $\frac{5}{4}$ (d) $\frac{3}{2}$

SSC MTS 2020 Tier - 1

Q.528. If x and y are two numbers having opposite signs, and $x^2 : y^2$ = 16 : 81, then the value of $\frac{3x + 4y}{2x - 3y}$?
SSC MTS 05/10/2021 (Morning)
(a) $\frac{12}{25}$ (b) - $\frac{27}{40}$ (c) - $\frac{24}{35}$ (d) $\frac{48}{35}$

Q.529. If $(11a^3 - 15b^3) : (10a^3 + 4b^3)$ = 5 : 7, then (9a + 5b) : (5a - 3b) is equal to:
SSC MTS 06/10/2021 (Afternoon)
(a) 10 : 7 (b) 13 : 5 (c) 15 : 4 (d) 14 : 9

SSC CGL 2020 Tier - 1

Q.530. If x + y = 4 and $\frac{1}{x} + \frac{1}{y} = \frac{16}{15}$, then what is the value of $(x^3 + y^3)$?
SSC CGL 13/08/2021 (Morning)
(a) 18 (b) 19 (c) 21 (d) 16

Q.531. If x - y = 11 and $\frac{1}{x} - \frac{1}{y} = \frac{11}{24}$, then what is the value of $x^3 - y^3 + x^2y^2$?
SSC CGL 13/08/2021 (Afternoon)
(a) 1331 (b) 1115 (c) 1105 (d) 1307

Q.532. If $16x^2 + y^2 = 48$ and xy = 2, x, y > 0, then the value of $(64x^3 + y^3)$ is:
SSC CGL 13/08/2021 (Afternoon)
(a) 320 (b) 340 (c) 300 (d) 240

Q.533. If $x - \frac{1}{x} = 5$, $x \neq 0$,then what is the value of $\frac{x^6 - 5x^3 - 1}{x^6 + 7x^3 - 1}$?
SSC CGL 13/08/2021 (Afternoon)
(a) $\frac{41}{45}$ (b) $\frac{45}{41}$ (c) $\frac{45}{49}$ (d) $\frac{49}{45}$

Q.534. If $x^4 + \frac{1}{x^4} = 727$, x > 1, then what is the value of $(x - \frac{1}{x})$?
SSC CGL 13/08/2021 (Evening)
(a) 6 (b) - 6 (c) - 5 (d) 5

Q.535. If $x - \frac{1}{x} = 1$, then what is the value of $x^8 + \frac{1}{x^8}$?
SSC CGL 13/08/2021 (Evening)
(a) 3 (b) 119 (c) 47 (d) - 1

Q.536. If $a^3 + b^3 = 405$ and a + b = 9, then the value of ab is:
SSC CGL 16/08/2021 (Morning)
(a) 15 (b) 10 (c) 12 (d) 8

Q.537. If $(2x - \frac{3}{x}) = 2$, then what is the value of $(16x^4 + \frac{81}{x^4})$?
SSC CGL 16/08/2021 (Morning)
(a) 184 (b) 328 (c) 180 (d) 220

Q.538. If a - $\frac{12}{a}$ = 1, where a > 0, then the value of $a^2 + \frac{16}{a^2}$ is:
SSC CGL 16/08/2021 (Afternoon)
(a) 15 (b) 17 (c) 11 (d) 19

Q.539. If $4x^4 - 37x^2 + 9 = 0$, x > $\sqrt{\frac{3}{2}}$, then what is the value of $8x^3 - \frac{27}{x^3}$?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 16/08/2021 (Afternoon)
(a) 215 (b) - 215 (c) 35 (d) - 35

Q.540. If x + y = 2 and $\frac{1}{x} + \frac{1}{y} = \frac{18}{5}$, then the value of ($x^3 + y^3$)
SSC CGL 16/08/2021 (Evening)
(a) $4\frac{2}{3}$ (b) $4\frac{3}{5}$ (c) $3\frac{1}{3}$ (d) $3\frac{1}{5}$

Q.541. If $x^2 + 4y^2 = 53$ and x - 2y = 5, then what is the value of $x^3 - 8y^3$?
SSC CGL 16/08/2021 (Evening)
(a) - 85 (b) 335 (c) 155 (d) 85

Q.542. If $a^2 + c^2 + 17 = 2(a - 8b - 2b^2)$, then what is the value of ($a^3 + b^3 + c^3$)?
SSC CGL 17/08/2021 (Morning)
(a) 9 (b) - 7 (c) 10 (d) - 4

Q.543. If $4x^4 = 5x^2 - 1,\ x > \frac{1}{\sqrt{2}}$ then what is the value of ($2x^2 - x - 1$) ?
SSC CGL 17/08/2021 (Evening)
(a) 0 (b) 1 (c) - 2 (d) 2

Q.544. If $x^2 + 9y^2 + 4z^2 = 12(x - 2y + 2z) - 88$, then the value of (x - 3y + z) is:
SSC CGL 17/08/2021 (Evening)
(a) 10 (b) 13 (c) 11 (d) 5

Q.545. Simplify the following expression.
$$\frac{(375+125)^2-(125-375)^2}{375\times375-125\times125}$$
SSC CGL 18/08/2021 (Morning)
(a) $\frac{15}{8}$ (b) $\frac{3}{4}$ (c) $\frac{3}{2}$ (d) $\frac{27}{28}$

Q.546. If $x^2 - 5\sqrt{2}x + 1 = 0$, then what is the value of $\frac{(x^3+\frac{1}{x})}{x^2+1}$?
SSC CGL 18/08/2021 (Afternoon)
(a) $\frac{12\sqrt{2}}{5}$ (b) $\frac{24\sqrt{2}}{5}$ (c) $\frac{26\sqrt{2}}{5}$ (d) $\frac{18\sqrt{2}}{5}$

Q.547. What is the constant term in the expansion of $(5x^2 - \frac{1}{x})^3$?
SSC CGL 18/08/2021 (Afternoon)
(a) 5 (b) - 15 (c) 15 (d) 75

Q.548. If $a^3 - b^3 = 2349$ and (a - b) = 9, then $(a + b)^2 - ab$ is equal to:
SSC CGL 18/08/2021 (Evening)
(a) 261 (b) 280 (c) 229 (d) 244

Q.549. If a + b + c = 0, then what is the value of $\frac{(b+c)^2}{bc} + \frac{(c+a)^2}{ca} + \frac{(a+b)^2}{ab}$.
SSC CGL 18/08/2021 (Evening)
(a) 1 (b) - 3 (c) - 1 (d) 3

Q.550. If $a^2 + b^2 + c^2 + 216 = 12(a + b - 2c)$, then $\sqrt{ab - bc - ca}$ is:
SSC CGL 20/08/2021 (Morning)
(a) 6√5 (b) 4√5 (c) 3√5 (d) 8√5

Q.551. If $(56\sqrt{7}x^3 - 2\sqrt{2}y^3) \div (2\sqrt{7}x - \sqrt{2}y) = Ax^2 + By^2 - Cxy$, then find the value of $A + B - \sqrt{14}C$.
SSC CGL 20/08/2021 (Afternoon)
(a) 19 (b) 10 (c) 58 (d) 38

Q.552. If x - y = 4 and $x^3 - y^3 = 316$, y > 0 then the value of $x^4 - y^4$ is:
SSC CGL 20/08/2021 (Evening)
(a) 2482 (b) 2320 (c) 2500 (d) 2401

Q.553. If $8 + 2px^2 - 36x - 27x^3 = (2 - 3x)^3$, then what is the value of p?
SSC CGL 23/08/2021 (Morning)
(a) 27 (b) 54 (c) 9 (d) - 27

Q.554. If $2x^2 - 7x + 5 = 0$, then what is the value of $x^3 + \frac{125}{8x^3}$
SSC CGL 23/08/2021 (Morning)
(a) $12\frac{5}{8}$ (b) $16\frac{5}{8}$ (c) $10\frac{5}{8}$ (d) $18\frac{5}{8}$

Q.555. If $x + \frac{1}{x} = \frac{17}{4}$, x > 1, then what is the value of $x - \frac{1}{x}$?
SSC CGL 23/08/2021 (Morning)
(a) $\frac{9}{4}$ (b) $\frac{3}{2}$ (c) $\frac{8}{3}$ (d) $\frac{15}{4}$

Q.556. If $9(a^2 + b^2) + c^2 + 20 = 12(a + 2b)$, then the value of $\sqrt{6a + 9b + 2c}$ is:
SSC CGL 23/08/2021 (Evening)
(a) 3 (b) 4 (c) 2 (d) 6

Q.557. If 2x + 3y + 1 = 0, then what is the value of ($8x^3 + 8 + 27y^3 - 18xy$) ?
SSC CGL 24/08/2021 (Morning)
(a) 7 (b) - 9 (c) - 7 (d) 9

Q.558. Simplify the following expression.
$$\frac{5(a^6-b^6)^3+5(b^6-c^6)^3+5(c^6-a^6)^3}{2(a^3-b^3)^3+2(b^3-c^3)^3+2(c^3-a^3)^3}$$
SSC CGL 24/08/2021 (Afternoon)
(a) $\frac{5}{2}(a^3+b^3)(b^3+c^3)(c^3+a^3)$
(b) $\frac{5}{2}(a^3+b^3)(b^3-c^3)(c^3-a^3)$
(c) $\frac{5}{2}(a^3-b^3)(b^3+c^3)(c^3+a^3)$
(d) $\frac{5}{2}(a^3-b^3)(b^3-c^3)(c^3+a^3)$

Q.559. If y = 2x + 1, then what is the value of ($8x^3 - y^3 + 6xy$)?
SSC CGL 24/08/2021 (Afternoon)
(a) - 15 (b) 1 (c) - 1 (d) 15

Q.560. Given that $x^8 - 34x^4 + 1 = 0$, x > 0. What is the value of ($x^3 - x^{-3}$) ?
SSC CGL 24/08/2021 (Evening)
(a) 12 (b) 14 (c) 18 (d) 16

SSC CHSL 2020 Tier - 1

Q.561. If $x^4 + y^4 + x^2y^2 = 117$ and $x^2 + y^2 - xy = 3(4 + \sqrt{3})$, then the value of ($x^2 + y^2$) will be:
SSC CHSL 12/04/2021 (Morning)
(a) 9 (b) $6\sqrt{3}$ (c) 12 (d) $13\sqrt{3}$

Q.562. If $x^2 - 3x + 1 = 0$, then the Value of $2(x^8 + \frac{1}{x^8}) - 5(x^2 + \frac{1}{x^2})$ is:
SSC CHSL 12/04/2021 (Evening)
(a) 3479 (b) 4379 (c) 4370 (d) 4279

Q.563. If $x - y - z = 0$, then the value of $(x^2 + y^2 + z^2) \div (y^2 + zx)$ is:
SSC CHSL 12/04/2021 (Evening)
(a) - 1 (b) 2 (c) - 2 (d) 1

Q.564. Given that $(2x + y)^3 - (x + 2y)^3 = (x - y)[A(x^2 + y^2) + Bxy]$, then the value of (2A - B) is:
SSC CHSL 13/04/2021 (Afternoon)
(a) 7 (b) 6 (c) 0 (d) 1

Q.565. If $x^3 + y^3 = 468$ and x + y = 12, then the value of $x^4 + y^4$ will be:
SSC CHSL 13/04/2021 (Evening)
(a) 3620 (b) 2036 (c) 3025 (d) 3026

Q.566. If $a^2 + b^2 + c^2 + 170 = 2(8a + 5b - 9c)$, then the value of $\sqrt{4a + 8b - c}$ will be.
SSC CHSL 13/04/2021 (Evening)
(a) 15 (b) 12 (c) 9 (d) 8

Q.567. If x + y + z = 5, $\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 0$, xyz = 12 and $x^3 + y^3 + z^3 = 151$, then the value of ($x^2 + y^2 + z^2$) is:
SSC CHSL 15/04/2021 (Morning)
(a) 24 (b) 23 (c) 22 (d) 21

Q.568. If x + y = 5 and $\frac{1}{x} + \frac{1}{y} = \frac{20}{9}$, then the value of ($x^3 + y^3$) will be:
SSC CHSL 15/04/2021 (Morning)
(a) $\frac{205}{4}$ (b) $\frac{635}{8}$ (c) $\frac{635}{4}$ (d) $\frac{365}{4}$

Q.569. If $(7x + 3)^3 + (x - 2)^3 + 27(2x - 5)^3 = 9(7x + 3)(x - 2)(2x - 5)$ then the value of 5x + 3 is:
SSC CHSL 15/04/2021 (Morning)
(a) 8 (b) 6 (c) 10 (d) 2

Q.570. If $(x + \frac{2}{x}) = 7$, then what is the value of $(2x^2 + \frac{8}{x^2})$?
SSC CHSL 16/04/2021 (Morning)
(a) 44 (b) 94 (c) 50 (d) 90

Q.571. If $(\frac{x}{y} + 1) = 4$, then what is the

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

value of $(\frac{x^2+y^2}{y^2})$?
SSC CHSL 16/04/2021 (Morning)
(a) 12 (b) 22 (c) 14 (d) 10

Q.572. If $a^2 + 4b^2 + 25c^2 + 18 = 2(a - 2b + 20c)$, then what is the value of (a + 2b + 5c) ?
SSC CHSL 16/04/2021 (Afternoon)
(a) 3 (b) 4 (c) 6 (d) 5

Q.573. Simplify the following expression.
$\frac{0.8 \times 0.8 \times 0.8 + 0.6 \times 0.6 \times 0.6}{0.08 \times 0.08 + 0.06 \times 0.06 - 0.08 \times 0.06}$
SSC CHSL 16/04/2021 (Evening)
(a) 14 (b) 1.4 (c) 140 (d) 160

Q.574. If $x^2 + y^2 = 45$ and x - y = 5 then what is the value of $x^3 - y^3$?
SSC CHSL 16/04/2021 (Evening)
(a) 150 (b) 250 (c) - 25 (d) 275

Q.575. If a + b + c = 4, ab + bc + ca = - 14 and abc = - 18, then the value of $\sqrt{4a^3 + 4b^3 + 4c^3 - 36}$ will be:
SSC CHSL 19/04/2021 (Evening)
(a) 26 (b) 24 (c) 25 (d) 18

Q.576. Using algebraic identities, simplify the following expression.
$\frac{(x^4+x^2+1)}{(x^2+x+1)}$
SSC CHSL 04/08/2021 (Morning)
(a) $(x^2 - 2x + 1)$ (b) $(x^2 + x + 1)$
(c) $(x^2 + 2x + 1)$ (d) $(x^2 - x + 1)$

Q.577. If a + b = p, ab = q the $(a^4 + b^4)$ is equal to :
SSC CHSL 04/08/2021 (Morning)
(a) $p^4 - 2p^2q^2 + q^2$ (b) $p^4 - 4p^2q^2 + 2q^2$
(c) $p^4 - 4p^2q + q^2$ (d) $p^4 - 4p^2q + 2q^2$

Q.578. If $\sqrt{x} + \frac{1}{\sqrt{x}} = \sqrt{6}$,then the value of $x^6 + \frac{1}{x^6}$ will be:
SSC CHSL 04/08/2021 (Afternoon)
(a) 2270 (b) 2502 (c) 2702 (d) 2712

Q.579. If $x^2 + 1 - 2x = 0$, x > 0, then $x^2(x^2 - 2)$ = _____.
SSC CHSL 04/08/2021 (Evening)
(a) 1 (b) $\sqrt{2}$ (c) - 1 (d) 0

Q.580. If $x^2 + 4y^2 + 3z^2 + \frac{19}{4} = 2\sqrt{3}(x + y + z)$, then the value of (x - 4y + 3z) = ?
SSC CHSL 05/08/2021 (Morning)
(a) $\frac{\sqrt{3}}{3}$ (b) $2\sqrt{3}$ (c) $\sqrt{3}$ (d) $\frac{\sqrt{3}}{2}$

Q.581. If $9x^2 - 6x + 1 = 0$, then the value of $27x^3 + (27x^3)^{-1}$ will be:
SSC CHSL 05/08/2021 (Afternoon)
(a) 8 (b) 4 (c) 2 (d) 1

Q.582. If $(4x - 5)^3 + (x - 2)^3 + 27(2x - 5)^3 = 9(4x - 5)(x - 2)(2x - 5)$ then the value of $(x + \frac{3}{2})$ will be:
SSC CHSL 05/08/2021 (Afternoon)
(a) $\frac{3}{2}$ (b) $\frac{1}{2}$ (c) $\frac{7}{2}$ (d) $\frac{5}{2}$

Q.583. If a + b = 24 and $a^2 + b^2 = 306$, where a > b, then the value of 4a - 5b is:
SSC CHSL 05/08/2021 (Evening)
(a) 18 (b) 20 (c) 12 (d) 15

Q.584. If a + b - c = 0, then what is the value of $\frac{(b-c)^2}{4bc} + \frac{(c-a)^2}{4ca} - \frac{(a+b)^2}{4ab}$?
SSC CHSL 06/08/2021 (Morning)
(a) $\frac{1}{2}$ (b) $\frac{-3}{4}$ (c) $\frac{-1}{2}$ (d) $\frac{3}{4}$

Q.585. Simplify the following expression:
$(2a - b - 3c)(4a^2 + b^2 + 9c^2 + 2ab + 6ac - 3bc)$
SSC CHSL 06/08/2021 (Morning)
(a) $-8a^3 + b^3 + 27c^3$
(b) $8a^3 + b^3 + 27c^3$
(c) $8a^3 - b^3 - 27c^3 - 18abc$
(d) $8a^3 - b^3 - 27c^3 + 18abc$

Q.586. If $(x^2 + \frac{1}{49x^2}) = 15\frac{5}{7}$ then what is the value of $(x + \frac{1}{7x})$?
SSC CHSL 06/08/2021 (Afternoon)
(a) 7 (b) ± 7 (c) ± 4 (d) 4

Q.587. If $(3x + 2y)^3 + (3x - 2y)^3 = 3kx(3x^2 + 4y^2)$, then the value of k will be:
SSC CHSL 09/08/2021 (Morning)
(a) 18 (b) 9 (c) 3 (d) 6

Q.588. If $x + y = 27$ and $x^2 + y^2 = 425$ then the value of $(x - y)^2$ will be:
SSC CHSL 09/08/2021 (Afternoon)
(a) 225 (b) 169 (c) 121 (d) 144

Q.589. If $x + \frac{1}{15x} = 3$, then the value of $9x^3 + \frac{1}{375x^3}$ will be:
SSC CHSL 10/08/2021 (Morning)
(a) 237.6 (b) 376.2 (c) 273.6 (d) 367.2

Q.590. If 2x + 3y + 4z = 11, $8x^3 + 27y^3 + 64z^3 = 105$, and xyz = 1, then the value of $4x^2 + 9y^2 + 16z^2 - 6xy - 12yz - 8xz$ is:
SSC CHSL 10/08/2021 (Afternoon)
(a) 3 (b) 4 (c) 5 (d) 6

Q.591. If $(x - 1.5)^3 + (x - 4)^3 + (x - 3.5)^3 = 3(x - 1.5)(x - 4)(x - 3.5)$, then what is the value of x ?
SSC CHSL 10/08/2021 (Evening)
(a) 1 (b) 3 (c) 6 (d) 9

Q.592. If $x^4 + x^{-4} = 47$, $x > 0$, then the value of $(2x - 3)^2$ is:
SSC CHSL 11/08/2021 (Morning)
(a) 9 (b) 3 (c) 5 (d) 7

Q.593. If $a^2 + b^2 + c^2 + 48 = 8(a + b + c)$, then the value of $\sqrt[3]{a^3 - b^3 + c^3}$?
SSC CHSL 11/08/2021 (Morning)
(a) 6 (b) 4 (c) 3 (d) 2

Q.594. If a - $\frac{24}{a}$ = 5, where a > 0, then the value of $a^2 + \frac{64}{a^2}$ is:
SSC CHSL 11/08/2021 (Afternoon)
(a) 45 (b) 56 (c) 60 (d) 65

Q.595. If 3x - 2y + 3 = 0 , then what will be the value of $27x^3 + 54xy + 30 - 8y^3$?
SSC CHSL 12/08/2021 (Morning)
(a) - 27 (b) 57 (c) - 57 (d) 3

Q.596. If a = $\frac{\sqrt{5}+2}{\sqrt{5}-2}$ and b = $\frac{\sqrt{5}-2}{\sqrt{5}+2}$, then the value of $2a^2 + 2b^2 - 5ab$ is equal to:
SSC CHSL 12/08/2021 (Afternoon)
(a) 693 (b) 649 (c) 635 (d) 639

Q.597. If $x^2 + (4 - \sqrt{3})x - 1 = 0$, then what is the value of $x^2 + \frac{1}{x^2}$?
SSC CHSL 12/08/2021 (Evening)
(a) $9 - 8\sqrt{3}$ (b) $21 - 12\sqrt{3}$
(c) $21 - 8\sqrt{3}$ (d) $17 - 8\sqrt{3}$

SSC CPO 2020 Tier - 1

Q.598. If $a^2 + b^2 + c^2 + 216 = 12 \times (a + b - 2c)$ then $\sqrt{ab - bc + ca}$ is:
SSC CPO 23/11/2020 (Morning)
(a) 6 (b) 4 (c) 3 (d) 8

Q.599. The value of
$\frac{0.325\times0.325+0.175\times0.175+25\times0.00455}{5\times0.0065\times3.25-7\times0.175\times0.025}$ - $\frac{0.5}{1.5}$ is:
SSC CPO 23/11/2020 (Evening)
(a) - 3 (b) 3 (c) 0 (d) - 1

Q.600. If $x^2 + 8y^2 - 12y - 4xy + 9 = 0$, then the value of (7x - 8y) is:
SSC CPO 23/11/2020 (Evening)
(a) 12 (b) 5 (c) 9 (d) 21

Q.601. If $x + y + z = 19$, $x^2 + y^2 + z^2 = 133$ and $xz = y^2$, $x > z > 0$, what is the value of (x - z) ?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CPO 25/11/2020 (Morning)
(a) - 2 (b) 0 (c) - 5 (d) 5

Answer Key :-

1.(b)	2.(b)	3.(c)	4.(b)
5.(d)	6.(a)	7.(d)	8.(b)
9.(d)	10.(b)	11.(d)	12.(c)
13.(b)	14.(a)	15.(a)	16.(c)
17.(b)	18.(b)	19.(a)	20.(c)
21.(a)	22.(c)	23.(d)	24.(a)
25.(b)	26.(b)	27.(a)	28.(a)
29.(b)	30.(a)	31.(a)	32.(a)
33.(c)	34.(d)	35.(c)	36.(c)
37.(c)	38.(b)	39.(a)	40.(c)
41.(b)	42.(c)	43.(a)	44.(c)
45.(d)	46.(a)	47.(d)	48.(a)
49.(c)	50.(a)	51.(d)	52.(c)
53.(c)	54.(d)	55.(a)	56.(b)
57.(a)	58.(c)	59.(b)	60.(b)
61.(c)	62.(c)	63.(a)	64.(a)
65.(b)	66.(d)	67.(d)	68.(a)
69.(d)	70.(b)	71.(c)	72.(a)
73.(c)	74.(c)	75.(c)	76.(b)
77.(c)	78.(a)	79.(a)	80.(a)
81.(b)	82.(b)	83.(d)	84.(b)
85.(c)	86.(c)	87.(a)	88.(c)
89.(b)	90.(c)	91.(b)	92.(a)
93.(b)	94.(d)	95.(a)	96.(d)
97.(b)	98.(a)	99.(b)	100.(c)
101.(b)	102.(d)	103.(a)	104.(c)
105.(d)	106.(a)	107.(c)	108.(a)
109.(b)	110.(c)	111.(a)	112.(c)
113.(c)	114.(c)	115.(b)	116.(b)
117.(a)	118.(a)	119.(a)	120.(b)
121.(c)	122.(d)	123.(c)	124.(b)
125.(d)	126.(b)	127.(d)	128.(a)
129.(b)	130.(c)	131.(b)	132.(a)
133.(b)	134.(a)	135.(a)	136.(b)
137.(a)	138.(b)	139.(a)	140.(d)
141.(a)	142.(d)	143.(a)	144.(a)
145.(c)	146.(b)	147.(b)	148.(d)
149.(d)	150.(d)	151.(d)	152.(c)
153.(c)	154.(d)	155.(c)	156.(b)
157.(c)	158.(d)	159.(a)	160.(a)
161.(c)	162.(d)	163.(d)	164.(d)
165.(a)	166.(c)	167.(c)	168.(a)
169.(a)	170.(d)	171.(b)	172.(d)

173.(d)	174.(c)	175.(b)	176.(c)
177.(c)	178.(b)	179.(d)	180.(c)
181.(c)	182.(a)	183.(b)	184.(c)
185.(d)	186.(b)	187.(c)	188.(d)
189.(b)	190.(a)	191.(d)	192.(d)
193.(d)	194.(c)	195.(b)	196.(d)
197.(c)	198.(a)	199.(c)	200.(b)
201.(c)	202.(a)	203.(c)	204.(a)
205.(b)	206.(b)	207.(a)	208.(c)
209.(a)	210.(b)	211.(a)	212.(a)
213.(c)	214.(c)	215.(b)	216.(d)
217.(d)	218.(b)	219.(c)	220.(c)
221.(c)	222.(d)	223.(a)	224.(c)
225.(a)	226.(c)	227.(d)	228.(b)
229.(d)	230.(d)	231.(d)	232.(c)
233.(d)	234.(b)	235.(c)	236.(b)
237.(d)	238.(c)	239.(b)	240.(b)
241.(c)	242.(b)	243.(a)	244.(a)
245.(b)	246.(c)	247.(a)	248.(a)
249.(d)	250.(b)	251.(b)	252.(a)
253.(b)	254.(a)	255.(c)	256.(a)
257.(c)	258.(a)	259.(a)	260.(b)
261.(a)	262.(d)	263.(a)	264.(c)
265.(a)	266.(d)	267.(b)	268.(a)
269.(c)	270.(a)	271.(a)	272.(d)
273.(b)	274.(d)	275.(b)	276.(c)
277.(b)	278.(b)	279.(b)	280.(c)
281.(c)	282.(c)	283.(b)	284.(b)
285.(a)	286.(c)	287.(b)	288.(b)
289.(a)	290.(c)	291.(c)	292.(b)
293.(b)	294.(a)	295.(c)	296.(a)
297.(c)	298.(c)	299.(c)	300.(a)
301.(d)	302.(b)	303.(d)	304.(a)
305.(c)	306.(c)	307.(b)	308.(c)
309.(b)	310.(d)	311.(b)	312.(b)
313.(d)	314.(d)	315.(d)	316.(a)
317.(a)	318.(d)	319.(b)	320.(d)
321.(d)	322.(c)	323.(d)	324.(b)
325.(b)	326.(d)	327.(d)	328.(a)
329.(c)	330.(c)	331.(b)	332.(d)
333.(a)	334.(d)	335.(a)	336.(d)
337.(d)	338.(d)	339.(c)	340.(d)
341.(b)	342.(c)	343.(d)	344.(b)
345.(d)	346.(d)	347.(a)	348.(d)
349.(c)	350.(a)	351.(d)	352.(c)
353.(a)	354.(a)	355.(a)	356.(c)

357.(c)	358.(d)	359.(d)	360.(d)
361.(b)	362.(b)	363.(b)	364.(a)
365.(b)	366.(a)	367.(c)	368.(d)
369.(d)	370.(a)	371.(a)	372.(d)
373.(b)	374.(c)	375.(b)	376.(b)
377.(c)	378.(d)	379.(b)	380.(a)
381.(b)	382.(b)	383.(c)	384.(d)
385.(b)	386.(b)	387.(b)	388.(d)
389.(a)	390.(c)	391.(b)	392.(b)
393.(d)	394.(b)	395.(a)	396.(a)
397.(b)	398.(d)	399.(a)	400.(d)
401.(b)	402.(a)	403.(c)	404.(c)
405.(a)	406.(c)	407.(d)	408.(d)
409.(a)	410.(c)	411.(b)	412.(a)
413.(a)	414.(a)	415.(d)	416.(d)
417.(b)	418.(c)	419.(a)	420.(c)
421.(a)	422.(c)	423.(d)	424.(a)
425.(c)	426.(c)	427.(d)	428.(a)
429.(c)	430.(a)	431.(b)	432.(b)
433.(a)	434.(b)	435.(c)	436.(a)
437.(b)	438.(a)	439.(c)	440.(c)
441.(c)	442.(a)	443.(d)	444.(c)
445.(b)	446.(a)	447.(c)	448.(c)
449.(a)	450.(c)	451.(a)	452.(c)
453.(b)	454.(a)	455.(d)	456.(c)
457.(d)	458.(b)	459.(c)	460.(b)
461.(a)	462.(a)	463.(b)	464.(a)
465.(c)	466.(a)	467.(a)	468.(c)
469.(a)	470.(b)	471.(d)	472.(d)
473.(c)	474.(b)	475.(b)	476.(b)
477.(c)	478.(a)	479.(b)	480.(a)
481.(d)	482.(c)	483.(d)	484.(a)
485.(b)	486.(d)	487.(a)	488.(b)
489.(a)	490.(a)	491.(a)	492.(b)
493.(d)	494.(d)	495.(c)	496.(b)
497.(b)	498.(a)	499.(d)	500.(a)
501.(c)	502.(d)	503.(a)	504.(a)
505.(a)	506.(a)	507.(c)	508.(a)
509.(b)	510.(d)	511.(d)	512.(d)
513.(c)	514.(d)	515.(a)	516.(a)
517.(a)	518.(b)	519.(d)	520.(b)
521.(a)	522.(a)	523.(c)	524.(d)
525.(a)	526.(b)	527.(a)	528.(c)
529.(c)	530.(b)	531.(b)	532.(a)
533.(c)	534.(d)	535.(c)	536.(c)
537.(a)	538.(b)	539.(a)	540.(a)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

541.(b)	542.(b)	543.(a)	544.(b)
545.(c)	546.(b)	547.(c)	548.(a)
549.(d)	550.(a)	551.(c)	552.(b)
553.(a)	554.(b)	555.(d)	556.(b)
557.(a)	558.(a)	559.(c)	560.(b)
561.(c)	562.(b)	563.(b)	564.(d)
565.(d)	566.(c)	567.(b)	568.(d)
569.(a)	570.(d)	571.(d)	572.(b)
573.(c)	574.(d)	575.(a)	576.(d)
577.(d)	578.(c)	579.(c)	580.(c)
581.(c)	582.(c)	583.(d)	584.(b)
585.(c)	586.(c)	587.(d)	588.(c)
589.(a)	590.(a)	591.(b)	592.(c)
593.(b)	594.(d)	595.(d)	596.(d)
597.(c)	598.(a)	599.(b)	600.(c)
601.(d)			

Solutions :-

Sol.1.(b) **Given**: $x = \sqrt{6} + 2$ and $y = \sqrt{6} - 2$

$= (\frac{x}{y} + \frac{y}{x})^2 - 3 = (\frac{\sqrt{6}+2}{\sqrt{6}-2} + \frac{\sqrt{6}-2}{\sqrt{6}+2})^2 - 3$

$= [\frac{(\sqrt{6}+2)^2 + (\sqrt{6}-2)^2}{(\sqrt{6})^2 - (2)^2}]^2 - 3$

$= [\frac{6+4+4\sqrt{6}+6+4-4\sqrt{6}}{6-4}]^2 - 3$

$= [\frac{20}{2}]^2 - 3 = 100 - 3 = 97$

Sol.2.(b) $x \alpha \frac{y^3}{z^2}$

$\frac{1}{36} = k\frac{2^3}{3^2} \Rightarrow k = \frac{9}{36 \times 8} = \frac{1}{32}$

Now,

$800x$ when $y = 3$ and $z = 5$

$x \alpha \frac{y^3}{z^2} \Rightarrow x = k \times \frac{3^3}{5^2} = \frac{1}{32} \times \frac{27}{25}$

$800x = 800 \times \frac{1}{32} \times \frac{27}{25} = 27$

Sol.3.(c) $0.4x + 0.16y - 1.7 = 0$

$0.3x + 0.12y - 3.4 = 0$

Comparing these two equations with

$a_1x + b_1y + C_1 = 0$ & $a_2x + b_2y + C_2 = 0$.

We have ;

$\frac{a_1}{a_2} = \frac{0.4}{0.3} = \frac{4}{3}, \frac{b_1}{b_2} = \frac{0.16}{0.12} = \frac{4}{3},$

$\frac{c_1}{c_2} = \frac{-1.7}{-3.4} = \frac{1}{2} \Rightarrow \frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{1}{2}$

Clearly, we can see that the equations has no solution.

Sol.4.(b)

For the two parallel lines:- $\frac{a_1}{a_2} = \frac{b_1}{b_2}$

According to the question,

$a_1 = 4$, $a_2 = (k - 2)$, $b_1 = (k - 2)$, $b_2 = 9$

$\Rightarrow \frac{4}{(k-2)} = \frac{(k-2)}{9} \Rightarrow 36 = (k - 2)^2$

$\Rightarrow 6 = k - 2$ (as k > 0)

$\Rightarrow k = 8$

Now, $k^2 + 6 = 64 + 6 = 70$

Sol.5.(d) $p(x) = 2x^3 + ax^2 + 3x - 5)$

and $g(x) = (x^3 + x^2 - 2x + a)$

Put $x - 2 = 0 \Rightarrow x = 2$

On putting value of x in $p(x)$ and $g(x)$

$p(2) = 16 + 4a + 6 - 5 = 17 + 4a$ ... (i)

and $g(2) = 8 + 4 - 4 + a = 8 + a$ ... (ii)

$p(x)$ and $g(x)$ leaves the same remainder.

Hence, from (i) and (ii)

$17 + 4a = 8 + a \Rightarrow 3a = -9 \Rightarrow a = -3$

Now, Remainder = 8 + a = 5

Sol.6.(a) Formula used :

$a^2 - b^2 = (a - b)(a + b)$

$(x + y)(x - y)(x^2 + y^2)(x^4 + y^4)(x^8 + y^8)(x^{16} + y^{16})$

$(x^2 - y^2)(x^2 + y^2)(x^4 + y^4)(x^8 + y^8)(x^{16} + y^{16})$

$(x^4 - y^4)(x^4 + y^4)(x^8 + y^8)(x^{16} + y^{16})$

$(x^8 - y^8)(x^8 + y^8)(x^{16} + y^{16})$

$(x^{16} - y^{16})(x^{16} + y^{16}) = x^{32} - y^{32}$

Sol.7.(d) Given,

$x^4 + y^4 = x^2y^2 \Rightarrow x^4 + y^4 - x^2y^2 = 0$

$x^6 + y^6 = x^{(2)^3} + y^{(2)^3}$

$= (x^2 + y^2)(x^4 + y^4 - x^2y^2)$

$x^6 + y^6 = (x^2 + y^2) \times 0 = 0$

Sol.8.(b) $ax + by = 1$ --- (1)

And, $bx + ay = \frac{2ab}{a^2 + b^2}$ ---- (2)

Put b = 0 in equation (1) we get;

$ax + 0 \times y = 1 \Rightarrow a = x = 1$

Now , put b = 0 in equation (2) we get;

$0 + ay = \frac{2a \times 0}{a^2 + 0^2} \Rightarrow ay = 0 \Rightarrow y = 0$

So, put (a = 1 and b = 0) in the options

Value of x = 1 obtained from option b

Sol.9.(d) $x = (7 + 3\sqrt{5}) \Rightarrow x^2 = 94 + 42\sqrt{5}$

$\frac{1}{x} = \frac{1}{(7+3\sqrt{5})} \times \frac{(7-3\sqrt{5})}{(7-3\sqrt{5})}$

$= \frac{(7-3\sqrt{5})}{4} \Rightarrow \frac{1}{x^2} = \frac{94-42\sqrt{5}}{16}$

Now , $x^2 + \frac{1}{x^2}$

$= (94 + 42\sqrt{5}) + \frac{94-42\sqrt{5}}{16}$

$= (94 + 42\sqrt{5}) + \frac{47-21\sqrt{5}}{8}$

$= \frac{94 \times 8 + 42\sqrt{5} \times 8 + 47 - 21\sqrt{5}}{8}$

$= \frac{799 + 315\sqrt{5}}{8}$

Sol.10.(b) $x + \frac{1}{x} = 11$

$x^2 + \frac{1}{x^2} = 11^2 - 2 = 119$

$x^4 + \frac{1}{x^4} = 119^2 - 2 = 14159$

Now , $x^8 - 14159x^4 + 11$

$x^8 - (x^4 + \frac{1}{x^4})x^4 + 11$

$x^8 - x^8 - \frac{x^4}{x^4} + 11 = 10$

Sol.11.(d) If $(a + b + c) = 0$, Then $a^3 + b^3 + c^3 = 3abc$

$\frac{(1-m)^3 + (m-n)^3 + (n-1)^3}{12(1-m)(m-n)(n-1)}$

$= \frac{3(1-m)(m-n)(n-1)}{12(1-m)(m-n)(n-1)} = \frac{1}{4}$

Sol.12.(c) $3x^2 + 2kx + 3 = 0$

$D = b^2 - 4ac$

For real roots , D must be equal to zero .

$0 = (2k)^2 - 4 \times 3 \times 3$

$k^2 = \frac{36}{4} = 9 \Rightarrow k = 3$

Sol.13.(b) $\frac{(a^2+b^2-c^2)^2 - (a^2-b^2+c^2)^2}{b^2-c^2} =$

$\frac{(a^2+b^2-c^2+a^2-b^2+c^2) \times (a^2+b^2-c^2-a^2+b^2-c^2)}{b^2-c^2}$

$= \frac{2a^2 \times 2(b^2-c^2)}{b^2-c^2} = 4a^2$

Sol.14.(a) $a = 335$, $b = 215$ and $c = 180$

$a^3 + b^3 + c^3 - 3abc = (\frac{a+b+c}{2})$

$\{(a-b)^2 + (b-c)^2 + (c-a)^2\}$

$= (\frac{335+215+180}{2})$

$\{(120)^2 + (35)^2 + (155)^2\}$

Using digital sum :-

$= \frac{10}{2}\{(3)^2 + (8)^2 + (11)^2\}$

$= 5\{9 + 64 + 121\}$

$= 5\{9 + 1 + 4\} = 5\{5\} = 25 = 7$ digital sum

Only option (a) has 7 as a digital sum.

Sol.15.(a) If $a + b + c = 0$, then $a^3 + b^3 + c^3 = 3abc$

$\frac{(u-v)^3 + (v-w)^3 + (w-u)^3}{(u^2-v^2)^3 + (v^2-w^2)^3 + (w^2-u^2)^3}$

$= \frac{3(u-v)(v-w)(w-u)}{3(u^2-v^2)(v^2-w^2)(w^2-u^2)}$

$= \frac{1}{(u+v)(v+w)(w+u)}$

Sol.16.(c) $x^3 - y^3 = 270$, and $x - y = 6$

$(x^3 - y^3) = (x - y)\{(x - y)^2 + 3xy\}$

$270 = 6(36 + 3xy) \Rightarrow xy = 3$

Now , $(x + y) = \sqrt{(6)^2 + 4xy}$

$= \sqrt{36 + 4 \times 3} = 4\sqrt{3}$

Search on Tg: @apna_pdf

Search on Telegram @apna_pdf

Sol.17.(b) $p + q + r = 0$ ....(given)

Let , $p = 0$ then $q = -r$

Now , $\left(\frac{p^2}{p^2-qr} + \frac{q^2}{q^2-pr} + \frac{r^2}{r^2-pq}\right)$

$\left(0 + \frac{q^2}{q^2-0} + \frac{r^2}{r^2-0}\right) = 2$

Sol.18.(b) $x + \frac{1}{x} = 5\sqrt{2}$

$x^3 + \frac{1}{x^3} = \left(5\sqrt{2}\right)^3 - 3\left(5\sqrt{2}\right)$

$= 250\sqrt{2} - 15\sqrt{2} = 235\sqrt{2}$

$\Rightarrow x^3 - \frac{1}{x^3} = \sqrt{\left(x^3 + \frac{1}{x^3}\right)^2 - 4}$

$= \sqrt{\left(235\sqrt{2}\right)^2 - 4}$

$= \sqrt{110450 - 4} = \sqrt{110446} = 49\sqrt{46}$

Now , $x^6 - \frac{1}{x^6} = \left(x^3 + \frac{1}{x^3}\right)\left(x^3 - \frac{1}{x^3}\right)$

$= 235\sqrt{2} \times 49\sqrt{46}$

$= 235 \times 49 \times 2 \times \sqrt{23} = 23030\sqrt{23}$

Sol.19.(a) $a^3 - b^3 = 6272$ and $a - b = 8$

$a^3 - b^3 = (a - b)\left[(a-b)^2 + 3ab\right]$

$6272 = 8\left[8^2 + 3ab\right]$

$784 = 64 + 3ab$

$720 = 3ab \Rightarrow ab = 240$

$(a+b)^2 = (a-b)^2 + 4ab$

$(a+b)^2 = 8^2 + 4 \times 240 = 1024$

$\Rightarrow a + b = 32$

Now, $a^3 + b^3 = (a + b)[(a + b)^2 - 3ab]$

$a^3 + b^3 = 32\left[32^2 - 3 \times 240\right]$

$= 32\,[1024 - 720] \Rightarrow 32 \times 304 = 9728$

Short trick :-

$a^3 - b^3 = 6272$, and $a - b = 8$,

By hit and trial ,

$a = 20$ and $b = 12$ satisfy the given equation .

Now ,

$a^3 + b^3 = 8000 + 1728 = 9728$

Sol.20.(c) $a^2 + b^2 + c^2 - ab - bc - ca$

$= \frac{(a-b)^2 + (b-c)^2 + (c-a)^2}{2}$

$= \frac{(101-102)^2 + (102-103)^2 + (103-101)^2}{2}$

$= \frac{1+1+4}{2} = 3$

Sol.21.(a) $\left(x + \frac{1}{x}\right) = 5$

$x^2 + \frac{1}{x^2} = (5)^2 - 2 = 23$

And, $x^4 + \frac{1}{x^4} = (23)^2 - 2 = 527$ ------ (1)

Now, $x - \frac{1}{x} = \sqrt{5^2 - 4} = \sqrt{21}$

$x^2 - \frac{1}{x^2} = \left(x + \frac{1}{x}\right)\left(x - \frac{1}{x}\right) = 5\sqrt{21}$

And , $x^4 - \frac{1}{x^4} = \left(x^2 + \frac{1}{x^2}\right)\left(x^2 - \frac{1}{x^2}\right)$

$= 23 \times 5\sqrt{21} = 115\sqrt{21}$ ----- (2)

Now, $x^8 - \frac{1}{x^8} = \left(x^4 + \frac{1}{x^4}\right)\left(x^4 - \frac{1}{x^4}\right)$

$= 527 \times 115\sqrt{21} = 60605\sqrt{21}$

Sol.22.(c) $x - \frac{1}{x} = -6$

$x^2 + \frac{1}{x^2} = (-6)^2 + 2 = 38$

$x^3 - \frac{1}{x^3} = (-6)^3 + 3 \times (-6)$

$= -216 - 18 = -234$

$x^5 - \frac{1}{x^5} = \left(x^2 + \frac{1}{x^2}\right)\left(x^3 - \frac{1}{x^3}\right) - \left(x - \frac{1}{x}\right)$

$= 38 \times (-234) - (-6) = -8892 + 6 = -8886$

Sol.23.(d) $x^2 + \frac{1}{x^2} = 7$

$x + \frac{1}{x} = \sqrt{7 + 2} = 3$

As $0 < x < 1$, so value of $\left(x - \frac{1}{x}\right)$ will always be –ve.

$x - \frac{1}{x} = -\sqrt{9 - 4} = -\sqrt{5}$

$x^2 - \frac{1}{x^2} = \left(x + \frac{1}{x}\right)\left(x - \frac{1}{x}\right)$

$= (3)(-\sqrt{5}) = -3\sqrt{5}$

Sol.24.(a) $x^4 + \frac{1}{x^4} = 254$

$x^2 + \frac{1}{x^2} = \sqrt{254 + 2} = 16$

$x + \frac{1}{x} = \sqrt{16 + 2} = 3\sqrt{2}$ And ,

$x^3 + \frac{1}{x^3} = \left(3\sqrt{2}\right)^3 - 3 \times 3\sqrt{2}$

$= 54\sqrt{2} - 9\sqrt{2} = 45\sqrt{2}$

Now,

$x^5 + \frac{1}{x^5} = \left(x^3 + \frac{1}{x^3}\right) \times \left(x^2 + \frac{1}{x^2}\right) - \left(x + \frac{1}{x}\right)$

$= 45\sqrt{2} \times 16 - 3\sqrt{2} = 717\sqrt{2}$

Sol.25.(b)

$\frac{2x}{x+2} + \frac{1}{2x+4} - \frac{12-x}{2x^2+4x} = a + \frac{b}{x}$

$\Rightarrow \frac{4x^2 + x - (12 - x)}{2x^2 + 4x} = \frac{4x^2 + 2x - 12}{2x^2 + 4x}$

$= \frac{2x^2 + x - 6}{x^2 + 2x} = \frac{(x+2)(2x-3)}{x(x+2)} = 2 + \frac{-3}{x}$

On comparing we get ,

$a = 2$ and $b = -3$

So , $ab = -6$

Sol.26.(b) $6^x = 3^y = 2^z = k$ (let)

Then, $k^{\frac{1}{z}} = 2$, $k^{\frac{1}{y}} = 3$, $k^{\frac{1}{x}} = 6$

$\Rightarrow k^{\frac{1}{x}} \rightarrow 2 \times 3 \Rightarrow k^{\frac{1}{x}} = k^{\frac{1}{z}} \times k^{\frac{1}{y}}$

therefore , $k^{\frac{1}{x}} = k^{\frac{1}{y}} \times k^{\frac{1}{z}}$

$\Rightarrow \frac{1}{x} = \frac{1}{z} + \frac{1}{y} \Rightarrow \frac{1}{y} + \frac{1}{z} - \frac{1}{x} = 0$

Sol.27.(a) $17x + my + 102 = 0$

$23x + 299y + 138 = 0$

For infinite number of solutions ,

$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2} \Rightarrow \frac{17}{23} = \frac{m}{299}$

$m = \frac{17 \times 299}{23} = 221$

Sol.28.(a) Formula : $a^3 + b^3 + c^3 - 3abc$

$= (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$

$\Rightarrow 85 - 3 \times 25 = 5(a^2 + b^2 + c^2 - ab - bc - ca)$

$\Rightarrow 85 - 75 = 5(a^2 + b^2 + c^2 - ab - bc - ca)$

$\Rightarrow 10 = 5(a^2 + b^2 + c^2 - ab - bc - ca)$

$\Rightarrow a^2 + b^2 + c^2 - ab - bc - ca = \frac{10}{5} = 2$

Sol.29.(b) Since, α, β are the roots of $6x^2 + 13x + 7 = 0$. then,

$\alpha + \beta = \frac{-13}{6}$ and $\alpha\beta = \frac{7}{6}$

$\alpha^2 + \beta^2 = \left(\frac{-13}{6}\right)^2 - 2 \times \frac{7}{6} = \frac{169}{36} - \frac{7}{3} = \frac{85}{36}$

So, the equation whose roots are α^2, β^2 is given by :

$x^2 - \left(\frac{85}{36}\right)x + \frac{49}{36} = 0 \Rightarrow 36x^2 - 85x + 49 = 0$

Sol.30.(a) Formula used :

$x^3 + y^3 + z^3 - 3xyz = \frac{1}{2}(x + y + z)$

$\left[(x-y)^2 + (y-z)^2 + (z-x)^2\right]$

$= \frac{(222 + 223 + 224)}{2}\left[(222 - 223)^2 + (223 - 224)^2 + (224 - 222)^2\right]$

$= \frac{669}{2}\left[(-1)^2 + (-1)^2 + (2)^2\right]$

$= \frac{669}{2} \times 6 = 2007$

Sol.31.(a) Dividing and multiplying by $\left(k + \frac{1}{k}\right)$, we get

$$\frac{\left(k+\frac{1}{k}\right)\left(k-\frac{1}{k}\right)\left(k^2+\frac{1}{k^2}\right)\left(k^4+\frac{1}{k^4}\right)\left(k^8+\frac{1}{k^8}\right)\left(k^{16}+\frac{1}{k^{16}}\right)\left(k^{32}+\frac{1}{k^{32}}\right)}{\left(k+\frac{1}{k}\right)}$$

$$= \frac{\left(k^2-\frac{1}{k^2}\right)\left(k^2+\frac{1}{k^2}\right)\left(k^4+\frac{1}{k^4}\right)\left(k^8+\frac{1}{k^8}\right)\left(k^{16}+\frac{1}{k^{16}}\right)\left(k^{32}+\frac{1}{k^{32}}\right)}{\left(k+\frac{1}{k}\right)}$$

$$= \frac{\left(k^4-\frac{1}{k^4}\right)\left(k^4+\frac{1}{k^4}\right)\left(k^8+\frac{1}{k^8}\right)\left(k^{16}+\frac{1}{k^{16}}\right)\left(k^{32}+\frac{1}{k^{32}}\right)}{\left(k+\frac{1}{k}\right)}$$

$$= \frac{\left(k^8-\frac{1}{k^8}\right)\left(k^8+\frac{1}{k^8}\right)\left(k^{16}+\frac{1}{k^{16}}\right)\left(k^{32}+\frac{1}{k^{32}}\right)}{\left(k+\frac{1}{k}\right)}$$

$$= \frac{\left(k^{16}-\frac{1}{k^{16}}\right)\left(k^{16}+\frac{1}{k^{16}}\right)\left(k^{32}+\frac{1}{k^{32}}\right)}{\left(k+\frac{1}{k}\right)}$$

$$= \frac{\left(k^{32}-\frac{1}{k^{32}}\right)\left(k^{32}+\frac{1}{k^{32}}\right)}{\left(k+\frac{1}{k}\right)} = \frac{\left(k^{64}-\frac{1}{k^{64}}\right)}{\left(k+\frac{1}{k}\right)}$$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.32.(a) Statement 1.
Sum of squares of n even natural no.
$= \frac{2}{3} \times (n)(n+1)(2n+1)$
Sum of squares of n odd natural no.
$= \frac{1}{3} \times n \times (2n+1) \times (2n-1)$
$= (100^2 + 98^2 + 96^2 ..... + 2^2) - (99^2 + 97^2 + 95^2 ..... + 1^2)$
$= \frac{2}{3} \times (50)(50+1)(2 \times 50 + 1) - \frac{1}{3} \times 50 \times (2 \times 50 + 1) \times (2 \times 50 - 1)$
$= \frac{1}{3} \times 50 \times 101 \times (102 - 99) = 5050$
Statement 1 is correct .
Statement 2 :-
$8x + \frac{8}{x} = -16 \Rightarrow x + \frac{1}{x} = -2 \Rightarrow x = -1$
Now, $x^{197} + x^{-197} = -2$
Statement 2 is incorrect .

Sol.33.(c) $mx^m - nx^n = 0 \Rightarrow mx^m = nx^n$
$\Rightarrow \frac{m}{n} = \frac{x^n}{x^m}$
$\frac{1}{x^m + x^n} + \frac{1}{x^m - x^n} = \frac{1}{n+m} + \frac{1}{n-m}$
$= \frac{2n}{n^2 - m^2} = \frac{2mn}{m(n^2 - m^2)} = \frac{2mn}{x^n(n^2 - m^2)}$

Sol.34.(d) $(ax + by)^2 + (ay - bx)^2 = 8^2 + p^2$
$\Rightarrow a^2x^2 + b^2y^2 + 2abxy + a^2y^2 + b^2x^2 - 2abxy = 64 + p^2$
$\Rightarrow a^2x^2 + b^2y^2 + a^2y^2 + b^2x^2 = 64 + p^2$
$\Rightarrow a^2(x^2 + y^2) + b^2(x^2 + y^2) = 64 + p^2$
$\Rightarrow (x^2 + y^2)(a^2 + b^2) = 64 + p^2$
$\Rightarrow 25 \times 17 = 425 = 64 + p^2$
$\Rightarrow p^2 = 425 - 64 = 361 \Rightarrow p = 19$
Short-Trick: Value putting a = 4, b = 3, x = -1 and y = 4

Sol.35.(c) $2 = x + \frac{1}{1 + \frac{1}{5 + \frac{1}{2}}}$
$2 = x + \frac{1}{1 + \frac{2}{11}} \Rightarrow 2 = x + \frac{11}{13} \Rightarrow x = \frac{15}{13}$

Sol.36.(c) Given:- $x^3 + 2x^2 - ax - b$ is divisible by $x^2 - 1$.
Therefore, $x^2 = 1$ satisfies the equation and $x^3 + 2x^2 - ax - b = 0$ at $x^2 = 1$
Or x = +1 or -1
$\Rightarrow x^3 + 2x^2 - ax - b = 0$ ($\because x = 1$)
$\Rightarrow 1 + 2 - a - b = 0 \Rightarrow 3 - a - b = 0$
$\Rightarrow a + b = 3$ ... (i)
$\Rightarrow x^3 + 2x^2 - ax - b = 0$ ($\because x = -1$)
$\Rightarrow -1 + 2 + a - b = 0 \Rightarrow 1 + a - b = 0$
$\Rightarrow a - b = -1$ ... (ii)
From eq . (i) and (ii):- a = 1 and b = 2

Sol.37.(c) $x = \sqrt[3]{5} + 2 \Rightarrow x - 2 = \sqrt[3]{5}$
Cubing both sides, we get
$(x-2)^3 = 5 \Rightarrow x^3 - 6x^2 + 12x - 8 = 5$
$\Rightarrow x^3 - 6x^2 + 12x - 12 = 1$

Sol.38.(b) (ax + by), on squaring it,
$(ax + by)^2 = a^2x^2 + 2abxy + b^2y^2$
So,
(ax + by) is a factor of $a^2x^2 + 2abxy + b^2y^2$

Sol.39.(a) $7a^2 + 7a = 7a(a + 1)$
a and a + 1 are two consecutive number and out of two consecutive number one is odd and one is even and even is always divisible by 2
So, the complete number is divisible by 14 and 7 both.
Short-Trick:
Put the value of a = 1
$7a^2 + 7a = 7(1)^2 + 7(1) = 14$
So, number is divisible by both 7 and 14

Sol.40.(c) $(a^{\frac{2}{3}} + 2a^{\frac{1}{2}} + 3a^{\frac{1}{3}} + 2a^{\frac{1}{6}} + 1)$
$(a^{\frac{1}{3}} - 2a^{\frac{1}{6}} + 1) - a^{\frac{1}{2}}(a^{\frac{1}{2}} - 2)$
Let $a^{\frac{1}{6}} = p$ then,
$= (p^4 + 2p^3 + 3p^2 + 2p + 1)(p^2 - 2p + 1) - p^3(p^3 - 2)$
$= p^6 + 2p^5 + 3p^4 + 2p^3 + p^2 - 2p^5 - 4p^4 - 6p^3 - 4p^2 - 2p + p^4 + 2p^3 + 3p^2 + 2p + 1 - p^6 + 2p^3$
$= 1$
Short-Trick:
As the equation is independent of a, so you can put a = 0 for the solution
Which gives 1 as answer

Sol.41.(b) a + b + c + d = 2 .... (given)
Let $a = b = c = d = \frac{1}{2}$
Therefore, (1 + a)(1 + b)(1 + c)(1 + d)
$= (1 + \frac{1}{2})(1 + \frac{1}{2})(1 + \frac{1}{2})(1 + \frac{1}{2})$
$= (\frac{3}{2})(\frac{3}{2})(\frac{3}{2})(\frac{3}{2}) = \frac{81}{16}$

Sol.42.(c)
$(2x + y)^3 = 8x^3 + y^3 + 12x^2y + 6xy^2$
Coefficient of $x^2 = 12y$

Sol.43.(a) Given, $x^{2a} = y^{2b} = z^{2c} \neq 0$ .....(1)
and $x^2 = yz$ .....(2)
Let x = y = z = m ...(where m is any integer value) put these value in eq (2)
$x^2 = yz \Rightarrow m^2 = m \times m$
.....(condition satisfied)
put these value in eq (1)
$x^{2a} = y^{2b} = z^{2c} \Rightarrow m^{2a} = m^{2b} = m^{2c} \neq 0$
.....(3)....(m is an integer value)
in equation (3) since base is same then power must be same
$\Rightarrow 2a = 2b = 2c \Rightarrow a = b = c$
let $a = b = c = k \Rightarrow \frac{ab + bc + ca}{bc}$
$\Rightarrow \frac{(k \times k) + (k \times k) + (k \times k)}{k \times k} = \frac{3k^2}{k^2} = 3$

Short trick : On putting the values as, a = b = c = 1 and x = y = z = 2, all equations are satisfied.

Sol.44.(c)
$x^3 + y^3 + z^3 - 3xyz = \frac{1}{2}(x + y + z)[(x-y)^2 + (y-z)^2 + (z-x)^2]$
$= \frac{1}{2}(5.51 + 5.52 + 5.57)[(5.51 - 5.52)^2 + (5.52 - 5.57)^2 + (5.57 - 5.51)^2]$
$= \frac{16.6}{2} \times [(-0.01)^2 + (-0.05)^2 + (0.06)^2]$
$= 8.3[\frac{1 + 25 + 36}{10000}] = \frac{83 \times 62}{100000} = 0.05146$

Sol.45.(d) $\frac{1}{\sqrt{7 - 4\sqrt{3}}}$.....(i)
We know that, $7 - 4\sqrt{3} = (2 - \sqrt{3})^2$
Putting the values in eq (i), We get
$= \frac{1}{\sqrt{(2 - \sqrt{3})^2}} = \frac{1}{2 - \sqrt{3}}$
On solving we get,
$= \frac{1 \times (2 + \sqrt{3})}{(2 - \sqrt{3})(2 + \sqrt{3})} = \frac{(2 + \sqrt{3})}{4 - 3}$
$= 2 + \sqrt{3} = 2 + 1.73 = 3.73$

Sol.46.(a) On solving the equation
(2x + 3y + 4)(2x + 3y - 5)
$= 4x^2 + 6xy - 10x + 6xy + 9y^2 - 15y + 8x + 12y - 20$
$= 4x^2 + 9y^2 + 12xy - 2x - 3y - 20$ ..... eq(1)
On comparing equation (1) with
$(ax^2 + by^2 + 2hxy + 2gx + 2fy + c)$
We get,
$a = 4, b = 9, h = 6, g = -1, f = -\frac{3}{2}, c = -20$
Now, putting these values in equation
$\{\frac{(g + f - c)}{abh}\} = (\frac{(-1 - (\frac{3}{2}) + 20}{216}) = \frac{35}{432}$

Sol.47.(d)
Let us assume the value of x = 3 and y = 2
Now, putting the value in equation
$(4x^3y - 6x^2y^2 + 4xy^3 - y^4)$
$= 4 \times 27 \times 2 - 6 \times 9 \times 4 + 4 \times 3 \times 8 - 16$
$= 216 - 216 + 96 - 16 = 80$
Now, check for these values in the four options.
Only option (d) is satisfied.
$= x^4 - (x - y)^4 = 3^4 - (3 - 2)^4 = 80$

Sol.48.(a) Given, $x = \sqrt[6]{27} - \sqrt{6\frac{3}{4}}$
and $y = \frac{\sqrt{45} + \sqrt{605} + \sqrt{245}}{\sqrt{80} + \sqrt{125}}$
$\Rightarrow x^2 = (\sqrt[6]{27} - \sqrt{6\frac{3}{4}})^2$
$= \sqrt[3]{27} + \frac{27}{4} - 2 \times \sqrt[6]{27} \times \sqrt{6\frac{3}{4}}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= 3 + \frac{27}{4} - 9 = \frac{3}{4}$

$y = \frac{\sqrt{45}+\sqrt{605}+\sqrt{245}}{\sqrt{80}+\sqrt{125}}$

$y = \frac{3\sqrt{5}+11\sqrt{5}+7\sqrt{5}}{4\sqrt{5}+5\sqrt{5}} = \frac{7}{3} \Rightarrow y^2 = \frac{49}{9}$

$x^2 + y^2 = \frac{3}{4} + \frac{49}{9} = \frac{223}{36}$

Sol.49.(c) Given,

$\sqrt{86 - 60\sqrt{2}} = a - b\sqrt{2}$ ...(1)

But $\sqrt{86 - 60\sqrt{2}}$

$\Rightarrow \sqrt{36 + 50 - 2 \times 6 \times 5\sqrt{2}}$

$\Rightarrow \sqrt{(6 - 5\sqrt{2})^2} \Rightarrow (6 - 5\sqrt{2})$

Comparing this with equation (1)

a = 6, b = 5

Now,

$\sqrt{a^2 + b^2} = \sqrt{6^2 + 5^2} = \sqrt{61} \approx 7.8$

Sol.50.(a) Given, $a = \sqrt{8} - \sqrt{7}$ and

$a = \frac{1}{b} \Rightarrow b = \frac{1}{\sqrt{8}-\sqrt{7}}$

Apply rationalization

$\Rightarrow b = \frac{1}{\sqrt{8}-\sqrt{7}} \times \frac{\sqrt{8}+\sqrt{7}}{\sqrt{8}+\sqrt{7}} = \sqrt{8} + \sqrt{7}$

$\Rightarrow a + b = a + \frac{1}{a}$ ...($a = \frac{1}{b}$)

$= \sqrt{8} - \sqrt{7} + \sqrt{8} + \sqrt{7} = 2\sqrt{8}$

$\Rightarrow a^2 + \frac{1}{a^2} = a^2 + b^2 = (2\sqrt{8})^2 - 2 = 30$

Now,

$ab = (\sqrt{8} - \sqrt{7})(\sqrt{8} + \sqrt{7}) = 1$

$\Rightarrow \frac{a^2 + b^2 - 3ab}{a^2 + ab + b^2} = \frac{30 - 3(1)}{30 + 1} = \frac{27}{31}$

Sol.51.(d) Short-Trick: Put a = 1, b = - 1

(a + b + 4){ab + 4(a + b)} - 4ab = 0

$\Rightarrow$ (1 - 1 + 4){1 (- 1) + 4(1 - 1)} - 4 × 1 ×− 1 = 0

$\Rightarrow$ (4)(-1) + 4 = 0 $\Rightarrow$ - 4 + 4 = 0

Condition satisfied.

$\{\frac{1}{(a+b+4)^{117}} - 2^{-234}\}$

$\Rightarrow \{\frac{1}{(1-1+4)^{117}} - 2^{-234}\}$

$\Rightarrow \frac{1}{(2^2)^{117}} - 2^{-234} \Rightarrow \frac{1}{(2)^{234}} - 2^{-234}$

$\Rightarrow 2^{-234} - 2^{-234} = 0$

Sol.52.(c) $(x + y)^{\frac{1}{3}} + (z + y)^{\frac{1}{3}} = -(x + z)^{\frac{1}{3}}$

$\Rightarrow (x + y)^{\frac{1}{3}} + (z + y)^{\frac{1}{3}} + (x + z)^{\frac{1}{3}} = 0$

$\Rightarrow [(x + y)^{\frac{1}{3}}]^3 + [(z + y)^{\frac{1}{3}}]^3 + [(x + z)^{\frac{1}{3}}]^3$

$= 3(x + y)^{\frac{1}{3}}(z + y)^{\frac{1}{3}}(x + z)^{\frac{1}{3}}$

$\Rightarrow 2(x + y + z) = 3[(x + y)(z + y)(x + z)]^{\frac{1}{3}}$

Cubing both sides,

$\Rightarrow 8(x + y + z)^3 = 27[(x + y)(z + y)(x + z)]$

$\Rightarrow x^3 + y^3 + z^3 + 3(x + y)(y + z)(z + x)$

$= \frac{27}{8}[(x + y)(z + y)(x + z)]$

$\Rightarrow x^3 + y^3 + z^3 = (\frac{27}{8} - 3)[(x + y)(z + y)(x + z)]$

$\Rightarrow x^3 + y^3 + z^3 = \frac{3}{8}[(x + y)(z + y)(x + z)]$

Sol.53.(c) $\frac{1}{4}\{(a + \frac{1}{a})^2 - (a - \frac{1}{a})^2\}$

$\Rightarrow \frac{1}{4}[\{(a)^2 + (\frac{1}{a})^2 + 2a \times \frac{1}{a}\} - \{(a)^2 + (\frac{1}{a})^2 - 2a \times \frac{1}{a}\}]$

$\Rightarrow \frac{1}{4}(a^2 + \frac{1}{a^2} + 2 - a^2 - \frac{1}{a^2} + 2)$

$\Rightarrow \frac{1}{4} \times 4 = 1$

Short-Trick:

We know that ,

$(a + b)^2 - (a - b)^2 = 4ab$

$= \frac{1}{4}\{(a + \frac{1}{a})^2 - (a - \frac{1}{a})^2\}$

$= \frac{1}{4} \times 4a \times \frac{1}{a} = 1$

Sol.54.(d) Given, $3^{\sqrt[4]{x}} + 4^{\sqrt[4]{x}} = 5^{\sqrt[4]{x}}$

We know that 3, 4 and 5 are triplet pairs

$\Rightarrow 3^2 + 4^2 = 5^2$

Comparing it with the question term

$\sqrt[4]{x} = 2 \Rightarrow (\sqrt[4]{x})^4 = 2^4 \Rightarrow x = 16$

Sol.55.(a) Given, $x = 2 - \sqrt{3} \Rightarrow \frac{1}{x} = \frac{1}{2-\sqrt{3}}$

Applying rationalization

$\Rightarrow \frac{1}{2-\sqrt{3}} \times \frac{2+\sqrt{3}}{2+\sqrt{3}} = 2 + \sqrt{3}$

$\Rightarrow x - \frac{1}{x} = (2 - \sqrt{3}) - (2 + \sqrt{3}) = -2\sqrt{3}$

$\Rightarrow x^3 - \frac{1}{x^3} = (-2\sqrt{3})^3 + 3(-2\sqrt{3})$

(If $x - \frac{1}{x} = k$, then $x^3 - \frac{1}{x^3} = k^3 + 3k$)

$= -24\sqrt{3} - 6\sqrt{3} = -30\sqrt{3}$

Sol.56.(b) Short-Trick: Put x = 0

$\{\frac{2(x^3-8)}{x^2-x-2} \times \frac{x^2+2x+1}{x^2-4x-5}\} \div \frac{x^2+2x+4}{3x-15}$

$\Rightarrow \{\frac{2(0-8)}{0-2} \times \frac{0+1}{0-5}\} \div \frac{0+4}{0-15}$

$\Rightarrow (8 \times \frac{1}{-5}) \div (\frac{4}{-15}) = 6$

Sol.57.(a) Given,

$x^4 - 5x^2 - 1 = 0 \Rightarrow x^2 - \frac{1}{x^2} = 5$

$\Rightarrow (x^6 - 3x^2 + \frac{3}{x^2} - \frac{1}{x^6} + 1)$

$= \{x^6 - \frac{1}{x^6} - 3(x^2 - \frac{1}{x^2}) + 1\}$

$\Rightarrow \{(x^2)^3 - \frac{1}{(x^2)^3} - 3(x^2 - \frac{1}{x^2}) + 1\}$

$\Rightarrow (x^2 - \frac{1}{x^2})^3 + 1 \Rightarrow 5^3 + 1 = 126$

Sol.58.(c) Given, x + y = 7 and xy = 10

$(x + y)^2 = x^2 + y^2 + 2xy$

$\Rightarrow (7)^2 = x^2 + y^2 + 2(10)$

$\Rightarrow x^2 + y^2 = 49 - 20 = 29$

Also,

$x^3 + y^3 = (x + y)(x^2 + y^2 - xy)$

Put the values of (x + y), $(x^2 + y^2)$ and (xy)

$x^3 + y^3 = (7)(29 - 10) = 133$

Now,

$\frac{1}{x^3} + \frac{1}{y^3} \Rightarrow \frac{x^3+y^3}{(xy)^3} = \frac{133}{10^3} = 0.133$

Short-Trick:

Using hit and trial method :-

put x = 5 and y = 2

x + y = 7 $\Rightarrow$ 5 + 2 = 7

xy = 10 $\Rightarrow$ 5 × 2 = 10

Both conditions satisfied clearly

5 and 2 are the values of x and y respectively.

$\frac{1}{x^3} + \frac{1}{y^3} \Rightarrow \frac{1}{5^3} + \frac{1}{2^3}$

$\Rightarrow \frac{1}{125} + \frac{1}{8} = \frac{8+125}{125 \times 8} = 0.133$

Sol.59.(b) Given,

$(3x - 1)^3 + (4x - 3)^3 + (2x + 1)^3$

= 3(3x - 1)(4x - 3)(2x + 1)

$\Rightarrow (3x - 1)^3 + (4x - 3)^3 + (2x + 1)^3 - 3(3x - 1)(4x - 3)(2x + 1) = 0$

We know that

$a^3 + b^3 + c^3 - 3abc = 0$, Only if either a + b + c = 0 or a = b = c

Case 1:

(3x - 1) + (4x - 3) + (2x + 1) = 0

3x + 4x + 2x - 1 - 3 + 1 = 0 $\Rightarrow$ 9x - 3 = 0

$\Rightarrow x = \frac{1}{3}$ (But $x \neq \frac{1}{3}$)

Case 2 :

(3x - 1) = (4x - 3) = (2x + 1)

(3x - 1)=(4x - 3) or (4x - 3)

= (2x + 1) or (3x - 1) = (2x + 1)

4x - 3x = 3 - 1 or 4x - 2x = 1 + 3 or 3x - 2x = 1 + 1

$\Rightarrow$ x = 2 or $x = \frac{4}{2}$ = 2 or x = 2

Sol.60.(b) Put x = 1, y = 1 and z = - 2

x + y + z = 0 $\Rightarrow$ 1 + 1 + (- 2) = 0

0 = 0 .....(condition satisfied)

$(x^2 + y^2 + z^2) \div (z^2 - xy)$

$\Rightarrow [(1)^2 + (1)^2 + (-2)^2] \div [(-2)^2 - 1 \times 1]$

$\Rightarrow 6 \div 3 = 2$

Sol.61.(c) Given,

$x^2 - 3x - 1 = 0 \Rightarrow x^2 - 1 = 3x \Rightarrow x - \frac{1}{x} = 3$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Now, $(x^2 + 8x - 1)(x^3 + x^{-1})^{-1}$

$\Rightarrow \frac{(x^2 + 8x - 1)}{(x^3 + \frac{1}{x})} \Rightarrow \frac{(x^3 + 8x^2 - x)}{(x^4 + 1)}$

$\Rightarrow \frac{x^2(x - \frac{1}{x} + 8)}{x^2(x^2 + \frac{1}{x^2})} \Rightarrow \frac{x - \frac{1}{x} + 8}{x^2 + \frac{1}{x^2}}$

$\Rightarrow \frac{3 + 8}{3^2 + 2}$ = 1...(If x - $\frac{1}{x}$ = k, then $x^2 + \frac{1}{x^2}$ = $k^2 + 2$)

Sol.62.(c) x = 2 - p ⇒ x + p = 2

Cubing both sides

$(x + p)^3 = 2^3$

$\Rightarrow x^3 + p^3 + 3xp(x + p) = 8$

$\Rightarrow x^3 + p^3 + 3xp(2) = 8$

$\Rightarrow x^3 + 6xp + p^3 = 8$

Sol.63.(a) $2x^2 + y^2$ + 6x - 2xy + 9 = 0

$\Rightarrow x^2 + 6x + 9 + x^2 + y^2$ - 2xy = 0

$\Rightarrow (x + 3)^2 + (x - y)^2 = 0$

Sum of the squares of two numbers is equal to zero only if the numbers themselves are zero.

⇒ (x + 3) = 0 and (x - y) = 0 ⇒ x = y = - 3

Now,

$4x^3 - y^3 + x^2y^2 \Rightarrow 3x^3 + x^4$ .....(x = y)

$\Rightarrow x^3(3 + x) \Rightarrow (-3)^3(3 - 3) = 0$

Sol. 64.(a) Given, ab + bc + ca = 8 and $a^2 + b^2 + c^2 = 20$

We know that,

$\Rightarrow (a + b + c)^2 = a^2 + b^2 + c^2 + 2$ (ab + bc + ca) = 20 + 2(8) = 36

⇒ (a + b + c) = 6

$\Rightarrow \frac{1}{2}$(a + b + c) $[(a - b)^2 + (b - c)^2 + (c - a)^2]$

= $a^3 + b^3 + c^3$ - 3abc = (a + b + c) {$(a + b + c)^2$ - 3 (ab + bc + ca)}

⇒ 6{$(6)^2$ - 3 × 8} = 6 (36 - 24) = 6 × 12 = 72

Sol.65.(b) x + y = 1

Squaring both sides

$x^2 + y^2 + 2xy = 1 \Rightarrow x^2 + y^2 = 1 - 2xy$

Again squaring both sides

$x^4 + y^4 + 2x^2y^2 = 1 + 4x^2y^2 - 4xy$

$x^4 + y^4 = 1 + 2x^2y^2 - 4xy$

$x^4 + y^4 = 1 + 2(x^2y^2 - 2xy)$

Put (x^2y^2 - 2xy = 12) = 1 + 2(12) = 25

Sol.66.(d)

$16x^2 + 9y^2 + 4z^2 = 24(x - y + z) - 61$

$\Rightarrow (16x^2 - 24x + 9) + (9y^2 + 24y + 16) + (4z^2 - 24z + 36) = 0$

$\Rightarrow (4x - 3)^2 + (3y + 4)^2 + (2z - 6)^2 = 0$

$\Rightarrow x = \frac{3}{4}, y = -\frac{4}{3}, z = 3$

Therefore,

$xy + 2z = \frac{3}{4} \times (-\frac{4}{3}) + 2 \times 3$

$= (-1) + 6 = 5$

Sol.67.(d) We know that,

$(a^3 - b^3)$ = (a - b)$(a^2 + b^2 + ab)$

So, $5\sqrt{5}x^3$ - $81\sqrt{3}y^3$

= $(\sqrt{5}x - 3\sqrt{3}y)[(\sqrt{5}x)^2 + (3\sqrt{3}y)^2 + \sqrt{5}x \times 3\sqrt{3}y]$

= $(\sqrt{5}x - 3\sqrt{3}y)(5x^2 + 27y^2 + 3\sqrt{15}xy)$

Put this value in question term,

$\frac{5\sqrt{5}x^3 - 81\sqrt{3}y^3}{(\sqrt{5}x - 3\sqrt{3}y)}$ = Ax^2 + By^2 + Cxy

$\Rightarrow \frac{(\sqrt{5}x - 3\sqrt{3}y)(5x^2 + 27y^2 + 3\sqrt{15}xy)}{(\sqrt{5}x - 3\sqrt{3}y)}$

= Ax^2 + By^2 + Cxy

⇒ $(5x^2 + 27y^2 + 3\sqrt{15}xy)$

= Ax^2 + By^2 + Cxy

Comparing the coefficients of x^2, y^2 and xy

A = 5, B = 27 and C = $3\sqrt{15}$

(6A + B - $\sqrt{15}C$) = 6(5) + 27 - ($\sqrt{15} \times 3\sqrt{15}$)

= 12

Sol.68.(a) We know that

$(x + y + z)^2 = x^2 + y^2 + z^2 + 2(xy + yz + zx)$

Put the given values

19^2 = 133 + 2(xy + yz + y^2)

114 = y(x + y + z) ⇒ y = 6

x + z = 19 - 6 = 13 ⇒ xz = 6^2 = 36

Only 9 and 4 are such pairs whose sum is 13 and multiplication is 36

Required difference = 9 - 4 = 5

Sol.69.(d) $x^4 + \frac{1}{x^4}$ = 194

$\Rightarrow x^2 + \frac{1}{x^2} = \sqrt{194 + 2} = 14$

$\Rightarrow x + \frac{1}{x} = \sqrt{14 + 2} = 4$

= x^2 + 1 = 4x ⇒ x^2 - 4x = - 1

$(x - 2)^2$ = 4 - 1 = 3

Sol.70.(b) We know the roots of an equation = $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

here , a = 1, b = - 4 and c = a

According to question

$\frac{-(-4) + \sqrt{(-4)^2 - 4a(1)}}{2(1)}$ ..... (1)

= $\frac{-(-4) - \sqrt{(-4)^2 - 4a(1)}}{2(1)}$ ..... (2)

Equating eq .(1) and (2), we get

$2\sqrt{16 - 4a}$ = 0

16 = 4a so, a= 4 ans.

Short trick :

For real and equal roots,

D = $b^2 - 4ac = 0$

a = 1 , b = - 4 and c = a

$\Rightarrow (-4)^2 - 4a = 0 \Rightarrow 4a = 16 \Rightarrow a = 4$

Sol.71.(c) $\frac{x^3 + 15x^2 + 75x + 125}{x^2 - 25} \times (x - 5)$

= $\frac{x^3 + 5^3 + 3 \times x \times 5(x + 5)}{x^2 - 5^2} \times (x - 5)$

= $\frac{(x + 5)^3}{(x - 5)(x + 5)} \times (x - 5)$

= $(x + 5)^2$

= x^2 + 25 + 10x or x^2 + 10x + 25

Sol.72.(a) $\frac{88 \div 8 \times k - 3 \times 3}{6^2 - 7 \times 5 + k^2}$ = 1

$\Rightarrow \frac{11 \times k - 9}{36 - 35 + k^2}$ = 1 ⇒ 11k - 9 = 1 + k^2

⇒ k^2 - 11k + 10 = 0 ⇒ k^2 - 10k - k + 10 = 0

⇒ k(k - 10) - 1(k - 10) = 0

⇒ (k - 10)(k - 1) = 0 ⇒ k = 10 and 1

Sol.73.(c) **Given:** a + b = 2c

$a + b = c + c \Rightarrow a - c = c - b$

On squaring both side

$a^2 + c^2 - 2ac = c^2 + b^2 - 2bc$

$a^2 + 2bc = b^2 + 2ac$

Sol.74.(c) Let: $x = y = z = \frac{1}{3}$

Then, $\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = \frac{1}{\frac{1}{3}} + \frac{1}{\frac{1}{3}} + \frac{1}{\frac{1}{3}}$

= 3 + 3 + 3 = 9

Sol.75.(c) $a^2 + \frac{1}{a^2}$ = (a + $\frac{1}{a}$)^2 - 2

= 12^2 - 2 = 142

Sol.76.(b)

Given that, a+b+c = 18 & $a^2 + b^2 + c^2$ = 36

Then, $a^3 + b^3 + c^3$ - 3abc = $\frac{1}{2}$(a + b + c)

$[3(a^2 + b^2 + c^2) - (a + b + c)^2]$

= $\frac{1}{2} \times 18[3 \times 36 - 18^2]$

= 9[108 − 324] = 9 × (-216) = -1944

Sol.77.(c) After checking all the options one by one, only option (c) satisfied.

x = 5, y = 4, z = 3

⇒ x + y + z = 12;

LHS = 5 + 4 + 3 = 12 = RHS

⇒ x + y -z = 6;

LHS = 5 + 4 - 3 = 6 = RHS

⇒ x - y + z = 4

LHS = 5 - 4 + 3 = 4 = RHS

Sol.78.(a) $\Rightarrow \sqrt{x} + \frac{1}{\sqrt{x}}$ = 7

On squaring both side,

$\Rightarrow x + \frac{1}{x}$ + 2 = 49 ⇒ $x + \frac{1}{x}$ = 47

Sol.79.(a)

$x^2 + y^2$ = 280 and xy = 120

$x^2 + y^2 - 2xy$ = 280 - 2 × 120 = 40

.....(i)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$x^2 + y^2 + 2xy = 280 + 2 \times 120 = 520$ .....(ii)

Now, on dividing (i) by (ii):

$\frac{x^2+y^2-2xy}{x^2+y^2+2xy} = \frac{40}{520}$

$\Rightarrow \frac{(x-y)^2}{(x+y)^2} = \frac{1}{13} \Rightarrow \frac{(x-y)}{(x+y)} = \frac{1}{\sqrt{13}}$

Sol.80.(a) If the lines have no solution

$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}, \Rightarrow \frac{2}{1} = \frac{7k}{1} \Rightarrow k = \frac{2}{7}$

Sol.81.(b) $x + \frac{1}{x} = 2\sqrt{10}$

$x - \frac{1}{x} = \sqrt{(2\sqrt{10})^2 - 4}$

$= \sqrt{40 - 4} = \sqrt{36} = 6$ .... (x > 1)

So, $x^3 - \frac{1}{x^3} = (6)^3 + 3 \times 6 = 234$

Sol.82.(b) Given :- x + 2z = 3

x + 2y + 3z = 5

3x - 5z = -13

By checking all options one by one, only option (b) satisfies,

hence, x = -1, y = 0, z = 2

Sol.83.(d) $x + \frac{1}{9x} = 3$

Multiplying both side by 3, we have ;

$3x + \frac{1}{3x} = 9$

Then, $9x^2 + \frac{1}{9x^2} = 9^2 - 2 = 81 - 2 = 79$

Sol.84.(b) $t^3 + (\frac{3}{5})^3 + \frac{9}{5}t$

$= (\frac{2}{5})^3 + (\frac{3}{5})^3 + \frac{9}{5} \times \frac{2}{5}$

$= \frac{8}{125} + \frac{27}{125} + \frac{90}{125} = \frac{125}{125} = 1$

Sol.85.(c)

$\frac{7x^2 - 9x + 7}{x^2 - x + 1} = \frac{7x - 9 + \frac{7}{x}}{x - 1 + \frac{1}{x}}$

$= \frac{7(x + \frac{1}{x}) - 9}{(x + \frac{1}{x}) - 1} = \frac{7 \times 15 - 9}{15 - 1} = \frac{96}{14}$

$= \frac{48}{7}$

Sol.86.(c) For many solutions

$\frac{a}{3} = \frac{b}{-(5-2a)} = \frac{2}{6}$

$\Rightarrow \frac{a}{3} = \frac{2}{6} \Rightarrow a = 1$

And $\frac{b}{-(5-2a)} = \frac{2}{6} \Rightarrow 3b = -5 + 2a$

$\Rightarrow 3b = -5 + 2 \Rightarrow b = -1$

Sol.87.(a) m + n = 24

Let m = 12

n = 12

$\Rightarrow (m - 16)^3 + (n - 8)^3 = (12 - 16)^3 + (12 - 8)^3$

$= (-4)^3 + (4)^3 = 0$

Sol.88.(c) Given Equation :

2x + y = a and 8x + by = 12

For infinite solution $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ ...(i)

Here, $a_1 = 2$, $a_2 = 8$, $b_1 = 1$, $b_2 = b$, $c_1 = -a$, $c_2 = -12$

Put this value in eqn(i)

$\frac{2}{8} = \frac{1}{b} = \frac{-a}{-12}$

By equating this equation ,

a = 3 , b = 4

Now , Sum of a and b = 4 + 3 = 7

Sol.89.(b)

Given , $a^2 + b^2 + c^2 = 2(a + c - 1)$

Here , $a^2 + b^2 + c^2 - 2a - 2c + 2 = 0$

$\Rightarrow a^2 - 2a + 1 + b^2 + c^2 - 2c + 1 = 0$

$\Rightarrow (a - 1)^2 + b^2 + (c - 1)^2 = 0$

Now , $(a - 1)^2$ **= 0 , a = 1**

$b^2 = 0$, b =0 and $(c - 1)^2 = 0$, c = 1

$\therefore a^3 + b^3 + c^3 = 2$

Sol.90.(c) Given: 5x – 3y + 7z = 22; 3x – 5y – 2z = – 46; 2x – 2y + 5z = 24

By checking option one by one, option (c) satisfy

5x – 3y + 7z = 22

Put x = – 5, y = 3, z = 8

- 25 - 9 + 56 = 22

Sol.91.(b) This type of question we will go to options,

After checking all options one by one only option (b) satisfies.

x = 1, y = 1, z = 1

Equation (i)

5x + 4y - 8z = 1 LHS

= 5x + 4y - 8z = 5 + 4 - 8 = 1 = RHS

Equation(ii)

7x - 9y + z = - 1 LHS

= 7x - 9y + z = 7 - 9 + 1 = -1 = RHS

Equation (iii)

2x + 3y - 4z = 1 LHS

= 2x + 3y - 4z = 2 + 3 - 4 = 1 = RHS

Sol.92.(a) Given :- a + b = 1

$\frac{1}{a^2} + \frac{1}{b^2} + \frac{2}{ab} = \frac{a^2+b^2+2ab}{a^2b^2} = \frac{(a+b)^2}{a^2b^2}$

$= \frac{1}{a^2b^2}$

Sol.93.(b) $x - ay = 2 - a$

$x - ay - (2 - a) = 0$ ... (i)

$(1 - a)x + 6y - (a + b)$ ... (ii)

For No solution

$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

$\frac{a_1}{a_2} = \frac{b_1}{b_2}$	$\frac{b_1}{b_2} \neq \frac{c_1}{c_2}$
$\frac{1}{1-a} = \frac{-a}{6}$	$\frac{-a}{6} \neq \frac{-2+a}{-a-b}$
(1 - a) (- a) = 6	On putting value of a = 3
$a^2 - a - 6 = 0$	$\frac{-3}{6} \neq \frac{-2+3}{-3-b}$
$a^2 - 3a + 2a - 6 = 0$	$-3 - b \neq -2$
$a(a - 3) + 2(a - 3) = 0$	$-b \neq 1$
$(a - 3)(a + 2) = 0$	$b \neq -1$
$a = 3$ or -2	

Sol.94.(d)

Given: m = a secA and y = b tan A

$b^2m^2 - a^2y^2 + \frac{a^2y^2}{b^2m^2} + \cos^2 A$

$= b^2a^2sec^2A - a^2b^2tan^2A + \frac{a^2b^2tan^2A}{b^2a^2sec^2A} + \cos^2 A$

$= a^2b^2(sec^2A - tan^2A) + \frac{tan^2A}{sec^2A} + \cos^2 A$

$= a^2b^2(1) + \frac{Sin^2A \times cos^2A}{cos^2A} + \cos^2 A$

$= a^2b^2 + 1$

Sol.95.(a) Given equation, kx - 15y + 7 = 0 and 7x - 21y - 19 = 0

There is no solution = $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

Then,

$\Rightarrow \frac{k}{7} = \frac{-15}{-21} \Rightarrow k = 5$

Sol.96.(d) $x^2 + \frac{1}{x^2} = 83$

Subtract both side by 2 in above equation,

$\Rightarrow x^2 + \frac{1}{x^2} - 2 = 83 - 2 \Rightarrow (x - \frac{1}{x})^2 = 81$

$\Rightarrow x - \frac{1}{x} = \sqrt{81} = 9$

We know that,

$x^3 - \frac{1}{x^3} = a^3 + 3$

$= 9^3 + 3 \times 9 = 729 + 27 = 756$

Sol.97.(b) $x + \frac{1}{x} = \frac{65}{8}$

$\Rightarrow x - \frac{1}{x} = \sqrt{(x + \frac{1}{x})^2 - 4}$

$= \sqrt{(\frac{65}{8})^2 - 4} = \sqrt{\frac{4225}{64} - 4}$

$= \sqrt{\frac{4225 - 256}{64}} = \sqrt{\frac{3969}{64}} = \frac{63}{8}$

Sol.98.(a) Let the five consecutive numbers are x - 2 , x -1 , x , x + 1 , x + 2

According to question

x - 2 + x -1 + x + x + 1 + x + 2 = 80

$\Rightarrow$ 5x = 80 $\Rightarrow$ x = 16

Largest number = x + 2 = 16 + 2 = 18

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.99.(b) Given x = $7 - 4\sqrt{3}$

$\frac{1}{x} = 7 + 4\sqrt{3} \Rightarrow x + \frac{1}{x} = 14$

$x^2 + \frac{1}{x^2} = 14^2 - 2 = 196 - 2 = 194$

Sol.100.(c) Let the three consecutive numbers x, y, and z be 3 , 2 and 1 respectively,

x - y + z = 2a .... (i)

Put the value x, y and z, we get

⇒ 3 - 2 + 1 = 2a ⇒ a = 1

x + 4y - 2z = 3(4 - a) .... (ii)

⇒ 3 + 8 - 2 = 3(4 - a) ⇒ 9 = 3(4 - a) ⇒ a = 1

2x - 3y + 4z = 6 - 2a .... (iii)

⇒ 6 - 6 + 4 = 6 - 2a ⇒ 4 = 6 - 2a ⇒ a = 1

It is clear form in all above equations satisfies the value of x, y and z, so the value of a = 1

Sol.101.(b) Given: $x + \frac{1}{x} = 2$

Put the value of x = 1 satisfies the equation,

$\Rightarrow x + \frac{1}{x} = 1 + \frac{1}{1} = 2$

⇒ LHS = RHS

Now,

$(x^{2723} + \frac{1}{x^{3356}}) = (1)^{2723} + \frac{1}{(1)^{3356}}$

= 1 + 1 = 2

Sol.102.(d) 3a + 2b = 27

On cubing both side we get

$(3a)^3 + (2b)^3 + 3\times 3a \times 2b(3a + 2b) = 27^3$

$27a^3 + 8b^3 + 18ab(3a + 2b) = 27^3$

$1458 + 18ab \times 27 = 19683$

$18ab \times 27 = 19683 - 1458$

$2ab = \frac{18225}{9 \times 27} = 75$

Sol.103.(a) $(a + \frac{1}{a}) = 7\sqrt{3}$

$a^2 + \frac{1}{a^2} = (7\sqrt{3})^2 - 2 = 49 \times 3 - 2 = 145$

$(a^6 + \frac{1}{a^6}) = 145^3 - 3 \times 145$

= 3048625 - 435 = 3048190

Sol.104.(c) $(x + \frac{1}{x}) = 7$

$(x - \frac{1}{x}) = \sqrt{7^2 - 4} = \sqrt{49 - 4}$

$= \sqrt{45} = 3\sqrt{5}$

Sol.105.(d) Given,

$ax + (a^2 + 1)y = 4$ and $4x + ay = a^2$

After checking all options one by one, only option (d) satisfies,

a = -12, then x = 48, y=4

$\Rightarrow ax + (a^2 + 1)y = 4$

LHS = $ax + (a^2 + 1)y$

$= -12 \times 48 + [(-12)^2 + 1]4 = -576 + 145 \times 4$

= - 576 + 580 = 4 = RHS

$\Rightarrow 4x + ay = a^2$

LHS = 4x + ay

= 4 × 48 - 12 × 4 = 192 - 48 = 144

RHS = $a^2 = (-12)^2 = 144$

LHS = RHS

Sol.106.(a) Given: a + b + c = 0

$a + b = -c$

On squaring both side we get,

$a^2 + b^2 + 2ab = (-c)^2$

$a^2 + b^2 + 2ab = c^2$

Sol.107.(c) $3t - \frac{1}{3t} = 3$

Taking square both side,

$\Rightarrow 9t^2 + \frac{1}{9t^2} - 2 = 9 \Rightarrow 9t^2 + \frac{1}{9t^2} = 11$

adding 1 to both sides

$\Rightarrow 9t^2 + \frac{1}{9t^2} + 1 = 11 + 1$

$\Rightarrow 9t^2 + \frac{1}{9t^2} + 1 = 12$

Sol.108.(a)

Given: 3x + 2y = 10 and 2xy = 7

We know that,

$(a - b) = \sqrt{(a + b)^2 - 4 \times a \times b}$

$(3x - 2y) = \sqrt{(3x + 2y)^2 - 4 \times 3x \times 2y}$

So,

$(3x - 2y) = \sqrt{(10)^2 - 12 \times 7}$

$= \sqrt{100 - 84} = \sqrt{16} = 4$

Sol.109.(b) Given ,

$3x + 2y = 7$ .... (i)

$2x + 3y = 7$ .....(ii)

If $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$, then these equations have a unique Solution

Here , $a_1 = 3$, $a_2 = 2$, $b_1 = 2$, $b_2 = 3$

$\frac{3}{2} \neq \frac{2}{3}$

∴ it has unique solution

Sol.110.(c) $(3x + 17 - 2y)(3x - 17 - 2y)$

After rearranging we can write it,

= [(3x - 2y) + 17] [(3x - 2y) - 17)

= (a + b)(a - b) = $a^2 - b^2$

= $(3x - 2y)^2 - 17^2$

= $9x^2 - 12xy + 4y^2 - 289$

Sol.111.(a) When $a + b + c = 0$ then

$a^3 + b^3 + c^3 - 3abc = 0$

now

$a + b = c$ .... (given)

$a + b + (-c) = 0$

$a^3 + b^3 + (-c)^3 - 3ab(-c)$

$a^3 + b^3 - c^3 + 3abc = 0$

Sol.112.(c) $a^3 + \frac{1}{a^3} = 2$

Let $a = 1$

L.H.S. = $a^3 + \frac{1}{a^3} = 1^3 + \frac{1}{1^3} = 2$ = R.H.S.

Therefore,

$a + \frac{1}{a} = 1 + \frac{1}{1} = 2$

Sol.113.(c) $x^2 + 7x + 8 = 0$

On dividing by x we get,

$x + 7 + \frac{8}{x} = 0 \Rightarrow x + \frac{8}{x} = -7$ .... (i)

Now,

$\frac{4x}{x^2 - 5x + 8}$

On dividing by x we get,

$\frac{4}{x + \frac{8}{x} - 5} \Rightarrow \frac{4}{-7 - 5} = \frac{4}{-12} = -\frac{1}{3}$

Sol.114.(c) $a_1 = 3$, $b_1 = 1$, $c_1 = -3$

a_2 = a-b , $b_2 = a + b$, $c_1 = -3a - b + 3$

For infinite solution

$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

Hence,

$\frac{3}{a - b} = \frac{1}{a + b} = \frac{-3}{-3a - b + 3}$

$\frac{1}{a + b} = \frac{-3}{-3a - b + 3}$

$-3a - b + 3 = -3a - 3b$

$2b = -3$ or $b = \frac{-3}{2}$ ... (i)

Now,

$\frac{3}{a - b} = \frac{1}{a + b} \Rightarrow 3a + 3b = a - b$

$2a + 4b = 0 \Rightarrow 2a + 4 \times \frac{-3}{2} = 0$

$2a = 6 \Rightarrow a = 3$

hence, $a = 3$ and $b = \frac{-3}{2}$

Sol.115.(b) $(x + y)^2 + (x - y)^2$

$x^2 + y^2 + 2xy + x^2 + y^2 - 2xy$

$2(x^2 + y^2)$

Sol.116.(b)

$a_1 = 4$, $b_1 = 6$, $c_1 = -7$

$a_2 = 6$, $b_2 = K + 4$, $c_1 = -21$

For Unique solution

$\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \Rightarrow \frac{4}{6} \neq \frac{6}{K + 4}$

$K + 4 \neq 9 \Rightarrow k \neq 5$

Sol.117.(a) $a^2 + b^2 = 148$

Then $a + b = \sqrt{148 + 2ab}$

$= \sqrt{148 + 108} = \sqrt{256} = 16$

and

$a - b = \sqrt{148 - 2ab} = \sqrt{148 - 108}$

$= \sqrt{40} = 2\sqrt{10}$

now,

$\frac{a + b}{a - b} = \frac{16}{2\sqrt{10}} = \frac{8}{\sqrt{10}}$

Sol.118.(a) Equation :- $5x + 7y - 8 = 0$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

For no solution -

$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

Therefore, the correct option is (a).

Sol.119.(a) $2a - b = 3$ .... (i)

On cubing both side we get,

$8a^3 - b^3 - 3 \times 2ab\,(2a - b) = 27$

$8a^3 - b^3 - 6ab \times 3 = 27$

$999 - 18ab = 27 \Rightarrow -18ab = -972$

$ab = 54 \Rightarrow ab = 9 \times 6$

Take the value of a = 6 and b = 9

$2a - b = 3$

LHS = 2a - b = 2 × 6 - 9 = 3 = RHS

$8a^3 - b^3 = 999$

LHS = $8a^3 - b^3$

= 8 × 216 - 729 = 999

Value of a and b satisfies the given equation,

So,

$4a^2 - b^2 = 4 \times 36 - 81 = 63$

Sol.120.(b) Let correct answers be x and wrong or un-attempted answer be y

According to the question,

x + y = 160

y = 160 - x------(i)

4x - y = 400------(ii)

Put the value of y in equation (ii)

4x - (160 - x) = 400 ⇒ 4x - 160 + x = 400

5x = 560 ⇒ x = 112

Hence, he did 112 answers correctly.

Sol.121.(c) $2x - 3 = 0 \Rightarrow x = \frac{3}{2}$

Putting the value of x in $2x^3 - 3x^2 + 6x - 4$

$\Rightarrow 2(\frac{3}{2})^3 - 3(\frac{3}{2})^2 + 6 \times \frac{3}{2} - 4$

$\Rightarrow 2 \times \frac{27}{8} - 3 \times \frac{9}{4} + 6 \times \frac{3}{2} - 4$

$\Rightarrow \frac{27}{4} - \frac{27}{4} + 9 - 4 = 5$

Sol.122.(d) $A = \frac{9}{16} \div \frac{25}{36}$

$= \frac{9}{16} \times \frac{36}{25} = \frac{81}{100}$

B = 9 ÷ [(16 ÷ 25) ÷ 36]

$= 9 \div [\frac{16}{25} \times \frac{1}{36}] = 9 \div [\frac{4}{225}]$

$= 9 \times [\frac{225}{4}] = \frac{2025}{4}$

C = [9 ÷ (16 ÷ 25)] ÷ 36

$= [9 \div \frac{16}{25}] \div 36 = [9 \times \frac{25}{16}] \times \frac{1}{36}$

$= \frac{25}{16} \times \frac{1}{4} = \frac{25}{64}$

D = (9 ÷ 16) ÷ (25 ÷ 36)

$= (\frac{9}{16}) \div (\frac{25}{36}) = (\frac{9}{16}) \times (\frac{36}{25}) = \frac{81}{100}$

Clearly, value of A and D are equal.

Sol.123.(c)

$A = 60\,[\frac{6}{25} \div (\frac{16}{15} \text{ of } \frac{3}{8}) + 5 - (1 - 2\frac{1}{12})]$

$= 60\,[\frac{6}{25} \div (\frac{2}{5}) + 5 - (1 - \frac{25}{12})]$

$= 60\,[\frac{6}{25} \times (\frac{5}{2}) + 5 - (-\frac{13}{12})]$

$= 60\,[\frac{3}{5} + 5 + \frac{13}{12}] = 60\,[\frac{28}{5} + \frac{13}{12}]$

$= 60\,[\frac{28 \times 12 + 13 \times 5}{60}] = 60\,[\frac{336 + 65}{60}]$

$= 60\,[\frac{401}{60}] = 401$

Sum of the digits of A = 4 + 0 + 1 = 5

Sol.124.(b) 640 ÷ 8 + 930 ÷ 15 – k + 32 × 5 = 1104 ÷ 16 × 148 ÷ 37

⇒ 80 + 62 - k + 160 = 69 × 4

⇒ 80 + 62 - k + 160 = 276

⇒ 302 - k = 276 ⇒ - k = - 26 ⇒ k = 26

Sol.125.(d) For system of linear equations to be parallel, $\frac{a_1}{a_2} = \frac{b_1}{b_2}$

Here, $a_1 = 5$, $b_1 = k$, $c_1 = -2$ & $a_2 = k + 1$, $b_2 = 4$, $c_2 = 7$

$\frac{5}{k+1} = \frac{k}{4} \Rightarrow k^2 + k = 20$

$k^2 + k - 20 = 0 \Rightarrow k^2 + 5k - 4k - 20 = 0$

k(k + 5) - 4(k + 5) = 0

(k + 5)(k - 4) = 0 ⇒ k = 4

Sol.126.(b)

$\frac{15}{8} + [\{\frac{4}{5} \text{ of } \frac{5}{12} \div (1\frac{1}{15})\} \times 1\frac{7}{12}]$

$\frac{15}{8} + [\{\frac{1}{3} \div \frac{16}{15}\} \times \frac{19}{12}]$

$\frac{15}{8} + [\{\frac{1}{3} \times \frac{15}{16}\} \times \frac{19}{12}]$

$\frac{15}{8} + [\frac{5}{16} \times \frac{19}{12}]$

$\frac{15}{8} + \frac{95}{192} = \frac{360 + 95}{192} = \frac{455}{192}$

According to question,

$\frac{a}{b} = \frac{455}{192}$

Hence,

$4b - a = 4 \times 192 - 455$

= 768 - 455 = 313

Sol.127.(d) Given:- x + y = 12 and xy = 27

As we know, $x^3 + y^3 = (x + y)\left[(x + y)^2 - 3xy\right] = 12\left[12^2 - 3 \times 27\right]$

$= 12[144 - 81] = 12 \times 63 = 756$

Sol.128.(a) $x + y = 4(x - y)$

$x + y = 4x - 4y \Rightarrow 5y = 3x \Rightarrow \frac{y}{x} = \frac{3}{5}$

Let $x = 5a$ and $y = 3a$

$\frac{5xy}{3(x^2 - y^2)} = \frac{5 \times 5a \times 3a}{3(25a^2 - 9a^2)}$

$= \frac{75a^2}{3 \times 16a^2} = \frac{25}{16}$

Sol.129.(b) Formula used :

$x^3 + y^3 + z^3 - 3xyz = (x + y + z)\left[(x + y + z)^2 - 3(xy + yz + zx)\right]$

Now, $x^3 + y^3 + z^3 - 3 \times (-1) = 1\left[1^2 - 3 \times (-1)\right]$

$x^3 + y^3 + z^3 + 3 = 4 \Rightarrow x^3 + y^3 + z^3 = 1$

Sol.130.(c) Put α = 0, β = 1, γ = -1.

we have ;

$\frac{3\beta^2 + \alpha^2 + \gamma^2}{2\beta^2 - \alpha\gamma} = \frac{3 + 0 + 1}{2 - 0} = \frac{4}{2} = 2$

Sol.131.(b) Put y = 0, then x = 4

Now, $x^3 - 27y^3 - 36xy = 4^3 - 0 - 0 = 64$

Sol.132.(a) Given: $x + \frac{1}{x} = 2$

Putting the value of $x = 1$

LHS = $x + \frac{1}{x} = 1 + 1 = 2$

LHS = RHS

Now, $(x^4 + \frac{4}{x^4})(x^3 - \frac{4}{x^3})$

$= [(1)^4 + \frac{4}{(1)^4}][(1)^3 - \frac{4}{(1)^3}]$

= 5 × -3 = -15

Sol.133.(b) $16x^4 + \frac{1}{16x^4} = 14159$

$4x^2 + \frac{1}{4x^2} = \sqrt{14159 + 2}$

$= \sqrt{14161} = 119 \Rightarrow 4x^2 + \frac{1}{4x^2} = 119$

and $2x + \frac{1}{2x} = \sqrt{119 + 2} = \sqrt{121} = 11$

Sol.134.(a) a + 2b + 3c = 0

We know that when

$x + y + z = 0$

then $x^3 + y^3 + z^3 = 3xyz$

Hence,

$a^3 + 8b^3 + 27c^3 = 3 \times a \times 2b \times 3c = 18abc$

Sol.135.(a) $x = 110$, $y = 111$, $z = 112$

$x^3 + y^3 + z^3 - 3xyz$

$= \frac{1}{2}(x + y + z)\{(x - y)^2 + (y - z)^2 + (z - x)^2\}$

$= \frac{1}{2}(110 + 111 + 112)\{(110 - 111)^2 + (111 - 112)^2 + (112 - 110)^2\}$

$= \frac{1}{2}(333)\{(-1)^2 + (-1)^2 + (2)^2\}$

$= \frac{1}{2}(333) \times 6 = 999$

Sol.136.(b) $(a - 18)^2 + (b - 12)^2 + (c - 6)^2 = 0$

In such condition,

Put, a - 18 = 0 ⇒ a = 18 ... (i)

b - 12 = 0 ⇒ b = 12 ... (ii)

c - 6 = 0 ⇒ c = 6 ... (iii)

$(a + b + c)^{\frac{1}{2}} = \sqrt{a + b + c}$

$= \sqrt{18 + 12 + 6} = \sqrt{36} = \pm 6$

Sol.137.(a) $x^2 + y^2 = 528$ ..... (i)

$x + y = 28$

On squaring both side

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$x^2 + y^2 + 2xy = 784$
528 + $2xy$ = 784 ..... [from eq . (i)]
$2xy$ = 784 - 528 ⇒ xy = 128
Now, $\sqrt{xy} = 8\sqrt{2}$

Sol.138.(b) $\frac{a}{b} + \frac{b}{a} = 1$
$a^2 + b^2 = ab$ ... (i)
Now, $\frac{a^3 + b^3}{3ab}$
$= \frac{(a+b)(a^2 + b^2 - ab)}{3ab}$
$= \frac{(a+b)(ab - ab)}{3ab}$ ... from(i) = 0

Sol.139.(a)
$x^5 - 12x^4 + 12x^3 - 12x^2 + 12x - 1$
$x^5 - 11x^4 - x^4 + 11x^3 + x^3 - 11x^2 - x^2 + 11x + x - 1$
Now, x = 11 ....(given)
On putting value of 11 as x , we get
$x^5 - x \times x^4 - x^4 + x \times x^3 + x^3 - x \times x^2 - x^2 + x \times x + x - 1$
$x^5 - x^5 - x^4 + x^4 + x^3 - x^3 - x^2 + x^2 + x - 1$
⇒ x - 1 = 11 - 1 = 10

Sol.140.(d) $a^3 + b^3 + c^3 - 3abc = (a + b + c)[(a + b + c)^2 - 3(ab + bc + ca)]$
= (15) $[(15)^2 - 3(35)]$ = (15) [225 - 105]
= 15 × 120 = 1800

Sol.141.(a) p(x) = $(x^3 - 3x^2 + 4x - 75)$
g(x) = (x − 5)
Put g(x) = 0 ⇒ x - 5 = 0 ⇒ x = 5
Put value of x in p(x)
p(x) = $(5^3 - 3 \times 5^2 + 4 \times 5 - 75)$
= (125 − 3 × 25 + 20 − 75)
= (125 − 75 + 20 − 75) = -5
5 must be added to p(x).

Sol.142.(d) $a^3 + b^3 + c^3 - 3abc$
= (a + b + c) $[(a + b + c)^2 - 3(ab + bc + ca)]$
= 13 × $[(13)^2 - 3(22)]$
= 13 × [169 - 66] = 13 × 103 = 1339

Sol.143.(a) $x^2 + 4y^2 + 2x + 1 = 0$
Let, x = -1 and y = 0 then,
LHS = $x^2 + 4y^2 + 2x + 1$
= $(-1)^2 + 4(0)^2 + 2(-1) + 1$
= 0 = RHS (satisfy)
Now, $x^{39} + y^{36} = (-1)^{39} + (0)^{36} = -1$

Sol.144.(a) $x^2 - 6x - 1 = 0$
On Dividing by x, we get
$x - 6 - \frac{1}{x} = 0 \Rightarrow x - \frac{1}{x} = 6$
On squaring both side
$x^2 + \frac{1}{x^2} = 36 + 2 \Rightarrow x^2 + \frac{1}{x^2} = 38$
Now, $x^2 + \frac{1}{x^2} - 8 = 38 - 8 = 30$

Sol.145.(c) Given : 2a + 2b + c = 0
For such type of question we should satisfy the given condition by putting any value of a, b, c.
Here, Put a = 0 , b = 1 and c = -2
2(0) + 2(1) + (-2) = 0
0 + 2 - 2 = 0 ⇒ 0 = 0
Hence, the above values satisfy the given part.
Now put above value in question part
$\frac{4a^2 + 4b^2 + 4c^2}{5c^2 - 8ab}$
$= \frac{4 \times (0)^2 + 4 \times (1)^2 + 4 \times (-2)^2}{5(-2)^2 - 8 \times 0 \times 1}$
$= \frac{0 + 4 + 4 \times 4}{5 \times 4 - 0} = \frac{20}{20} = 1$

Sol.146.(b) $a^3 = (\sqrt{2} - 1)^{\frac{1}{3}}$
On taking cube both side,
$a^3 = \sqrt{2} - 1$ and $\frac{1}{a^3} = \sqrt{2} + 1$
Now,
$(a - \frac{1}{a})^3 = a^3 - \frac{1}{a^3} - 3 \times a \times \frac{1}{a}(a - \frac{1}{a})$
$(a - \frac{1}{a})^3 + 3(a - \frac{1}{a}) = a^3 - \frac{1}{a^3}$
On putting value of a^3 and $\frac{1}{a^3}$
$(a - \frac{1}{a})^3 + 3(a - \frac{1}{a})$
$= \sqrt{2} - 1 - (\sqrt{2} + 1)$
$= \sqrt{2} - 1 - \sqrt{2} - 1 = -2$

Sol.147.(b) Given: x = 4 + y
⇒ x - y = 4
⇒ $x^2 + y^2 - 2xy = 16$ .....(i)
and $x^3 = 184 + y^3 \Rightarrow x^3 - y^3 = 184$
⇒ $(x - y)(x^2 + y^2 + xy) = 184$
⇒ $(4)(x^2 + y^2 + xy) = 184$
⇒ $(x^2 + y^2 + xy) = 46$ .....(ii)
On solving eq . (i) and (ii)
xy = 10
⇒ $(x + y)^2 = (x^2 + y^2 + xy) + xy = 46 + 10$
= 56
So, $x + y = 2\sqrt{14}$

Sol.148.(d) $(x - 3y)^3 + 27(y^3 - xy^2)$
⇒ $x^3 - 27y^3 - 9xy(x - 3y) + 27y^3 - 27xy^2$
⇒ $x^3 - 27y^3 - 9x^2y + 27xy^2 + 27y^3 - 27xy^2$
⇒ $x^3 - 9x^2y$

Sol.149.(d) Let x = y = z = 1
Put the value in the given expression
$\frac{17x^4 + 9y^4 + 16z^4}{8x^2y^2 + 6y^2z^2 + 10z^2x^2}$
$= \frac{17(1)^4 + 9(1)^4 + 16(1)^4}{8(1)^2(1)^2 + 6(1)^2(1)^2 + 10(1)^2(1)^2}$
$= \frac{17 + 9 + 16}{8 + 6 + 10} = \frac{42}{24} = 1.75$

Sol.150.(d) Given, $7x^2 + 5x + 7 = 0$
Dividing both sides by x, we get
$7x + 5 + \frac{7}{x} = 0 \Rightarrow x + \frac{1}{x} = \frac{-5}{7}$
Taking cube both sides
$(x + \frac{1}{x})^3 = (\frac{-5}{7})^3$
$\Rightarrow x^3 + \frac{1}{x^3} + 3.x.\frac{1}{x}(x + \frac{1}{x}) = \frac{-125}{343}$
$\Rightarrow x^3 + \frac{1}{x^3} + 3(\frac{-5}{7}) = \frac{-125}{343}$
$\Rightarrow x^3 + \frac{1}{x^3} = \frac{-125}{343} + \frac{15}{7}$
$\Rightarrow x^3 + \frac{1}{x^3} = \frac{610}{343}$

Sol.151.(d) We know
$(a + b)^2 = a^2 + b^2 + 2ab$
Hence,
$49a^2 + 70ab + 25b^2 = (7a + 5b)^2$

Sol.152.(c) $(x + y)^2 = x^2 + y^2 + 2xy$
Subtracting both side by 3xy, we get ;
$(x + y)^2 - 3xy = x^2 + y^2 - xy$
$10^2 - 3 \times 12 = x^2 + y^2 - xy$
$100 - 36 = x^2 + y^2 - xy \Rightarrow x^2 + y^2 - xy = 64$

Sol.153.(c) $(x - \frac{1}{x-1}) = 3$
Subtracting both side by 1, we have ;
$(x - 1 - \frac{1}{x-1}) = 2$
Let , $(x - 1) = k \Rightarrow k - \frac{1}{k} = 2$
$k^2 + \frac{1}{k^2} = 2^2 + 2 = 6$
So, $(x - 1)^2 + \frac{1}{(x-1)^2} = 6$

Sol.154.(d) Formula used :
$a^2 + b^2 + c^2 - ab - bc - ca$
$= \frac{1}{2}[(a - b)^2 + (b - c)^2 + (c - a)^2]$
Then, $p^2 + q^2 + r^2 - pq - qr - rp$
$= \frac{1}{2}[(106 - 105)^2 + (105 - 104)^2 + (104 - 106)^2]$
$= \frac{1}{2}[1^2 + 1^2 + (-2)^2] \Rightarrow \frac{1}{2} \times 6 = 3$

Sol.155.(c) $\sqrt{1 + \frac{x^3}{9}} = 5$
$1 + \frac{x^3}{9} = 25 \Rightarrow \frac{x^3}{9} = 24$
$\Rightarrow x^3 = 24 \times 9 = 216 \Rightarrow x = 6$

Sol.156.(b) $x + \frac{1}{x} = 15$
On squaring both side, we get;
$x^2 + \frac{1}{x^2} + 2 = 225$
$\Rightarrow x^2 + \frac{1}{x^2} = 225 - 2 = 223$

Sol.157.(c) $(a - 2b) = 8, 2ab = 9$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\because (a - 2b)^2 = (a + 2b)^2 - 8ab$

$(a + 2b)^2 = 8^2 + 8 \times \frac{9}{2}$

$(a + 2b)^2 = 64 + 36 = 100$

$(a + 2b) = 10$

Sol.158.(d) According to question,
A + 10 = (B-10) × 2
A - 2B = -30.....(i)
A - 10 = B + 10
A - B = 20.....(ii)
From equation (ii)×2 - (i), we get, A = 70

Sol.159.(a) Given,
x + y = 2 and $\frac{x}{y} + \frac{y}{x} = 1$

$\Rightarrow x^2 + y^2 = xy$

Formula :

$x^3 + y^3 = (x + y)(x^2 + y^2 - xy)$

$\Rightarrow x^3 + y^3 = 2 \times 0 = 0$

Sol.160.(a) According to the question,

$\frac{A}{L} = 1 - \frac{M}{B} = \frac{B-M}{B}$

$\frac{L}{A} = \frac{B}{B-M}$ and $\frac{N}{C} = 1 - \frac{B}{M} = \frac{M-B}{M}$

$= \frac{C}{N} = \frac{M}{M-B}$

$= \frac{L}{A} + \frac{C}{N} = \frac{B}{B-M} - \frac{M}{B-M} = \frac{B-M}{B-M}$

= 1

Sol.161.(c) Given, a α b α $\frac{1}{c}$ α $\frac{1}{d}$

So, a α $\frac{1}{d}$

Sol.162.(d) A + $\frac{1}{1+\frac{1}{2+\frac{1}{3}}} = \frac{9}{10}$

$\Rightarrow$ A + $\frac{1}{1+\frac{1}{\frac{7}{3}}} = \frac{9}{10}$

$\Rightarrow$ A + $\frac{1}{1+\frac{3}{7}} = \frac{9}{10} \Rightarrow$ A + $\frac{7}{10} = \frac{9}{10}$

$\Rightarrow$ A = $\frac{2}{10}$ or $\frac{1}{5}$

Sol.163.(d) x (5 - $\frac{2}{x}$) = $\frac{5}{x}$

$\Rightarrow x(\frac{5x-2}{x}) = \frac{5}{x} \Rightarrow 5x^2 - 5 = 2x$

Dividing both sides by 5x

$\Rightarrow x - \frac{1}{x} = \frac{2}{5}$

then $x^2 + \frac{1}{x^2} = \frac{4}{25} + 2 = \frac{54}{25}$

Sol.164.(d) Formula used :-

$a^3 - b^3$ = (a - b)($a^2 + b^2 + ab$)

$\frac{(157 \times 157) + (157 \times 133) + (133 \times 133)}{(157 \times 157 \times 157) - (133 \times 133 \times 133)}$

Let 157 = a and 133 = b then,

$\frac{a^2 + ab + b^2}{(a-b)(a^2 + b^2 + ab)} = \frac{1}{(a-b)}$

$= \frac{1}{157 - 133} = \frac{1}{24}$

Sol.165.(a) Formula used : - $a^3 - b^3$

= $(a - b)(a^2 + b^2 + ab)$

Let the a = 3.254 and b = 0.746

$\frac{(a-b)(a^2 + b^2 + ab)}{(a^2 + b^2 + ab)} = (a - b)$

= 3.254 - 0.746 = 2.508

Sol.166.(c) $\frac{a^2 - (b-c)^2}{(a+c)^2 - b^2} + \frac{b^2 - (a-c)^2}{(a+b)^2 - c^2}$

$+ \frac{c^2 - (a-b)^2}{(b+c)^2 - a^2}$

$= \frac{\{(a + (b-c))(a - (b-c))\}}{\{(a + c - b)(a + c + b))\}} +$

$\frac{\{(b + (a-c))(b - (a-c))\}}{\{(a + b - c)(a + b + c))\}} +$

$\frac{\{(c + (a-b))(c - (a-b))\}}{\{(b + c - a)(b + c + a))\}}$

$= \frac{\{(a + (b-c))\}}{\{(a + c + b)\}} + \frac{\{(b - (a-c))\}}{\{(a + b + c)\}} +$

$\frac{\{(c + (a-b)\}}{\{(b + c + a)\}}$

$= \frac{\{(a + (b-c) + (b - (a-c) + (c + (a-b)\}}{\{(a + c + b)\}}$

$= \frac{(a + c + b)}{(a + c + b)} = 1$

Sol.167.(c)

$\Rightarrow (1 + x)^3 + (1 - x)^3 + (-2)^3$

$\Rightarrow (1^3 + x^3 + 3x(1 + x) + (1^3 - x^3 - 3x(1 - x) + (-2)^3$

$\Rightarrow 6x^2 + 2\ 6x^2 - 6 = -6(1 - x^2)$

Sol.168.(a) Formula :

$(a + b)^2 - (a - b)^2 = 4ab$

$(1 - 2x)^2 - (1 + 2x)^2$

= - 4 × 1 × 2x = - 8x

Sol.169.(a) $a + b + c = 5$ .....(1)
and $ab + bc + ca = 7$ .....(2)
Squaring both side in equation (1)

$(a + b + c)^2 =$

$a^2 + b^2 + c^2 + 2(ab + bc + ca)]$

$\Rightarrow a^2 + b^2 + c^2 = 25 - 14 = 11$

Then, $a^3 + b^3 + c^3 - 3abc =$

$(a + b + c)[a^2 + b^2 + c^2 - (ab + bc + ca)]$

$\Rightarrow a^3 + b^3 + c^3 - 3abc = 5(11 - 7) = 20$

Sol.170.(d) $\Rightarrow (x - 2y)(y - 3x) + (x + y)(x - y) + (x - 3y)(2x + y)$

$\Rightarrow xy - 3x^2 - 2y^2 + 6xy + x^2 - y^2 + 2x^2 + xy - 6xy - 3y^2$

$\Rightarrow 2xy - 6y^2 = 2y(x - 3y)$

Sol.171.(b) Put x = 2 in equation

$2x^2 + 12kx - 25k = 0$

$2 \times (2)^2 + 12k \times 2 - 25k = 0 \Rightarrow$ k = 8

Sol.172.(d) $2x + \frac{2}{x} = 5 \Rightarrow x + \frac{1}{x} = \frac{5}{2}$

$x^3 + \frac{1}{x^3} = (\frac{5}{2})^3 - 3 \times (\frac{5}{2}) = \frac{65}{8}$

$x^3 + \frac{1}{x^3} + 2 = \frac{65}{8} + 2 = \frac{81}{8}$

Sol.173.(d)

$(a^3 - b^3) = (a - b)\{(a - b)^2 + 3ab\}$

4401 = $9\{81 + 3ab\}$

4401 = $9\{81 + 3ab\}$

$489 - 81 = 3ab \Rightarrow ab = \frac{408}{3} = 136$

Sol.174.(c) According to question,

$a + \frac{1}{a} = 6 \Rightarrow a^2 + \frac{1}{a^2} = (6)^2 - 2 = 34$

Now , $\frac{3}{4}(a^2 + \frac{1}{a^2}) = \frac{3}{4} \times 34 = \frac{51}{2} = 25.5$

Sol.175.(b) $a = \frac{1}{a - \sqrt{6}} \Rightarrow a - \frac{1}{a} = \sqrt{6}$

$a + \frac{1}{a} = \sqrt{(\sqrt{6})^2 + 4} = \sqrt{10}$

Sol.176.(c)

$(a + b) = 30 \Rightarrow a^2 + b^2 = 900 - 2ab$

$\sqrt{\frac{a}{b}} = \frac{8}{3} + \sqrt{\frac{b}{a}}$

$\frac{a-b}{\sqrt{ab}} = \frac{8}{3} \Rightarrow \frac{a^2 + b^2 - 2ab}{ab} = \frac{64}{9}$

$\frac{900 - 4ab}{ab} = \frac{64}{9} \Rightarrow ab = \frac{8100}{100} = 81$

Sol.177.(c) $2x + 3y = 9$ and $xy = 3$
Then ,

$8x^3 + 27y^3 = (2x + 3y)$

$\{(2x + 3y)^2 - 3(2x \times 3y)\}$

= (9) $\{(9)^2 - 18xy\}$ = (9) $\{81 - 18 \times 3\}$

= 243

Sol.178.(b) $a^2 + \frac{1}{a^2} = \frac{7}{3}$

$a - \frac{1}{a} = \sqrt{(\frac{7}{3} - 2)} = \frac{1}{\sqrt{3}}$

Now , $a^3 - \frac{1}{a^3} = (\frac{1}{\sqrt{3}})^3 + 3 \times \frac{1}{\sqrt{3}}$

$= \frac{1}{3\sqrt{3}} + \sqrt{3} = \frac{10}{3\sqrt{3}}$

Sol.179.(d) $a + b = 10$ and $a^2 + b^2 = 58$

$(a + b)^2 = a^2 + b^2 + 2ab$

100 = 58 + $2ab \Rightarrow ab = 21$

Sol.180.(c) $a^3 + b^3 + c^3 - 3abc$

= $(a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$

Sol.181.(c)

$2a + 3b = 14$ and $2a - 3b = 10$

On adding , we get

$4a = 24 \Rightarrow a = 6$ and $b = \frac{2}{3}$

Now , $ab = 4$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.182.(a) $(a - b) = 10$

$\Rightarrow a^2 + b^2 = 100 + 2ab$

$\sqrt{\frac{a}{b}} = \frac{8}{3} - \sqrt{\frac{b}{a}}$

$\frac{a+b}{\sqrt{ab}} = \frac{8}{3} \Rightarrow \frac{a^2 + b^2 + 2ab}{ab} = \frac{64}{9}$

$\frac{100 + 4ab}{ab} = \frac{64}{9}$

$ab = \frac{900}{28} = \frac{225}{7} = 32\frac{1}{7}$

Sol.183.(b)

Identity :- $(a + b)^2 = a^2 + b^2 + 2ab$

Sol.184.(c)

$\frac{x^2 + 7x + 2}{x^2 + 13x + 2} = \frac{x + \frac{2}{x} + 7}{x + \frac{2}{x} + 13}$

$= \frac{1 + 7}{1 + 13} = \frac{4}{7}$

Sol.185.(d) $x + \frac{1}{x} = 7$

$x - \frac{1}{x} = \sqrt{(7)^2 - 4} = 3\sqrt{5}$

Now , $x^3 - \frac{1}{x^3} = (3\sqrt{5})^3 + 3 \times (3\sqrt{5})$

$= 144\sqrt{5}$

Sol.186.(b) $y - \frac{1}{y} = 9$

$y^3 - \frac{1}{y^3} = (9)^3 + 3 \times 9 = 756$

Sol.187.(c) $(2x + 3y)^2 = 4x^2 + 9y^2 + 12xy$

$16 = 64 + 12xy \Rightarrow xy = (-4)$

Now , $(2x + 3y)^3 = 8x^3 + 27y^3 + 3 \times 2x \times 3y(2x + 3y)$

$64 = 8x^3 + 27y^3 - 72\,(4)$

$8x^3 + 27y^3 = 288 + 64 = 352$

Sol.188.(d) $(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

$a^2 + b^2 + c^2 = 225 - 2 \times 22 = 181$

Sol.189.(b)

$[\{(x - 5)(x - 1)\} - \{(9x - 5)(9x - 1)\}] \div 16x$

$\Rightarrow [\{x^2 - 6x + 5\} - \{81x^2 - 54x + 5\} \div 16x$

$\Rightarrow [\{-80x^2 + 48x\}] \div 16x$

$\Rightarrow [16x\{-5x + 3\}] \div 16x \Rightarrow -\{5x - 3\}$

Sol.190.(a) $x + \frac{1}{x} = 2 \Rightarrow x = 1$

$x^{1823} + \frac{1}{x^{1929}} = 1 + 1 = 2$

Sol.191.(d) $2x^2 - 32 = 2(x^2 - 16)$

$= 2(x - 4)(x + 4)$

Sol.192.(d) $x - \frac{1}{x} = 0.4$

$x^2 + \frac{1}{x^2} = (0.4)^2 + 2 = 2.16$

Sol.193.(d) $x + \frac{1}{x} = 5 \Rightarrow x^2 + \frac{1}{x^2} = 23$

$\Rightarrow x^3 + \frac{1}{x^3} = 110$

Now ,

$x^5 + \frac{1}{x^5} = (x^2 + \frac{1}{x^2})(x^3 + \frac{1}{x^3}) - (x + \frac{1}{x})$

$\Rightarrow 23 \times 110 - 5 = 2530 - 5 = 2525$

Sol.194.(c)

$(x + y + z)^2 = x^2 + y^2 + z^2 + 2(xy + yz + zx)$

$(x + y + z) = \sqrt{628 + 2 \times 24} = \sqrt{676} = 26$

Sol.195.(b)

$x + \frac{1}{x} = -1 \Rightarrow x^3 = 1$ or $x^{15} = 1$

Now ,

$x^{15} + \frac{1}{x^{15}} = 1 + 1 = 2$

Sol.196.(d) $\frac{x^3 + y^3 + z^3 - 3xyz}{(x - y)^2 + (y - z)^2 + (z - x)^2}$

$\frac{\frac{(x + y + z)}{2} \{(x - y)^2 + (y - z)^2 + (z - x)^2\}}{(x - y)^2 + (y - z)^2 + (z - x)^2}$

$= \frac{(x + y + z)}{2}$

Sol.197.(c) $(x - 2) - \frac{1}{(x - 2)} = 5$

$(x - 2)^3 - \frac{1}{(x - 2)^3} = 5^3 + 3 \times 5 = 140$

Sol.198.(a) $(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

$256 = a^2 + b^2 + c^2 + 2 \times 81$

$a^2 + b^2 + c^2 = 94$

Sol.199.(c)

$(a + b + c)^2 - (a - b + c)^2 + 4ac$

$\Rightarrow 2ab + 2bc + 2ac + 2ab + 2bc - 2ac + 4ac$

$\Rightarrow 4(ab + bc + ca)$

Sol.200.(b) $x + \frac{1}{x} = 5\sqrt{5}$

$\Rightarrow x - \frac{1}{x} = \sqrt{(5\sqrt{5})^2 - 4} = 11$

$\Rightarrow x^3 - \frac{1}{x^3} = (11)^3 + 3 \times 11 = 1364$

Sol.201.(c) $x^4 + \frac{1}{x^4} = 194$

$x^2 + \frac{1}{x^2} = \sqrt{194 + 2} = 14$

$x + \frac{1}{x} = \sqrt{14 + 2} = 4$

$x^3 + \frac{1}{x^3} = 4^3 - 3 \times 4 = 52$

Now , $x^3 + \frac{1}{x^3} + x + \frac{1}{x} = 52 + 4 = 56$

Sol.202.(a)

$a^3 + b^3 + c^3 - 3abc = \frac{a + b + c}{2}$

$\{3(a^2 + b^2 + c^2) - (a + b + c)^2\}$

$= \frac{5}{2}\{3(15) - (5)^2\} = \frac{5}{2}\{(20)\} = 50$

Now , $a^3 + b^3 + c^3 - 3abc - 27 = 50 - 27 = 23$

Sol.203.(c) $x + y = \sqrt{427 + 404} = \sqrt{831}$

$x - y = \sqrt{427 - 404} = \sqrt{23}$

Now , $\frac{x + y}{x - y} = \sqrt{\frac{831}{23}}$

Sol.204.(a) $4x^2 - y^2 + 6y - 9$

$= 4x^2 - (y^2 - 6y + 9) \Rightarrow (2x)^2 - (y - 3)^2$

$= (2x + y - 3)(2x - y + 3)$

Sol.205.(b)

If $x - \frac{1}{x} = k$ then , $x^3 - \frac{1}{x^3} = k^3 + 3k$

$x^3 = \sqrt{6} - 1 \Rightarrow \frac{1}{x^3} = \frac{1}{\sqrt{6} - 1}$

$x^3 - \frac{1}{x^3} = (\sqrt{6} - 1) - \frac{1}{\sqrt{6} - 1}$

$= \frac{7 - 2\sqrt{6} - 1}{\sqrt{6} - 1} = \frac{6 - 2\sqrt{6}}{\sqrt{6} - 1} \times \frac{\sqrt{6} + 1}{\sqrt{6} + 1}$

$= \frac{6\sqrt{6} + 6 - 12 - 2\sqrt{6}}{5} = \frac{4\sqrt{6} - 6}{5}$

Sol.206.(b) $ab + bc + ca$

$= \frac{(a + b + c)^2 - (a^2 + b^2 + c^2)}{2}$

$= \frac{(17)^2 - (101)}{2} = 94$

Now ,

$(a - b)^2 + (b - c)^2 + (c - a)^2 =$

$2(a^2 + b^2 + c^2) - 2(ab + bc + ca)$

$= 2 \times 101 - 2 \times 94 = 14$

Sol.207.(a) $x + \frac{1}{x} = 5$

$x^2 + \frac{1}{x^2} = 5^2 - 2 = 23$

$x^4 + \frac{1}{x^4} = 23^2 - 2 = 527$

Now , $x^4 + \frac{1}{x^4} - 36 = 527 - 36 = 491$

Sol.208.(c) $a^2 + b^2 + c^2 = ab + bc + ca$

only possible when $a = b = c$

So , $\frac{11a^4 + 13b^4 + 15c^4}{16a^2b^2 + 19b^2c^2 + 17c^2a^2} = \frac{39a^4}{52a^4}$

$= \frac{3}{4}$

Sol.209.(a) $(c + d)^2 - (c - d)^2 = 4cd$

Sol.210.(b)

$\frac{x^2 - 3x + 2}{x^2 - 4} = \frac{x^2 + 1 - 2x - x + 1}{(x - 2)(x + 2)}$

$= \frac{(x - 1)^2 - (x - 1)}{(x - 2)(x + 2)} = \frac{(x - 1)(x - 2)}{(x - 2)(x + 2)}$

$= \frac{(x - 1)}{(x + 2)}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.211.(a) If $(l + m + n) = 0$ then ,
$l^3 + m^3 + n^3 = 3lmn$
$(\frac{l^2}{mn} + \frac{m^2}{nl} + \frac{n^2}{lm})^2$
$= (\frac{l^3 + m^3 + n^3}{lmn})^2 = (\frac{3lmn}{lmn})^2 = 9$

Sol.212.(a) $2x + 5y = 15$, $xy = 6$
$(2x + 5y)^2 = 4x^2 + 25y^2 + 20xy$
$4x^2 + 25y^2 = 225 - 120 = 105$

Sol.213.(c) $x + \frac{1}{x} = \sqrt{9.76}$
$x - \frac{1}{x} = \sqrt{(\sqrt{9.76})^2 - 4}$
$= \sqrt{9.76 - 4} = 2.4$
$x^3 - \frac{1}{x^3} = (2.4)^3 + 3 \times 2.4$
$= 13.824 + 7.2 = 21.024$

Sol.214.(c) $5a + \frac{4}{a} = 15$
$25a^2 + \frac{16}{a^2} = (15)^2 - 2 \times 5 \times 4$
$= 225 - 40 = 185$

Sol.215.(b)
$(x^3 - y^3) = (x - y)(x^2 + y^2 + xy)$
Here ,
$\frac{(x^3 - y^3)(x + y)}{x^2 + y^2 + xy} = (x - y)(x + y)$
$= x^2 - y^2$

Sol.216.(d) $(a + b)^2 + (b + c)^2 + (c + a)^2 = a^2 + b^2 + c^2 + (a + b + c)^2$
$= 115 + (17)^2 = 115 + 289 = 404$

Sol.217.(d) $(2a - 3b - c)^2 - (a + 2b + c)^2$
$= 4a^2 + 9b^2 + c^2 - 12ab + 6bc - 4ac - a^2 - 4b^2 - c^2 - 4ab - 4bc - 2ac$
$= 3a^2 + 5b^2 - 16ab + 2bc - 6ac$

Sol.218.(b) $x + \frac{1}{x} = 3.2$
$x - \frac{1}{x} = \sqrt{(3.2)^2 - 4} = \sqrt{6.24}$
Now , $x^2 - \frac{1}{x^2} = 3.2 \times \sqrt{6.24} = 12.8$
$\sqrt{0.39}$

Sol.219.(c) $x^2 + y^2 + z^2 = 2(x + z - 1)$
$x^2 - 2x + 1 + z^2 - 2z + 1 + y^2 = 0$
$(x - 1)^2 + (z - 1)^2 + (y)^2 = 0$
$\Rightarrow x = 1$, $z = 1$ and y = 0
Now , $x^3 + y^3 + z^3 = 1 + 0 + 1 = 2$

Sol.220.(c) Formula:-
$(a + b)^3 = a^3 + b^3 + 3ab(a + b)$
$(x + 3y)^3 = x^3 + 27y^3 + 9xy(x + 3y)$
$216 = x^3 + 27y^3 + 54xy$

Sol.221.(c) Given , p + q = 12 , pq = 14
Then, $p^2 - pq + q^2 = (p + q)^2 - 3pq$
$= 144 - 3 \times 14 = 102$

Sol.222.(d) $\frac{(x+3)^3 + (x-3)^3}{x^2 + 27}$
$= \frac{(x^3 + 3^3 + 9x(x+3) + (x^3 - 3^3 - 9x(x-3)}{x^2 + 27}$
$= \frac{2x^3 + 27x + 27x}{x^2 + 27} \Rightarrow \frac{2x(x^2 + 27)}{x^2 + 27} = 2x$

Sol.223.(a)
$\frac{1}{8}[\frac{1}{b-1} - \frac{1}{b+1} - \frac{2}{b^2+1} - \frac{4}{b^4+1}]$
$= \frac{1}{8}[\frac{b+1-b+1}{b^2-1} - \frac{2}{b^2+1} - \frac{4}{b^4+1}]$
$= \frac{1}{8}[\frac{2}{b^2-1} - \frac{2}{b^2+1} - \frac{4}{b^4+1}]$
$= \frac{1}{8}[\frac{2(b^2+1-b^2+1)}{b^4-1} - \frac{4}{b^4+1}]$
$= \frac{1}{8}[\frac{2(2)}{b^4-1} - \frac{4}{b^4+1}]$
$= \frac{1}{8}[\frac{4(b^4+1-b^4+1)}{b^8-1}] = \frac{1}{8}[\frac{8}{b^8-1}]$
$= \frac{1}{b^8-1}$

Sol.224.(c)
(d + e + f) = 14 , squaring both side
$\{d^2 + e^2 + f^2 + 2(de + ef + fd)\} = 196$
2(de + ef + fd) = 196 - 96 = 100
de + ef + fd = 50

Sol.225.(a)
Given:- $g = (2 - \sqrt{3})$, $\frac{1}{g} = (2 + \sqrt{3})$
Then, $g - \frac{1}{g} = -2\sqrt{3}$
Therefore , $(g^3 - \frac{1}{g^3})$
$= (-2\sqrt{3})^3 - 3 \times 2\sqrt{3} = -24\sqrt{3} - 6\sqrt{3}$
$= -30\sqrt{3}$

Sol.226.(c)
Given:- $(2x + 13 - y)(2x - 13 - y)$
$\{(2x - y) + 13\}\{(2x - y) - 13\}$
$(2x - y)^2 - (13)^2$
$4x^2 + y^2 - 4xy - 169$

Sol.227.(d) $(3x - 2y)(3x + 2y)(9x^2 + 4y^2)$
$= (9x^2 - 4y^2)(9x^2 + 4y^2) \Rightarrow (81x^4 - 16y^4)$

Sol.228.(b)
Formula : $\{(a + b)(a - b) = a^2 - b^2\}$
$\{(5p + 3q)(5p - 3q) = 25p^2 - 9q^2\}$

Sol.229.(d) Given, $p^2 - 4p - 1 = 0$ --------(1)
Dividing both side by p , $p - \frac{1}{p} = 4$
Squaring both sides of equation (1)
$p^2 + \frac{1}{p^2} = (4)^2 + 2 = 18$
So, $p^2 + 3p + \frac{1}{p^2} - \frac{3}{p} = p^2 + \frac{1}{p^2} + 3$
$(p - \frac{1}{p}) = 18 + 3(4) = 30$

Sol.230.(d) Given $3x - 2y = 3$ and $xy = 9$
So, $3x + 2y = \sqrt{(3x - 2y)^2 + 4ab}$
$= \sqrt{9 + 4 \times 9 \times 3 \times 2} = \sqrt{225} = 15$
{where $a = 3x$ and $b = 2y$ }

Sol.231.(d) px + qy = 1
Put $p = 1$, $q = 0$
Then, $x = 1$
and qx + py = $\frac{2pq}{p^2 + q^2}$ ----------(1)
Put $x = 1$ in the equation (1)
$y = \frac{2 \times 1 \times 0}{1^2 + 0^2} = 0$
So, $(x^2 + y^2)(p^2 + q^2) = (1 + 0)(1 + 0) = 1$

Sol.232.(c) $7b - \frac{1}{4b} = 7$
Multiply by $\frac{4}{7}$, we get
$4b - \frac{1}{7b} = 4$
$16b^2 + \frac{1}{49b^2} = (4)^2 + 2 \times 4 \times \frac{1}{7}$
$= 16 + \frac{8}{7} = \frac{120}{7}$

Sol.233.(d) $3x^3 + 5x^2y + 12xy^2 + 7y^3$
$= 3(-64) + 5(16)(-1) + 12(-4)(1) + 7(-1)$
$= -192 - 80 - 48 - 7 = -327$

Sol.234.(b)
$(a + b + c)^2 = \{a^2 + b^2 + c^2 + 2(ab + bc + ca)\}$
$256 = \{90 + 2(ab + bc + ca)\}$
$(ab + bc + ca) = \frac{256 - 90}{2} = 83$

Sol.235.(c) Formula : $a^3 + b^3 + c^3$ - 3abc
= (a + b + c) $(a^2 + b^2 + c^2$ - ab - bc - ca)
And we know, If (a + b + c) = 0
Then,
$a^3 + b^3 + c^3$ = 3abc

Sol.236.(b)
If , $a + \frac{1}{a}$ = k , then $a^2 + \frac{1}{a^2} = k^2 - 2$
and $a^3 + \frac{1}{a^3} = k^3 - 3k$
Here $x + \frac{1}{x} = 7$,
$x^3 + \frac{1}{x^3} = 7^3 - 3 \times 7 = 322$
$x^6 + \frac{1}{x^6} = 322^2 - 2 = 103684 - 2 = 103682$

Sol.237.(d) $(a^3 - b^3 - 3a^2b + 3ab^2)$
$= (a - b)^3 = (17 - 13)^3 = 64$

Sol.238.(c) $\frac{x^4 - 2x^2 + 1}{x^2 - 2x + 1} = \frac{(x^2 - 1^2)(x^2 - 1^2)}{(x - 1)(x - 1)}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{(x+1)(x-1)(x+1)(x-1)}{(x-1)(x-1)}$

$= (x+1)(x+1) = x^2 + 2x + 1$

Sol.239.(b) $x - \frac{1}{x} = \sqrt{6} \Rightarrow (x - \frac{1}{x})^2 = 6$

$\Rightarrow x^2 + \frac{1}{x^2} = (\sqrt{6})^2 + 2 = 8$

Similarly , $x^4 + \frac{1}{x^4} = 62$ and

$x + \frac{1}{x} = \sqrt{(\sqrt{6})^2 + 4} = \sqrt{10}$

now

$x^8 - \frac{1}{x^8} = [(x^4) + \frac{1}{(x^4)}]\,[(x^2 + \frac{1}{x^2})$

$[(x^2 - \frac{1}{x^2})]$

$= 62 \times 8 \times (x + \frac{1}{x})(x - \frac{1}{x})$

$= 496 \times \sqrt{10} \times \sqrt{6}$

$= 496 \times \sqrt{60} = 496 \times 2\sqrt{15} = 992\sqrt{15}$

So, $x^8 - \frac{1}{x^8} = 992\sqrt{15}$

Sol.240.(b)

$(a + b + c)^2 - a^2 - b^2 - c^2$

$= a^2 + b^2 + c^2 + 2(ab + bc + ac) - a^2 - b^2 - c^2 = 2(ab + bc + ac)$

Sol.241.(c) According to the question,

$\frac{X-5Y}{X+5Y} = \frac{7}{13}$

13X − 65Y = 7X + 35Y

6X = 100Y $\Rightarrow \frac{X}{Y} = \frac{100}{6} = \frac{50}{3}$

Sol.242.(b) Let , the numbers be a and b.
According to question,

$(a - b)^3 = 1728 \Rightarrow (a - b) = 12$

a = 12 + b ---- (1)

ab = 108 ----- (2)

From the above equations,we get

a = 18 and b = 6

Therefore, $18^3 - 6^3 = 5616$

Sol.243.(a)

$(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

$(19)^2 = 155 + 2(ab + bc + ca)$

$361 = 155 + 2(ab + bc + ca)$

$2(ab + bc + ca) = 361 - 155 = 206$

$(ab + bc + ca) = \frac{206}{2} = 103$

Now ,

$(a - b)^2 + (b - c)^2 + (c - a)^2$

$= a^2 + b^2 - 2ab + b^2 + c^2 - 2bc + c^2 + a^2 - 2ca$

$= 2(a^2 + b^2 + c^2) - 2(ab + bc + ca)$

$= 2(155) - 2(103) = 310 - 206 = 104$

Sol.244.(a)

$a^2 + b^2 + c^2 = ab + bc + ac$ .....(Given)

only possible when , $a = b = c$

So, $\frac{11a^4 + 13b^4 + 17c^4}{17a^2b^2 + 9b^2c^2 + 15c^2a^2}$

$= \frac{11a^4 + 13a^4 + 17a^4}{17a^2a^2 + 9a^2a^2 + 15a^2a^2} = \frac{41a^4}{41a^4} = 1$

Sol.245.(b) $(x - y)^2 = 324 \Rightarrow x - y = 18$

$(x + y)^2 = (x - y)^2 + 4xy$

$(x + y)^2 = 324 + 4 \times 144 = 900$

$x + y = 30$

Now ,

$x^2 - y^2 = (x - y)(x + y) = 18 \times 30 = 540$

Sol.246.(c) Given,

p = $\frac{\sqrt{2}+1}{\sqrt{2}-1}$ and q = $\frac{\sqrt{2}-1}{\sqrt{2}+1}$

p × q = $\frac{\sqrt{2}+1}{\sqrt{2}-1} \times \frac{\sqrt{2}-1}{\sqrt{2}+1} = 1$ and p + q

$= \frac{\sqrt{2}+1}{\sqrt{2}-1} + \frac{\sqrt{2}-1}{\sqrt{2}+1} = 6$

According to question,

$\frac{p^2}{q} + \frac{q^2}{p} = \frac{p^3 + q^3}{pq} = \frac{(p+q)^3 - 3pq(p+q)}{pq}$

$= \frac{(6)^3 - 3(1)(6)}{1} = 198$

Sol.247.(a) $x + \frac{1}{x} = 2\sqrt{2}$

$x - \frac{1}{x} = \sqrt{(2\sqrt{2})^2 - 4} = 2$

$x^3 - \frac{1}{x^3} = (x - \frac{1}{x})^3 + 3(x - \frac{1}{x})$

$= (2)^3 + 3 \times 2 = 14$

$x^3 + \frac{1}{x^3} = (x + \frac{1}{x})^3 - 3(x + \frac{1}{x})$

$= (2\sqrt{2})^3 - 3 \times 2\sqrt{2} = 16\sqrt{2} - 6\sqrt{2} = 10\sqrt{2}$

Now ,

$x^6 - \frac{1}{x^6} = (x^3 - \frac{1}{x^3})(x^3 + \frac{1}{x^3})$

$x^6 - \frac{1}{x^6} = 14 \times 10\sqrt{2} = 140\sqrt{2}$

Sol.248.(a)

$a^3 + b^3 + c^3 - 3abc = \frac{(a+b+c)}{2}$

$\{3(a^2 + b^2 + c^2) - (a + b + c)^2\}$

$= 6\{3 \times 50 - 144\} = 36$

Sol.249.(d) $(3y - \frac{3}{y}) = 5$

Then, $y - \frac{1}{y} = \frac{5}{3}$

Now, $y^2 + \frac{1}{y^2} = (\frac{5}{3})^2 + 2 = \frac{43}{9}$

Sol.250.(b) $x^2 - 7x + 1 = 0$

$x + \frac{1}{x} = 7$

$x - \frac{1}{x} = \sqrt{(7)^2 - 4} = \pm\sqrt{45} = \pm 3\sqrt{5}$

Now ,

$x^2 - \frac{1}{x^2} = (x + \frac{1}{x})(x - \frac{1}{x})$

$= 7 \times \pm 3\sqrt{5} = \pm 21\sqrt{5}$

Since , $0 < x < 1$

So , $x^2 - \frac{1}{x^2} = -21\sqrt{5}$

Sol.251.(b) $x + \frac{1}{x} = 2 \Rightarrow x = 1$

Then, $x^7 + \frac{1}{x^{117}} = 1 + 1 = 2$

Sol.252.(a)

$a^3 + b^3 + c^3 - 3abc = \frac{(a+b+c)}{2}$

$\{3(a^2 + b^2 + c^2) - (a + b + c)^2\}$

$= 10 \times \{3 \times 152 - 20^2\}$

$= 10 \times (456 - 400) = 560$

Sol.253.(b)

$\frac{l^2 - m^2}{(l+m)^2} = \frac{(l+m)(l-m)}{(l+m)^2} = \frac{(l-m)}{(l+m)}$

Sol.254.(a) $x^4 + \frac{1}{x^4} = 142$

$x^2 + \frac{1}{x^2} = \sqrt{142 + 2} = 12$

$x + \frac{1}{x} = \sqrt{14}$

$x^3 + \frac{1}{x^3} = (\sqrt{14})^3 - (3 \times \sqrt{14}) = 11\sqrt{14}$

$x^7 + \frac{1}{x^7} = (x^3 + \frac{1}{x^3})(x^4 + \frac{1}{x^4}) - (x + \frac{1}{x})$

$= 11\sqrt{14} \times 142 - \sqrt{14} = 1561\sqrt{14}$

Sol.255.(c)

$a^3 + b^3 + c^3 - 3abc = (a + b + c)$

$\{(a + b + c)^2 - 3(ab + bc + ca)\}$

$\Rightarrow a^3 + b^3 + c^3 - 3(-1)$

$= 7 \times \{49 - 3 \times 11\}$

$\Rightarrow a^3 + b^3 + c^3 + 3 = 7 \times \{16\}$

$\Rightarrow a^3 + b^3 + c^3 = 109$

Sol.256.(a) $(x - \frac{1}{x}) = 6$

$(x + \frac{1}{x}) = \sqrt{6^2 + 4} = \sqrt{40} = 2\sqrt{10}$

Now, $x^2 - \frac{1}{x^2} = (x + \frac{1}{x})(x - \frac{1}{x})$

$\Rightarrow x^2 - \frac{1}{x^2} = 2\sqrt{10} \times 6 = 12\sqrt{10}$

Sol.257.(c) $(x + \frac{1}{x}) = 3\sqrt{2}$

$\Rightarrow (x - \frac{1}{x}) = \sqrt{(3\sqrt{2})^2 - 4} = \sqrt{14}$

$\Rightarrow (x^2 - \frac{1}{x^2}) = 3\sqrt{2} \times \sqrt{14} = 6\sqrt{7}$

Again, $(x^2 + \frac{1}{x^2}) = (3\sqrt{2})^2 - 2 = 16$

$(x^4 + \frac{1}{x^4}) = (16)^2 - 2 = 254$

$\Rightarrow (x^4 - \frac{1}{x^4}) = 16 \times 6\sqrt{7} = 96\sqrt{7}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Now , $(x^8 - \frac{1}{x^8}) = (x^4 + \frac{1}{x^4})(x^4 - \frac{1}{x^4})$

$= 254 \times 96\sqrt{7} = 24384\sqrt{7}$

Sol.258.(a)

$\frac{2a-5}{a} - \frac{4b-5}{b} + \frac{6c+5}{c} = 0$

$\Rightarrow bc(2a-5) - ac(4b-5) + ab(6c+5) = 0$

$\Rightarrow 2abc - 5bc - 4abc + 5ac + 6abc + 5ab = 0$

$\Rightarrow 4abc - 5(bc - ac - ab) = 0$

$\Rightarrow 5(bc - ac - ab) = 4abc$

$\Rightarrow \frac{(bc - ac - ab)}{abc} = \frac{4}{5}$

$\Rightarrow (\frac{1}{a} - \frac{1}{b} - \frac{1}{c}) = \frac{4}{5}$

Sol.259.(a)

$[(1 + P)(1 + P^2)(1 + P^4)(1 + P^8)(1 + P^{16})(1 - P) - 1]$

$\Rightarrow [(1 - P^2)(1 + P^2)(1 + P^4)(1 + P^8)(1 + P^{16}) - 1]$

$\Rightarrow [(1 - P^4)(1 + P^4)(1 + P^8)(1 + P^{16}) - 1]$

$\Rightarrow [(1 - P^8)(1 + P^8)(1 + P^{16}) - 1]$

$\Rightarrow [(1 - P^{16})(1 + P^{16}) - 1]$

$\Rightarrow [(1 - P^{32}) - 1] = -P^{32}$

Sol.260.(b) $(x - y)^2 = x^2 + y^2 - 2xy$

$x^2 + y^2 = 25 + 2 \times 150 = 325$

Now ,

$(x + y)^2 = x^2 + y^2 + 2xy$

$(x + y)^2 = 325 + 300 = 625$

$(x + y) = 25$

Short tricks :-

$(x - y) = 5$ and $xy = 150$

Clearly , value of $x = 15$ and $y = 10$

So , $(x + y) = 15 + 10 = 25$

Sol.261.(a)

$a^3 - b^3 = (a - b)(a^2 + b^2 + ab)$

According to the question,

$a - b = 1$

Hence, $a^3 - b^3 = (a^2 + b^2 + ab)$

Sol.262.(d) $(x^2 + \frac{1}{x^2}) = 18$

$x + \frac{1}{x} = \sqrt{18 + 2} = 2\sqrt{5}$

$x^3 + \frac{1}{x^3} = (2\sqrt{5})^3 - 3(2\sqrt{5})$

$= 40\sqrt{5} - 6\sqrt{5} = 34\sqrt{5}$

Sol.263.(a) Identity used :-

$a^2 - b^2 = (a + b)(a - b)$

$\frac{p^2-(q-r)^2}{(p+r)^2-q^2} + \frac{q^2-(p-r)^2}{(p+q)^2-r^2} + \frac{r^2-(p-q)^2}{(q+r)^2-p^2} =$

$\frac{[p+(q-r)][p-(q-r)]}{[(p+r)+q][(p+r)-q]} + \frac{[q+(p-r)][q-(p-r)]}{[(p+q)+r][(p+q)-r]}$

$+ \frac{[r+(p-q)][r-(p-q)]}{[(q+r)+p][(q+r)-p]}$

$= \frac{(p+q-r)[p-q+r]}{(p+r+q)[p-q+r]} + \frac{(q+p-r)[q-p+r]}{(p+q+r)[p+q-r]}$

$+ \frac{(p-q+r)[r-p+q]}{(q+r+p)[q+r-p]}$

$= \frac{(p+q-r)}{(p+q+r)} + \frac{(q-p+r)}{(p+q+r)} + \frac{(p-q+r)}{(q+r+p)}$

$= \frac{(p+q-r)+(q-p+r)+(p-q+r)}{(p+q+r)}$

$= \frac{p+q-r+q-p+r+p-q+r}{(p+q+r)} = 1$

Short trick :-

Put p , q = 0 then ,

$\frac{p^2-(q-r)^2}{(p+r)^2-q^2} + \frac{q^2-(p-r)^2}{(p+q)^2-r^2} + \frac{r^2-(p-q)^2}{(q+r)^2-p^2}$

$\frac{-r^2}{r^2} + \frac{(-r^2)}{(-r^2)} + \frac{r^2}{r^2} = 1$

Sol.264.(c) As per question, $\frac{a}{b} = \frac{7}{6}$

So, $\frac{6a + 13b}{6a - 13b} = \frac{6 \times 7 + 13 \times 6}{6 \times 7 - 13 \times 6}$

$= \frac{42 + 78}{42 - 78} = -\frac{120}{36} = -\frac{10}{3}$

Sol.265.(a) $\frac{1}{2+2p} + \frac{1}{2+2q} + \frac{1}{2+2r}$

According to question,

$\frac{1}{2+2\frac{x}{y+z}} + \frac{1}{2+2\frac{y}{z+x}} + \frac{1}{2+2\frac{z}{x+y}}$

$= \frac{y+z}{2(y+z+x)} + \frac{z+x}{2(z+x+y)} +$

$\frac{x+y}{2(x+y+z)} = \frac{2(x+y+z)}{2(x+y+z)} = 1$

Sol.266.(d) $y - \frac{1}{y} = 4$

$y + \frac{1}{y} = \sqrt{4^2 + 4} = 2\sqrt{5}$

$y^3 + \frac{1}{y^3} = (2\sqrt{5})^3 - 3 \times 2\sqrt{5} = 34\sqrt{5}$

$y^6 + \frac{1}{y^6} = (34\sqrt{5})^2 - 2 = 5778$

Sol.267.(b) $x^2 + 1 = 15x$

Squaring both side

$x^4 + 1 + 2x^2 = 225x^2$

$x^4 - 223x^2 + 1 = 0$

$x^4 - 223x^2 + 6 = 5$

Sol.268.(a) $p^3 + q^3 + r^3 - 3pqr$

$= (p + q + r)\{(p + q + r)^2 - 3(pq + qr + pr)\}$ -----(1)

According to the question ,

$p + q + r = pqr = \frac{1}{p} + \frac{1}{q} + \frac{1}{r} = 1$

$\Rightarrow p + q + r = pqr = \frac{pq + qr + rp}{pqr} = 1$ ----- (2)

By Putting the value of equation(2) into equation (1) we get ;-

$p^3 + q^3 + r^3 - 3 = (1)((1)^2 - 3(1))$

$p^3 + q^3 + r^3 = 1 - 3 + 3 = 1$

Sol.269.(c) $\frac{256x^4 - 16y^4}{(80x^2 - 20y^2)(16x^2 + 4y^2)}$

$= \frac{16(16x^4 - y^4)}{20(4x^2 - y^2)\,4(4x^2 + y^2)}$

$= \frac{16(16x^4 - y^4)}{80((4x^2)^2 - (y^2)^2)} = \frac{16(16x^4 - y^4)}{80(16x^4 - y^4)}$

$= \frac{1}{5}$

Sol.270.(a)

$7a - \frac{7}{a} + 4 = 0 \Rightarrow a - \frac{1}{a} = -\frac{4}{7}$

Now , $a^3 - \frac{1}{a^3} = (-\frac{4}{7})^3 + 3 \times (-\frac{4}{7})$

$= \frac{-64 - 49 \times 12}{343} = -\frac{652}{343}$

So, $a^3 - \frac{1}{a^3} - 1 = -\frac{652}{343} - 1 = \frac{-995}{343}$

Sol.271.(a) $\frac{s^2+t^2+2st-u^2}{s^2-t^2-2tu-u^2} = \frac{(s+t)^2-u^2}{s^2-(t+u)^2}$

$\frac{(s+t+u)(s+t-u)}{(s+t+u)(s-t-u)} = \frac{(s+t-u)}{(s-t-u)}$

Sol.272.(d) $x^2 - 8x - 1 = 0 \Rightarrow x - \frac{1}{x} = 8$

So, $x^2 + \frac{1}{x^2} = (8)^2 + 2 = 64 + 2 = 66$

Sol.273.(b) $x^2 + \frac{1}{x^2} = 6$

Given that , $0 < x < 1$, so the value of $(x^2 - \frac{1}{x^2})$ will always be –ve .

$x^2 - \frac{1}{x^2} = -\left(\sqrt{(6)^2 - 4}\right) = -4\sqrt{2}$

$x^4 - \frac{1}{x^4} = (x^2 + \frac{1}{x^2})(x^2 - \frac{1}{x^2})$

$= 6 \times (-4\sqrt{2}) \Rightarrow x^4 - \frac{1}{x^4} = -24\sqrt{2}$

Sol.274.(d) $x = \frac{1}{x-3} \Rightarrow x^2 - 3x = 1$

Dividing both sides by x we get;

$\Rightarrow x - \frac{1}{x} = 3$

So, $x + \frac{1}{x} = \sqrt{(3)^2 + 4} = \sqrt{13}$

Sol.275.(b) $x + \frac{1}{x} = 1, \Rightarrow x^2 + 1 = x$

Now,

$\frac{x^2 + 7x + 1}{x^2 + 11x + 1} = \frac{x + 7x}{x + 11x} = \frac{8x}{12x} = \frac{2}{3}$

Sol.276.(c) Given, $x + \frac{1}{x} = \sqrt{6}$

$(x^2 + \frac{1}{x^2}) = (\sqrt{6})^2 - 2 = 4$

$(x^2 - \frac{1}{x^2}) = \sqrt{4^2 - 4} = \sqrt{12} = 2\sqrt{3}$

Then,

$(x^4 - \frac{1}{x^4}) = (x^2 - \frac{1}{x^2})(x^2 + \frac{1}{x^2})$

$= 2\sqrt{3} \times 4 = 8\sqrt{3}$

Since, $(x^2 + \frac{1}{x^2}) = 4$ then,

$(x^4 + \frac{1}{x^4}) = (4)^2 - 2 = 14$

Now,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$(x^8 - \frac{1}{x^8}) = (x^4 + \frac{1}{x^4})(x^4 - \frac{1}{x^4})$

$= 14 \times 8\sqrt{3} = 112\sqrt{3}$

Sol.277.(b) $(\frac{5}{b} + 5b)(\frac{25}{b^2} - 25 + 25b^2)$

$= (\frac{5}{5} + 5 \times 5)(\frac{25}{5\times5} - 25 + 25 \times 5 \times 5)$

$= (26)(1 - 25 + 625) = 15626$

Sol.278.(b) Given, $x - \frac{1}{x} = 10$

$x^2 + \frac{1}{x^2} = (10)^2 + 2 = 102$

Now, $x^4 + \frac{1}{x^4} = 102 \times 102 - 2 = 10402$

Sol.279.(b) $(x - 5)^2 + (x + 3)^2 + 4x$

$= x^2 + 25 - 10x + x^2 + 9 + 6x + 4x$

$= 2x^2 + 34 = 2(x^2 + 17)$

Sol.280.(c) formula used :-

$a^3 + b^3 = (a + b)\left[(a + b)^2 - 3ab\right]$

$8x^3 + 27y^3 = 16\left[16^2 - 3 \times 2 \times 3 \times 9\right]$

$= 16[256 - 162] = 16 \times 94 = 1504$

Sol.281.(c)

$x^3 + y^3 = (x + y)\left[(x + y)^2 - 3xy\right]$

$= 25\left[25^2 - 3 \times 20\right] = 25[625 - 60]$

$= 25 \times 565 = 14125$

Sol.282.(c) $x^2 - \frac{1}{x^2} = 4\sqrt{2}$

$x^2 + \frac{1}{x^2} = \sqrt{\left(4\sqrt{2}\right)^2 + 4} = 6$

Now,

$x^4 - \frac{1}{x^4} = (x^2 + \frac{1}{x^2})(x^2 - \frac{1}{x^2})$

$= 6 \times 4\sqrt{2} = 24\sqrt{2}$

Sol.283.(b) $(x^2 + \frac{1}{x^2}) = 18$

$(x^2 + \frac{1}{x^2} - 2) = 18 - 2 \Rightarrow (x - \frac{1}{x}) = 4$

$\Rightarrow (x^3 - \frac{1}{x^3}) = (4)^3 + 3 \times 4 = 76$

Sol.284.(b) $3x - z = 0 \Rightarrow z = 3x$

$3x - 9y + 4z = 5$

or $15x - 9y = 5$ ....e.q .(1)

$2x + 7y + z = 12$ or $5x + 7y = 12$ ....e.q .(2)

on solving e.q .(1) and e.q .(2) , we get

$y = \frac{31}{30}$ and $x = \frac{143}{150}$, $z = 3x = \frac{143}{50}$

Sol.285.(a) $(2a + b)^2 = 10^2$

$4a^2 + b^2 + 4ab = 100$

$4a^2 + b^2 = 100 - 18 = 82$

Now ,

$(2a - b) = \sqrt{4a^2 + b^2 - 4ab}$

$= \sqrt{82 - 18} = \sqrt{64} = 8$

Sol.286.(c) $x^2 + \frac{1}{x^2} = 2\sqrt{5}$

$x^4 + \frac{1}{x^4} = \left(2\sqrt{5}\right)^2 - 2 = 18$

Now ,

$x^4 - \frac{1}{x^4} = \sqrt{\left(18^2 - 4\right)} = \sqrt{320} = 8\sqrt{5}$

Sol.287.(b) $x^4 + \frac{1}{x^4} = 79$

$x^4 + \frac{1}{x^4} + 2 = 81 \Rightarrow x^2 + \frac{1}{x^2} = 9$

$x^2 + \frac{1}{x^2} - 2 = 7 \Rightarrow x - \frac{1}{x} = \sqrt{7}$

Sol.288.(b)

$x + y = \sqrt{13} \Rightarrow x^2 + y^2 + 2xy = 13$

$x - y = \sqrt{11} \Rightarrow x^2 + y^2 - 2xy = 11$

On adding both , we get

$2\left(x^2 + y^2\right) = 24 \Rightarrow \left(x^2 + y^2\right) = 12$

Again , $x^2 + y^2 + 2xy = 13$

$xy = \frac{13 - 12}{2} = \frac{1}{2}$

Now , $xy\left(x^2 + y^2\right) = \frac{1}{2} \times 12 = 6$

Sol.289.(a)

$ab + bc + ca = 0 \Rightarrow ab + ca = -bc$

$\frac{1}{a^2 - bc} = \frac{1}{a^2 + (ab + ca)} = \frac{1}{a(a + b + c)}$

Similarly , $\frac{1}{b^2 - ca} = \frac{1}{b(a + b + c)}$

and $\frac{1}{c^2 - ab} = \frac{1}{c(a + b + c)}$

Now ,

$\frac{1}{a^2 - bc} + \frac{1}{b^2 - ca} + \frac{1}{c^2 - ab}$

$= \frac{1}{a(a + b + c)} + \frac{1}{b(a + b + c)} + \frac{1}{c(a + b + c)}$

$= \frac{bc + ca + ab}{abc(a + b + c)} = 0$

Sol.290.(c) Let the required value of A be x

According to question,

$\frac{52}{91} = \frac{x}{126} \Rightarrow x = 72$

Sol.291.(c) $ax + by + c_1 = 0$

$px + qy + c_2 = 0$

For infinite no. of solutions :-

$\frac{a}{p} = \frac{b}{q} = \frac{c_1}{c_2}$

So , $\frac{38}{46} = \frac{q}{414} \Rightarrow q = \frac{414 \times 38}{46}$

$q = 9 \times 38 = 342$

Sol.292.(b)

$x^3 + y^3 + z^3 - 3xyz = \frac{(x + y + z)}{2}$

$\left\{(x - y)^2 + (y - z)^2 + (z - x)^2\right\}$

$= \frac{14 + 15 + 17}{2}$

$\{(14 - 15)^2 + (15 - 17)^2 + (17 - 14)^2\}$

$= 23\{1 + 4 + 9\} = 322$

Sol.293.(b) Given,

$18x + 36y + 45 = 0$ -------(1)

$px - 54y + 67 = 0$ --------(2)

$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ (no solution)

$\frac{18}{p} = \frac{36}{(-54)} \neq \frac{45}{67}$

$p = \frac{18 \times (-54)}{36} = -27$

Sol.294.(a) $(a + b)^2 - (a - b)^2 = 4ab$

$\Rightarrow (\frac{9}{8} + \frac{8}{9})^2 - (\frac{9}{8} - \frac{8}{9})^2$

$\Rightarrow 4 \times \frac{9}{8} \times \frac{8}{9} \Rightarrow 4$

Sol.295.(c)

$\frac{1 + x^2}{1 - x} \div \frac{1 - x^4}{x - 1} \times \frac{x(1 - x)}{(1 + x)}$

$\Rightarrow \frac{1 + x^2}{1 - x} \times \frac{x - 1}{1 - x^4} \times \frac{x(1 - x)}{(1 + x)}$

$\Rightarrow \frac{1+x^2}{1-x} \times \frac{-(1-x)}{(1-x^2)\ (1+x^2)} \times \frac{x(1-x)}{(1+x)}$

$\Rightarrow \frac{1 + x^2}{1 - x} \times \frac{-(1 - x)}{(1 - x)(1 + x)(1 + x^2)} \times \frac{x(1 - x)}{(1 + x)} \Rightarrow \frac{-x}{(1 + x)^2}$

Sol.296.(a) $K + \frac{1}{K} - 2 = 0 \Rightarrow K + \frac{1}{K} = 2$

Here the value of k = 1

Therefore, $K^{17} + \frac{1}{K^{12}} = 1^{17} + \frac{1}{1^{12}} = 2$

Sol.297.(c) According to the question,

$a^4 + \frac{1}{a^4} = 194$

$\Rightarrow a^2 + \frac{1}{a^2} = \sqrt{194 + 2} = 14$

$\Rightarrow a + \frac{1}{a} = \sqrt{14 + 2} = 4$

$\Rightarrow a^3 + \frac{1}{a^3} = 64 - 3 \times 4 = 52$

Now, we can write

$\frac{a^6 + 1}{a^3}$ as $\frac{\frac{a^6}{a^3} + \frac{1}{a^3}}{\frac{a^3}{a^3}} = a^3 + \frac{1}{a^3} = 52$

Sol.298.(c)

$(a - b)(b + a)(a^2 + b^2)(2b^4 + 2a^4)$

$= (a^2 - b^2)(a^2 + b^2)(2b^4 + 2a^4)$

$\Rightarrow (a^4 - b^4)2(b^4 + a^4) = 2(a^8 - b^8)$

Sol.299.(c) $\frac{(15)^3 + (4)^3}{(15^2 + 4^2 - k)} = 19$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\Rightarrow \frac{(15+4)(15)^2+(4)^2-(60)}{(15^2+4^2-k)} = 19$

$\Rightarrow (15)^2 + (4)^2 - 60 = (15)^2 + (4)^2 - k$

$\Rightarrow k = 60$

Sol.300.(a) $x^2 + \frac{1}{x^2} = 38$

$\Rightarrow x - \frac{1}{x} = \sqrt{38 - 2} = 6$

Sol.301.(d)

Formula:- $p^3 - r^3 = (p - r)[p^2 + r^2 + pr]$

$(21)^2 = p^2 + r^2 + 2 \times 38$

$\Rightarrow p^2 + r^2 = 365$

$(p - r)^2 = (p + r)^2 - 4pr$

$\Rightarrow (p - r)^2 = 441 - 4 \times 38$

$(p - r) = \sqrt{289} = 17$

$p^3 - r^3 = 17[365 + 38]$

$\Rightarrow p^3 - r^3 = 17[403] = 6851$

Sol.302.(b) Formula:- $a^3 + b^3 + c^3 - 3abc$

$= \frac{1}{2}(a + b + c)\{(a - b)^2 + (b - c)^2 + (c - a)^2\}$

Therefore, $(a + b + c)$

$\{(a - b)^2 + (b - c)^2 + (c - a)^2\}$

$= 2a^3 + 2b^3 + 2c^3 - 6abc$

Sol.303.(d)

$x + \frac{1}{x} = -2$ (clearly visible that x = -1)

Therefore, $x^7 + \frac{1}{x^7} + x^2 + \frac{1}{x^2}$

$= (-1)^7 + \frac{1}{(-1)^7} + (-1)^2 + \frac{1}{(-1)^2}$

$= -2 + 2 = 0$

Sol.304.(a) $\frac{4x^2 + 9y^2 + 12xy}{144}$

$= \frac{(2x+3y)^2}{(12)^2} = (\frac{x}{6} + \frac{y}{4})^2$

Sol.305.(c)

$(a - 4)^3 = a^3 - 64 - 3 \times a^2 \times 4 + 3 \times a \times 16$

$\Rightarrow a^3 - 12a^2 + 48a - 64$

Sol.306.(c) $x - y = 8$ and $8xy = 8 \Rightarrow xy = 1$

$(8)^2 = x^2 + y^2 - 2 \Rightarrow x^2 + y^2 = 66$

then , $2(x^3 - y^3) = 2 \times 8(66 + 1)$

$= 16 \times 67 = 1072$

Sol.307.(b) $a^3 = b^3 + 988$

$\Rightarrow a^3 - b^3 = 988$ and $a - b = 4$

$2a^2 + 2ab + 2b^2 = 2(a^2 + ab + b^2)$

$= 2(\frac{a^3 - b^3}{a - b}) = 2(\frac{988}{4}) = 494$

Sol.308.(c) $a^3 + 3a^2 + 3a = 63$

$\Rightarrow a^3 + 3a^2 + 3a - 63 = 0$

$\Rightarrow (a - 3)(a^2 + 6a + 21) = 0$

$\Rightarrow a = 3 \Rightarrow a^2 + 2a = 9 + 6 = 15$

Sol.309.(b) $(a + b + c)^2$

$= a^2 + b^2 + c^2 + 2(ab + bc + ca)$

$(6)^2 = 40 + 2(ab + bc + ca)$

$(ab + bc + ca) = -2 \Rightarrow a^3 + b^3 + c^3 - 3abc$

$= (a + b + c)(a^2 + b^2 + c^2 - (ab + bc + ca))$

$\Rightarrow a^3 + b^3 + c^3 - 3abc = (6)[(40 - (-2)]$

$= 252$

Sol.310.(d) $4ab + 4bc + 4ca = 160$

$\Rightarrow ab + bc + ca = 40$

$9a + 9b + 9c = 81 \Rightarrow (a + b + c) = 9$

$(a + b + c)^2$

$= (a^2 + b^2 + c^2 + 2ab + 2bc + 2ca)$

$81 = a^2 + b^2 + c^2 + 80$

$a^2 + b^2 + c^2 = 1 \Rightarrow 6a^2 + 6b^2 + 6c^2 = 6$

Sol.311.(b)

$N + \frac{1}{N} = \sqrt{3}$ (squaring both side)

$N^2 + \frac{1}{N^2} = 3 - 2 = 1$(cubing both side)

$N^6 + \frac{1}{N^6} = 1 - 3 = -2$

So the value of,

$N^6 + \frac{1}{N^6} + 11 \Rightarrow -2 + 11 = 9$

Sol.312.(b) $\frac{(a+b)^2 - (a-b)^2}{ab}$

$= \frac{a^2 + b^2 + 2ab - a^2 - b^2 + 2ab}{ab} = 4$

Sol.313.(d) $(a - b)^3 - a^3 + b^3$

$= (a)^3 - (b)^3 - 3ab(a - b) - a^3 + b^3$

$= -3ab(a - b)$

Sol.314.(d)

$(300 - 1)^2 = 90000 + 1 - 600 = 89401$

Sol.315.(d)

$\frac{(k+\frac{1}{k})}{(k+\frac{1}{k})} \times (k - \frac{1}{k})(k^2 + \frac{1}{k^2})(k^4 + \frac{1}{k^4})$

$(k^8 + \frac{1}{k^8})(k^{16} + \frac{1}{k^{16}})$ Multiply by

$\frac{(k+\frac{1}{k})}{(k+\frac{1}{k})}$

$\frac{(k^2-\frac{1}{k^2})(k^2+\frac{1}{k^2})(k^4+\frac{1}{k^4})(k^8+\frac{1}{k^8})(k^{16}+\frac{1}{k^{16}})}{(k+\frac{1}{k})}$

$= \frac{(k^4-\frac{1}{k^4})(k^4+\frac{1}{k^4})(k^8+\frac{1}{k^8})(k^{16}+\frac{1}{k^{16}})}{(k+\frac{1}{k})}$

$= \frac{(k^8-\frac{1}{k^8})(k^8+\frac{1}{k^8})(k^{16}+\frac{1}{k^{16}})}{(k+\frac{1}{k})}$

$= \frac{(k^{16}-\frac{1}{k^{16}})(k^{16}+\frac{1}{k^{16}})}{(k+\frac{1}{k})} = \frac{(k^{32}-\frac{1}{k^{32}})}{(k+\frac{1}{k})}$

Sol.316.(a) $x + \frac{1}{x} = \frac{K}{2}$

$\frac{x^8 + 1}{x^4}$ [dividing by x^4]

$x^4 + \frac{1}{x^4} = [\{(\frac{K}{2})^2 - 2\}^2 - 2]$

$= [\{\frac{K^2 - 8}{4}\}^2 - 2] = \frac{K^4 - 16K^2 + 32}{16}$

Sol.317.(a) Formula :-

$(a^3 + b^3 + c^3 - 3abc) = \frac{a+b+c}{2}$

$\{(a - b)^2 + (b - c)^2 + (c - a)^2\}$

$\Rightarrow \frac{(p^3 + q^3 + r^3 - 3pqr)}{(p + q + r)}$

$= \frac{\{(6)^2 + (-5)^2 + (3)^2\}}{2} = 35$

Sol.318.(d) If $A + \frac{1}{A} = -1$, then $A^3 = 1$

According to the question,

$\frac{A^6 + A^3 - 1}{A^9 + A^3 - 1} = \frac{1 + 1 - 1}{1 + 1 - 1} = 1$

Sol.319.(b) $(x + 1)^2 + (x + 2)^2 = 16$

$x^2 + 1 + 2x + x^2 + 4 + 4x = 16$

$2x^2 + 6x + 5 = 16 \Rightarrow 4x^2 + 12x + 10 = 32$

(multiply by 2 both side)

$4x^2 + 12x + 10 + 30 = 32 + 30$

(add 30 both side)

$4x^2 + 12x + 40 = 62$

Sol.320.(d)

$a^2 + 4b^2 + 9c^2 - 4ab + 12bc - 6ca$

$= a^2 + (2b)^2 + (3c)^2 - 2 \times a \times 2b + 2 \times 2b \times 3c - 2 \times 3c \times a$

$= (a - 2b - 3c)^2$

Sol.321.(d) Formula : -

$(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

$(1)^2 = a^2 + b^2 + c^2 + 2(-1)$

$\Rightarrow a^2 + b^2 + c^2 = 3$

Now,

$a^3 + b^3 + c^3 - 3abc = (a + b + c)$

$[a^2 + b^2 + c^2 - (ab + bc + ca)]$

$\Rightarrow a^3 + b^3 + c^3 - 3(-1)$

$= (1)[3 - (-1)] \Rightarrow a^3 + b^3 + c^3 = 1$

Sol.322.(c) $(a + b)^3 - a^3 - b^3$

$= a^3 + b^3 + 3ab(a + b) - a^3 - b^3$

$= 3ab(a + b)$

Sol.323.(d) $\frac{1}{(x-2)} + x = 8$

Subtracting 2 from both side; we get

$\frac{1}{(x-2)} + (x - 2) = 8 - 2 = 6$

$\frac{1}{(x-2)^2} + (x - 2)^2 = 6^2 - 2 = 34$

Search on T.G: @apna_pdf

Search on Telegram @apna_pdf

Sol.324.(b)

$\frac{1+x}{1-x^2} \div \frac{1+x}{1-x^4} - \frac{1-x^4}{1-x} \times \frac{1+x}{1-x^2}$

$= \frac{1+x}{1-x^2} \times \frac{(1-x^2)(1+x^2)}{1+x} - \frac{(1+x^2)(1+x)}{1-x}$

$= (1+x^2) - \frac{1+x+x^2+x^3}{1-x}$

$= \frac{1-x+x^2-x^3-1-x-x^2-x^3}{1-x}$

$= \frac{-2x-2x^3}{1-x} = \frac{2x+2x^3}{x-1} = \frac{2x(1+x^2)}{x-1}$

Sol.325.(b) If $x + y + z = 0$

Then, $x^3 + y^3 + z^3 = 3xyz$

$\frac{x}{(yz)^2} + \frac{y}{(xz)^2} + \frac{z}{(xy)^2} = \frac{x^3+y^3+z^3}{x^2y^2z^2}$

$= \frac{3}{xyz}$

Sol.326.(d) $\frac{K}{K^2-2K+1} = \frac{1}{6}$

$\Rightarrow K^2 + 1 = 8k \Rightarrow k + \frac{1}{K} = 8$

$\Rightarrow \frac{1}{K^3} + K^3 = (8)^3 - 3 \times 8 = 488$

Sol.327.(d) $x - \frac{1}{x} = 4$

$\Rightarrow x^2 + \frac{1}{x^2} = 18 \Rightarrow x^4 + \frac{1}{x^4} = 322$

$(x^6 + \frac{1}{x^6}) = (x^2 + \frac{1}{x^2})(x^4 + \frac{1}{x^4}) - (x^2 + \frac{1}{x^2})$

$\Rightarrow (x^6 + \frac{1}{x^6}) = 322 \times 18 - 18 = 5778$

Sol.328.(a) Two lines have no solution, if these two lines are parallel to each other. The lines are parallel to each other means that the slopes of the lines are equal.

$18x - 72y + 13 = 0 \Rightarrow y = \frac{18}{72}x + \frac{13}{72}$

Slope $(m) = \frac{1}{4}$

and $7x - my - 17 = 0 \Rightarrow y = \frac{7}{m}x - \frac{17}{m}$

Value of (m) for no solution $\Rightarrow \frac{7}{m} = \frac{1}{4}$

m = 28

Sol.329.(c)

$2^x + 3^y = 17$ and $2^{x+2} - 3^{y+1} = 5$,

By option ,

Putting the value of $x = 3$ and $y = 2$, we get

$2^x + 3^y = 2^3 + 3^2 = 17$ .....satisfied

and $2^{x+2} - 3^{y+1} = 2^5 - 3^3 = 32 - 27 = 5$ .....satisfied

Sol.330.(c) $x^2 - 5x + 1 = 0$

$x + \frac{1}{x} = 5$ ..... (eq .1)

{When $x + \frac{1}{x} = k$,

then $x^3 + \frac{1}{x^3} = k^3 - 3k$}

$x^3 + \frac{1}{x^3} = 110$ ..... (eq .2)

Now, given eq . = $\frac{x^6 + x^4 + x^2 + 1}{5x^3}$

Divide numerator and denominator by x^3

$\frac{x^3 + x + \frac{1}{x} + \frac{1}{x^3}}{5} = \frac{110+5}{5} = 23$

Sol.331.(b) $k + k^{-1} = -2$

$k + \frac{1}{k} = -2$

Clearly , K = -1

Putting the value in given equation :-

$\frac{k^2+4k-2}{k^2+k-5} = \frac{1-4-2}{1-1-5} = \frac{-5}{-5} = 1$

Sol.332.(d) Formula :- When , $x + \frac{1}{x} = k$, Then $x^2 + \frac{1}{x^2} = k^2 - 2$

Given that , $x + \frac{1}{x} = 5\sqrt{2}$

Then , $x^2 + \frac{1}{x^2} = 48$

And $x^4 + \frac{1}{x^4} = 2302$

Sol.333.(a) Formula :-

$a^4 + b^4 + 2a^2b^2 = (a^2 + b^2)^2$

$a^2 + b^2 = 121 - 70 = 51$

Now,

$a^4 + b^4 = 51^2 - 2 \times (35)^2$

= 2601 - 2450 = 151

Sol.334.(d)

Given , x + y = 36 then , x = 36 - y

$= (x - 27)^3 + (y - 9)^3$

$= (36 - y - 27)^3 + (y - 9)^3$

$= (9 - y)^3 + (y - 9)^3$

$= (9 - y)^3 - (9 - y)^3 = 0$

Sol.335.(a) Formula:-

$(a + b - c)^2 = a^2 + b^2 + c^2 + 2ab - 2bc - 2ca$

Given , $\frac{a^2 + b^2 + c^2 - 1024}{ab - bc - ca} = -2$

$a^2 + b^2 + c^2 - 1024 = -2ab + 2bc + 2ca$

$a^2 + b^2 + c^2 + 2ab - 2bc - 2ca = 1024$

$(a + b - c)^2 = 1024$

$(5c - c)^2 = 1024$

.....(Given , a + b = 5c) $\Rightarrow$ c = 8

Sol.336.(d) $x = \frac{\sqrt{5}-2}{\sqrt{5}+2} = \frac{\sqrt{5}-\sqrt{4}}{\sqrt{5}+\sqrt{4}}$

Rationalizing,

$x = \frac{\sqrt{5}-\sqrt{4}}{\sqrt{5}+\sqrt{4}} \times \frac{\sqrt{5}-\sqrt{4}}{\sqrt{5}-\sqrt{4}} = \frac{9-4\sqrt{5}}{1}$

$= 9 - 4\sqrt{5}$ ..... eq (1)

Then , $\frac{1}{x} = 9 + 4\sqrt{5}$ ..... eq (2)

Adding eq . (1) and eq . (2) , we get

$x + \frac{1}{x} = 18$, Then , $x^2 + \frac{1}{x^2} = 322$

Short Trick:- If $x = \frac{\sqrt{a}-\sqrt{b}}{\sqrt{a}+\sqrt{b}}$,

Then $x + \frac{1}{x} = \frac{2(a+b)}{(a-b)}$

According to question ,

$x = \frac{\sqrt{5}-\sqrt{4}}{\sqrt{5}+\sqrt{4}}$, Then

$x + \frac{1}{x} = \frac{2(5+4)}{(5-4)} = 18$

Then , $x^2 + \frac{1}{x^2} = 322$

Sol.337.(d) Given that ,

$x + \frac{y^2}{x} = 5$ .....eq .(1)

$\frac{x^2+y^2}{x} = 5 \Rightarrow x^2 + y^2 = 5x$

$\Rightarrow x^2 - 5x = -y^2$ .....eq .(2)

$\frac{x^2+2x+y^2}{x^3-5x^2} = \frac{x\left(x+2+\frac{y^2}{x}\right)}{x(x^2-5x)}$ ....eq .(3)

Putting value of eq .(1) and eq .(2) in eq .(3), we get

$\frac{x\left(x+2+\frac{y^2}{x}\right)}{x(x^2-5x)} = \frac{(5+2)}{(-y^2)} = -\frac{7}{y^2}$

Sol.338.(d) Given ,

$x + \frac{1}{x} = 8 \Rightarrow x - 8 = \frac{-1}{x}$ .... (eq .1)

$\frac{5}{x^2-8x+2} = \frac{5}{x\left(x-8+\frac{2}{x}\right)}$ ..... (eq .2)

Putting the value of eq . (1) in eq . (2) , we get

$\frac{5}{x\left(x-8+\frac{2}{x}\right)} = \frac{5}{x\left(\frac{2}{x}-\frac{1}{x}\right)} = 5$

Sol.339.(c) Identities :- when $ax + \frac{y}{a} = k$, then $(ax)^2 + \frac{y^2}{a^2} = k^2 - 2xy$

Now,

$4a + \frac{5}{a} + 5 = 14 \Rightarrow 4a + \frac{5}{a} = 9$ ...e.q .(1)

On squaring e.q .(1) , we get

$16a^2 + \frac{25}{a^2} = 9^2 - 2 \times 4 \times 5 = 41$

Sol.340.(d) Identity : when $x - \frac{1}{x} = k$, then,

$x^2 + \frac{1}{x^2} = k^2 + 2 \Rightarrow x - \frac{1}{x} = 13$,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

then , $x^2 + \frac{1}{x^2} = 13^2 + 2 = 171$

And $x^4 + \frac{1}{x^4} = (171)^2 - 2$

= 29241 - 2 = 29239

Sol.341.(b)

$(x^4 + x^2 + 25) = (x^4 + x^2 + 5^2)$

$[\{(x^2+5)^2 - 2 \times 5 \times x^2\} + x^2]$

$= [(x^2+5)^2 - 10x^2 + x^2]$

$= [(x^2+5)^2 - 9x^2] = [(x^2+5)^2 - (3x)^2]$

$= (x^2 + 3x + 5)(x^2 - 3x + 5)$

Sol.342.(c) $x = 3 + 2\sqrt{2}$

x = $(\sqrt{2})^2 + (1)^2 + 2\sqrt{2} = (\sqrt{2}+1)^2$

$\sqrt{x} = (\sqrt{2}+1)$ .....eq .(1)

Taking reciprocal of eq .(1) , we get

$\frac{1}{\sqrt{x}} = \frac{1}{(\sqrt{2}+1)} \times \frac{(\sqrt{2}-1)}{(\sqrt{2}-1)} = \frac{(\sqrt{2}-1)}{1}$

$= (\sqrt{2} - 1)$ .....eq .(2)

Now, From eq .(1) and eq .(2), we get,

$\sqrt{x} - \frac{1}{\sqrt{x}} = (\sqrt{2}+1) - (\sqrt{2}-1) = 2$

Sol.343.(d) when, $x + \frac{1}{x} = -2$

then, $x = -1$

Now ,

$x^{17} + x^{-17} + x^{12} + x^{-12}$ = - 1 -1 + 1 + 1 = 0

Sol.344.(b)

A number is the factor of its square. .

Squaring the identity (mx+n)

$(mx + n)^2 = (m^2x^2 + 2\,mnx + n^2)$

Sol.345.(d)

$x^3 + y^3 + z^3 - 3xyz = (x + y + z)$

$(x^2 + y^2 + z^2 - xy - yz - zx)$

When (x + y + z) = 0 ,

then $x^3 + y^3 + z^3 = 3xyz$ .....eq .(1)

$(x + y + z) = 0$ ..... (given)

$\frac{x^2}{(yz)} + \frac{y^2}{(xz)} + \frac{z^2}{(xy)} = \frac{x^3+y^3+z^3}{xyz}$

$= \frac{3xyz}{xyz} = 3$

Sol.346.(d) $(x + y + z)^2$

$= x^2 + y^2 + z^2 + 2(xy + yz + zx)$

$(a + b + c)^2 = 9 + 2 \times 8$

$a + b + c = 5$

Now, (a + b + c) - 3 = 5 - 3 = 2

Sol.347.(a) Formula:-

$(a - b)^3 = a^3 - b^3 - 3ab(a - b)$

$a - b = 2$ and $a^3 - b^3 = 80$ .....(given)

Now , $(2)^3 = 80 - 3ab(2) \Rightarrow$ ab = 12

Sol.348.(d) $\frac{1}{x^2 + a^2} = x^2 - a^2$

$x^4 - a^4 = 1 \Rightarrow x^4 = a^4 + 1 \Rightarrow$ x = $\sqrt[4]{a^4 + 1}$

Sol.349.(c) Statement 1.

$100^2 - 99^2 + 98^2 - 97^2 ..... + 22^2 - 21^2$

$\Rightarrow$ (100 + 99)(100 - 99) + (98 + 97)(98 - 97) ..... + (22 + 21)(22 - 21)

$\Rightarrow$ 100 + 99 + 98 + 97.....22 + 21

Sum = $\frac{n}{2} \times (a + l)$

$= \frac{80}{2}(100 + 21)$ = 40 × 121 = 4840

Statement 2.

$\Rightarrow (k^2 + \frac{1}{k^2})(k - \frac{1}{k})(k^4 + \frac{1}{k^4})(k + \frac{1}{k})$

$(k^4 - \frac{1}{k^4})$

$= (k^2 + \frac{1}{k^2})(k^2 - \frac{1}{k^2})(k^4 + \frac{1}{k^4})(k^4 - \frac{1}{k^4})$

$= (k^4 - \frac{1}{k^4})(k^8 - \frac{1}{k^8})$ .....eq .(1)

Now, $(k^{16} - \frac{1}{k^{16}}) = (k^8 - \frac{1}{k^8})(k^8 + \frac{1}{k^8})$

.....e.q .(2)

Where , e.q .(1) $\neq$ e.q .(2)

Sol.350.(a) Clearly , option 'a' is the correct algebraic expression/.

(a - 1)(b - 1) = ab - a - b + 1

Sol.351.(d) x = 1 .....(given)

$x^2 + y^2 + z^2 = xy + yz + zx$ .....(given)

Put , y = 1 and z = 1 . which satisfies the given condition.

$\frac{10x^4 + 5y^4 + 7z^4}{13x^2y^2 + 6y^2z^2 + 3z^2x^2} = \frac{10+5+7}{13+6+3} = 1$

Sol.352.(c) x - y = - 10

$x^2 - 2xy = 84$

Adding y^2 both sides

$x^2 - 2xy + y^2 = 84 + y^2$

$(x - y)^2 = 84 + y^2$

y^2 = 100 - 84 $\Rightarrow$ y = 4

Sol.353.(a) When , $x + \frac{1}{x} = 1$,

then $x^3 = -1$

x^3 + 1 = 0 .....e.q .(1)

Now, $x^{12} + x^9 + x^6 + x^3 + 1$

$\Rightarrow x^9(x^3 + 1) + x^3(x^3 + 1) + 1 \Rightarrow 1$

Sol.354.(a) a + b = 2 .....eq .(1)

$\frac{a}{b} + \frac{b}{a} = 1$

$\frac{a^2 + b^2}{ab} = 1 \Rightarrow a^2 + b^2 = ab$

$a^2 + b^2$ - ab = 0 .....eq .(2)

$a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$

From eq (1) and (2)

$a^3 + b^3 = 0$

Sol.355.(a) $4x^2 + y^2 = 40$

Adding (4xy) both sides , we get

$(2x)^2 + y^2 + 4xy = 40 + 4xy$ xy = 6 given)

$(2x + y)^2 = 64 \Rightarrow 2x + y = 8$

Short trick :-

$4x^2 + y^2 = 40$ and xy = 6 ....(given)

Put x= 3 and y = 2 which satisfy the both given equations .

Now , the value of 2x + y = 2 × 3 + 2 = 8

Sol.356.(c) ab = 3 ...(given)

2a + 3b = 10

On squaring ,

$4a^2 + 9b^2 + 12ab = 100$

$4a^2 + 9b^2$ = 100 - 12 × 3 = 64

Sol.357.(c) xy = 8 ....(given)

(4x - 7y) = 11

On squaring , we get

$16x^2 + 49y^2 - 56xy = 121$

$16x^2 + 49y^2$ = 121 + 56 × 8 = 569

Sol.358.(d) $mx^m - nx^n = 0$

$x^m = \frac{nx^n}{m}$ ----(i)

and $x^n = \frac{mx^m}{n} \Rightarrow x^{2n} = \frac{m^2x^{2m}}{n^2}$ ----(ii)

Now, $\frac{1}{x^m + x^n} + \frac{1}{x^m - x^n}$

$= \frac{x^m + x^n + x^m - x^n}{x^{2m} - x^{2n}} = \frac{2x^m}{x^{2m} - x^{2n}}$

$= \frac{2x^m}{\frac{n^2x^{2n}}{m^2} - x^{2n}} = \frac{2x^m}{\frac{x^{2n}(n^2 - m^2)}{m^2}}$

{using eq . (i) and (ii)}

$\Rightarrow \frac{2x^m m^2}{x^{2n}(n^2 - m^2)} = \frac{2 \times \frac{nx^n}{m} \times m^2}{x^{2n}(n^2 - m^2)}$

$= \frac{2mn}{x^n(n^2 - m^2)}$

Sol.359.(d) $5x^2 + 7x + 5 = 0$

Dividing both sides by 5x.

$x + \frac{1}{x} = \frac{-7}{5}$

$x^3 + \frac{1}{x^3} = (\frac{-7}{5})^3 - (\frac{-7}{5}) \times 3$

$= \frac{-343}{125} + \frac{21}{5} = \frac{182}{125}$

Sol.360.(d) Concept :- If $(x)^2 + (y)^2 = 0$, only possible when x = 0 and y = 0 .

$x^2 + y^2 + 2y + 4x + 5 = 0$

$\Rightarrow (x^2 + 4x + 4) + (y^2 + 2y + 1) = 0$

$\Rightarrow (x + 2)^2 + (y + 1)^2 = 0$

So, $x + 2 = 0 \Rightarrow x = -2$

And, $y + 1 = 0 \Rightarrow y = -1$

Now, $\frac{x+y}{x-y} = \frac{-3}{-1} = 3$

Sol.361.(b) Concept :

When a + b + c = 0 ,

then $a^3 + b^3 + c^3 = 3abc$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\frac{(x-y)^3+(y-z)^3+(z-x)^3}{6(x-y)(y-z)(z-x)}$

$= \frac{3(x-y)(y-z)(z-x)}{6(x-y)(y-z)(z-x)} = \frac{1}{2}$

Sol.362.(b) $k + \frac{1}{k} + 2 = 0$

$\Rightarrow k + \frac{1}{k} = -2$ (Only possible when k = -1)

Then, $k^{10} + \frac{1}{k^{11}} = 1 + (-1) = 0$

Sol.363.(b) We know that,

$(a-b)^3 + 3ab(a-b) = a^3 - b^3$

So,

$3[a - \frac{1}{a}] + [a - \frac{1}{a}]^3 = a^3 - \frac{1}{a^3}$

Sol.364.(a) $If,\ x^4 + \frac{1}{x^4} = 194$ then,

$x^2 + \frac{1}{x^2} = \sqrt{194 + 2} = 14$

When, $x^2 + \frac{1}{x^2} = 14$ then

$x + \frac{1}{x} = \sqrt{14 + 2} = 4$

Now, $x^3 + \frac{1}{x^3} = 4^3 - 4 \times 3 = 64 - 12 = 52$

Sol.365.(b) $(a+1)^2 + (a+2)^2 = 16$

$\Rightarrow a^2 + 2a + 1 + a^2 + 4a + 4 = 16$

$\Rightarrow 2a^2 + 6a + 5 = 16$

$\Rightarrow 2(2a^2 + 6a + 5) = 16 \times 2$

$\Rightarrow 4a^2 + 12a + 10 = 32$

So, $4a^2 + 12a + 10 + 30 = 32 + 30$

$\Rightarrow 4a^2 + 12a + 40 = 62$

Sol.366.(a) I. $K + \frac{1}{K} = 12$

then $K^2 + \frac{1}{K^2} = 144 - 2 = 142$ (True)

II. The value of

$(K^2 + \frac{1}{K^2})(K - \frac{1}{K})(K^4 + \frac{1}{K^4})(K + \frac{1}{K})$

$= (K^2 + \frac{1}{K^2})(K^2 - \frac{1}{K^2})(K^4 + \frac{1}{K^4})$

$= (K^4 - \frac{1}{K^4})(K^4 + \frac{1}{K^4})$

$= (K^8 - \frac{1}{K^8}) \neq K^{16} - \frac{1}{K^{16}}$ (not true)

So, only 1 statement is correct.

Sol.367.(c) $2x - 1 = 0 \Rightarrow x = \frac{1}{2}$,

Put $x = \frac{1}{2}$ in the given equation.

$3x^4 - 2x^2 + 4x - 1$

$= 3(\frac{1}{2})^4 - 2(\frac{1}{2})^2 + 4(\frac{1}{2}) - 1$

$= \frac{3}{16} - \frac{1}{2} + 2 - 1 = \frac{11}{16}$

So, the remainder $= \frac{11}{16}$

Sol.368.(d) $(a + b)^2 - (a - b)^2$

$= (a^2 + b^2 + 2ab) - (a^2 + b^2 - 2ab)$

$= a^2 + b^2 + 2ab - a^2 - b^2 + 2ab = 4ab$

Sol.369.(d) $9m^2 + n^2 = 40$ and mn = 4

$\Rightarrow 9m^2 + n^2 + 6mn = 40 + 6mn$

$\Rightarrow (3m + n)^2 = 40 + 24 = 64$

$\Rightarrow 3m + n = 8$

Sol.370.(a) $x^2 + 4y^2 + 4y - 4xy - 2x - 8$

$= (x^2 - 4xy + 4y^2) + 4y - 2x - 8$

$= (x - 2y)^2 - 2(x - 2y) - 8$

$(x - 2y)^2 - 4(x - 2y) + 2(x - 2y) - 8$

$= (x - 2y)\{(x - 2y) - 4\}$

$+ 2\{(x - 2y) - 4\}$

$= \{x - 2y - 4\}\{x - 2y + 2\}$

Sol.371.(a) $y = 1 + \sqrt{3} + \sqrt{4}$

$y - 1 = \sqrt{3} + \sqrt{4}$

Squaring both side, we have :

$(y-1)^2 = (\sqrt{3} + \sqrt{4})^2$

$y^2 + 1 - 2y = 3 + 4 + 4\sqrt{3}$

$y^2 + 1 - 2y = 7 + 4\sqrt{3} \Rightarrow y^2 - 2y - 6 = 4\sqrt{3}$

Again, squaring both side, we have :

$(y^2 - 2y - 6)^2 = (4\sqrt{3})^2$

$y^4 + 4y^2 + 36 - 4y^3 + 24y - 12y^2 = 48$

$y^4 - 8y^2 - 12 - 4y^3 + 24y = 0$

Multiplying both side by 2,

$2y^4 - 16y^2 - 24 - 8y^3 + 48y = 0$

$2y^4 - 8y^3 - 6y^2 + 28y - 84 - 10y^2 + 60 + 20y = 0$

$2y^4 - 8y^3 - 6y^2 + 28y - 84 - 10(y^2 - 6 - 2y) = 0$

$2y^4 - 8y^3 - 6y^2 + 28y - 84 = 10(y^2 - 6 - 2y)$

$= 10 \times 4\sqrt{3} = 40\sqrt{3}$

Sol.372.(d) $x = \frac{\sqrt{5} - \sqrt{4}}{\sqrt{5} + \sqrt{4}}$

$= \frac{(\sqrt{5} - \sqrt{4})(\sqrt{5} - \sqrt{4})}{(\sqrt{5} + \sqrt{4})(\sqrt{5} - \sqrt{4})} = (\sqrt{5} - \sqrt{4})^2$

$y = \frac{\sqrt{5} + \sqrt{4}}{\sqrt{5} - \sqrt{4}} = \frac{(\sqrt{5} + \sqrt{4})(\sqrt{5} + \sqrt{4})}{(\sqrt{5} - \sqrt{4})(\sqrt{5} + \sqrt{4})}$

$= (\sqrt{5} + \sqrt{4})^2$

$x^2 + y^2 = [\sqrt{5} - \sqrt{4}]^4 + [\sqrt{5} + \sqrt{4}]^4$

$= \{(\sqrt{5} - \sqrt{4})^2 + (\sqrt{5} + \sqrt{4})^2\}^2 - 2(\sqrt{5} - \sqrt{4})^2 (\sqrt{5} + \sqrt{4})^2$

$= 18^2 - 2 = 324 - 2 = 322$

$\Rightarrow \frac{x^2 - xy + y^2}{x^2 + xy + y^2} = \frac{322 - 1}{322 + 1} = \frac{321}{323}$

Sol.373.(b) $\frac{2p}{p^2 - 5p + 1} = \frac{1}{10}$

$\Rightarrow p^2 - 5p + 1 = 20p$

$\Rightarrow p^2 - 25p + 1 = 0$

Dividing both side by p.

$\Rightarrow p + \frac{1}{p} = 25$

Sol.374.(c) On checking all the options for the values a and b one by one, option (c) gets satisfied.

$a^2 = b^2 + (ab)^2$

$cot^2x = cos^2x + cos^2x cot^2x$

$cot^2x = cos^2x(1 + cot^2x) = cos^2x.cosec^2x$

$cot^2x = cot^2x$

LHS = RHS (satisfied)

Sol.375.(b)

$\frac{1}{1+a+\frac{1}{b}} + \frac{1}{1+b+\frac{5}{c}} + \frac{1}{1+\frac{c}{5}+\frac{1}{a}}$

putting a = b = 1 and c = 5 in the given expression

$\frac{1}{1+1+1} + \frac{1}{1+1+\frac{5}{5}} + \frac{1}{1+\frac{5}{5}+1}$

$= \frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{3}{3} = 1$

Sol.376.(b)

$4(z + 7)(2z - 1) = (4z + 28)(2z - 1)$

$= 8z^2 - 4z + 56z - 28 = 8z^2 + 52z - 28$

Now, $8z^2 + 52z - 28 = Az^2 + Bz + C$

On comparing both side, we have :

A = 8, B = 52 , C = - 28

So, A + B + C = 8 + 52 - 28 = 32

Sol.377.(c) $p^3 + 27 = p^3 + 3^3$

$= (p + 3)(p^2 + 3^2 - 3p) = (p + 3)(p^2 + 9 - 3p)$

Sol.378.(d) Formula used :

$(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

$a^2 + b^2 + c^2 = 9^2 - 2 \times 23 = 81 - 46 = 35$

Sol.379.(b) $x - \frac{1}{x} = \sqrt{(2\sqrt{5})^2 - 4}$

$= \sqrt{20 - 4} = \sqrt{16} = 4$

$x^3 - \frac{1}{x^3} = (4)^3 + 3 \times 4 = 64 + 12 = 76$

Sol.380.(a) Formula : $x^3 + y^3 + z^3 = 3xyz$ (when x + y + z = 0)

$\frac{x^2}{yz} + \frac{y^2}{zx} + \frac{z^2}{xy} = \frac{x^3 + y^3 + z^3}{xyz}$

$= \frac{3xyz}{xyz} = 3$

Sol.381.(b) $(a + b)^3 - a^3 + b^3$

$= a^3 + b^3 + 3ab(a + b) - a^3 + b^3$

$= 2b^3 + 3ab(a + b)$

Sol.382.(b) If $x^2 + \frac{1}{x^2} = 66$

$(x - \frac{1}{x})^2 = 66 - 2 = 64 \Rightarrow x - \frac{1}{x} = \sqrt{64} = 8$

Sol.383.(c) $P - \frac{1}{P} = 6$

$P^2 + \frac{1}{P^2} = 6^2 + 2 = 38$

$P^4 + \frac{1}{P^4} = 38^2 - 2 = 1444 - 2 = 1442$

Sol.384.(d)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$x^4 - 15x^3 + 15x^2 - 15x + 40$; (given x = 14)

$x^4 - 14x^3 - x^3 + 14x^2 + x^2 - 14x - x + 14 + 26$

$x^3(x - 14) - x^2(x - 14) + x(x - 14) - 1(x - 14) + 26$

Putting x = 14, we get,

$x^4 - 15x^3 + 15x^2 - 15x + 40 = 26$

Sol.385.(b) $y - \frac{1}{y} = \sqrt{11^2 - 4}$

$= \sqrt{121 - 4} = \sqrt{117} = 3\sqrt{13}$

$y^3 - \frac{1}{y^3} = (3\sqrt{13})^3 + 3 \times 3\sqrt{13}$

$= 351\sqrt{13} + 9\sqrt{13} = 360\sqrt{13}$

Sol.386.(b) $(x - \frac{1}{x})^2 = 12$

$x - \frac{1}{x} = \sqrt{12} = 2\sqrt{3}$

Now, $x + \frac{1}{x} = \sqrt{(2\sqrt{3})^2 + 4} = \sqrt{16} = 4$

So, $x^2 - \frac{1}{x^2} = 4 \times 2\sqrt{3} = 8\sqrt{3}$

Sol.387.(b) $a^3 + b^3 + c^3 = 3abc$,
either a + b + c = 0 or a = b = c

Sol.388.(d) $m + \frac{1}{m-2} = 4$

Subtracting both side by 2. We get :

$m - 2 + \frac{1}{m-2} = 2$

So, $(m - 2)^2 + \frac{1}{(m-2)^2} = 2^2 - 2 = 2$

Sol.389.(a) $5x - \frac{5}{x} + 6 = 0$

$5x - \frac{5}{x} = -6 \Rightarrow 5(x - \frac{1}{x}) = -6$

$(x - \frac{1}{x}) = \frac{-6}{5}$

$x^2 + \frac{1}{x^2} = (\frac{-6}{5})^2 + 2 = \frac{86}{25}$

Sol.390.(c) $\frac{a^3 - b^3}{a^2 - b^2} - \frac{3ab}{a+b}$

$= \frac{(a-b)(a^2 + b^2 + ab)}{(a-b)(a+b)} - \frac{3ab}{a+b}$

$= \frac{(a^2 + b^2 + ab)}{a+b} - \frac{3ab}{a+b} = \frac{a^2 + b^2 - 2ab}{a+b}$

$= \frac{(a-b)^2}{a+b} = \frac{(26-22)^2}{26+22} = \frac{16}{48} = \frac{1}{3}$

Sol.391.(b) $(a - b + c)^2$

$= a^2 + b^2 + c^2 - 2ab - 2bc + 2ca$

Sol.392.(b) $\frac{x}{8} + \frac{1}{\frac{x}{8}} = 1$

By applying formula, [$a^3 + b^3 = (a + b)\{a^2 - ab + b^2\}$] we get,

$(\frac{x}{8})^3 + \frac{1}{(\frac{x}{8})^3} = 1 - 3 = -2 \Rightarrow \frac{x}{8} = -1$

$x = -8$ So, $x^3 = (-8)^3 = -512$

Sol.393.(d) Formula used :

$p^3 + q^3 + r^3 = 3pqr$ (when p + q + r = 0)

P + q + r = 8.15 + 9.06 - 17.21 = 0

So, $p^3 + q^3 + r^3 - 3pqr = 3pqr - 3pqr = 0$

Sol.394.(b) $x^4 + (\frac{2}{x})^4 = 15617$

$(x^2 + \frac{4}{x^2})^2 = 15617 + 8 = 15625$

$x^2 + (\frac{2}{x})^2 = \sqrt{15625} = 125$

$(x + \frac{2}{x})^2 = 125 + 4 = 129$

$x + \frac{2}{x} = \sqrt{129}$

Sol.395.(a) Formula used ; $(x + y + z)^2$

$= x^2 + y^2 + z^2 + 2(xy + yz + zx)$

$0 = 40 + 2(xy + yz + zx)$

$-40 = 2(xy + yz + zx)$

$xy + yz + zx = \frac{-40}{2} = -20$

Sol.396.(a) I. $x^3 + y^3 + z^3 = 12^3 - 2^3 - 10^3$

= 1728 - 8 - 1000 = 720

II. $4(x^2 + y^2) = 4[(x + y)^2 - 2xy]$

$= 4[48^2 - 64] = 4[2304 - 64]$

$= 4 \times 2240 = 8960$

Clearly, we can see that neither statement I nor II is correct..

Sol.397.(b) It is given that $x + \frac{1}{x} = 6$

Now , $\frac{3x}{2x^2 - 5x + 2}$

On dividing numerator and denominator by x, we get :

$\frac{3}{2x - 5 + \frac{2}{x}} = \frac{3}{2(x + \frac{1}{x}) - 5}$

$= \frac{3}{12 - 5} = \frac{3}{7}$

Sol.398.(d)

$8p^3 + q^3 = (2p + q)[(2p + q)^2 - 6pq]$

$361 = 19[361 - 6pq]$

$19 = 361 - 6pq \Rightarrow 342 = 6pq$

$pq = \frac{342}{6} = 57$

Sol.399.(a) $\frac{a}{b} + \frac{b}{a} = -1$

$\frac{a^2 + b^2}{ab} = -1 \Rightarrow a^2 + b^2 = -ab$

Now, $(a - b)^2 = a^2 + b^2 - 2ab$

$4 = a^2 + b^2 - 2ab = -ab - 2ab = -3ab$

$ab = -\frac{4}{3}$

$a^3 - b^3 = (a - b)[(a - b)^2 + 3ab]$

$= 2[4 + 3 \times (\frac{-4}{3})] = 2 \times 0 = 0$

Sol.400.(d) $x = 2 - 2^{\frac{1}{3}} + 2^{\frac{2}{3}}$

$x - 2 = 2^{\frac{2}{3}} - 2^{\frac{1}{3}}$

Taking cube on both side,

$(x - 2)^3 = (2^{\frac{2}{3}} - 2^{\frac{1}{3}})^3$

$x^3 - 8 - 6x^2 + 12x$

$= 4 - 2 - 3 \times 2^{\frac{2}{3}} \times 2^{\frac{1}{3}}(2^{\frac{2}{3}} - 2^{\frac{1}{3}})$

$x^3 - 10 - 6x^2 + 12x = -6(x - 2)$

$x^3 - 10 - 6x^2 + 12x + 6x - 12 = 0$

$x^3 - 6x^2 + 18x = 22$

Sol.401.(b)

$\frac{2abc}{9} = \frac{2 \times (-12)(-6)18}{9} = 288$

Sol.402.(a) $x^4 + \frac{1}{x^4} = 47$

Adding both side by 2,

$(x^2 + \frac{1}{x^2})^2 = 49 \Rightarrow x^2 + \frac{1}{x^2} = \sqrt{49} = 7$

Again, Adding both side by 2

$(x + \frac{1}{x})^2 = 9 \Rightarrow x + \frac{1}{x} = 3$

So, $x + \frac{1}{x} - 2 = 3 - 2 = 1$

Sol.403.(c) Formula used :

$a^3 + b^3 + c^3 = 3abc$ (when a + b + c = 0)

$a^2 - b^2 = (a - b)(a + b)$

Now, (x - y) + (y - z) + (z - x) = 0

$\Rightarrow (x - y)^3 + (y - z)^3 + (z - x)^3$

$= 3(x - y)(y - z)(z - x)$ $(x^2 - y^2) + (y^2 - z^2) + (z^2 - x^2) = 0$

$\Rightarrow (x^2 - y^2)^3 + (y^2 - z^2)^3 + (z^2 - x^2)^3 = 3(x^2 - y^2)(y^2 - z^2)(z^2 - x^2)$

So, $\frac{(x-y)^3 + (y-z)^3 + (z-x)^3}{(x^2-y^2)^3 + (y^2-z^2)^3 + (z^2-x^2)^3}$

$= \frac{3(x-y)(y-z)(z-x)}{3(x^2-y^2)(y^2-z^2)(z^2-x^2)}$

$= \frac{1}{(x+y)(y+z)(z+x)}$

Sol.404.(c) As we know that,

$(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

$10^2 = 38 + 2(ab + bc + ca)$

$62 = 2(ab + bc + ca) \Rightarrow 31 = ab + bc + ca$

Now, $(a - b)^2 + (b - c)^2 + (c - a)^2$

$= 2[a^2 + b^2 + c^2 - (ab + bc + ca)]$

$= 2[38 - 31] = 2 \times 7 = 14$

Sol.405.(a) $16y^2 - k = (4y + \frac{3}{2})(4y - \frac{3}{2})$

$\Rightarrow 16y^2 - k = (4y)^2 - (\frac{3}{2})^2$

[$(a + b)(a - b) = (a^2 - b^2)$]

$\Rightarrow 16y^2 - k = 16y^2 - \frac{9}{4} \Rightarrow k = \frac{9}{4}$

Sol.406.(c) Formula used :

$(m - n)^3 = m^3 - n^3 - 3mn(m-n)$

$\Rightarrow \frac{\{(m^2 + n^2)(m - n) - (m - n)^3\}}{(m^2 n - mn^2)} =$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\frac{\{m^3 - m^2n + n^2m - n^3 - (m^3 - n^3 - 3m^2n + 3mn^2)\}}{(m^2n - mn^2)}$

$= \frac{2(m^2n - mn^2)}{m^2n - mn^2} = 2$

Sol.407.(d) Formula used :

$(x + y + z)^2 = x^2 + y^2 + z^2 + 2(xy + yz + zx)$

$x^3 + y^3 + z^3 - 3xyz = (x + y + z)[x^2 + y^2 + z^2 - (xy + yz + zx)]$

$x + y + z = 8$, $x^2 + y^2 + z^2 = 20$

Now, $xy + yz + zx = \frac{8^2 - 20}{2} = 22$

So, $x^3 + y^3 + z^3 - 3xyz = 8(20 - 22)$

$= 8 \times (-2) = -16$

Sol.408.(d)

$\{(1 \div x) \times (x^3 - 2x^2) + (4^3 \div 2^5) \times x\} \div 25 = 1$

$\{\frac{1}{x} \times x(x^2 - 2x) + (64 \div 32) \times x\} = 25$

$\{(x^2 - 2x) + 2x\} = 25 \Rightarrow x^2 = 25 \Rightarrow x = \pm 5$

So, the possible value of x is 5 and -5 .

Sol.409.(a)

$(7x + 4y)^2 + (7x - 4y)^2 = 2[(7x)^2 + (4y)^2]$

$= 2[49x^2 + 16y^2] = 98x^2 + 32y^2$

Sol.410.(c) 6x + 7y = 5xy -------- (1)

10y - 4x = 4xy

5y - 2x = 2xy -------- (2)

Then , [eq . (2)] × 3

15y - 6x =6xy ---------(3)

Adding eqn. (1) and (3) we get:

22y = 11xy ⇒ x = 2

Putting x = 2 in eqn(2) we get : y = 4

Sol.411.(b) The best approach to solve his question is the value putting method.

By putting x = 6 and y = 4, we get :

x + y = 6 + 4 = 10 and 2xy = 2 × 6 × 4

= 48(satisfied)

So, 2x – y = 2 × 6 – 4 = 8

Sol.412.(a) $a^2 + b^2 + 1 = 2a$

$\rightarrow (a - 1)^2 + b^2 = 0$

→ a = 1 and b = 0

So, $a^4 + b^7 = 1^4 + 0 = 1$

Sol.413. (a) Formula used :

$x^3 + y^3 + z^3 = 3abc$ (when a + b + c = 0)

Now, $\frac{a^2}{bc} + \frac{b^2}{ac} + \frac{c^2}{ab} = \frac{a^3 + b^3 + c^3}{abc}$

$= \frac{3abc}{abc} = 3$

Sol.414.(a) Formula used :

$(x - y)^3 = x^3 - y^3 - 3xy(x - y)$

$(x + y)^3 - (x - y)^3 - 6y(x^2 - y^2)$

$= (x + y)^3 - (x - y)^3 - 3(x + y)(x - y)2y$

$= (x + y)^3 - (x - y)^3 - 3(x + y)(x - y)[x + y - (x - y)]$

$= [(x + y) - (x - y)]^3 = [2y]^3 = 8y^3$

Sol.415.(d) $x^2 + 6x + 1 = 0$

Dividing both side by x,

$x + 6 + \frac{1}{x} = 0 \Rightarrow x + \frac{1}{x} = -6$

$x^3 + \frac{1}{x^3} = (-6)^3 - 3 \times (-6)$

= - 216 + 18 = -198

Also, $x + 6 = -\frac{1}{x}$

Now, $(x + 6)^3 + \frac{1}{(x + 6)^3} = -(\frac{1}{x^3} + x^3)$

= 198

Sol.416.(d) Putting b = 1, we have ;

$a^2 = 82 - 1 = 81 \Rightarrow a = 9$

and $c^2 = 65 - 1 = 64 \Rightarrow c = 8$

Now ,

2a + 7b - 3c = 2 × 9 + 7 × 1 - 3 × 8

= 18 + 7 - 24 = 1

Sol.417.(b) $x(x - 5) = -1$

$x - 5 = \frac{-1}{x} \Rightarrow x + \frac{1}{x} = 5$..... (1)

Now, $x^3 + \frac{1}{x^3} = 5^3 - 3 \times 5 = 110$

$\Rightarrow x^6 + 1 = 110x^3 \Rightarrow x^6 - 110x^3 = -1$

$\Rightarrow x^3(x^3 - 110) = -1$

Sol.418.(c) Given, $a + \frac{1}{a} = p^2$,

$(a + b)^2 = a^2 + b^2 + 2ab$

Then, $a^2 + \frac{1}{a^2} = p^4 - 2$

Sol.419.(a) a = - 9.6, b = 4.44

and c = 5.16,

If a + b + c = 0

⇒ - 9.6 + 4.44 + 5.16 = 0

then $a^3 + b^3 + c^3 - 3abc = 0$

Sol.420.(c) $\sqrt{1 + \frac{x}{529}} = \frac{24}{23}$

$1 + \frac{x}{529} = \frac{576}{529}$

$\frac{x}{529} = \frac{47}{529} \Rightarrow x = 47$

Sol.421.(a)

$k(21x^2 + 24) + rx + (14x^2 - 9) = 0$ ------(i)

$k(7x^2 + 8) + px + (2x^2 - 3) = 0$ ----(ii)

Multiply equation (ii) by 3 and subtract from equation (i),

$k(21x^2 + 24) + rx + (14x^2 - 9) - 3 \times [k(7x^2 + 8) + px + (2x^2 - 3)] = 0$

$8x^2 - (3p - r)x + 0 = 0$ --------(iii)

So let roots of equation (iii) are α *and* β

$\alpha + \beta = \frac{3p - r}{8} \Rightarrow \alpha\beta = 0$

Equations have both roots common.

so, $\frac{3p - r}{8} = 0 \Rightarrow \frac{p}{r} = \frac{1}{3}$

Sol.422.(c)

$\frac{\sqrt{7} + \sqrt{5}}{\sqrt{7} - \sqrt{5}} \div \frac{\sqrt{14} + \sqrt{10}}{\sqrt{14} - \sqrt{10}} + \frac{\sqrt{10}}{\sqrt{5}}$

$= \frac{\sqrt{7} + \sqrt{5}}{\sqrt{7} - \sqrt{5}} \times \frac{\sqrt{14} - \sqrt{10}}{\sqrt{14} + \sqrt{10}} + \frac{\sqrt{2} \times \sqrt{5}}{\sqrt{5}}$

$= \frac{\sqrt{7} + \sqrt{5}}{\sqrt{7} - \sqrt{5}} \times \frac{\sqrt{2}(\sqrt{7} - \sqrt{5})}{\sqrt{2}(\sqrt{7} + \sqrt{5})} + \sqrt{2} = 1 + \sqrt{2}$

Sol.423.(d) $(x + \frac{1}{x})^2 = 3$

$\Rightarrow x^2 + \frac{1}{x^2} + 2 = 3 \Rightarrow x^2 + \frac{1}{x^2} = 1$

On cubing above equation, we get

$(x^2 + \frac{1}{x^2})^3 = 1^3 \Rightarrow x^6 + \frac{1}{x^6} + 3(x^2)(\frac{1}{x^2}) = 1$

$x^6 + \frac{1}{x^6} + 3 = 1 \Rightarrow x^6 + \frac{1}{x^6} = -2$

So, $x^6 + x^{-6} = -2$

Sol.424.(a) 2X + 3Y = 12 .....(1)

3X - 2Y = 5 .....(2)

Multiplying eqn (1) by 3 and eqn (2) by 2, we get

6X + 9Y = 36 .....(3)

6X - 4Y = 10 .....(4)

Solving equation (3) and (4), we get

X = 3 and Y = 2

So, option (a) is the correct answer.

Sol.425.(c) Let $x = 3$ and $y = -2$

Putting above values of x and y, we get

$xy = (3)(-2) = -6$ ....(satisfied)

$x^3 + y^3 = 3^3 + (-2)^3$

= 27 - 8 = 19 .....(satisfied)

Hence, $x = 3$ and $y = -2$

So,

$\frac{1}{x^{-1}} + \frac{1}{y^{-1}} = x + y = 3 + (-2) = 3 - 2 = 1$

Sol.426.(c) $2^x = 3^y = 6^z = K$

$\Rightarrow 2 = K^{\frac{1}{x}}, 3 = K^{\frac{1}{y}}, 6 = K^{\frac{1}{z}}$

Now, 2 × 3 = 6

$\Rightarrow K^{\frac{1}{x}} \times K^{\frac{1}{y}} = K^{\frac{1}{z}} \Rightarrow K^{\frac{1}{x} + \frac{1}{y}} = K^{\frac{1}{z}}$

$\Rightarrow \frac{1}{x} + \frac{1}{y} = \frac{1}{z} \Rightarrow \frac{1}{x} + \frac{1}{y} - \frac{1}{z} = 0$

Sol.427.(d) $a + b = \sqrt{11}$

$\Rightarrow a^2 + b^2 = 11 - 2ab$ --------- (1)

$\Rightarrow a - b = \sqrt{7} \Rightarrow a^2 + b^2 = 7 + 2ab$-------- (2)

From equation (1) and (2) we have:

⇒ 11 - 2ab = 7 + 2ab ⇒ 4 = 4ab ⇒ ab = 1

Putting ab = 1 in eq .(1) we get :

$\Rightarrow a^2 + b^2 = 11 - 2 = 9$

Now, $a^2b^2(a^2 + b^2) = 1^2 \times 9 = 9$

Sol.428.(a)

Arithmetic mean of x and y = $\frac{x + y}{2} = 8$

⇒ x + y = 16

Geometric mean of x and y = $\sqrt{xy} = 3\sqrt{7}$

$\Rightarrow xy = (3\sqrt{7})^2 = 63$

$x^3 + y^3 = (x + y)[(x + y)^2 - 3xy]$

$= 16[16^2 - 3 \times 63] = 16[256 - 189]$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

= 16 × 67 = 1072

Sol.429.(c)

$25x^2 + 16y^2 + 9z^2 - 40xy + 24yz - 30zx$

$= (-5x)^2 + (4y)^2 + (3z)^2 - (2.5x.4y) + (2.4y.3z) - (2.5x.3z)$

$= (-5x + 4y + 3z)^2$

Sol.430.(a) $xy = 6$ and

$x^2y + xy^2 + x + y = 63$

$\Rightarrow xy(x + y) + (x + y) = 63$

$\Rightarrow 6(x + y) + (x + y) = 63$

$\Rightarrow 7(x + y) = 63 \Rightarrow x + y = 9$

Squaring both sides,

$\Rightarrow x^2 + y^2 + 2xy = 81$

$\Rightarrow x^2 + y^2 = 81 - 12 \Rightarrow x^2 + y^2 = 69$

Sol.431.(b) Formula: $a^3 + b^3 + c^3 - 3abc$

$= (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$

$x^3 + 27y^3 + 64z^3 - 36xyz$

$= (x)^3 + (3y)^3 + (4z)^3 - 3.x.3y.4z$

$=(x + 3y + 4z)(x^2 + 9y^2 + 16z^2 - 3xy - 12yz - 4xz)$

Sol.432.(b)

$(a + b)^2 + (a - b)^2 = 2(a^2 + b^2)$

$= (5x + 4y)^2 + (5x - 4y)^2$

$= 2(25x^2 + 16y^2) = 50x^2 + 32y^2$

Sol.433.(a) Let the required no. be A

ATQ,

$(x^3 - 3x^2y + 3xy^2 - y^3) - A = x^3 - y^3$

$A = (x^3 - 3x^2y + 3xy^2 - y^3) - x^3 + y^3$

$A = -3x^2y + 3xy^2$

Sol.434.(b) $(a + b)^2 = (a - b)^2 + 4ab$

$= 10^2 + 4 \times 4 = 100 + 16 = 116$

$a^3 - b^3 = 10(10^2 + 3 \times 4) = 10(100 + 12)$

$= 10 \times 112 = 1120$

So, $a^3 - b^3 + 4(a + b)^2 = 1120 + 4 \times 116$

$= 1120 + 464 = 1584$

Sol.435.(c) Putting x = y = 1, we get a = 2, b = 0 and c = 1

So, $a^2 + b^2 + c^2 - 2ab + 2ac - 2bc = 2^2 + 0 + 1^2 - 0 + 2 \times 2 \times 1 - 0 = 4 + 1 + 4 = 9$

Now, on putting x = y = 1 in all the options given, option (c) gets satisfied.

$(2x + 2y - 1)^2 = (2 + 2 - 1)^2$

$= 3^2 = 9$ (satisfied)

Sol.436.(a)

$y^6 + \frac{1}{y^6} = (y^3 + \frac{1}{y^3})^2 - 2$

$\Rightarrow y^3 + \frac{1}{y^3} = (\sqrt{5})^3 - 3 \times \sqrt{5} = 5\sqrt{5} - 3\sqrt{5}$

$= 2\sqrt{5}$

So, $y^6 + \frac{1}{y^6} = (2\sqrt{5})^2 - 2 = 20 - 2 = 18$

Sol.437.(b)

$P = \frac{x^2 - 100}{x^2 - 16} = \frac{(x-10)(x+10)}{(x-4)(x+4)}$,

$Q = \frac{x+10}{x-4}$

So, $\frac{P}{Q} = \frac{(x-10)(x+10)}{(x-4)(x+4)} \times \frac{x-4}{(x+10)}$

$= \frac{x-10}{x+4}$

Sol.438.(a)

$\frac{a}{2} = \frac{b}{3} = \frac{c}{4} = \frac{2a - 3b + 5c}{k}$ = n(let)

a = 2n , b = 3n, c = 4n and

$2a - 3b + 5c$ = kn -------(i)

Put value of a,b and c in equation (i),

2 × 2n - 3 × 3n + 5 × 4n = kn

⇒ 4n - 9n + 20n = kn ⇒ 15n = kn ⇒ k = 15

Sol.439.(c) $\frac{x-1}{x} = 5 \Rightarrow x - 1 = 5x$

$\Rightarrow 4x = -1 \Rightarrow \frac{1}{x} = -4$

So, $1 + \frac{1}{x^2} = 1 + 16 = 17$

Sol.440.(c) $2x + \frac{1}{3x} = 12$

Multiplying both side by $\frac{3}{2}$,

$3x + \frac{1}{2x} = 18$

So, $9x^2 + \frac{1}{4x^2} = 18^2 - (2 \times 3 \times \frac{1}{2})$

= 324 - 3 = 321

Sol.441.(c) $\frac{4}{x} - \frac{3}{2x} = 20$

$\Rightarrow \frac{8-3}{2x} = 20 \Rightarrow 5 = 40x \Rightarrow x = \frac{5}{40} = \frac{1}{8}$

Sol.442.(a) Formula used :

$x^3 - y^3 = (x - y)[(x - y)^2 + 3xy]$

$\Rightarrow 520 = 5[5^2 + 3xy] \Rightarrow 104 = 25 + 3xy$

$\Rightarrow 79 = 3xy \Rightarrow xy = \frac{79}{3}$

Sol.443.(d) Formula used:

$x^3 + y^3 + z^3 = 3xyz$,

when (x + y + z) = 0

$\frac{x^2}{yz} + \frac{y^2}{zx} + \frac{z^2}{xy} = \frac{x^3 + y^3 + z^3}{xyz}$

$= \frac{3xyz}{xyz} = 3$

Sol.444.(c)

$(2a - b)^2 = (2a + b)^2 - 4(2a)b$

$(2a - b)^2 = 10^2 - 4 \times 9$

$(2a - b)^2 = 100 - 36 = 64 \Rightarrow 2a - b = 8$

Sol.445.(b) $a^2 + b^2 = (a + b)^2 - 2ab$

$= 12^2 - 2 \times 35 = 144 - 70 = 74$

$a^4 + b^4 = (a^2 + b^2)^2 - 2a^2b^2 =$

$74^2 - 2 \times 35^2 = 5476 - 2450 = 3026$

$a^4 + b^4 - 10^3 = 3026 - 1000 = 2026$

Sol.446.(a) $(a^3 + 8b^3)$ = (a+2b)

$\{(a + 2b)^2 - 3 \times 2ab\}$

$5427 = 27\ (27^2 - 3 \times 2ab)$

$201 = 729 - 3 \times 2ab \Rightarrow 2ab = \frac{528}{3} = 176$

Sol.447.(c) $x^2 + ax = b$

By cubing both side, we get:

$x^6 + x^3a^3 + 3ax^3 \times b = b^3$

$x^3(x^3 + a^3 + 3ab) = b^3$

Now , comparing this equation with the given equation i.e. $x^3(x^3 + c) = d$

$c = a^3 + 3ab$ and $d = b^3$

Sol.448.(c) As we know that ,

$x^3 + y^3 + z^3 - 3xyz$

$= (x + y + z)(x^2 + y^2 + z^2 - xy - yz - xz)$

So, when $x + y + z = 0$,

we have, $x^3 + y^3 + z^3 - 3xyz = 0$

Sol.449.(a) $r + \frac{64}{r} = 16$

On putting value, r = 8

$8 + \frac{64}{8} = 16 \Rightarrow 16 = 16$ (satisfy)

$r^4 + \frac{1}{r^3} = 8^4 + \frac{1}{8^3} = 4096\frac{1}{512}$

Sol.450.(c) On putting value, p = 11

$p(p^2 + 3p + 3) \Rightarrow 11(11^2 + 3 \times 11 + 3)$

$\Rightarrow 11(121 + 33 + 3) \Rightarrow 11 \times 157 = 1727$

Sol.451.(a) $\frac{X^2}{y^2} + \frac{y^2}{X^2} = 7$

Let $\frac{X}{y} = k$ then $\frac{y}{X} = \frac{1}{k}$

$k^2 + \frac{1}{k^2} = 7 \Rightarrow k^2 + \frac{1}{k^2} + 2 = 7 + 2$

$k + \frac{1}{k} = 3 \Rightarrow \frac{X^3}{y^3} + \frac{y^3}{X^3} = k^3 + \frac{1}{k^3}$

$k^3 + \frac{1}{k^3} = 3^3 - 3 \times 3$

$k^3 + \frac{1}{k^3} = 18$ So, $\frac{X^3}{y^3} + \frac{y^3}{X^3} = 18$

Sol.452.(c) $a^2 - 4a + 1 = 0$

Dividing both side by a

$a + \frac{1}{a} = 4$; $a^2 + \frac{1}{a^2} = 4^2 - 2 = 14$

$a^2 + \frac{1}{a^2} + a + \frac{1}{a} = 14 + 4 = 18$

Sol.453.(b) Formula used :

$x^3 - \frac{1}{x^3} = (x - \frac{1}{x})^3 + 3(x - \frac{1}{x})$

$x^3 - \frac{1}{x^3} = (\frac{7}{3})^3 + 3 \times \frac{7}{3} = \frac{343}{27} + 7$

$= \frac{532}{27} = 19\frac{19}{27}$

Sol.454.(a) $x^3 + \frac{1}{x^3} = (\frac{11}{5})^3 - 3 \times \frac{11}{5}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{1331}{125} - \frac{33}{5} = \frac{506}{125} = 4\frac{6}{125}$

Sol.455.(d) Formula used :

$(1 + x + x^2)(1 - x + x^2) = 1 + x^2 + x^4$

So, $1 + x + x^2 = \frac{585}{65} = 9$

Sol.456.(c)

Formula used : $a^2 + b^2 + c^2 - ab - bc - ca$

$= \frac{1}{2}[(a - b)^2 + (b - c)^2 + (c - a)^2]$

$\Rightarrow a^2 + b^2 + c^2 - ab - bc - ca$

$= \frac{1}{2}[(2022 - 2021)^2 +$

$(2021 - 2020)^2 + (2020 - 2022)^2]$

$\Rightarrow \frac{1}{2} \times [1 + 1 + 4] = \frac{1}{2} \times 6 = 3$

Sol.457.(d) $(x - 2y)^2 = x^2 + 4y^2 - 4xy$

$= 40 - 4 \times 6 = 40 - 24 = 16 \Rightarrow x - 2y = 4$

Sol.458.(b) $x^2 - 8x + 1 = 0$

Dividing both sides by x. We get

$x + \frac{1}{x} = 8 \Rightarrow x^2 + \frac{1}{x^2} = 64 - 2 = 62$

$x^4 + \frac{1}{x^4} = 3844 - 2 = 3842$

Multiplying both sides by x^4

$x^8 + 1 = 3842x^4 \Rightarrow x^8 - 3842x^4 + 1 = 0$

Sol.459.(c) $144x^2 - 36x + \frac{9}{4}$

$= (12x)^2 - 2 \times 12 \times \frac{3}{2} + (\frac{3}{2})^2 = (12x - \frac{3}{2})^2$

So, square of $12x - \frac{3}{2} = 144x^2 - 36x + \frac{9}{4}$

Sol.460.(b) It is given that,

a + b = 17 , ab = 34

$a^2 + b^2 = (a + b)^2 - 2ab$

$\Rightarrow 17^2 - 2 \times 34 = 289 - 68 = 221$

Sol.461.(a) Formula used :

$x^3 + y^3 + z^3 = 3xyz$, when x + y + z = 0

$8x^3 + 27y^3 + 64z^3 = 72\,xyz$

$(2x)^3 + (3y)^3 + (4z^3) = 3 \times 2x \times 3y \times 4z$

So, $2x + 3y + 4z = 0 \Rightarrow 2x + 3y = -4z$

Sol.462.(a) Formula used :

$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

$= \frac{[5.4^3 - 0.4^3]}{[5.4^2 + 5.4 \times 0.4 + 0.4^2]}$

$= \frac{(5.4 - 0.4)[5.4^2 + 5.4 \times 0.4 + 0.4^2]}{[5.4^2 + 5.4 \times 0.4 + 0.4^2]} = 5$

Sol.463.(b)

$x^5 - 10x^4 + 10x^3 - 10x^2 + 10x - 1$

$x^5 - 9x^4 - x^4 + 9x^3 + x^3 - 9x^2 - x^2 + 9x + x - 1$

$x^4(x - 9) - x^3(x - 9) + x^2(x - 9) - x(x - 9) + x - 1$

Putting x = 9 , we get

0 + 9 - 1 = 8

Sol.464.(a) Formula used :

$(x + y)^3 = x^3 + y^3 + 3xy(x + y)$

$(p + 1)^3 - 1 = p^3 + 3p^2 + 3p = 26$

$(p + 1)^3 = 3^3 \Rightarrow p + 1 = 3 \Rightarrow p = 2$

Now, $p^2 + 2p = 2^2 + 2 \times 2 = 4 + 4 = 8$

Sol.465.(c) $\frac{a}{b} + \frac{b}{a} = -1 \Rightarrow \frac{a^2 + b^2}{ab} = -1$

$\Rightarrow a^2 + b^2 = -ab \Rightarrow a^2 + b^2 + ab = 0$ .....(1)

$\Rightarrow 6(a^3 - b^3) = 6(a - b)(a^2 + b^2 + ab)$

$\Rightarrow 6(a^3 - b^3) = 6(a - b) \times 0$ (From eqn. 1)

$\Rightarrow 6(a^3 - b^3) = 0$

Sol.466.(a) $p^4 + \frac{1}{p^4} + 2 = 4354 + 2 = 4356$

$p^2 + \frac{1}{p^2} = \sqrt{4356} = 66$

$p^2 + \frac{1}{p^2} - 2 = 66 - 2 \Rightarrow p - \frac{1}{p} = \sqrt{64} = 8$

$p^3 - \frac{1}{p^3} = 8^3 + 3 \times 8 = 512 + 24 = 536$

Sol.467.(a)

$x^3 + y^3 = (x + y)[(x + y)^2 - 3xy]$

$= 14[14^2 - 3xy] = 2744 - 42xy$

$x^3 + y^3 + 42xy = 2744 - 42xy + 42xy$

$= 2744$

Short trick :

Putting x =14 , y = 0

$x^3 + y^3 + 42xy = 14^3 + 0 + 0 = 2744$

Sol.468.(c) $y = \frac{1}{3}(t + 1)$

$3y = t + 1 \Rightarrow x = 5t = t + 1$

$4t = 1 \Rightarrow t = \frac{1}{4}$

Sol.469.(a) $x^4 + \frac{1}{x^4} = 2207$

$x^2 + \frac{1}{x^2} = \sqrt{2207 + 2} = 47$

$x + \frac{1}{x} = \sqrt{47 + 2} = 7$

$x^3 + \frac{1}{x^3} = 7^3 - 3 \times 7 = 343 - 21 = 322$

$x^5 + \frac{1}{x^5} = (x^3 + \frac{1}{x^3})(x^2 + \frac{1}{x^2}) - (x + \frac{1}{x})$

$= (47 \times 322) - 7 = 15134 - 7 = 15127$

Sol.470.(b) $(2x + 3y + 4z) \times$

$(4x^2 + 9y^2 + 16z^2 - 6xy - 12yz - 8xz)$

$= (2x)^3 + (3y)^3 + (4z)^3 - 3 \times 2x \times 3y \times 4z$

$= 8x^3 + 27y^3 + 64z^3 - 72xyz$

Sol.471.(d)

$\Rightarrow 3ab \times (a + b)^{-1} \times (a^{-1} + b^{-1})$

$\Rightarrow 3ab \times \frac{1}{a + b} \times (\frac{1}{a} + \frac{1}{b})$

$\Rightarrow 3ab \times \frac{1}{a + b} \times \frac{a + b}{ab} = 3$

Sol.472.(d) $x^4 + \frac{1}{x^4} = 14159$

$x^2 + \frac{1}{x^2} = \sqrt{14159 + 2} = 119$

$x + \frac{1}{x} = \sqrt{119 + 2} = 11$

Sol.473.(c) Formula used:

$a^3 + b^3 = (a + b)^3 - 3ab(a + b)$

$8x^2 + 9x + 8 = 0$

Dividing both sides by 8x. We get

$x + \frac{1}{x} = -\frac{9}{8}$

$x^3 + \frac{1}{x^3} = (-\frac{9}{8})^3 - 3 \times x \times \frac{1}{x} \times (-\frac{9}{8})$

$= -\frac{729}{512} + \frac{27}{8} = \frac{999}{512}$

Sol.474.(b) x can be written as x + 2 - 2

So, $x^2 + 2x + 3$

$= \{(x + 2) - 2\}^2 + 2\{(x + 2) - 2\} + 3$

$\Rightarrow (x + 2)^2 + 2^2 - 2 \times 2(x + 2) + 2(x + 2) - 4 + 3$

$\Rightarrow (x + 2)^2 + 4 - 4(x + 2) + 2(x + 2) - 4 + 3$

$\Rightarrow (x + 2)^2 - 2(x + 2) + 3$

Sol.475.(b) $a + b = 2c$ So, $a - c = c - b$

According to the question,

$\frac{a}{a - c} + \frac{c}{b - c} = \frac{a}{c - b} + \frac{c}{b - c}$

$= \frac{a}{-(b - c)} + \frac{c}{b - c} = \frac{c - a}{b - c} = \frac{a - c}{c - b} = 1$

Sol.476.(b) Formula used :

$x^3 + y^3 + z^3 - 3xyz$

$= (x + y + z)(x^2 + y^2 + z^2 - xy - yz - zx)$

$85 - 3 \times 20 = 25(x^2 + y^2 + z^2 - xy - yz - zx)$

$85 - 60 = 25(x^2 + y^2 + z^2 - xy - yz - zx)$

$(x^2 + y^2 + z^2 - xy - yz - zx) = \frac{25}{25} = 1$

Sol.477.(c) $(x^2 - 14x + 49)(x^2 + 6x + 9)$

$(x^2 - 7x - 7x + 49)(x^2 + 3x + 3x + 9)$

$\{x(x - 7) - 7(x - 7)\}\{x(x + 3) + 3(x + 3)\}$

$(x - 7)(x - 7)(x + 3)(x + 3)$

So,

$\sqrt{(x - 7)(x - 7)(x + 3)(x + 3)}$

$= (x - 7)(x + 3)$

Sol.478.(a) $(x^3 + y^3)^{\frac{2}{3}} = (x^2 + y^2)$

On cubing both sides, we get,

$(x^3 + y^3)^2 = (x^2 + y^2)^3$

$\Rightarrow x^6 + y^6 + 2x^3y^3 = x^6 + y^6 + 3x^2y^2(x^2 + y^2)$

$\Rightarrow \frac{2x^3y^3}{3x^2y^2} = (x^2 + y^2) \Rightarrow (x^2 + y^2) = \frac{2}{3}xy$

$\Rightarrow \frac{(x^2 + y^2)}{xy} = \frac{2}{3}$

Sol.479.(b) $a^2 - (x^2 + 2x + 1)$

$\Rightarrow a^2 - (x + 1)^2 \Rightarrow (a + x + 1)(a - x - 1)$

So, the factors of $a^2 - x^2 - 2x - 1$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

are (a + x + 1) (a - x - 1)

Sol.480.(a) x - 2y = 3

$(x + 2y)^2 = (x - 2y)^2 + 4 \times 2xy$

$\Rightarrow (x + 2y)^2 = 3^2 + 4 \times 5 = 9 + 20 = 29$

Sol.481.(d) $a^2 + b^2 + \frac{1}{a^2} + \frac{1}{b^2} = 4$

$\Rightarrow a^2 + \frac{1}{a^2} - 2 + b^2 + \frac{1}{b^2} - 2 = 0$

$\Rightarrow (a - \frac{1}{a})^2 + (b - \frac{1}{b})^2 = 0$

$\Rightarrow (\frac{a^2 - 1}{a})^2 + (\frac{b^2 - 1}{b})^2 = 0$

$\Rightarrow a^2 = 1, b^2 = 1$

So, $a^4 + b^4 = 1 + 1 = 2$

Sol.482.(c) a + b + c = 0 , b + c = - a

$(a + b + c)^2 =$

$a^2 + b^2 + c^2 + 2(ab + bc + ca)$

$a^2 + b^2 + c^2 = -2\{a(b + c) + bc\}$

$= 2(a^2 - bc) \Rightarrow \frac{a^2 + b^2 + c^2}{a^2 - bc} = 2$

Sol.483.(d)

$a^3 - b^3 = (a - b)\left[(a - b)^2 + 3ab\right]$

$999 = 3\left[3^2 + 3ab\right] \Rightarrow 333 = 9 + 3ab$

$3ab = 333 - 9 = 324 \Rightarrow ab = \frac{324}{3} = 108$

$(a + b)^2 = (3)^2 + 4 \times 108 = 9 + 432 = 441$

$\Rightarrow a + b = 21$

Now, $a^2 - b^2 = (a + b)(a - b) = 21 \times 3 = 63$

Sol.484.(a)

$(a - 1)^2 + (b + 2)^2 + (c - 1)^2 = 0$

a - 1 = 0, b + 2 = 0, c -1 = 0

a = 1, b = - 2, c = 1

$a^2 + b^2 + c^2 = 1^2 + (-2)^2 + 1^2 = 6$

Sol.485.(b)

$16a^2 + 4b^2 + 9c^2 - 16ab + 12bc - 24ca$

$= (-4a)^2 + (2b)^2 + (3c)^2 + 2 \times (-4a) \times 2b + 2 \times 2b \times 3c + 2 \times (-4a) \times 3c$

$= (-4a + 2b + 3c)^2 = (4a - 2b - 3c)^2$

Sol.486.(d)

$p(p^2 + 3p + 3) = p^3 + 3p^2 + 3p + 1 - 1$

$= (p + 1)^3 - 1 = 39^3 - 1$

= 59319 - 1 = 59318

Sol.487.(a) $a + b = \sqrt{7}$, $a - b = \sqrt{5}$

$(a + b)^2 = (a - b)^2 + 4ab$

$(\sqrt{7})^2 = (\sqrt{5})^2 + 4ab \Rightarrow 7 - 5 = 4ab$

$\Rightarrow ab = \frac{2}{4} = \frac{1}{2}$,

Now, $a^2 + b^2 = (\sqrt{7})^2 - 2 \times \frac{1}{2} = 7 - 1 = 6$

$\Rightarrow 8ab(a^2 + b^2) - (a - b)^2 = 8 \times \frac{1}{2} \times 6 - (\sqrt{5})^2$

= 24 - 5 = 19

Sol.488.(b) $P(x) = (x^3 - 8)(x + 1)$

$= (x - 2)(x^2 + 2x + 4)(x + 1)$

$Q(x) = (x^3 + 1)(x - 2)$

$= (x + 1)(x^2 - x + 1)(x - 2)$

LCM of P(x) and Q(x)

$= (x + 1)(x - 2)(x^2 + 2x + 4)(x^2 - x + 1)$

Sol.489.(a) Formula used : $(x + y + z)^2$

$= x^2 + y^2 + z^2 + 2(xy + yz + zx)$

Since x + y + z = 0,

So, $x^2 + y^2 + z^2 = -2(xy + yz + zx)$

$\Rightarrow x^2 + y^2 + z^2 = -2\{y(x + z) + zx\}$

$= -2(-y^2 + zx) = 2(y^2 - zx)$ ($\because x + z = -y$)

Similarly ,

$x^2 + y^2 + z^2 = 2(x^2 - yz)$ and $2(z^2 - xy)$

Now, $\frac{x^2}{x^2 - yz} + \frac{y^2}{y^2 - zx} + \frac{z^2}{z^2 - xy}$

$= \frac{2x^2}{x^2 + y^2 + z^2} + \frac{2y^2}{x^2 + y^2 + z^2} + \frac{2z^2}{x^2 + y^2 + z^2} = \frac{2(x^2 + y^2 + z^2)}{x^2 + y^2 + z^2} = 2$

Sol.490.(a) Given

$x = \sqrt{10} + \sqrt{11}$, $y = \sqrt{10} - \sqrt{11}$

then

$= 7x^2 - 50xy + 7y^2$

$= 7(21 + 2\sqrt{110}) - 50(-1) + 7(21 - 2\sqrt{110})$

$= 147 + 14\sqrt{110} + 50 + 147 - 14\sqrt{110} = 344$

Sol.491.(a)

$2^2 (x)^{(a - b)(a + b)} \times 3^2 (x)^{(b - c)(b + c)} \times 6^{-2} (x)^{(c - a)(c + a)}$

$= 36 \times (x)^{a^2 - b^2 + b^2 - c^2} \times \frac{1}{36} \times (x)^{c^2 - a^2}$

= 1

Sol.492.(b) $x - \frac{1}{x} = 11$

On squaring both sides,

$x^2 + \frac{1}{x^2} = 121 + 2 = 123$

$x^4 + \frac{1}{x^4} + 2 = 15129 \Rightarrow x^4 + \frac{1}{x^4} = 15127$

On subtracting 2 both sides,

$x^4 + \frac{1}{x^4} - 2 = 15127 - 2$

$\Rightarrow (x^2 - \frac{1}{x^2})^2 = 15125 \Rightarrow x^2 - \frac{1}{x^2} = 55\sqrt{5}$

Sol.493.(d) $px^3 + x^2 + 3x + q$ is divisible by (x + 2) and (x - 2)

When x = -2

$p(-2)^3 + (-2)^2 + 3(-2) + q = 0$

$\Rightarrow -8p + 4 - 6 + q = 0 \Rightarrow 8p - q = -2$ ...(i)

When x = 2 $\Rightarrow p(2)^3 + (2)^2 + 3(2) + q = 0$

$8p + 4 + 6 + q = 0 \Rightarrow 8p + q = -10$.....(ii)

On solving eq (i) and (ii)

$p = \frac{-3}{4}$, q = - 4

Sol.494.(d) Formula used :-

$x^3 + y^3 = (x + y)\left[(x + y)^2 - 3xy\right]$

$\Rightarrow 416 = 8\left[8^2 - 3xy\right]$

$52 = 64 - 3xy \Rightarrow 12 = 3xy \Rightarrow xy = \frac{12}{3} = 4$

$x^2 + y^2 = (x + y)^2 - 2xy$

$= 8^2 - 2 \times 4 = 64 - 8 = 56$

$x^4 + y^4 = 56^2 - 2 \times 4^2 = 3136 - 32 = 3104$

Sol.495.(c)

x + y = 2z ⇒ x + y - z = 2z - z

x - z = z - y

Again ,

x + y - 2y = 2z - 2y ⇒ x - y = 2 (z - y)

$\frac{x}{x - z} + \frac{y}{y - z} = \frac{x}{z - y} - \frac{y}{z - y}$

$= \frac{x - y}{z - y} = \frac{2(z - y)}{z - y} = 2$

Short trick :

Putting z = 0 , we get x = - y

$\frac{x}{x - z} + \frac{y}{y - z} = \frac{x}{x - 0} + \frac{y}{y - 0}$

$= \frac{x}{x} + \frac{y}{y} = 1 + 1 = 2$

Sol.496.(b)

ab + bc + ca = 0 ⇒ a(b + c) = - bc

Similarly , b(c + a) = - ca , c(a + b) = - ab

$= \frac{1}{a^2 - bc} + \frac{1}{b^2 - ca} + \frac{1}{c^2 - ab}$

$= \frac{1}{a^2 + a(b + c)} + \frac{1}{b^2 + b(c + a)} + \frac{1}{c^2 + c(a + b)}$

$= \frac{1}{a(a + b + c)} + \frac{1}{b(a + b + c)} + \frac{1}{c(a + b + c)} = \frac{bc + ca + ab}{abc(a + b + c)} = 0$

Sol.497.(b) $(x + 2)$ and $(x - 3)$ are the factors of $x^2 + k_1x + k_2$.

$(x + 2) \times (x - 3) = x^2 - x - 6$

Now, equate $x^2 - x - 6$ and $x^2 + k_1x + k_2$

We get, $k_1 = -1$ and $k_2 = -6$

Sol.498.(a) Putting k = 1,

we get LHS = RHS i.e.2 = 2

So, $8 \times k \times k \times k = 8 \times 1^3 = 8$

Sol.499.(d) $p + \frac{1}{9}\sqrt{p} + k^2$

$= (\sqrt{p})^2 + 2 \times \frac{1}{18} \times \sqrt{p} + (\frac{1}{18})^2$

On comparing both side.we get ,

$k^2 = (\frac{1}{18})^2 \Rightarrow k = \pm\frac{1}{18}$

Sol.500.(a) x + y + 3 = 0

x + y = − 3 ....(1)

On cubing equation (1), we get

$x^3 + y^3 + 3xy(x + y) = -27$

$x^3 + y^3 + 3xy(-3) = -27$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$x^3 + y^3 - 9xy = -27$ .....(2)
Add 9 in equation (2) both side,we get
$\Rightarrow x^3 + y^3 - 9xy + 9 = -27 + 9 = -18$

Sol.501.(c) $(4x + 2y)^3 + (4x - 2y)^3$
$= 16(Ax^3 + Bxy^2)$
$\Rightarrow [64x^3 + 8y^3 + 24xy(4x + 2y)] + [64x^3 - 8y^3 - 24xy(4x - 2y)] = 16(Ax^3 + Bxy^2)$
$\Rightarrow [64x^3 + 8y^3 + 96x^2y + 48xy^2] + [64x^3 - 8y^3 - 96x^2y + 48xy^2] = 16(Ax^3 + Bxy^2)$
$\Rightarrow 128x^3 + 96xy^2 = 16(Ax^3 + Bxy^2)$
$\Rightarrow 16(8x^3 + 6xy^2) = 16(Ax^3 + Bxy^2)$
$\Rightarrow 8x^3 + 6xy^2 = Ax^3 + Bxy^2$
On comparing, we get A = 8 and B = 6
$\frac{1}{2}(\sqrt{A^2 + B^2}) = \frac{1}{2}(\sqrt{8^2 + 6^2})$
$= \frac{1}{2}(\sqrt{10^2}) = \frac{10}{2} = 5$

Sol.502.(d) $x = 4 + \sqrt{15}$
So, $\frac{1}{x} = \frac{1}{4 + \sqrt{15}} \times \frac{4 - \sqrt{15}}{4 - \sqrt{15}}$
$= 4 - \sqrt{15}$
$\Rightarrow (x + \frac{1}{x})^2 = x^2 + \frac{1}{x^2} + 2$
$\Rightarrow x^2 + \frac{1}{x^2} = (x + \frac{1}{x})^2 - 2$
$= (4 + \sqrt{15} + 4 - \sqrt{15})^2 - 2$
$= (8)^2 - 2 = 64 - 2 = 62$

Sol.503.(a) $x^3 + y^3 + z^3 - 3xyz$
$= (x + y + z)\ [x^2 + y^2 + z^2 - xy - yz - zx]$
$\Rightarrow x^3 + y^3 + z^3 - 3xyz$
$= (x + y + z)\ [(x + y + z)^2 - 3(xy + yz + zx)]$
$\Rightarrow 1604 - 3xyz = (11)[(11)^2 - 3(-6)]$
$\Rightarrow 1604 - 3xyz = (11)[121 + 18]$
$\Rightarrow 1604 - 3xyz = (11)[139]$
$\Rightarrow 3xyz = 1604 - 1529 \Rightarrow 3xyz = 75$
$\Rightarrow xyz = 25$

Sol.504.(a) $a^2 + b^2 + 49c^2 + 18$
$= 2(b - 28c - a)\ a^2 + b^2 + 49c^2 + 18$
$= 2b - 56c - 2a$
$a^2 + 2a + 1 + b^2 - 2b$
$+ 1 + 49c^2 + 56c + 16 = 0$
$(a + 1)^2 + (b - 1)^2 + (7c + 4)^2 = 0$
So, $a = -1$, $b = 1$ and $c = -\frac{4}{7}$
$a + b - 7c = -1 + 1 - 7(-\frac{4}{7}) = 0 + 4 = 4$

Sol.505.(a) Let $k^3 = x$,
Now, $8k^6 + 15k^3 - 2 = 0$ becomes
$8x^2 + 15x - 2 = 0$.
$8x^2 + 16x - x - 2 = 0$
$(8x - 1)(x + 2) = 0 \Rightarrow x = \frac{1}{8}$ or -2

For positive value we take $x = \frac{1}{8}$
$x = k^3 = \frac{1}{8}$, $k = \frac{1}{2}$
$(k + \frac{1}{k}) = \frac{1}{2} + 2 = 2\frac{1}{2}$

Sol.506.(a) If $x - y + z = 0$ then
$\Rightarrow x^3 - y^3 + z^3 = -3xyz$
$\Rightarrow -(-x^3 + y^3 - z^3) = -3xyz$
$\Rightarrow y^3 - x^3 - z^3 = 3xyz$ .....(1)
Now,
$\frac{y^2}{2xz} - \frac{x^2}{2yz} - \frac{z^2}{2xy} = \frac{y^3 - x^3 - z^3}{2xyz}$
$= \frac{3xyz}{2xyz} = \frac{3}{2}$

Sol.507.(c)
$2\sqrt{2}x^3 - 3\sqrt{3}y^3 = (\sqrt{2}x - \sqrt{3}y)$
$(Ax^2 - Bxy + Cy^2)$ .....(1)
$2\sqrt{2}x^3 - 3\sqrt{3}y^3 = (\sqrt{2}x - \sqrt{3}y)$
$(2x^2 + \sqrt{6}xy + 3y^2)$.....(2)
On comparing we get,
A = 2, B = $-\sqrt{6}$ and C = 3
$A^2 + B^2 + C^2 = 2^2 + (-\sqrt{6})^2 + 3^2$
$= 4 + 6 + 9 = 19$

Sol.508.(a)
$x^3 + y^3 + z^3 - 3xyz = (x + y + z)$
$[(x + y + z)^2 - 3(xy + yz + zx)]$
$\Rightarrow x^3 + y^3 + z^3 - 3xyz$
$= 18 \times [(18)^2 - 3(90)] = 972$
$\Rightarrow x^3 + y^3 + z^3 - 3xyz + 4xyz = 972 + 4xyz$
$\Rightarrow x^3 + y^3 + z^3 + xyz = 972 + 4 \times 81$
$\Rightarrow x^3 + y^3 + z^3 + xyz = 972 + 324 = 1296$
$\sqrt[4]{x^3 + y^3 + z^3 + xyz} = \sqrt[4]{1296} = 6$

Sol.509.(b) $(a + b - c)^2 =$
$a^2 + b^2 + c^2 + 2(ab - bc - ac)$
$(5)^2 = a^2 + b^2 + c^2 + 2(10)$
$a^2 + b^2 + c^2 = 25 - 20 = 5$

Sol.510.(d) $\sqrt{x} - \frac{1}{\sqrt{x}} = \sqrt{3}$
On squaring, we get
$x + \frac{1}{x} - 2 = 3 \Rightarrow x + \frac{1}{x} = 5$
On squaring, we get
$x^2 + \frac{1}{x^2} + 2 = 25 \Rightarrow x^2 + \frac{1}{x^2} = 23$
On squaring, we get
$x^4 + \frac{1}{x^4} + 2 = 529 \Rightarrow x^4 + \frac{1}{x^4} = 527$

Sol.511.(d) Given,
$a^3 + b^3 = 218$ and a + b = 2,
$(a + b)^3 = a^3 + b^3 + 3ab(a + b)$
$2^3 = 218 + 3ab \times 2$
$\Rightarrow -210 = 6ab \Rightarrow ab = -35$
$\sqrt{(1 - ab)} = \sqrt{1 - (-35)} = \sqrt{36} = 6$
Short trick :
by hit and trial method a = 7 and b = − 5
$\sqrt{(1 - ab)} = \sqrt{1 - (-35)} = \sqrt{36} = 6$

Sol.512.(d) $x^2 - 5x - 1 = 0$
$\Rightarrow x^2 - 1 = 5x$ ..... dividing both sides by x
$\Rightarrow x - \frac{1}{x} = 5$
then
$\Rightarrow \frac{x^6 - x^4 + x^2 - 1}{x^3} = x^3 - x + \frac{1}{x} - \frac{1}{x^3}$
$\Rightarrow (x^3 - \frac{1}{x^3}) - (x - \frac{1}{x})$
Used identity
$(x^3 - \frac{1}{x^3}) = (x - \frac{1}{x})^3 + 3 \times (x - \frac{1}{x})$
Now,
$\Rightarrow (5^3 + 3 \times 5) - 5 = 140 - 5 = 135$

Sol.513.(c)
$(x + y)^3 - (x - y)^3 - 3y(2x^2 - 3y^2) = ky^3$
$\Rightarrow x^3 + y^3 + 3x^2y + 3xy^2 - (x^3 - 3x^2y + 3xy^2 - y^3) - 6x^2y + 9y^3 = ky^3$
$\Rightarrow x^3 + y^3 + 3x^2y + 3xy^2 - x^3 + 3x^2y - 3xy^2 + y^3 - 6x^2y + 9y^3 = ky^3$
$\Rightarrow 11y^3 = ky^3 \Rightarrow k = 11$

Sol.514.(d) $\sqrt{x} - \frac{1}{\sqrt{x}} = \sqrt{5}$ ..... squaring both sides
$x + \frac{1}{x} = (\sqrt{5})^2 + 2 = 7$
$\frac{(x^4 + \frac{1}{x^2})}{(x^2 + 1)}$ dividing numerator and denominator by x
$\Rightarrow \frac{(x^3 + \frac{1}{x^3})}{(x + \frac{1}{x})} = \frac{(7)^3 - 3 \times 7}{7} = 46$

Sol.515.(a) Given that
$a + b + c = 6$, $a^2 + b^2 + c^2 = 32$
and $a^3 + b^3 + c^3 = 189$
now,
$(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$
$\Rightarrow 6^2 = 32 + 2(ab + bc + ca)$
$\Rightarrow ab + bc + ca = 2$
now,
$a^3 + b^3 + c^3 - 3abc$
$= (a + b + c)\ [a^2 + b^2 + c^2 - (ab + bc + ca)]$
$\Rightarrow 189 - 3abc = 6 \times [32 - 2]$
$\Rightarrow 3abc = 9 \Rightarrow abc = 3 \Rightarrow 4abc = 12$

Sol.516.(a) $x^4 - 79x^2 + 1 = 0$
$\Rightarrow x^4 + 1 = 79x^2$ .....divide eq by x^2
$\Rightarrow x^2 + \frac{1}{x^2} = 79$ ..... add 2 both sides
$\Rightarrow x^2 + \frac{1}{x^2} + 2 = 81$ ... take square root both sides $\Rightarrow x + \frac{1}{x} = 9$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.517.(a) 4x - 3y = 12
Squaring both sides
$16x^2 + 9y^2 - 24xy = 144$
$16x^2 + 9y^2 = 144 + 24\times(5)$
$16x^2 + 9y^2 = 144 + 120 = 264$
$\frac{16x^2+9y^2}{8} = \frac{264}{8} = 33$

Sol.518.(b) $(a + \frac{1}{a} + 3)^2 = 16$

$a + \frac{1}{a} + 3 = \pm 4 \Rightarrow a + \frac{1}{a} = 1$ or -7

For $a + \frac{1}{a} = 1$, $a^2 + \frac{1}{a^2} = 1^2 - 2 = -1$

(No option matches)

For $a + \frac{1}{a} = -7$, $a^2 + \frac{1}{a^2}$

$= (-7)^2 - 2 = 49 - 2 = 47$

Sol.519.(d) $a^3 + b^3 + c^3 - 3abc$
$= (a + b + c)[(a+b+c)^2 - 3(ab+bc+ca)]$
$\Rightarrow a^3 + b^3 + c^3 - 3 \times (-40)$
$= 1 \times [1^2 - 3 \times (-22)]$
$a^3 + b^3 + c^3 + 120 = 67$
$a^3 + b^3 + c^3 = 67 - 120 = -53$

Sol.520.(b) $2x^2 + 5x + 1 = 0$
On dividing by 2x,
$x + \frac{5}{2} + \frac{1}{2x} = 0 \Rightarrow x + \frac{1}{2x} = -\frac{5}{2}$

$x - \frac{1}{2x} = \sqrt{\left(x + \frac{1}{2x}\right)^2 - 4 \times \frac{1}{2}}$

$x - \frac{1}{2x} = \sqrt{\left(-\frac{5}{2}\right)^2 - 2}$

$x - \frac{1}{2x} = \sqrt{\frac{25}{4} - 2} = \frac{\sqrt{17}}{2}$

Sol.521.(a) $\frac{22\sqrt{2}}{4\sqrt{2} - \sqrt{3+\sqrt{5}}}$,
dividing numerator and denominator by $\sqrt{2}$, we get

$\frac{22}{4 - \sqrt{\frac{3+\sqrt{5}}{2}}} = \frac{22}{4 - \sqrt{\frac{6+2\sqrt{5}}{4}}}$

$\frac{22}{4 - \sqrt{\left(\frac{\sqrt{5}+1}{2}\right)^2}} = \frac{22}{4 - \left(\frac{\sqrt{5}+1}{2}\right)}$

$= \frac{44}{7-\sqrt{5}} = \frac{44(7+\sqrt{5})}{(7-\sqrt{5})(7+\sqrt{5})}$

$= \frac{44(7+\sqrt{5})}{44}$

$= 7 + \sqrt{5} \Rightarrow 7 + \sqrt{5} = a + \sqrt{5}\, b$,
On comparing, a =7 and b = 1
(ab) : (a + b) = 7 × 1 : 7 + 1 = 7 : 8

Sol.522.(a) 2x - y = 2
Both side divided by 2 , then
$x - \frac{y}{2} = 1 \Rightarrow (x - \frac{y}{2})^3 = 1$

$x^3 - \frac{y^3}{8} - 3x\frac{y}{2}(x - \frac{y}{2}) = 1$

$x^3 - \frac{y^3}{8} - \frac{3}{2} \times \frac{3}{2}(1) = 1$

$x^3 - \frac{y^3}{8} = 1 + \frac{9}{4} = \frac{13}{4}$

Sol.523.(c)

$x = \sqrt{1 + \frac{\sqrt{3}}{2}} - \sqrt{1 - \frac{\sqrt{3}}{2}}$

$= \sqrt{\frac{4+2\sqrt{3}}{4}} - \sqrt{\frac{4-2\sqrt{3}}{4}}$

$= \sqrt{\left(\frac{\sqrt{3}+1}{2}\right)^2} - \sqrt{\left(\frac{\sqrt{3}-1}{2}\right)^2}$

$= \frac{\sqrt{3}+1-\sqrt{3}+1}{2} = 1$

so, $\frac{\sqrt{3}-x}{\sqrt{3}+x} = \frac{\sqrt{3}-1}{\sqrt{3}+1} = 2 - \sqrt{3} = 2 - 1.73$
$= 0.27$

Sol.524.(d) $x^2 - \sqrt{7}x + 1 = 0$

$x + \frac{1}{x} = \sqrt{7} \Rightarrow x^2 + \frac{1}{x^2} = (\sqrt{7})^2 - 2 = 5$

$x^3 + \frac{1}{x^3} = (\sqrt{7})^3 - 3 \times \sqrt{7} = 4\sqrt{7}$

$x^5 + \frac{1}{x^5} = (x^2 + \frac{1}{x^2})(x^3 + \frac{1}{x^3}) - (x + \frac{1}{x})$

$x^5 + \frac{1}{x^5} = 5 \times 4\sqrt{7} - \sqrt{7} = 19\sqrt{7}$

Sol.525.(a)
$x^3 + y^3 + z^3 - 3xyz = 0.98k$
$\Rightarrow \frac{1}{2}(x + y + z)[(x - y)^2$
$+ (y - z)^2 + (z - x)^2] = 0.98k$
$\Rightarrow \frac{1}{2}(32.5 + 34.6 + 30.9)[(32.5 - 34.6)^2 + (34.6 - 30.9)^2 + (30.9 - 32.5)^2]$
$= 0.98k$
$\Rightarrow \frac{1}{2}(98)[(-2.1)^2 + (3.7)^2 + (-1.6)^2]$
$= 0.98k$
$\Rightarrow (49)[(4.41) + (13.69) + (2.56)]$
$= 0.98k$
$\Rightarrow (49)[20.66] = 0.98k$
$\Rightarrow 1012.34 = 0.98k \Rightarrow k = 1033$

Sol.526.(b) $x + \frac{1}{x} = 3$.....(1)
On squaring eqn (1), we get
$x^2 + \frac{1}{x^2} = 7$.....(2)
On squaring eqn (2), we get
$x^4 + \frac{1}{x^4} = 47$.....(3)
On cubing eqn (1), we get
$x^3 + \frac{1}{x^3} = (3)^3 - (3)(3) = 27 - 9 = 18$
So, $x^3 + \frac{1}{x^3} = 18$ .....(4)
On multiplying (3) and (4), we get

$(x^4 + \frac{1}{x^4})(x^3 + \frac{1}{x^3}) = (47)(18)$

$(x^7 + \frac{1}{x^7}) + (x + \frac{1}{x}) = 846$

$x^7 + \frac{1}{x^7} + 3 = 846$ So, $x^7 + \frac{1}{x^7} = 843$

Sol.527.(a) $x^4 + y^4 + x^2y^2$
$= (x^2 - xy + y^2)(x^2 + xy + y^2)$
$\Rightarrow \frac{273}{16} = \frac{21}{4} \times (x^2 + xy + y^2)$
$(x^2 + xy + y^2) = \frac{273}{16} \times \frac{4}{21} = \frac{13}{4}$ ...(i)
$x^2 - xy + y^2 = \frac{21}{4}$...(ii) (Given that)
From equation (i) and (ii)
$x^2 + y^2 = \frac{\frac{13}{4} + \frac{21}{4}}{2} = \frac{17}{4}$
$xy = \frac{\frac{13}{4} - \frac{21}{4}}{2} = -1$
$(x - y)^2 = x^2 + y^2 - 2xy = \frac{17}{4} + 2$
$(x - y)^2 = \frac{25}{4} \Rightarrow (x - y) = \frac{5}{2}$

Sol.528.(c) According to the question, let x be negative and y be positive.
So, x : y = - 4 : 9
$\frac{3x+4y}{2x-3y}$ ——— (1)
In equation (1) dividing above by y in both numerator and denominator, we get
$= \frac{3(\frac{x}{y}) + 4}{2(\frac{x}{y}) - 3} = \frac{3(\frac{-4}{9}) + 4}{2(\frac{-4}{9}) - 3}$
$= \frac{-12+36}{-8-27} = \frac{24}{-35} = -\frac{24}{35}$

Sol.529.(c) Given, $\frac{11a^3 - 15b^3}{10a^3 + 4b^3} = \frac{5}{7}$
$\Rightarrow 77a^3 - 105b^3 = 50a^3 + 20b^3$
$\Rightarrow 27a^3 = 125b^3 \Rightarrow \frac{a}{b} = \frac{5}{3}$
(9a + 5b) : (5a - 3b)
⇒ (9 × 5 + 5 × 3) : (5 × 5 - 3 × 3)
⇒ (45 + 15) : (25 - 9) ⇒ 60 : 16 = 15 : 4.

Sol.530.(b)
$\frac{1}{x} + \frac{1}{y} = \frac{16}{15} = \frac{x+y}{xy} = \frac{16}{15}$
$\frac{4}{xy} = \frac{16}{15}$, $xy = \frac{15}{4}$
$x^3 + y^3 = (x + y)(x^2 + y^2 - xy)$
$= (x + y)[(x + y)^2 - 3xy]$
$\Rightarrow x^3 + y^3 = 4(4^2 - 3 \times \frac{15}{4}) = 19$

Sol.531.(b) Given that, $\frac{1}{x} - \frac{1}{y} = \frac{11}{24}$
$\frac{y-x}{xy} = \frac{11}{24}$ So, xy = - 24
$x^3 - y^3 + x^2y^2 = (x - y)\{(x - y)^2 + 3xy\} + x^2y^2$
$x^3 - y^3 + x^2y^2 = 11(121 - 72) + (-24)^2$
$x^3 - y^3 + x^2y^2 = 11 \times 49 + 576$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

= 539 + 576 = 1115

Short-trick:

Put x = 8 and y = -3

x - y = 11 ⇒ 8 - (-3) = 11 ⇒ xy = - 24

$x^3 - y^3 + x^2y^2$ = 512 - (-27) + 64 × 9

= 512 + 27 + 576 = 1115

Sol.532.(a) $16x^2 + y^2 = 48$

adding 8xy on both the sides

$16x^2 + y^2 + 8xy = 48 + 16 = 64$

$(4x + y)^2 = 8^2$

4x + y = 8 taking cube on both the side

$\Rightarrow 64x^3 + y^3 + 3 \times 4x \times y(4x + y) = 512$

$\Rightarrow 64x^3 + y^3 = 512 - 192 = 320$

Sol.533.(c) If $x - \frac{1}{x} = 5$ then

$x^3 - \frac{1}{x^3} = 125 + 15 = 140$

$\frac{x^6 - 5x^3 - 1}{x^6 + 7x^3 - 1}$ dividing the numerator and denominator by x^3

$\Rightarrow \frac{x^3 - 5 - \frac{1}{x^3}}{x^3 + 7 - \frac{1}{x^3}} = \frac{x^3 - \frac{1}{x^3} - 5}{x^3 - \frac{1}{x^3} + 7}$

$= \frac{140 - 5}{140 + 7} = \frac{45}{49}$

Sol.534.(d) $x^4 + \frac{1}{x^4} = 727$ adding 2 and taking root on both side

$\Rightarrow x^2 + \frac{1}{x^2} = 27$ subtracting 2 from both side and taking root

$\Rightarrow x - \frac{1}{x} = 5$ and - 5, But x > 1 So, x = 5

Sol.535.(c) $x - \frac{1}{x} = 1$

(On squaring both sides)

$\Rightarrow x^2 + \frac{1}{x^2} = 1^2 + 2 = 3$

Similarly,

$\Rightarrow x^4 + \frac{1}{x^4} = 3^2 - 2 = 7$

$\Rightarrow x^8 + \frac{1}{x^8} = 7^2 - 2 = 47$

Sol.536.(c) $x^3 + y^3 = (x + y)(x^2 + y^2 - xy)$

$= (x + y)[(x + y)^2 - 3xy]$

405 = 9(81- 3ab) ⇒ 45 = 81 - 3ab

3ab = 36 ⇒ ab = 12

Sol.537.(a) $(2x - \frac{3}{x}) = 2$

Squaring both side

$4x^2 + \frac{9}{x^2} - 2 \times 2 \times 3 = 4$

$4x^2 + \frac{9}{x^2} = 16$ (squaring both side)

$16x^4 + \frac{81}{x^4} + 2 \times 4 \times 9 = 256$

$16x^4 + \frac{81}{x^4} = 256 - 72 = 184$

Sol.538.(b) $a - \frac{12}{a} = 1$

$a^2 - 12 = a \Rightarrow a^2 - a - 12 = 0$

$a^2 - 4a + 3a - 12 = 0 \Rightarrow a(a - 4) + 3(a - 4) = 0$

$(a + 3)(a - 4) = 0 \Rightarrow a = -3$ and 4

Put a = 4

$a^2 + \frac{16}{a^2} = 16 + \frac{16}{16} = 16 + 1 = 17$

Sol.539.(a)

$4x^4 - 37x^2 + 9 = 0$ dividing both side by x^2

Then $4x^2 + \frac{9}{x^2} = 37$ subtracting 12 and taking root from both side

$2x - \frac{3}{x} = 5$ taking cube on both side

$8x^3 - \frac{27}{x^3} = 5^3 + 3 \times 5 \times 2 \times 3 = 125 + 90 = 215$

Sol.540.(a) $\frac{1}{x} + \frac{1}{y} = \frac{18}{5}$

$\frac{x + y}{xy} = \frac{18}{5} \Rightarrow xy = \frac{5}{9}$

$x^3 + y^3 = (x + y)\{(x + y)^2 - 3xy\}$

$x^3 + y^3 = 2(4 - \frac{5}{3}) = \frac{14}{3} = 4\frac{2}{3}$

Sol.541.(b) $(x - 2y)^2 = x^2 + 4y^2 - 4xy$

25 = 53 - 4xy ⇒ xy = 7

$x^3 - 8y^3 = (x - 2y)(x^2 + 4y^2 + 2xy)$

$x^3 - 8y^3 = 5(53 + 14)$

$x^3 - 8y^3 = 5 \times 67 = 335$

Sol.542.(b) $a^2 + c^2 + 17 = 2(a - 8b - 2b^2)$

$a^2 + c^2 + 17 - 2a + 16b + 4b^2 = 0$

$(a-1)^2 + (2b + 4)^2 + c^2 = 0$

a = 1, b = - 2, c = 0

$a^3 + b^3 + c^3 = (1)^3 + (-2)^3 + 0 = -7$

Sol.543.(a) Short-Trick: Put x = 1

$4x^4 = 5x^2 - 1 \Rightarrow 4(1) = 5(1) - 1$

⇒ 4 = 4 (satisfy)

$(2x^2 - x - 1) = 2(1) - 1 - 1 = 0$

Sol.544.(b)

$x^2 + 9y^2 + 4z^2 = 12(x - 2y + 2z) - 88$

$x^2 - 12x + 9y^2 + 24y + 4z^2 - 24z + 88 = 0$

$x^2 - 12x + 36 + 9y^2 + 24y + 16 + 4z^2 - 24z + 36 = 0$

$(x - 6)^2 + (3y + 4)^2 + (2z - 6)^2 = 0$

$x = 6, y = -\frac{4}{3}, z = 3$

(x - 3y + z) = (6 + 4 + 3) = 13

Sol.545.(c) Short-Trick:

$(a + b)^2 - (a - b)^2 = 4ab$

$\frac{(375 + 125)^2 - (125 - 375)^2}{375 \times 375 - 125 \times 125}$

$= \frac{4 \times 375 \times 125}{500 \times 250} = \frac{3}{2}$

Sol.546.(b)

$x^2 + 1 = 5\sqrt{2}x$ (dividing both side by x)

$x + \frac{1}{x} = 5\sqrt{2} \Rightarrow x^2 + \frac{1}{x^2} = 48$

$\frac{(x^3 + \frac{1}{x})}{x^2 + 1} = \frac{(x^2 + \frac{1}{x^2})}{x + \frac{1}{x}} = \frac{48}{5\sqrt{2}} = \frac{24\sqrt{2}}{5}$

Sol.547.(c) $(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$

Constant term would be $3ab^2$

$= 3 \times 5x^2 \times \frac{1}{x^2} = 15$

Sol.548.(a) $a^3 - b^3 = 2349$

$(a - b)(a^2 + b^2 + ab) = 2349$

$(a^2 + b^2 + ab) = 261$

$(a + b)^2 - ab = a^2 + b^2 + ab = 261$

Sol.549.(d) Short-Trick:

Put a = 2,b = -1,c = -1

$\frac{(b + c)^2}{bc} + \frac{(c + a)^2}{ca} + \frac{(a + b)^2}{ab}$

$\frac{(-1 - 1)^2}{(-1) \times (-1)} + \frac{(-1 + 2)^2}{(-1) \times 2} + \frac{(2 - 1)^2}{2 \times (-1)}$

$= 4 - \frac{1}{2} - \frac{1}{2} = 3$

Sol.550.(a)

$a^2 + b^2 + c^2 + 216 = 12(a + b - 2c)$

$(a - 6)^2 + (b - 6)^2 + (c + 12)^2 = 0$

a = 6, b = 6, c = - 12

$\sqrt{ab - bc - ca} =$

$\sqrt{6 \times 6 - \{6 \times (-12)\} - (-12 \times 6)}$

$= \sqrt{180} = 6\sqrt{5}$

Sol.551.(c)

$(56\sqrt{7}x^3 - 2\sqrt{2}y^3) \div (2\sqrt{7}x - \sqrt{2}y)$

$= Ax^2 + By^2 - Cxy,$

$[(2\sqrt{7}x)^3 - (\sqrt{2}y)^3] \div (2\sqrt{7}x - \sqrt{2}y)$

$= Ax^2 + By^2 - Cxy$

$28x^2 + 2y^2 + 2\sqrt{14}xy = Ax^2 + By^2 - Cxy$

Comparing the above equation we get,

$A = 28, B = 2, C = -2\sqrt{14}$

$A + B - \sqrt{14}C = 28 + 2 + 28 = 58$

Sol.552.(b) x = 7 , y = 3 satisfies given equation

$x^4 - y^4 = 2401 - 81 = 2320$

Sol.553.(a)

$8 + 2px^2 - 36x - 27x^3 = (2 - 3x)^3$

$8 + 2px^2 - 36x - 27x^3 = 8 + 54x^2 - 36x - 27x^3$

Comparing coefficient of x^2 term, p = 27

Sol.554.(b) $2x^2 - 7x + 5 = 0$

$\Rightarrow x + \frac{5}{2x} = \frac{7}{2}$

Cubing both side,

$\Rightarrow x^3 + \frac{125}{8x^3} = \frac{343}{8} - (3 \times \frac{7}{2} \times \frac{5}{2})$

$\Rightarrow x^3 + \frac{125}{8x^3} = \frac{133}{8} \Rightarrow x^3 + \frac{125}{8x^3} = 16\frac{5}{8}$

Sol.555.(d) $x + \frac{1}{x} = \frac{17}{4}$

Squaring both side,

$x^2 + \frac{1}{x^2} = \frac{289}{16} - 2$

$x^2 + \frac{1}{x^2} - 2 = \frac{225}{16} \Rightarrow x - \frac{1}{x} = \frac{15}{4}$

Search on Tg: @apna_pdf

Search on Telegram @apna_pdf

Short-Trick: $x + \frac{1}{x} = \frac{17}{4}$

x = 4, satisfy

$x - \frac{1}{x} = 4 - \frac{1}{4} = \frac{15}{4}$

Sol.556.(b)

$9(a^2 + b^2) + c^2 + 20 = 12(a + 2b)$

$(3a - 2)^2 + (3b - 4) + c^2 = 0$

$a = \frac{2}{3}$, $b = \frac{4}{3}$, $c = 0$

$\Rightarrow \sqrt{6a + 9b + 2c}$

$= \sqrt{6 \times \frac{2}{3} + 9 \times \frac{4}{3} + 2 \times 0}$

$= \sqrt{4 + 12} = 4$

Sol.557.(a) $2x + 3y + 1 = 0$

$2x + 3y = -1$

On cubing both sides,

$(2x + 3y)^3 = (-1)^3$

$8x^3 + 27y^3 + 3 \times 2x \times 3y(-1) = -1$

$8x^3 + 27y^3 - 18xy = -1$

Adding 8 both sides,

$8x^3 + 27y^3 - 18xy + 8 = 7$

Sol.558.(a)

$\frac{5[(a^6-b^6)^3+(b^6-c^6)^3+(c^6-a^6)^3]}{2[(a^3-b^3)^3+(b^3-c^3)^3+(c^3-a^3)^3]}$

As we know that when a + b + c = 0 then $a^3 + b^3 + c^3 = 3abc$

So, $\frac{5[3(a^6-b^6)(b^6-c^6)(c^6-a^6)]}{2[3(a^3-b^3)(b^3-c^3)(c^3-a^3)]} =$

$\frac{5[3(a^3+b^3)(b^3+c^3)(c^3+a^3)(a^3-b^3)(b^3-c^3)(c^3-a^3)]}{2[3(a^3-b^3)(b^3-c^3)(c^3-a^3)]}$

$= \frac{5}{2}(a^3 + b^3)(b^3 + c^3)(c^3 + a^3)$

Sol.559.(c) $y = 2x + 1$,

$y - 2x = 1$

Cubing both sides,

$y^3 - 8x^3 - 3 \times y \times 2x(y - 2x) = 1$

$y^3 - 8x^3 - 6xy = 1$

$8x^3 - y^3 + 6xy = -1$

Sol.560.(b)

$x^8 - 34x^4 + 1 = 0$ dividing both side by x^4

$x^4 + \frac{1}{x^4} = 34$ adding 2 and taking root on both side

$x^2 + \frac{1}{x^2} = 6$ subtracting 2 and taking root on both side

$x - \frac{1}{x} = 2$ taking cube on both side

$x^3 - \frac{1}{x^3} = 2^3 + 2 \times 3 = 8 + 6 = 14$

Sol.561.(c) $x^4 + y^4 + x^2y^2 = 117$

$x^2 + y^2 - xy = 3(4 + \sqrt{3})$

$= 12 + 3\sqrt{3}$....(i)

$x^4 + y^4 + x^2y^2$

$= (x^2 + y^2 - xy)(x^2 + y^2 + xy)$

$117 = 3(4 + \sqrt{3})(x^2 + y^2 + xy)$

$(x^2 + y^2 + xy) = \frac{39}{4 + \sqrt{3}} = 3(4 - \sqrt{3})$

$= 12 - 3\sqrt{3}$....(ii)

On adding (i) and (ii)

$x^2 + y^2 = 12$

Sol.562.(b) $x^2 - 3x + 1 = 0$

$x + \frac{1}{x} = 3 \Rightarrow x^2 + \frac{1}{x^2} = 7$

$x^4 + \frac{1}{x^4} = 47 \Rightarrow x^8 + \frac{1}{x^8} = 2207$

$2(x^8 + \frac{1}{x^8}) - 5(x^2 + \frac{1}{x^2})$

$= 2 \times 2207 - 5 \times 7 = 4379$

Sol.563.(b) $x - y - z = 0$

x = 2, y = 1, z = 1,

satisfies given equation

$(x^2 + y^2 + z^2) \div (y^2 + zx) = 2$

Sol.564.(d) Using the identity

$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

Let $a = 2x + y$, $b = x + 2y$

$a^2 + b^2 = (2x + y)^2 + (x + 2y)^2$

$= 5x^2 + 5y^2 + 8xy$

$ab = (2x + y)(x + 2y) = 2x^2 + 2y^2 + 5xy$

$(2x + y)^3 - (x + 2y)^3$

$= (x - y)(5x^2 + 5y^2 + 8xy + 2x^2 + 2y^2 + 5xy)$

$(2x + y)^3 - (x + 2y)^3$

$= (x - y)(7x^2 + 7y^2 + 13xy)$

On comparing

$(2x + y)^3 - (x + 2y)^3 = (x - y) \times [A(x^2 + y^2) + Bxy]$

A = 7 and B = 13

2A - B = 14 - 13 = 1

Sol.565.(d) $(x + y)^3 = x^3 + y^3 + 3xy(x + y)$

$(12)^3 = 468 + 3xy \times 12$

$1728 - 468 = 36xy \Rightarrow \frac{1260}{36} = xy$, $xy = 35$

$(x + y)^2 = x^2 + y^2 + 2xy$

$x^2 + y^2 = 144 - 70 = 74$

$(x^2 + y^2)^2 = x^4 + y^4 + 2x^2y^2$

$x^4 + y^4 = (74)^2 - 2(35)^2$

$= 5476 - 2450 = 3026$

Sol.566.(c)

$a^2 + b^2 + c^2 + 170 = 2(8a + 5b - 9c)$

$a^2 + b^2 + c^2 + 64 + 25 + 81 - 16a - 10b + 18c = 0$

$(a - 8)^2 + (b - 5)^2 + (c + 9)^2 = 0$

a = 8, b = 5 and c = - 9

$4a + 8b - c = 32 + 40 + 9 = 81$

$\Rightarrow \sqrt{4a + 8b - c} = 9$

Sol.567.(b) $\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 0$

$\Rightarrow (xy + yz + zx) = 0$

$x^3 + y^3 + z^3 - 3xyz = (x + y + z)[(x^2 + y^2 + z^2) - (xy + yz + zx)]$

$\Rightarrow 151 - 36 = 5 \times [(x^2 + y^2 + z^2) - 0]$

$x^2 + y^2 + z^2 = 23$

Sol.568.(d) $\frac{1}{x} + \frac{1}{y} = \frac{20}{9}$

$\Rightarrow xy = \frac{9}{20} \times (x + y) \Rightarrow xy = \frac{9}{4}$

$x^3 + y^3 = (x + y)^3 - 3xy(x + y)$

$= 125 - 3 \times \frac{9}{4} \times 5$

$= 125 - \frac{135}{4} = \frac{365}{4}$

Sol.569.(a)

$(7x + 3)^3 + (x - 2)^3 + 27(2x - 5)^3 - 9(7x + 3)(x - 2)(2x - 5) = 0$

$\Rightarrow 7x + 3 + x - 2 + 6x - 15 = 0$

$14x = 14 \Rightarrow x = 1$

So, $(5x + 3) = 5 + 3 = 8$

Sol.570.(d) $(x + \frac{2}{x}) = 7$

Squaring both sides

$x^2 + \frac{4}{x^2} + 2 \times x \times \frac{2}{x} = 49$

$x^2 + \frac{4}{x^2} + 4 = 49 \Rightarrow x^2 + \frac{4}{x^2} = 45$

Multiply by 2 both sides

$(2x^2 + \frac{8}{x^2}) = 90$

Sol.571.(d) $(\frac{x}{y} + 1) = 4 \Rightarrow \frac{x}{y} = 3$

Squaring both side , then we get $\frac{x^2}{y^2} = 9$

Add 1 both side , then we get

$\Rightarrow \frac{x^2}{y^2} + 1 = 9 + 1 \Rightarrow \frac{x^2 + y^2}{y^2} = 10$

Short-trick:

Put, x = 3 and y = 1

$\frac{x^2 + y^2}{y^2} = \frac{9 + 1}{1} = 10$

Sol.572.(b) $a^2 + 4b^2 + 25c^2 + 18 = 2(a - 2b + 20c)$

$\Rightarrow (a^2 - 2a + 1) + (4b^2 + 4b + 1) + (25c^2 - 40c + 16) = 0$

$(a - 1)^2 + (2b + 1)^2 + (5c - 4)^2 = 0$

a = 1 , b = - 0.5 , c = 0.8

Now, a + 2b + 5c = 1 - 1 + 4 = 4

Sol.573.(c)

$\frac{0.8 \times 0.8 \times 0.8 + 0.6 \times 0.6 \times 0.6}{0.08 \times 0.08 + 0.06 \times 0.06 - 0.08 \times 0.06}$

$= \frac{10000 \times (8^3 + 6^3)}{1000 \times (8^2 + 6^2 - 8 \times 6)}$

$= \frac{10 \times (8 + 6) \times (8^2 + 6^2 - 8 \times 6)}{(8^2 + 6^2 - 8 \times 6)} = 140$

Sol.574.(d) $(x - y)^2 = x^2 + y^2 - 2xy$

$25 = 45 - 2xy \Rightarrow xy = 10$

Now, $(x - y)^3 = x^3 - y^3 - 3xy(x - y)$

$125 = x^3 - y^3 - 3 \times 10 \times 5$

$\Rightarrow x^3 - y^3 = 275$

Sol.575.(a)

$a^3 + b^3 + c^3 - 3abc =$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$(a+b+c)[(a+b+c)^2-3(ab+bc+ca)]$

$a^3+b^3+c^3+54=4[16+42]$

$\Rightarrow a^3+b^3+c^3=178$

$\sqrt{4a^3+4b^3+4c^3-36}=$

$\sqrt{4(178-9)}=\sqrt{4\times169}=26$

Sol.576.(d) Short-Trick: Put x = 1

$\frac{(x^4+x^2+1)}{(x^2+x+1)}=1$

Check option (d)

$(x^2-x+1)=1$

Sol.577.(d) a + b = p

Squaring both side

$a^2+b^2+2ab=p^2 \Rightarrow a^2+b^2=p^2-2q$

Squaring both side

$a^4+b^4+2a^2b^2=p^4+4q^2-4p^2q$

$a^4+b^4=p^4-4p^2q+2q^2$

Short trick :

Let a = 1, b = 1 ⇒ p = 2, q = 1

$\Rightarrow (a^4+b^4)=2$

Check option (d)

$p^4-4p^2q+2q^2=2$

Sol.578.(c) $\sqrt{x}+\frac{1}{\sqrt{x}}=\sqrt{6}$

Squaring both side

$x+\frac{1}{x}=4$

Squaring both side

$x^2+\frac{1}{x^2}=14$ ------- (1)

Taking cube both side

$x^6+\frac{1}{x^6}=14^3-14\times3$

$x^6+\frac{1}{x^6}=2702$

Sol.579.(c) $x^2+1-2x=0$

$x^2+1=2x$ (On squaring both side)

$\Rightarrow x^4+1+2x^2=4x^2$

$\Rightarrow x^4+1=2x^2 \Rightarrow x^2(x^2-2)=-1$

Sol.580.(c)

$x^2+4y^2+3z^2+\frac{19}{4}=2\sqrt{3}(x+y+z)$

$\Rightarrow x^2-2\sqrt{3}x+4y^2-2\sqrt{3}y+3z^2-2\sqrt{3}z+\frac{19}{4}=0$

$(x-\sqrt{3})^2+(2y-\frac{\sqrt{3}}{2})^2+(\sqrt{3}z-1)^2=0$

$(x-\sqrt{3})=0, (2y-\frac{\sqrt{3}}{2})=0, (\sqrt{3}z-1)=0$

$x=\sqrt{3}, y=\frac{\sqrt{3}}{4}, z=\frac{1}{\sqrt{3}}$

$(x-4y+3z)=\sqrt{3}-4\times\frac{\sqrt{3}}{4}+3\times\frac{1}{\sqrt{3}}=\sqrt{3}$

Sol.581.(c) $9x^2-3x-3x+1=0$

$3x(3x-1)-1(3x-1)=0$

$(3x-1)(3x-1)=0 \Rightarrow x=\frac{1}{3}$

$27x^3+(27x^3)^{-1}=27(\frac{1}{3})^3+\{27(\frac{1}{3})^3\}^{-1}$

$=1+1=2$

Sol.582.(c) $(4x-5)^3+(x-2)^3+27(2x-5)^3$

$=9(4x-5)(x-2)(2x-5)$

$(4x-5)^3+(x-2)^3+(6x-15)^3-3(4x-5)(x-2)(6x-15)=0$

The given equation is the form of $(a^3+b^3+c^3-3abc=0)$

If $a^3+b^3+c^3-3abc=0$, then a = b = c or a + b + c = 0

$(4x-5)+(x-2)+(6x-15)=0$

$11x=22 \Rightarrow x=2$

$x+\frac{3}{2}=2+\frac{3}{2}=\frac{7}{2}$

Sol.583.(d) Given that, a + b = 24

and $a^2+b^2=306$

$(a+b)^2=a^2+b^2+2ab$

$\Rightarrow 576=306+2ab$

$\Rightarrow ab=135=15\times9$

and a + b = 15 + 9 = 24

a = 15 and b = 9

So, 4a - 5b = 4(15) - 5(9) = 15

Short-Trick:

You can directly put the value of a = 15 and b = 9 So, 4a - 5b = 4(15) - 5(9) = 15

Sol.584.(b) If a + b - c = 0 then

b - c = - a, c - a = b, a + b = c

$\Rightarrow \frac{(b-c)^2}{4bc}+\frac{(c-a)^2}{4ca}-\frac{(a+b)^2}{4ab}$

$=\frac{(-a)^2}{4bc}+\frac{(b)^2}{4ca}-\frac{(c)^2}{4ab}$

$=\frac{a^3+b^3-c^3}{4abc}=\frac{-3abc}{4abc}=\frac{-3}{4}$

Sol.585.(c) $(2a-b-3c)(4a^2+b^2+9c^2+2ab+6ac-3bc)$

$\Rightarrow (2a-b-3c)\{(2a)^2+(b)^2+(3c)^2+2ab+6ac-3bc)$

We know, $a^3-b^3-c^3-3abc=(a-b-c)(a^2+b^2+c^2+ab+ac-bc)$

On comparing, we get,

$(2a)^3-(b)^3-(3c)^3-3(2a)(b)(3c)$

$=8a^3-b^3-27c^3-18abc$

Sol.586.(c) $(x^2+\frac{1}{49x^2})=15\frac{5}{7}$

$(x+\frac{1}{7x})^2=x^2+\frac{1}{49x^2}+2\times x\times\frac{1}{7x}$

$(x+\frac{1}{7x})^2=\frac{110}{7}+\frac{2}{7}=16$

$x+\frac{1}{7x}=\pm4$

Sol.587.(d) $(3x+2y)^3+(3x-2y)^3$

$=(3x)^3+(2y)^3+3.(3x)^2.(2y)+3(3x)(2y)^2+(3x)^3-(2y)^3-3.(3x)^2.(2y)+3(3x)(2y)^2$

$=(3x+2y)^3+(3x-2y)^3=54x^3+72xy^2$

$=(3x+2y)^3+(3x-2y)^3=18x(3x^2+4y^2)$

$3kx(3x^2+4y^2)=18x(3x^2+4y^2)$

On comparing,

$3k=18 \Rightarrow k=6$

Sol.588.(c) $x+y=27$

Squaring both side

$\Rightarrow x^2+y^2+2xy=729$

$\Rightarrow 2xy=729-425=304$

$\Rightarrow (x-y)^2=x^2+y^2-2xy$

$=425-304=121$

Sol.589.(a) $x+\frac{1}{15x}=3$

Multiplying both sides by '3'

$3x+\frac{1}{5x}=9$

$27x^3+\frac{1}{125x^3}=729-16.2$

$27x^3+\frac{1}{125x^3}=712.8$

Divide both side by 3

$9x^3+\frac{1}{375x^3}=237.6$

Sol.590.(a) We know, $a^3+b^3+c^3-3abc$

$=(a+b+c)\times(a^2+b^2+c^2-ab-bc-ca)$

Here, a = 2x, b = 3y, c = 4z

$\Rightarrow 8x^3+27y^3+64z^3-72xyz$

$=(2x+3y+4z)(4x^2+9y^2+16z^2-6xy-12yz-8xz)$

$\Rightarrow 105-72=11(4x^2+9y^2+16z^2-6xy-12yz-8xz)$

$4x^2+9y^2+16z^2-6xy-12yz-8xz=3$

Sol.591.(b)

$a^3+b^3+c^3=3abc \Rightarrow a+b+c=0$

$x-1.5+x-4+x-3.5=0$

$3x=9 \Rightarrow x=3$

Sol.592.(c) $x^4+x^{-4}=47$

$x^4+\frac{1}{x^4}+2=49 \Rightarrow x^2+\frac{1}{x^2}=7$

$\Rightarrow x^2+\frac{1}{x^2}+2=9 \Rightarrow x+\frac{1}{x}=3$

$\Rightarrow x^2-3x=-1 \Rightarrow 4x^2-12x=-4$

$\Rightarrow (2x-3)^2=4x^2-12x+9=-4+9=5$

Sol.593.(b)

$a^2+b^2+c^2+48=8(a+b+c)$

$\Rightarrow a^2-8a+16+b^2-8b+16+c^2-8c+16=0$

$\Rightarrow (a-4)^2+(b-4)^2+(c-4)^2=0$

a = 4,b = 4, c = 4

$\sqrt[3]{a^3-b^3+c^3}=\sqrt[3]{4^3-4^3+4^3}=4$

Sol.594.(d) $a-\frac{24}{a}=5$

$\Rightarrow a^2-5a-24=0 \Rightarrow a^2-8a+3a-24=0$

$\Rightarrow (a-8)(a+3)=0$

a = 8, - 3

$a^2+\frac{64}{a^2}=8^2+\frac{64}{8^2}=65$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.595.(d)
3x - 2y + 3 = 0 , 3x - 2y = - 3
After cubing both sides,
$27x^3 - 8y^3 - 18xy(3x - 2y) = -27$
$27x^3 - 8y^3 + 54xy = -27$
$27x^3 - 8y^3 + 54xy + 30 = 3$

Sol.596.(d) On rationalizing,
a = $\frac{\sqrt{5}+2}{\sqrt{5}-2} \times \frac{\sqrt{5}+2}{\sqrt{5}+2}$
= $(\sqrt{5} + 2)^2 = 9 + 4\sqrt{5}$
Similarly b = $9 - 4\sqrt{5}$ and ab = 1
$2a^2 + 2b^2 - 5ab = 2(9 + 4\sqrt{5})^2 + 2(9 - 4\sqrt{5})^2 - 5$
⇒ $2(81 + 80 + 72\sqrt{5}) + 2(81 + 80 - 72\sqrt{5}) - 5$
⇒ 2 × 161 + 2 × 161 - 5 = 644 - 5 = 639

Sol.597.(c) $x^2 + (4 - \sqrt{3})x - 1 = 0$,
$x - \frac{1}{x} = -(4 - \sqrt{3})$
On squaring both sides,
$x^2 + \frac{1}{x^2} = 21 - 8\sqrt{3}$

Sol.598.(a)
$a^2 + b^2 + c^2 + 216 = 12(a + b - 2c)$
Taking all to LHS and rearranging all we get
⇒ $a^2 - 12a + 36 + b^2 - 12b + 36 + c^2 + 24c + 144 = 0$
⇒ $(a - 6)^2 + (b - 6)^2 + (c + 12)^2 = 0$
Now we can easily say that a = 6, b = 6, and c = - 12,
Now we have to find out $\sqrt{ab - bc + ca}$
Putting the values of a,b and c we get
$\sqrt{36 + 72 - 72} = \sqrt{36} = 6$

Sol.599.(b)
$\frac{0.325 \times 0.325 + 0.175 \times 0.175 + 25 \times 0.00455}{5 \times 0.0065 \times 3.25 - 7 \times 0.175 \times 0.025} - \frac{0.5}{1.5}$
$= \frac{(0.325)^2 + (0.175)^2 + 2 \times 0.175 \times 0.325}{(0.325)^2 - (0.175)^2} - \frac{0.5}{1.5}$
$= \frac{(0.325 + 0.175)^2}{(0.325 + 0.175)(0.325 - 0.175)} - \frac{0.5}{1.5}$
$= \frac{0.325 + 0.175}{0.325 - 0.175} - \frac{0.5}{1.5}$
$= \frac{0.5}{0.15} - \frac{0.5}{1.5} = \frac{5 - 0.5}{1.5} = \frac{4.5}{1.5} = 3$

Sol.600.(c)
$x^2 + 8y^2 - 12y - 4xy + 9 = 0$,
⇒ $(x - 2y)^2 + (2y - 3)^2 = 0$
x = 2y and y = $\frac{3}{2}$ then, x = 3 Now,
⇒ 7x - 8y = 21 − 12 = 9

Sol.601.(d) $x + y + z = 19$,
$x^2 + y^2 + z^2 = 133$ and $xz = y^2$
Using $(x + y + z)^2 = x^2 + y^2 + z^2 + 2xy + 2yz + 2xz$ And putting the values we get
361 = 133 + 2(xy + yz + xz)
228 = 2(xy + yz + xz)
⇒ (xy + yz + xz) = 114
Now putting $xz = y^2$ and taking out y common simultaneously
We get y$(x + y + z)$ = 114
Putting $x + y + z$ = 19 we get y = 6
Now x + z = 13 and $x^2 + z^2 = 97$
Solving these equations we get
x = 9 and z = 4 As $x > z > 0$(given 0)
So x - z = 9 - 4 = 5

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Ratio & Proportion

Key - points:-

1) What are antecedent and consequent? In the form $x : y$; x is called the *antecedent* and y is called *consequent*.

2) $x : y$ can also be written as $\frac{x}{y}$

3) Duplicate ratio (square) :-

Duplicate ratio of x : y will be $x^2 : y^2$

4) Sub-duplicate Ratio (square root):-

Sub-duplicate Ratio of x : y will be $\sqrt{x} : \sqrt{y}$

5) Triplicate Ratio (cube) :-

Triplicate ratio of x : y will be $x^3 : y^3$

6) Sub-triplicate Ratio (cube root)

Sub-triplicate Ratio of x : y will be $\sqrt[3]{x} : \sqrt[3]{y}$

7) Inverse ratio :- $x : y$ will be $y : x$

8) Compound Ratio : If two or more ratios are given, then the antecedent of one is multiplied with antecedent of the other and respective consequents are also multiplied.

If a : b, c : d and e : f are three ratios, then their compound ratio will be $\frac{ace}{bdf}$.

9) 3rd Proportional:- 3rd proportion of a and b i.e. a : b :: b : x ⇒

Then , $x = \frac{b^2}{a}$

10) 4th Proportional: 4th proportional of a, b and c i.e. a : b :: c : x

Then , $x = \frac{b \times c}{a}$

11) Componendo and dividendo rule:

If a : b :: c : d , Then ⇒ $\frac{a+b}{a-b} = \frac{c+d}{c-d}$

12) Mean Proportion : Mean proportion of two numbers, a and b, is given by $\sqrt{ab}$.

Partnership

Concept 1

The ratio of profits of two or more partners will be equal to the ratio of their respective equivalent investment ratio.

Equivalent investment = (Amount Invested) × (Time for which the amount is invested).

We will take some examples to understand the concepts of partnership.

Example 1: A invests Rs. 10,000 and B invests Rs. 20,000 for a period of 1 year each. The profit, after 1 year will be divided in the ratio:

$\frac{Profit\ of\ A}{Profit\ of\ B} = \frac{10000 \times 12}{20000 \times 12} = \frac{1}{2}$

Example 2: A invests Rs.100 in a business. After 6 months B joins with an investment of Rs. 200. At the end of 1 year C joins with an investment of Rs.100. What will be the ratio of profit after 3 years?

	A	B	C
Amount(Rs.)	100	200	100
Time(month)	36	30	24
Equivalent Investment	3600 :	6000 :	2400
Profit Ratio	3 :	5 :	2

Example 3: In the previous case if the total profit after 3 years is 10,000. What will be the share of A?

Share of A in total profit =

$\frac{3}{3+5+2} \times 10{,}000 = \frac{3}{10} \times 10000$

$\Rightarrow 3 \times 1000 = 3000$

Note: In case someone invests in-between the total period of time, just take care for what time an amount is invested. Similarly there can be a case when someone opts out in that case also, the time for which the amount was invested will be taken into consideration and not the full period.

Concept 2

If $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{f}{g}$ = K, where K is constant . Then , K = $\frac{a+c+e+f}{b+d+f+g}$

Example : $\frac{1+x}{2-x} = \frac{9-x}{3+x}$ = K, Find the value of K ?

Sol . :- K = $\frac{1+x+9-x}{2-x+3+x} = \frac{10}{5}$ = 2

Concept 3

If two or three ratios are given , and we have to find an individual ratio of all of them, then we take LCM of the common entities and then balancing the common entities ,we get the required ratio.

Example :- a : b = 3 : 4 , b : c = 6 : 7.

LCM of the common entities i.e b = (4, 6) = 12

a : b = 3 : 4) × 3 = 9 : 12

b : c = 6 : 7) × 2 = 12 : 14

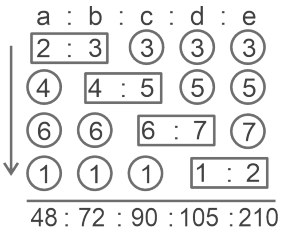
So, a : b : c = 9 : 12 : 14

Note : In case there are more than three ratios given , then the LCM approach will be tedious in finding the individual ratio of the given entities.

Alternative method

If a : b = 2 : 3, b : c = 4 : 5

c : d = 6 : 7, d : e = 1 : 2



To understand this concept we will take some examples

Example 1 : ₹5600 is to be divided among A, B, C & D in such a way that the ratio of share of A : B is 1 : 2, B : C is 3 : 1 , C : D is 2 : 3, find the share of A and B taken together ?

Share of A : B = 1 : 2

Share of B : C = 3 : 1

Share of C : D = 2 : 3

A : B : C : D →

1 × 3 × 2 : 2 × 3 × 2 : 2 × 1 × 2 : 2 × 1 × 3

= 6 : 12 : 4 : 6 or 3 : 6 : 2 : 3

Sum of the share of all of them = 3 + 6 + 2 + 3 = 14 unit

Total share of (A + B) = $\frac{6+3}{14}$ × 5600

= 9 × 400 = ₹3600

Example 2 : Sum of ₹ x is divided among A, B, C such that the ratio of the shares of A and B is 6 : 7 and that of B and C is 3 : 2. If the difference of the share of A and C is ₹540 . Find the value of x

Share of A and B = 6 : 7

Share of B and C = 3 : 2

Ratio of the shares of A, B and C = 6 × 3 : 3 × 7 : 7 × 2 = 18 : 21: 14

Diff. of A and C = 18 - 14 = 4 unit, which corresponds to ₹540

Total share of A, B and C = 18 + 21 + 14

= 53 unit = $\frac{540}{4}$ × 53 = ₹ 7155

Concept 4

If numerator and denominator of a ratio is multiplied and divided by same number, the ratio remains unchanged .

E.g. :- $\frac{a}{b} = \frac{a \times k}{b \times k} = \frac{\frac{a}{k}}{\frac{b}{k}}$

Ratio is independent of change in scale only and not of origin.

Concept 5

If there is 'n' number of unequal fractions such as $\frac{a1}{b1}, \frac{a2}{b2}, \frac{a3}{b3}, \frac{a4}{b4} \ldots \frac{an}{bn}$ then the ratio of (a_1+a_2+a_3+..a_n) and (b_1 + b_2 + b_3 + … b_n) lies between lowest and highest values of these fractions.

Example:- three unequal fractions are $\frac{1}{2}, \frac{2}{3}, \frac{4}{7}$. So, the ratio of (1 + 2 + 4) : (2 + 3 + 7) = 7 : 12. Among these fractions,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

lowest fraction is $\frac{1}{2}$ and the highest fraction is $\frac{2}{3}$ so, the required value lies between $\frac{1}{2}$ and $\frac{2}{3}$

Concept 6:
If aA = bB = cC, where a,b,c are constants and A, B, C are variables. Then the ratio of A : B : C = b × c : c × a : a × b.
Example: if 3A = 4B = 5C, then find A:B:C
The ratio of A : B : C = 4 × 5 : 5 × 3 : 3 × 4 = 20 : 15 : 12

Variety Questions

Q.1. The number of marbles in three bags is in the ratio of 2 : 3 : 4. If 12 marbles are added to each bag, then the ratio changed to 8 : 11 : 14. The total number of marbles in the beginning was:
SSC MTS 28/10/2024 (Morning)
(a) 216 (b) 162 (c) 200 (d) 126

Q.2. A function of two variable varies directly with x and inversely with y. Determine function when x = 5 and y = 3. Given that, for x = 0 and y = 1, f = 15 and for x = 1 and y = 15, f = 2.
SSC CGL 17/09/2024 (3rd Shift)
(a) 10 (b) 2 (c) 5 (d) 15

Q.3. A payment of ₹120 is made with ₹10, ₹5 and ₹2 coins. A total of 25 coins are used. Which of the following is the number of ₹10 coins used in the payment?
SSC CGL 12/09/2024 (1st Shift)
(a) 6 (b) 4 (c) 10 (d) 8

Q.4. What is the ratio of the mean proportional of 1.21 and 0.09 with the mean proportional of 0.16 and 0.36?
SSC CGL 11/09/2024 (3rd Shift)
(a) 11 : 8 (b) 13 : 8 (c) 13 : 12 (d) 11 : 13

Q.5. The mean proportional of $8a^2$ and $\frac{18}{a^4}$, where a is a positive number, is ____.
SSC CGL 09/09/2024 (3rd Shift)
(a) $\frac{12}{a^2}$ (b) 12a (c) $12a^2$ (d) $\frac{12}{a}$

Q.6. R pays ₹100 to P with ₹5, ₹2 and ₹1 coins. The total number of coins used for paying are 40. What is the number of coins of denomination ₹5 in the payment?
SSC CGL 09/09/2024 (1st Shift)
(a) 16 (b) 17 (c) 18 (d) 13

Q.7. Find the fourth proportion of the following numbers: $\frac{1}{3}$rd of 27, $\frac{4}{5}$th of 30, $\frac{3}{7}$th of 35.
Higher Secondary 24/06/2024 (Shift - 2)
(a) 35 (b) 40 (c) 45 (d) 38

Q.8. The concentration of three wines A, B and C are 10%, 20% and 30%, respectively. They are mixed in the ratio 2 : 3 : x resulting in a 23% concentration solution. Find the value of x.
SSC CHSL Tier II 02/11/2023
(a) 7 (b) 6 (c) 8 (d) 5

Q.9. In a school of 720 students, the ratio of boys to girls is 3 : 5. Find how many new boys may be allowed to the school if 18 new girls are admitted, so that the ratio of boys to girls changes to 2 : 3.
SSC CPO 05/10/2023 (3rd Shift)
(a) 42 (b) 50 (c) 44 (d) 38

Q.10. Ram has 12 hens and 5 cows, Shyam has 18 hens and 9 cows, Preetham has 4 hens and 8 cows, and Vinay has 10 hens and 7 cows. Who has a greater ratio of hens to cows?
SSC CPO 05/10/2023 (2nd Shift)
(a) Shyam (b) Preetham
(c) Vinay (d) Ram

Q.11. A company is manufacturing boxes of three types - plastic, wood and glass. The ratio of the numbers of plastic, wood and glass boxes is 2 : 3 : 5. The difference between the numbers of wood and glass boxes is 144. If the number of plastic boxes is increased by 25%, then what will be the number of plastic boxes now ?
SSC CPO 04/10/2023 (1st Shift)
(a) 144 (b) 216 (c) 360 (d) 180

Q.12. Find the fourth proportional of 12^{35}, 3^{12} and 4^{12}.
SSC MTS 14/09/2023 (3rd Shift)
(a) 12^{-23} (b) 3^{24} (c) 12^{-11} (d) 4^{24}

Q.13. Three numbers are in the ratio 1 : 2 : 3. By adding 5 to each of the numbers then the ratio changes to 2 : 3 : 4. The smallest number is:
SSC MTS 14/09/2023 (1st Shift)
(a) 5 (b) 15 (c) 12 (d) 20

Q.14. When x = 1 then y is directly proportional to x + 3 and y = 8. When z = 6 then x is inversely proportional to z and x = 2. Find the relation between y and z.
SSC MTS 12/09/2023 (2nd Shift)
(a) (y - 6) / z = 24 (b) (y - 6) / z = 12
(c) z(y - 6) = 12 (d) z(y - 6) = 24

Q.15. If A : B = $\frac{1}{3}$: $\frac{1}{5}$, B : C = $\frac{1}{7}$: $\frac{1}{8}$ and C : D = $\frac{1}{10}$: $\frac{1}{21}$, then A : B : C : D is:
SSC MTS 06/09/2023 (3rd Shift)
(a) 40 : 24 : 21 : 10 (b) 48 : 23 : 25 : 8
(c) 8 : 3 : 7 : 5 (d) 14 : 24 : 28 : 10

Q.16. The average of the two numbers is 48. If 3 is added to a smaller number, then the ratio between them is 11 : 20. Find the larger number. (Round up to two decimal places).
SSC MTS 05/09/2023 (3rd Shift)
(a) 40.87 (b) 3.87 (c) 63.87 (d) 70.87

Q.17. Arrange the ratios in ascending order 5 : $3\frac{1}{3}$, $6\frac{1}{4}$: $3\frac{1}{8}$ and 3.5 : 4.5.
SSC MTS 05/09/2023 (1st Shift)
(a) 3.5 : 4.5 < 5 : $3\frac{1}{3}$ < $6\frac{1}{4}$: $3\frac{1}{8}$
(b) $6\frac{1}{4}$: $3\frac{1}{8}$ < 5 : $3\frac{1}{3}$ < 3.5 : 4.5
(c) 5 : $3\frac{1}{3}$ < 3.5 : 4.5 < $6\frac{1}{4}$: $3\frac{1}{8}$
(d) 5 : $3\frac{1}{3}$ < $6\frac{1}{4}$: $3\frac{1}{8}$ < 3.5 : 4.5

Q.18. The incomes of P, Q and R are in the ratio of 9 : 15 : 10 and their savings are in the ratio is 10 : 15 : 12. If R spends 60% of his income, what is the ratio of the expenditures of P, Q and R?
SSC MTS 05/09/2023 (1st Shift)
(a) 18 : 17 : 30 (b) 17 : 30 : 18
(c) 17 : 18 : 30 (d) 18 : 30 : 17

Q.19. Find the fourth proportional to $(a+b)^2 \times (a^3-b^3), (a^3+b^3), (a^2-b^2)$.
SSC MTS 01/09/2023 (2nd Shift)
(a) $\frac{(a^2-ab+b^2)}{(a+b)}$ (b) $\frac{(a^2+ab+b^2)}{(a-b)}$
(c) $\frac{(a^2-ab+b^2)}{(a^2+ab+b^2)}$ (d) $\frac{(a^2+ab+b^2)}{(a^2-b^2)}$

Q.20. Two numbers A and B are such that the sum of 6% of A and 4% of B is $\frac{2}{5}$ of the sum of 7% of A and 11% of B, then the ratio A : B is:
SSC MTS 01/09/2023 (1st Shift)
(a) 3 : 7 (b) 5 : 8 (c) 1 : 8 (d) 1 : 7

Q.21. A certain sum was to be divided between A and B in the ratio 8 : 5. However, by mistake, it was divided in the ratio 5 : 8. Thus, A gets ₹300 less than his original share. Find the sum.
SSC CHSL 17/08/2023 (4th Shift)
(a) ₹2,600 (b) ₹1,500 (c) ₹1,300 (d) ₹600

Q.22. When P is subtracted from each of the numbers 8, 6, 2 and 9, the numbers so obtained in this order are in proportion. What is the mean proportional between (3P - 6) and (9P - 4) ?
SSC CHSL 10/08/2023 (4th Shift)
(a) 26 (b) 28 (c) 29 (d) 24

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.23. A sum of money is divided among A, B, C in the ratio 3 : 2 : 5, respectively. If the share of C is ₹300 more than B. Then how much more money will A get than B?
SSC CHSL 03/08/2023 (1st Shift)
(a) ₹150 (b) ₹75 (c) ₹100 (d) ₹125

Q.24. The mean proportional of (a + b) $(a-b)^3$, $(a+b)^3$ (a - b) is:
SSC CGL 25/07/2023 (4th shift)
(a) $(a+b)^2(a-b)^2$ (b) $(a+b)^2$(a − b)
(c) (a + b) $(a-b)^2$ (d) a^2-b^2

Q.25. The seats for Mathematics, English and Chemistry in a school are in the ratio of 6 : 4 : 7. If these seats are increased by 20%, 40% and 60%, respectively, the ratio of the increased seats is:
SSC CGL 19/07/2023 (2nd shift)
(a) 9 : 7 : 8 (b) 9 : 7 : 14
(c) 1 : 2 : 3 (d) 7 : 9 : 14

Q.26. A bag contains ₹550 in the form of 50p, 25p and 20p coins in the ratio 2 : 3 : 5. The difference between the amounts that are contributed by the 50 p and the 20 p coins is:
SSC CGL 17/07/2023 (3rd shift)
(a) ₹30 (b) ₹20 (c) ₹10 (d) ₹0

Q.27. In a party hall, there are people in blue and red dresses. The ratio of the number of men in blue to the number of women in red is 3 : 7. The ratio of men in red to the number of women in blue is 2 : 1. If the ratio of the number of people in blue to the number of people in red is 35 : 76, then what is the ratio of the number of men to the number of women ?
SSC MTS 04/05/2023 (Morning)
(a) 47 : 51 (b) 40 : 43
(c) 62 : 57 (d) 52 : 59

Q.28. P's income is 250 percent of Q's income and P's expenditure is 180 percent of Q's expenditure. If P's income is 400 percent of Q's expenditure, then what is the respective ratio of P's savings and Q's savings?
SSC CHSL 17/03/2023 (3rd Shift)
(a) 8 : 3 (b) 11 : 3 (c) 11 : 5 (d) 5 : 2

Q.29. The number of units manufactured by company A was 12500 units in 2019 and 10625 units in 2020. While in company B, the production fell from 34000 units in 2019 to 30600 units in 2020. If X and Y are the percentage decrease in the number of units manufactured by company A and B respectively from 2019 to 2020, then what will be the ratio of X and Y?
SSC CGL 13/12/2022 (1st Shift)
(a) 5 : 3 (b) 3 : 4 (c) 3 : 2 (d) 8 : 5

Q.30. In an office with 40 officers, the average salaries of class-A, class-B and class-C officers are ₹600, ₹750 and ₹1,000 a day, respectively. The number of class-A, class-B and class-C officers in the office are in the ratio 5 : 4 : 1, respectively. Find the monthly average salary (in ₹) of an officers, all the 40 of them taken together. [Assume the number of days in a month to be 30.]
SSC MTS 08/07/2022 (Morning)
(a) 25,800 (b) 21,000
(c) 24,030 (d) 24,600

Q.31. The ratio of income of A to that of B is 4 : 3. The expenditure of A is $\frac{5}{12}$ of his income and the expenditure of B is $\frac{7}{15}$ of his income. The difference between their expenditure is ₹4,500. Find the income of B.
SSC CHSL 25/05/2022 (Evening)
(a) ₹49,625 (b) ₹48,625
(c) ₹51,625 (d) ₹50,625

Q.32. A sum of ₹46,800 is divided among A, B, C and D in such a way that the ratio of the combined share of A and D to the combined share of B and C is 8 : 5. The ratio of the share of B to that of C is 5: 4. A receives ₹18,400. If x is the difference between the shares of A and B and y is the difference between the shares of C and D, then what is the value of (x - y) (in ₹) ?
SSC CGL Tier II (29/01/2022)
(a) 6000 (b) 6500 (c) 5000 (d) 7000

Q.33. If a number of pens and pencils are bought in the ratio of 5 : 3, then Ashok has to pay ₹44. If the ratio is changed as 3 : 5, then he has to pay ₹36. Find the ratio of the price of one pen to one pencil.
SSC MTS 11/10/2021 (Evening)
(a) 5 : 3 (b) 7 : 3 (c) 8 : 5 (d) 7 : 4

Q.34. Atul purchased Bread costing Rs.20 and gave a 100 rupee note to the shopkeeper. The shopkeeper gave the balance money in coins of denomination 2, 5, and 10. If these coins are in the ratio 5 : 4 : 1, then how many 5 coins did the shopkeeper give?
SSC CGL 03/08/2021 (Evening)
(a) 5 (b) 6 (c) 8 (d) 4

Q.35. In a school, $\frac{3}{8}$ of the number of students are girls and the rest are boys, One - third of the number of boys are below 10 years and $\frac{2}{3}$ of the number of girls is also below 10 years. If the number of students of age 10 or more years is 260, then the number of boys in the school is:
SSC CGL Tier II (15/11/2020)
(a) 280 (b) 300 (c) 234 (d) 312

Q.36. By adding 3 and 5 in numerator and denominator of a fraction it becomes $\frac{2}{3}$. If 1 and 3 are subtracted and added from numerator and denominator respectively, it becomes $\frac{2}{5}$. Find the fraction.
SSC CHSL 19/10/2020 (Morning shift)
(a) $\frac{5}{7}$ (b) $\frac{6}{7}$ (c) $\frac{7}{6}$ (d) $\frac{7}{5}$

Q.37. A, B and C spend 80%, 85% and 75% of their incomes, respectively. If their savings are in the ratio 8 : 9 : 20 and the difference between the incomes of A and C is Rs. 18,000 , then the income of B is :
SSC CGL Tier II (13/09/2019)
(a) Rs. 24,000 (b) Rs. 27,000
(c) Rs. 30,000 (d) Rs. 36,000

Q.38. The ratio of income of A and B last year was 4 : 3, respectively. The ratios of their individual incomes of the last year and the present year are 3 : 4 and 5 : 6, respectively. If their total income for the present year is Rs. 8.04 lakh, then the income of B last year was :
SSC CGL Tier II (12/09/2019)
(a) Rs. 2.7 lakh (b) Rs. 3.6 lakh
(c) Rs. 2.4 lakh (d) Rs. 2.8 lakh

Q.39. The ratio of the income of A to that of B is 5 : 7. A and B save Rs. 4000 and Rs. 5000 respectively. If the expenditure of A is equal to $66\frac{2}{3}$% of the expenditure of B, then the total income of A and B is :
SSC CGL Tier II (11/09/2019)
(a) Rs. 25,200 (b) Rs. 24,000
(c) Rs. 26,400 (d) Rs. 28,800

Q.40. The ratio between the divisor and remainder is 3 : 2 and the ratio between the divisor and the quotient is 7 : 12. If the remainder is 14, then find the remainder when the dividend is divided by 9.
SSC MTS 21/08/2019 (Morning)
(a) 3 (b) 6 (c) 4 (d) 5

Q.41. Ravi's age is $\frac{3}{5}$ of Shyam's age. After x years the ratio of the ages of Ravi and Shyam becomes 5 : 7. If initially the sum of their ages is 32, then what is the value of x ?
SSC MTS 08/08/2019 (Morning)
(a) 2 (b) 4 (c) 8 (d) 7

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.42. Rs. 8000 is distributed among A, B and C such that they receive notes of Rs. 500, Rs. 200 and Rs. 100 respectively. The amounts received by them are in the ratio 15 : 2 : 3. What was the ratio of the numbers of notes of Rs. 500, Rs 200 and Rs 100 ?
SSC CHSL 10/07/2019 (Morning)
(a) 3:1:3 (b) 3:3:1 (c) 4:1:2 (d) 3:2:2

Q.43. A sum of Rs. 4360 was to be divided among A , B , C and D in the ratio of 3 : 4 : 5 : 8, but it was divided in the ratio of $\frac{1}{3} : \frac{1}{4} : \frac{1}{5} : \frac{1}{8}$ by mistake.
As a result:
SSC CHSL 01/07/2019 (Evening)
(a) A received Rs. 956 more
(b) B received Rs. 318 more
(c) D received Rs. 1144 less
(d) C received Rs. 132 less

Q.44. A sum of Rs. x is divided among A , B and C such that the ratio of shares of A and B is 7 : 12 and that of B and C is 8 : 5. If the difference in the shares of A and C is Rs. 214 , then the value of x is :
SSC CGL 07/06/2019 (Evening)
(a) 11556 (b) 11128 (c) 11770 (d) 11342

Q.45. The prices of two articles are in the ratio 4 : 5. If the price of the first article is increased by x% and that of the other is decreased by 30% , then the new prices of A and B will be in the ratio 10 : 7. The value of x is :
SSC CGL 07/06/2019 (Afternoon)
(a) 24.5 (b) 22.5 (c) 25 (d) 20

Practice Questions

SSC CHSL 2024 Tier - 2

Q.46. If a man's age is four times the sum of the ages of his three children, and after 6 years his age will be twice the sum of the ages of his three children, then what is the man's present age?
SSC CHSL Tier II (18/11/2024)
(a) 60 years (b) 56 years
(c) 45 years (d) 30 years

SSC MTS 2024 Tier - 1

Q.47. In a student council election, there were three contestants. All the voters participated in the voting and 10% of votes were declared invalid. The contestants got the votes in the ratio 8 : 7 : 5. If the second candidate in the list got 4725 votes, the total number of valid votes is:
SSC MTS 07/10/2024 (Morning)
(a) 10,000 (b) 11,500 (c) 13,500 (d) 9,000

Q.48. 141 is divided into two parts in such a way that the one-eighth part of the first and one-ninth part of the second are in the ratio 5 : 6. Find the first part.
SSC MTS 07/10/2024 (Afternoon)
(a) 36 (b) 72 (c) 48 (d) 60

Q.49. The salaries of A and B are in a ratio of 2 : 3. Their savings are equal. If A's expenditure is $\frac{1}{2}$ of the salary, then what per cent of income does B spends ?
SSC MTS 07/10/2024 (Afternoon)
(a) 66.67% (b) 78.5% (c) 50% (d) 75%

Q.50. 360 toffees are distributed among Pushkal, Quadir and Rustam in the ratio 2 : 3 : 4. After distribution, Quadir gives 20% of his toffees to Pushkal and Rustam gives 25% of his toffees to Pushkal. What is the new ratio of toffees with Pushkal, Quadir and Rustam ?
SSC MTS 08/10/2024 (Evening)
(a) 5 : 4 : 6 (b) 7 : 3 : 5
(c) 6 : 4 : 5 (d) 3 : 5 : 7

Q.51. Due to a fault in the voting machine, the invalid votes are counted in votes of the candidate B, who gets 5 times the invalid votes. A gets the votes 8 times the invalid votes and wins the election by 28. What is the total number of votes polled ?
SSC MTS 14/10/2024 (Afternoon)
(a) 168 (b) 184 (c) 196 (d) 176

Q.52. The mean proportional between the numbers p and q is 8. Which of the following pairs of numbers can be the values of p and q ?
SSC MTS 15/10/2024 (Afternoon)
(a) 12 and 3 (b) 16 and 4
(c) 12 and 16 (d) 10 and 6

Q.53. The ratio of the incomes of Rama and Ganga is 4 : 3 and the ratio of their expenditures is 3 : 2. If each person saves ₹2,700, then find their expenditures, respectively.
SSC MTS 15/10/2024 (Evening)
(a) ₹8,100 and ₹5,000
(b) ₹8,000 and ₹5,000
(c) ₹8,100 and ₹5,400
(d) ₹8,000 and ₹5,400

Q.54. Shankar comes to buy a T-shirt in a showroom. He purchases a shirt which costs ₹1,020 after a discount. He pays his bill in the form of 50 paise, 20 paise and 10 paise coins in the ratio 2 : 3 : 4 (assume for the sake of the problem). What is the number of 10 paise coins he used to pay his bill ?
SSC MTS 17/10/2024 (Afternoon)
(a) 1530 (b) 510 (c) 1020 (d) 2040

Q.55. What should be added to each of the four numbers 5, 19, 7 and 25 to make them proportional ?
SSC MTS 23/10/2024 (Morning)
(a) 2 (b) 3 (c) 1 (d) 4

Q.56. If 49 : x :: x : 81 and 64 : y :: y : 169, where x and y are both natural numbers, then find the value of 2x + 3y.
SSC MTS 13/11/2024 (Evening)
(a) 312 (b) 126 (c) 348 (d) 438

Q.57. When x is added to each of 2, 3, 30 and 35, then the numbers obtained in this order are in proportion. What is the second largest part in the proportion ?
SSC MTS 14/11/2024 (Morning)
(a) 40 (b) 30 (c) 35 (d) 45

Q.58. The quantity of milk ordered on the first, second, third and fourth day of a four day ceremony is in the proportion of 30 litres, 24 litres, 35 litres and 'x' litres, respectively. Find the quantity of milk (in litres) ordered on the fourth day.
SSC MTS 14/11/2024 (Evening)
(a) 30 (b) 32 (c) 28 (d) 26

SSC CGL 2024 Tier - 1

Q.59. The average marks (out of 100) of boys and girls in an examination are 75 and 80, respectively. If the average marks of all the students in that examination are 78. Find the ratio of the number of boys to the number of girls.
SSC CGL 09/09/2024 (1st Shift)
(a) 2 : 3 (b) 3 : 4 (c) 1 : 3 (d) 1 : 2

Q.60. At present, A is thrice as old as B. C is 5 years elder than B. The sum of the ages of A, B, C is 75 years. The ratio of the age of B five years ago to the age of A three years from now is:
SSC CGL 09/09/2024 (2nd Shift)
(a) 2 : 3 (b) 1 : 4 (c) 4 : 7 (d) 1 : 5

Q.61. If x varies inversely as y and x = 2 when y = 6, then the value of y when x = 3 is:
SSC CGL 09/09/2024 (2nd Shift)
(a) 2 (b) 3 (c) 4 (d) 6

Q.62. The ages of two friends, Ram and Ravi, differ by 7 years. Ram's mother Mayadevi is three times as old as Ram, and Ravi is four times as old as his brother Soham. The ages of Mayadevi and Soham differ by 65 years. Find the age of Mayadevi (in years).
SSC CGL 10/09/2024 (1st Shift)
(a) 69 (b) 36 (c) 85 (d) 45

Q.63. What is the value of D, if A : C = B : D in the given table?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

A	B	C	D
25	40	30	?

SSC CGL 10/09/2024 (1st Shift)
(a) 56 (b) 48 (c) 45 (d) 42

Q.64. A money bag contains one rupee, 5 rupee and 10 rupee coins in the ratio of 3 : 5 : 7 respectively. If the total amount in the bag is ₹980, then find the number of coins of ₹10.
SSC CGL 10/09/2024 (1st Shift)
(a) 69 (b) 70 (c) 71 (d) 68

Q.65. A sum of money is divided among P, Q, R and S in the proportion of 4 : 9 : 2 : 3. If Q gets ₹560 more than R, then the share of S is:
SSC CGL 11/09/2024 (1st Shift)
(a) ₹140 (b) ₹340 (c) ₹240 (d) ₹440

Q.66. The incomes of P, Q and R are in the ratio 10 : 12 : 9 and their expenditures are in the ratio 12 : 15 : 8. If Q saves 25% of his income, then what is the ratio of the savings of P, Q and R ?
SSC CGL 12/09/2024 (1st Shift)
(a) 15 : 14 : 21 (b) 14 : 15 : 21
(c) 21 : 15 : 14 (d) 21 : 14 : 15

Q.67. Raj divides ₹1,200 in the ratio 2 : 1 : 3 among three of his friends. The amount equal to the sum of three times the largest share and two times the smallest share is:
SSC CGL 12/09/2024 (1st Shift)
(a) ₹2,400 (b) ₹1,800 (c) ₹2,200 (d) ₹2,000

Q.68. The ratio between male and female members in a club is 2 : 3. If the number of male members is increased by 200, the ratio becomes 5 : 6. How many female members are there in the club?
SSC CGL 12/09/2024 (2nd Shift)
(a) 1200 (b) 900 (c) 1400 (d) 1000

Q.69. Find the mean proportional of 12.96 and 0.16.
SSC CGL 13/09/2024 (3rd Shift)
(a) 1.21 (b) 1.96 (c) 1.44 (d) 1.69

Q.70. In a collection of rare coins, there is one gold coin for every four non-gold coins. If 20 more gold coins are added to the collection, the ratio of the number of gold coins to that of non-gold coins will be 2:3. The total number of coins in the collection will now become _____.
SSC CGL 17/09/2024 (1st Shift)
(a) 80 (b) 60 (c) 100 (d) 48

Q.71. In a company, the ratio of men and women is 5 : 3, respectively. When 150 additional women are employed in the company, the ratio becomes 5 : 4. How many men are employed in the company?
SSC CGL 17/09/2024 (2nd Shift)
(a) 850 (b) 750 (c) 550 (d) 950

Q.72. There are y yellow marbles and b blue marbles in a box. 18% of the yellow marbles were added to 24% of the blue marbles, and the total was 30. Three times the number of yellow marbles exceeds two times the number of blue marbles by 200. What is the ratio of y^2 to b^2?
SSC CGL 17/09/2024 (3rd Shift)
(a) 6 : 5 (b) 4 : 1 (c) 2 : 1 (d) 5 : 2

Q.73. The mean proportional of $4a^2$ and x is $\frac{1}{5a}$, where a is a positive number, then the value of x is _____
SSC CGL 18/09/2024 (2nd Shift)
(a) $\frac{1}{100a^4}$ (b) $\frac{1}{100a^2}$ (c) $\frac{1}{25a^2}$ (d) $\frac{1}{25a^4}$

Q.74. The cost of a diamond varies directly as the square of its weight. Once, this diamond broke into four pieces with weights in the ratio of 4 : 3 : 2 : 1 .When the pieces were sold, the merchant got ₹63,000 less than that of one piece. Find the original price of the diamond.
SSC CGL 19/09/2024 (1st Shift)
(a) ₹86,000 (b) ₹80,000
(c) ₹90,000 (d) ₹75,000

Q.75. The ratio of boys to girls initial in a college is 5 : 6. If 40 boys leave the college and 50 girls join the college, the ratio will become 8 : 11. Find the number of girls (initial) in the college.
SSC CGL 19/09/2024 (3rd Shift)
(a) 740 (b) 860 (c) 720 (d) 640

Q.76. 30 is the mean proportional of 18 and A. Find the value of A.
SSC CGL 23/09/2024 (1st Shift)
(a) 60 (b) 40 (c) 45 (d) 50

Q.77. The salaries of P and Q together amount to ₹9,60,000. P and Q save 64% and 44%, respectively of their individual salaries. If P's expenditure is 1.5 times Q's expenditure, then what is the ratio of P's salary to Q's salary?
SSC CGL 25/09/2024 (1st Shift)
(a) 2 : 3 (b) 7 : 3 (c) 3 : 7 (d) 3 : 2

Q.78. The ratio of circumference and diameter of a circle is 3 : 5. If the circumference is 6 cm, then the radius of the circle is:
SSC CGL 25/09/2024 (3rd Shift)
(a) 10 cm (b) 15 cm (c) 5 cm (d) 1.8 cm

Q.79. If a : b = c : d = e : f = 5 : 7, then what is the ratio (3a + 5c + 11e) : (3b + 5d + 11f)?
SSC CGL 26/09/2024 (2nd Shift)
(a) 7 : 11 (b) 3 : 7 (c) 5 : 7 (d) 11 : 7

Q.80. The monthly incomes of A, B and C are in the ratio 2 : 9 : 3 and their expenses are in the ratio 3 : 9 : 5. If A's saving is half of his total income, then savings of A, B and C are, respectively, in the ratio of:
SSC CGL 26/09/2024 (3rd Shift)
(a) 3 : 9 : 2 (b) 2 : 5 : 2
(c) 3 : 18 : 4 (d) 1 : 2 : 1

SSC CHSL 2024 Tier - 1

Q.81. Radhika requested the cashier of a bank to get her coins in lieu of her cheque worth ₹1,845. Cashier gave her a packet containing ₹5, ₹10 and ₹20 coins in the ratio of 3 : 5 : 7. What is the total worth of the smallest coin received by her ?
SSC CHSL 01/07/2024 (1st Shift)
(a) ₹135 (b) ₹125 (c) ₹145 (d) ₹105

Q.82. The age of the older of two boys is thrice that of the younger. 9 years ago it was five times that of the younger. Find the present age of each.
SSC CHSL 01/07/2024 (2nd Shift)
(a) 15 years, 45 years
(b) 18 years, 54 years
(c) 17 years, 51 years
(d) 12 years, 36 years

Q.83. P pays Q a sum of ₹150 using coins of ₹2, ₹5 and ₹10. He uses a total of 50 coins. If the ratio of ₹2 and ₹5 coins used is 5 : 2, then how many coins of ₹10 are used in the payment?
SSC CHSL 01/07/2024 (3rd Shift)
(a) 2 (b) 1 (c) 4 (d) 5

Q.84. In what ratio must a grocer mix two varieties of pulses costing ₹60 and ₹75 per kg, respectively, so as to get a mixture worth ₹65 per kg ?
SSC CHSL 01/07/2024 (3rd Shift)
(a) 3 : 4 (b) 2 : 1 (c) 2 : 3 (d) 1 : 2

Q.85. M varies inversely as (N^2 + 3). If M = 3 when N = 3, then what will be the value of M when N^2 = 69 ?
SSC CHSL 01/07/2024 (4th Shift)
(a) 1 (b) $\frac{1}{4}$ (c) $\sqrt{69}$ (d) $\frac{1}{2}$

Q.86. The difference between two numbers is 48. The ratio of these two numbers is 7 : 3.
What is the sum of the two numbers ?
SSC CHSL 01/07/2024 (4th Shift)
(a) 110 (b) 100 (c) 90 (d) 120

Q.87. Divide some money in the ratio Ravi, Reeta and Rahul that 5 (Part of Ravi) = 3 (Part of Reeta) = 11 (Part of

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Rahul). The money ratio of Ravi : Reeta : Rahul is equal to :
SSC CHSL 02/07/2024 (4th Shift)
(a) 11 : 5 : 3 (b) 11 : 33 : 15
(c) 5 : 11 : 3 (d) 33 : 55 : 15

Q.88. Among the ratios 3 : 4, 5 : 8, 1 : 2, 6 : 9 which is the greatest?
SSC CHSL 03/07/2024 (1st Shift)
(a) 5 : 8 (b) 6 : 9 (c) 1 : 2 (d) 3 : 4

Q.89. If a : b = 3 : 7 and b : c = 4 : 9, then find a : b : c.
SSC CHSL 03/07/2024 (2nd Shift)
(a) 12 : 28 : 63 (b) 3 : 28 : 63
(c) 12 : 28 : 9 (d) 3 : 28 : 9

Q.90. Which is the greatest ratio among the following?
$\frac{8}{11}, \frac{4}{5}, \frac{1}{2}$ and $\frac{1}{11}$
SSC CHSL 03/07/2024 (3rd Shift)
(a) $\frac{4}{5}$ (b) $\frac{8}{11}$ (c) $\frac{1}{2}$ (d) $\frac{1}{11}$

Q.91. When 'X' is added to each of the numbers 7, 11, 18 and 23, then the number so obtained are in proportion. What is the mean proportional between the (x - 1) and (2x - 10) ?
SSC CHSL 03/07/2024 (4th Shift)
(a) 78 (b) 98 (c) 48 (d) 68

Q.92. Convert 28% into the form of ratio.
SSC CHSL 04/07/2024 (1st Shift)
(a) 25 : 7 (b) 7 : 25 (c) 7 : 18 (d) 18 : 7

Q.93. A box filled with gift articles weighs 25 kg. If the weight of the box and the gift articles, respectively, are in the ratio 1 : 9, then the weight of the articles (in grams) is:
SSC CHSL 04/07/2024 (1st Shift)
(a) 22500 (b) 23500
(c) 21500 (d) 24500

Q.94. Find the third proportion to 36 and 48.
SSC CHSL 04/07/2024 (3rd Shift)
(a) 36 (b) 54 (c) 48 (d) 64

Q.95. If a : b = 3 : 4, b : c = 2 : 3, and c : d = 5 : 6, then a : b : c : d is:
SSC CHSL 05/07/2024 (1st Shift)
(a) 10 : 20 : 30 : 36 (b) 15 : 25 : 30 : 36
(c) 15 : 20 : 30 : 36 (d) 15 : 20 : 35 : 36

Q.96. If $\frac{1}{M} : \frac{1}{N} : \frac{1}{O}$ = 3 : 4 : 5, then M : N : O is equal to :
SSC CHSL 05/07/2024 (2nd Shift)
(a) 12 : 15 : 20 (b) 20 : 15 : 12
(c) 20 : 12 : 15 (d) 15 : 20 : 12

Q.97. The mean proportion of 0.14 and 2.24 is:
SSC CHSL 05/07/2024 (3rd Shift)
(a) 0.56 (b) - 2.39 (c) 1.12 (d) 1.02

Q.98. Find the fourth proportion to 1.25, 5.75 and 3.5
SSC CHSL 05/07/2024 (4th Shift)
(a) 4.5 (b) 16.1 (c) 12.5 (d) 6.5

Q.99. Two numbers are in the ratio 2 : 3. Their sum is 135. Find the numbers.
SSC CHSL 08/07/2024 (2nd Shift)
(a) 54, 81 (b) 45, 90 (c) 50, 85 (d) 60, 75

Q.100. Find the mean proportional between 25 and 81.
SSC CHSL 08/07/2024 (3rd Shift)
(a) 12 (b) 36 (c) 81 (d) 45

Q.101. Two numbers are, respectively, 30% and 60% more than a third number. The ratio of the two numbers is:
SSC CHSL 09/07/2024 (1st Shift)
(a) 13 : 16 (b) 12 : 13
(c) 11 : 15 (d) 13 : 17

Q.102. The strength of a school is 640, with the number of boys being 400. Find the ratio of girls to boys.
SSC CHSL 09/07/2024 (4th Shift)
(a) 5 : 6 (b) 3 : 5 (c) 4 : 5 (d) 8 : 5

Q.103. Raju and Ramu have more land than Sonu by 15% and 25%, respectively. What is the ratio of land owned by Raju and Ramu?
SSC CHSL 10/07/2024 (1st Shift)
(a) 56 : 25 (b) 21 : 23
(c) 23 : 25 (d) 25 : 23

Q.104. If x : y = 5 : 6,then 2x + 3y : 3x + 5y is:
SSC CHSL 10/07/2024 (2nd Shift)
(a) 18 : 35 (b) 28 : 45
(c) 18 : 45 (d) 28 : 48

Q.105. Which of the following ratios is greater ?
SSC CHSL 10/07/2024 (3rd Shift)
(a) 7 : 4 (b) 8 : 3 (c) 2 : 3 (d) 1 : 5

Q.106. The ratio of red to green sweets in a bag is 3 : 4. How many red sweets are there in the bag if the number of green sweets is 120 ?
SSC CHSL 11/07/2024 (1st Shift)
(a) 80 (b) 100 (c) 70 (d) 90

Q.107. Find the mean proportion to 0.72 and 2.85 (round up to one decimal place).
SSC CHSL 11/07/2024 (3rd Shift)
(a) 1.4 (b) 0.7 (c) 2.8 (d) 0.4

Q.108. What should be added to each term of the ratio 5 : 11 so that the ratio becomes 3 : 5 ?
SSC CHSL 11/07/2024 (4th Shift)
(a) 5 (b) 4 (c) 2 (d) 6

SSC CPO 2024 Tier - 1

Q.109. Two numbers are in the ratio of 3 : 7. If 11 is subtracted from each, the ratio between the numbers becomes 7 : 20. Find the smaller number.
SSC CPO 27/06/2024 (1st Shift)
(a) 39 (b) 21 (c) 36 (d) 27

Q.110. If 40% of A = 60% of B = $\frac{1}{6}$ of C, then find the ratio of A : B : C.
SSC CPO 27/06/2024 (3rd Shift)
(a) 15:10:18 (b) 36:10:15
(c) 15:10:36 (d) 10:15:36

Q.111. The ratio of marks of A and B is 3 : 4 and the ratio of marks of B and C is 4 : 5. If the difference in the marks of C and A is 30, then how much marks does B get?
SSC CPO 27/06/2024 (3rd Shift)
(a) 52 (b) 64 (c) 60 (d) 56

Q.112. A sum of ₹17,600 was divided between Jeevan, Praveen and Kanan, such that the ratio of the sums received by Jeevan and Praveen was 5 : 8, while the ratio of the sums received by Praveen and Kanan was 3 : 2. How much money did Jeevan receive as his share?
SSC CPO 28/06/2024 (1st Shift)
(a) ₹4,900 (b) ₹4,750
(c) ₹4,850 (d) ₹4,800

Q.113. Find the natural number obtained when the number 13 is subtracted from the mean proportional of 75 and 12.
SSC CPO 28/06/2024 (1st Shift)
(a) 14 (b) 30 (c) 27 (d) 17

Q.114. If four distinct positive numbers, a, b, c and d, in the order given are in proportion, then which of the following options is NOT correct?
SSC CPO 28/06/2024 (2nd Shift)
(a) b, a, d and c, in the order given are in proportion.
(b) c, d, b and a, in the order given are in proportion.
(c) d, c, b and a, in the order given are in proportion.
(d) a, c, b and d, in the order given are in proportion.

Q.115. Let 'a' be a positive number and b = $\frac{4}{a}$ What is the mean proportional of a and b
SSC CPO 28/06/2024 (3rd Shift)
(a) 4 (b) 3 (c) 2 (d) a

Q.116. What is the ratio between S and T if S is 75% of T ?
SSC CPO 28/06/2024 (3rd Shift)
(a) 4 : 3 (b) 2 : 3 (c) 75 : 1 (d) 3 : 4

Q.117. In a school, the total number of

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

boys is 20% more than the total number of girls. What is the ratio of the number of boys to that of girls in the school ?
SSC CPO 29/06/2024 (1st Shift)
(a) 6 : 5 (b) 5 : 6 (c) 5 : 3 (d) 4 : 5

Q.118. 42% of Ranita's weekly income is equal to 56% of Bhaskar's weekly income. If Bhaskar's weekly income was raised by ₹ 200, while Ranita's weekly income did not change, the ratio of the weekly incomes of Ranita and Bhaskar, respectively, would have been 5 : 4. What is Ranita's weekly income (in ₹) ?
SSC CPO 29/06/2024 (1st Shift)
(a) 4200 (b) 3600 (c) 3000 (d) 4000

Q.119. Swati earns a sum of ₹40,000, out of which she saves 25%. She spends the remaining amount on food and education in the ratio of 3 : 2. What is the percentage of expenditure incurred on education to her total income?
SSC CPO 29/06/2024 (2nd Shift)
(a) 30% (b) 20% (c) 60% (d) 40%

SSC Selection Post (Phase - XII)

Q.120. In an educational institution, the ratio of the numbers of students in middle school and in high school, respectively, in a given year was given as 4 : 3. If there were 324 students in middle school in that year in that institution, what was the number of students in high school in the same year in that institution?
Matriculation Level 20/06/2024 (Shift - 1)
(a) 243 (b) 240 (c) 249 (d) 246

Q.121. If class A has 11 boys and 18 girls, class B has 13 boys and 17 girls, and class C has 20 boys and 9 girls, which class has the biggest ratio(s) of boys to girls?
Matriculation Level 20/06/2024 (Shift - 4)
(a) Class A (b) Both class A and class B
(c) Class C (d) Class B

Q.122. A recipe is made using cheese and butter in the ratio 4: 3. If Arohi uses 8 bowls of cheese, how many bowls of butter should she use?
Matriculation Level 21/06/2024 (Shift - 1)
(a) 4 (b) 6 (c) 8 (d) 3

Q.123. The ratio of the salaries of S to F is 2 : 3 and the ratio of their savings is 3 : 4. What is the ratio of their expenditures if their total savings are equal to the salary of S?
Matriculation Level 21/06/2024 (Shift - 1)
(a) 8 : 15 (b) 7 : 15 (c) 8 : 13 (d) 7 : 12

Q.124. S varies directly as (R + 7), and S = 42 when R = 17. What is the value of S when R = 29 ?
Matriculation Level 24/06/2024 (Shift - 1)
(a) 51 (b) 63 (c) 58 (d) 66

Q.125. The price of a television set and a washing machine are in the ratio of 8 : 7. If the cost of the television set is ₹4,800 more than the cost of the washing machine, then find the price of the washing machine.
Matriculation Level 25/06/2024 (Shift - 1)
(a) ₹33,000 (b) ₹33,500
(c) ₹33,600 (d) ₹33,700

Q.126. Pooja, Chameli and Anju have a total of ₹450 in their purses. Pooja has ₹50 more than Chameli. Anju has two times what Pooja has. How much do Pooja, Chameli and Anju, respectively, have in their purses ?
Higher Secondary 20/06/2024 (Shift - 2)
(a) ₹150, ₹75 and ₹225
(b) ₹100, ₹50 and ₹300
(c) ₹125, ₹75 and ₹250
(d) ₹125, ₹50 and ₹275

Q.127. Two numbers are in the ratio 4 : 5. If 3 is added to the smaller and 7 is subtracted from the larger number, they are in the ratio 1 : 1. Find the numbers.
Higher Secondary 20/06/2024 (Shift - 2)
(a) 60, 75 (b) 40, 50 (c) 55, 44 (d) 20, 25

Q.128. What is the mean proportional of $45x^4$ and $5y^2$?
Higher Secondary 21/06/2024 (Shift - 2)
(a) $5x^2y$ (b) $25x^4y$ (c) $15x^2y$ (d) $45x^2y^2$

Q.129. The ages of A and B are in the ratio 4 : 7, respectively. After 8 years, the ratio of their ages will be 2 : 3. What is the sum of the ages of A and B (in years)?
Higher Secondary 21/06/2024 (Shift - 2)
(a) 44 (b) 36 (c) 38 (d) 42

Q.130. Which number should be added to 3, 11, 4 and 14 to make them in proportion?
Higher Secondary 25/06/2024 (Shift - 2)
(a) 3 (b) 2 (c) 4 (d) 1

Q.131. Two numbers are in the ratio 4 : 5. If 17 is subtracted from each, the new numbers are in the ratio 11 : 14. If 20 is added to each of the original numbers, then the ratio becomes:
Higher Secondary 25/06/2024 (Shift - 4)
(a) 224 : 275 (b) 275 : 241
(c) 241 : 275 (d) 224 : 241

Q.132. A bag contains a total of 180 coins in the denominations of ₹5 and ₹1. Find the number of ₹5 coins in the bag, if the total value of the coins is ₹500.
Higher Secondary 26/06/2024 (Shift - 2)
(a) 60 (b) 120 (c) 80 (d) 100

Q.133. Find the third proportional of 9, 7, ?, 14.
Higher Secondary 26/06/2024 (Shift - 2)
(a) 21 (b) 16 (c) 24 (d) 18

Q.134. Find the ratio between the fourth proportional of 42, 56, 63 and the fourth proportional of 189, 273, and 153.
Graduate Level 21/06/2024 (Shift - 3)
(a) 33 : 221 (b) 217 : 42
(c) 33 : 84 (d) 84 : 221

Q.135. Rishi and Sarita have ₹4,760. If $\frac{9}{16}$ of Rishi's amount is equal to $\frac{3}{4}$ of Sarita's amount, how much does Sarita have?
Graduate Level 24/06/2024 (Shift - 3)
(a) ₹3,570 (b) ₹1,190
(c) ₹2,720 (d) ₹2,040

Q.136. A sum of money was divided between Cyrus, Rohan and Mishti. The ratio of the sums received by Cyrus and Rohan was 3 : 2, while the ratio of the sums received by Rohan and Mishti was 7 : 12. If the sum received by Cyrus was ₹1,800 less than the sum received by Mishti, how many rupees did Rohan receive as his share?
Graduate Level 24/06/2024 (Shift - 3)
(a) ₹9,240 (b) ₹7,560
(c) ₹8,400 (d) ₹6,300

Q.137. The third proportional to $(5^2 - 3^2)$ and (5 - 3) is:
Graduate Level 25/06/2024 (Shift - 3)
(a) $\frac{1}{3}$ (b) $\frac{1}{8}$ (c) $\frac{1}{2}$ (d) $\frac{1}{4}$

Q.138. Four distinct positive numbers, 'a', 'b', 'c' and 'd', in the order given, are in proportion. 'b' is 35 more than 'a' and 'd' is 60 more than 'c'. The product of 'a' and 'c' is 5376. What is the sum of 'a', 'b', 'c' and 'd'?
Graduate Level 26/06/2024 (Shift - 3)
(a) 398 (b) 400 (c) 399 (d) 397

Q.139. A bag contains rupee, 50-paise and 25-paise coins in the ratio 3 : 4 : 6. If the total amount is ₹143, the number of 50-paise coins is:
Graduate Level 26/06/2024 (Shift - 4)
(a) 132 (b) 66 (c) 90 (d) 88

Q.140. The sum of the four numbers A, B, C and D is 875. If the ratio of A to B is 1 : 2, the ratio of B to C is 3 : 1 and the ratio of C to D is 2 : 3, find the value of C.
Graduate Level 26/06/2024 (Shift - 4)
(a) 120 (b) 130 (c) 125 (d) 135

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 2023 Tier - 2

Q.141. The ratio of the expenditure to the savings of Richa is 2 : 1. If her income and expenditure increase by 20% and 15%, respectively, then find the percentage increase in her savings.
SSC CHSL Tier II 10/01/2024
(a) 35% (b) 30% (c) 20% (d) 25%

Q.142. The ratio of prices of Coffee and Tea is 3 : 4 and the ratio of their quantities consumed by a family is 4 : 7. Find the ratio of expenditures on Coffee and Tea.
SSC CHSL Tier II 10/01/2024
(a) 3 : 7 (b) 7 : 3 (c) 7 : 4 (d) 4 : 7

Q.143. ₹7,786 is divided among A, B and C in such a manner that the ratio of the amount of A to that of B is 3 : 4 and the ratio of the amount of B to that of C is 12 : 13. The amount of money received by B is:
SSC CHSL Tier II 10/01/2024
(a) ₹7,138 (b) ₹2,977
(c) ₹2,748 (d) ₹5,038

SSC CPO 2023 Tier - 1

Q.144. The areas of the two triangles are in the ratio 4 : 3 and their heights are in the ratio 6 : 5. Find the ratio of their bases.
SSC CPO 03/10/2023 (1st Shift)
(a) 5 : 6 (b) 10 : 9 (c) 9 : 10 (d) 6 : 5

Q.145. If $\frac{x}{4y} = \frac{3}{4}$, then the value of $\frac{2x+3y}{x-2y}$ is
SSC CPO 05/10/2023 (2nd Shift)
(a) 8 (b) 6 (c) 9 (d) 7

SSC MTS 2023 Tier - 1

Q.146. P and Q are inversely proportional to each other and P is 10, when Q is 6. What will be the value of Q when P is 15?
SSC MTS 01/09/2023 (2nd Shift)
(a) 9 (b) 4 (c) 10 (d) 5

Q.147. The mean proportion of $(3 + 2\sqrt{2})^2$ and $(3 - 2\sqrt{2})^2$ is:
SSC MTS 04/09/2023 (1st Shift)
(a) $3 + 2\sqrt{2}$ (b) 5 (c) $2\sqrt{2}$ (d) 1

Q.148. Profit of ₹29,120 is divided among A, B and C so that A's share is $2\frac{1}{2}$ times B's and B's share is $1\frac{1}{5}$ times C. Find B's share.
SSC MTS 05/09/2023 (2nd Shift)
(a) ₹6,940 (b) ₹7,820 (c) ₹6,720 (d) ₹7,140

Q.149. Rupees 66,000 is to be divided amongst Asha, Bhupinder and Gargi in such a way that ratio of their shares is to be: Asha : Bhupinder = 9 : 5 and Bhupinder : Gargi = 2 : 1 . How much should Asha get ?
SSC MTS 05/09/2023 (3rd Shift)
(a) ₹38,000 (b) ₹36,000
(c) ₹32,000 (d) ₹34,000

Q.150. A certain sum is to be divided between A, B, and C in the ratio 2 : 5 : 7. But by mistake, it was divided in the ratio 5 : 2 : 7. Thus B loses by ₹150. Find the sum.
SSC MTS 06/09/2023 (1st Shift)
(a) ₹700 (b) ₹850 (c) ₹900 (d) ₹625

Q.151. If p : q = 5 : 2, then $p^2 - q^2 : p^2 + q^2$ = ?
SSC MTS 06/09/2023 (2nd Shift)
(a) 29 : 21 (b) 4 : 3 (c) 3 : 4 (d) 21 : 29

Q.152. The marks scored by a student are directly proportional to the time invested in studies. If the student gets 60 marks when he studies 4 hours a day, then how many hours he should use in his studies daily to get 75 marks ?
SSC MTS 08/09/2023 (1st Shift)
(a) 4.5 (b) 5 (c) 5.5 (d) 6

Q.153. Three numbers are in the ratio 5 : 2 : 7. The sum of their squares is 3822. The biggest number is :
SSC MTS 08/09/2023 (2nd Shift)
(a) 35 (b) 38 (c) 78 (d) 49

Q.154. Among four numbers the sum of the smallest and largest is 72 more than the sum of middle two numbers. If the numbers are in the ratio 6 : 7 : 15 : 19, then the smallest number is :
SSC MTS 08/09/2023 (2nd Shift)
(a) 72 (b) 144 (c) 168 (d) 216

Q.155. If the income of T is 8 times his savings, then his expenditure is ___ times his savings.
SSC MTS 11/09/2023 (3rd Shift)
(a) 6 (b) 7 (c) 8 (d) 5

Q.156. The ratio of the number of boys to the number of girls in a school of 1650 students is 6 : 5. If 124 new boys are admitted and few new girls are admitted, the ratio changes to 4 : 3. What is the ratio of the newly admitted girls to the newly admitted boys ?
SSC MTS 13/09/2023 (1st Shift)
(a) 3 : 4 (b) 62 : 9 (c) 4 : 3 (d) 9 : 62

Q.157. In a class of boys and girls, the number of girls is twice the number of boys. If 20 more boys join the class, the ratio of girls and boys is 1: 1. How many total students were there in the class initially ?
SSC MTS 14/09/2023 (1st Shift)
(a) 60 (b) 75 (c) 45 (d) 90

Q.158. If A : B : C = 3 : 4 : 5, then $\sqrt{A^2 + B^2} : \sqrt{C^2 - B^2}$ is:
SSC MTS 14/09/2023 (3rd Shift)
(a) 3 : 2 (b) 4 : 5 (c) 5 : 3 (d) 3 : 5

SSC CHSL 2023 Tier - 1

Q.159. The cost of 3 cups and 5 plates is ₹1,080 and the cost of 2 cups and 4 plates is ₹840. Find the ratio of the cost of a cup to the cost of a plate.
SSC CHSL 03/08/2023 (3rd Shift)
(a) 1 : 3 (b) 2 : 3 (c) 1 : 1 (d) 1 : 2

Q.160. The compound ratio of 3 : 4 and 6 : 7 is 36 : x. Find x.
SSC CHSL 03/08/2023 (4th Shift)
(a) 64 (b) 75 (c) 56 (d) 48

Q.161. Find 2 numbers such that their mean proportional is 25 and their third proportional is 25.
SSC CHSL 07/08/2023 (1st Shift)
(a) 5 and 5 (b) 5 and 25
(c) 25 and 125 (d) 25 and 25

Q.162. The present age of a father is twice that of his son. 8.5 years hence the ratio would be 7 : 4. Find the son's present age.
SSC CHSL 07/08/2023 (2nd Shift)
(a) 25.5 years (b)16.5 years
(c) 20.5 years (d) 24.6 years

Q.163. The sum of the amount that Sunaina and Ranjan have is ₹23 and the difference of their amount is ₹7. The ratio of the amount that Sunaina and Ranjan have is:—
SSC CHSL 07/08/2023 (3rd Shift)
(a) 5 : 3 (b) 7 : 15 (c)15 : 8 (d) 2 : 17

Q.164. Two numbers are in the ratio of 1 : 2. If 7 is added to both, their ratio changes to 3 : 5. The greater number is:
SSC CHSL 07/08/2023 (3rd Shift)
(a) 30 (b) 18 (c) 14 (d) 28

Q.165. The difference between 24 and the mean proportional of 7 and 63 is:
SSC CHSL 07/08/2023 (4th Shift)
(a) 3 (b) 2 (c) 5 (d) 4

Q.166. If a : b = 5 : 7, then $(6a^2 - 2b^2) : (b^2 - a^2)$ will be :
SSC CHSL 08/08/2023 (4th Shift)
(a) 12 : 5 (b) 21 : 5 (c) 13 : 6 (d) 17 : 8

Q.167. What is the fourth proportional of $3\sqrt{5}$, $5\sqrt{8}$ and $3\sqrt{10}$?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 09/08/2023 (4th Shift)
(a) $10\sqrt{5}$ (b) $40\sqrt{2}$ (c) 30 (d) 20

Q.168. The ratio of the father's age to his son's age is 5 : 3. The product of the numbers representing their ages is 960.The ratio of their ages after 6 years will be:
SSC CHSL 11/08/2023 (1st Shift)
(a) 23:15 (b) 23:17 (c) 21:15 (d) 21:17

Q.169. Find the third proportion of P and 12, when 8, P, 16 and 18 are in proportion.
SSC CHSL 11/08/2023 (2nd Shift)
(a) 16 (b) 8 (c) 18 (d) 12

Q.170. The total number of workers in a company is 960. If the number of female workers in the company is 420, then the respective ratio of the total number of male workers to the total number of female workers in the company is:
SSC CHSL 11/08/2023 (3rd Shift)
(a) 7 : 9 (b) 16 : 9 (c) 16 : 7 (d) 9 : 7

Q.171. Given that x varies directly as y and x = 45 when y = 9. What is the value of x when y = 50 ?
SSC CHSL 17/08/2023 (1st Shift)
(a) 225 (b) 190 (c) 175 (d) 250

Q.172. Divide ₹ 1488 among X, Y and Z. If the shares are in the ratio X : Y = 4 : 5, Y : Z = 7 : 6, then find out the share of Z.
SSC CHSL 17/08/2023 (3rd Shift)
(a) ₹ 460 (b) ₹ 450 (c) ₹ 470 (d) ₹ 480

SSC CGL 2023 Tier - 1

Q.173. The ratio of the number of boys to that of the girls in a school is 11 : 15. If there are 200 more girls than boys in the school, what is the number of boys in that school ?
SSC CGL 14/07/2023 (4th shift)
(a) 550 (b) 750 (c) 506 (d) 605

Q.174. The ratio between the monthly income and the expenditure of Vaidic is 8: 5. If his income increases by 20% and his expenditure increases by 30%, then find the percentage increase or decrease in his monthly savings.
SSC CGL 14/07/2023 (4th shift)
(a) $5\frac{2}{3}$% increase (b) $5\frac{2}{3}$% decrease
(c) $3\frac{1}{3}$% increase (d) $3\frac{1}{3}$% decrease

Q.175. In a factory, 48% of the number of male workers is equal to two-third of the number of female workers. What is the ratio of the number of males to that of the females in the factory ?
SSC CGL 18/07/2023 (2nd shift)
(a) 25 : 12 (b) 12 : 25 (c) 18 : 25 (d) 25 : 18

Q.176. Two numbers are, respectively, 17% and 50% more than a third number. The ratio of the two numbers is:
SSC CGL 19/07/2023 (4th shift)
(a) 27 : 25 (b) 39 : 50
(c) 19 : 11 (d) 29 : 25

Q.177. If a : b :: b : c, and b = 96, then which of the following can be a possible pair of values of a and c ?
SSC CGL 20/07/2023 (2nd shift)
(a) a = 24 ; c = 374 (b) a = 32 ; c = 288
(c) a = 48 ; c = 168 (d) a = 16 ; c = 586

Q.178. Three numbers are in the ratio $\frac{4}{5} : \frac{5}{6} : \frac{9}{10}$. The difference between the smallest and the greatest numbers is 12. Find the number which is neither the smallest nor the greatest.
SSC CGL 24/07/2023 (2nd shift)
(a) 96 (b) 108 (c) 100 (d) 104

Q.179. A pole is 9030 cm long. It is colored saffron, white and green in the ratio of 6 : 7 : 8. Find the length of the green part of the pole.
SSC CGL 24/07/2023 (4th shift)
(a) 3440cm (b) 3010cm
(c) 3480cm (d) 2580cm

Q.180. If a 7-storey building has a 28 m long shadow, the number of storeys of the building whose shadow is 48 m long is:
SSC CGL 26/07/2023 (3rd shift)
(a)14 (b) 24 (c) 16 (d) 12

Q.181. What smallest positive number should be subtracted from 2 and 3 so that 4 is the third proportion to them?
SSC CGL 26/07/2023 (4th shift)
(a) 1 (b) 2 (c) 4 (d) 3

Q.182. If the third proportional of $3x^2$ and 4xy is 48, then find the positive value of y.
SSC CGL 27/07/2023 (2nd shift)
(a) 3 (b) 5 (c) 2 (d) 4

SSC Selection Post (Phase - XI)

Q.183. The ratio of cheese to sauce for a single pizza is 1 cup to $\frac{1}{2}$ cup. If Rama used 15 cups of sauce to make a number of pizzas, then how many cups of cheese did she use on those pizzas ?
Graduate Level 27/06/2023 (Shift - 4)
(a) 20 cups (b) 10 cups
(c) 40 cups (d) 30 cups

Q.184. Out of the total income, a family saves 15% and the rest of the amount is spent on three types of expenditure - health, education and food in the ratio of 1 : 2 : 2. The income is Rs.300 less than thrice the expenditure incurred on education. What is the difference between the savings and the expenditure incurred on health?
Graduate Level 27/06/2023 (Shift - 4)
(a) Rs.300 (b) Rs.350
(c) Rs.2,250 (d) Rs.500

Q.185. Let M denote the mean proportional between 16 and 9 and let N denote the third proportional of 9 and 15. Find the value of 5M + 3N.
Graduate Level 28/06/2023 (Shift - 3)
(a) 300 (b) 125 (c) 135 (d) 225

Q.186. A company is manufacturing three different products - Glass, Plate and Bowl. The number of Plates is double the number of Glasses. The number of Glasses manufactured is twice the number of Bowls. What is the difference between the number of Plates and the number of Bowls if the total units manufactured by the company is 2380?
Graduate Level 28/06/2023 (Shift - 3)
(a) 1360 (b) 680 (c) 1120 (d) 1020

Q.187. Two numbers are in the ratio of 7 : 6. If the difference between their squares is 637, then the numbers are
Higher Secondary 30/06/2023 (Shift - 2)
(a) 49 and 42 (b) 49 and 12
(c) 43 and 36 (d)14 and 12

Q.188. The students in three batches of a dance class are in ratio 2 : 3 : 5. If 20 students increase in each batch the ratio changes to 4 : 5 : 7. Find the total number of students in the three batches before the increase.
Matriculation Level 27/06/2023 (Shift -1)
(a) 120 (b) 100 (c) 150 (d) 80

Q.189. In an examination, the ratio of practical to theory marks is 3 : 7. If 80% of the marks are scored in the practical and 60% of marks are scored in the theory, what is the ratio of marks scored in the theory and the practical ?
Matriculation Level 28/06/2023 (Shift - 1)
(a) 6 : 7 (b) 5 : 7 (c) 7 : 4 (d) 3 : 7

Q.190. If a : b : c = 4 : 7 : 9 and b : c : d = 28 : 36 : 21, then a : b : c : d is:
Matriculation Level 28/06/2023 (Shift - 4)
(a) 12 : 21 : 27 : 17 (b) 16 : 28 : 36 : 21
(c) 8 : 14 : 18 : 21 (d) 4 : 7 : 9 : 11

Q.191. The ratio of the number of boys to that of girls in a village is 5 : 3. If 40% of the boys and 60% of the girls appeared in an examination, then the ratio of the number of boys and girls who appeared

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

in the examination to the number who did not appear in the same examination, is :-
Matriculation Level 30/06/2023 (Shift - 4)
(a) 17 : 21 (b) 19 : 21
(c) 17 : 27 (d) 19 : 23

SSC CHSL 2022 Tier - 2

Q.192. The radii of two cylinders are in the ratio 2 : 1 and their heights are in the ratio 5 : 2. The ratio of their volumes is:
SSC CHSL Tier II (26/06/2023)
(a) 20 : 1 (b) 15 : 1 (c) 10 : 1 (d) 5 : 1

SSC MTS 2022 Tier - 1

Q.193. The ratio of two numbers is 5 : 9. If 6 is added to the greater number and 6 is subtracted from the smaller number, then the greater number becomes 6 times the smaller number. What are the numbers ?
SSC MTS 02/05/2023 (Afternoon)
(a) 15 and 27 (b) 10 and 18
(c) 25 and 45 (d) 20 and 36

Q.194. If $\frac{J}{4} = \frac{K}{5} = \frac{L}{3}$, then what is the value of $(L + J)^2 : (J + K)^2 : (K + L)^2$?
SSC MTS 04/05/2023 (Afternoon)
(a) 25 : 16 : 9 (b) 64 : 25 : 81
(c) 49 : 81 : 62 (d) 49 : 81 : 64

Q.195. In three positive numbers, the ratio of first and second is 3 : 4 and the ratio of second and third is 3 : 5. The product of first and third is 4500. What is the sum of the three numbers?
SSC MTS 11/05/2023 (Morning)
(a) 282 (b) 235 (c) 198 (d) 205

Q.196. When a sum of money was equally distributed among 50 children, each child received Rs. 80. If the same amount is equally distributed among another group of children such that each child get Rs. 50, then what is the number of children in the second group?
SSC MTS 15/05/2023 (Morning)
(a) 50 (b) 80 (c) 60 (d) 40

Q.197. If (x + y) : (y + z) : (z + x) = 3 : 5 : 7 and (x + y + z) = 45, then what is the value of z?
SSC MTS 16/05/2023 (Evening)
(a) 18 (b) 30 (c) 27 (d) 20

Q.198. A sum of Rs. 120 is dividedm among p, q and r in such a way that p gets Rs. 9 more than q and q gets Rs. 6 more than r. What is the ratio of shares of p, q and r respectively ?
SSC MTS 17/05/2023 (Morning)
(a) 18 : 15 : 13 (b) 15 : 12 : 10
(c) 16 : 13 : 11 (d) 11 : 8 : 10

SSC CHSL 2022 Tier - 1

Q.199. The expenditure and savings of a person are in a ratio of 4 : 3. His savings increase by $\frac{1}{5}$ of his income and income remains the same. What is the new ratio of his expenditure and savings?
SSC CHSL 10/03/2023 (1st Shift)
(a) 12 : 17 (b) 14 : 17
(c) 13 : 22 (d) 15 : 13

Q.200. Weight of Ayush and Abhishek are in the ratio of 8 : 5. Abhishek's weight increases by 40 percent and the total weight of Ayush and Abhishek both increases by 60 percent. If the total weight becomes 104 kg, then what is the weight of Ayush after the increment ?
SSC CHSL 10/03/2023 (3rd Shift)
(a) 60 kg (b) 75 kg (c) 69 kg (d) 72 kg

Q.201. The ratio of income of Jitendra, and Narendra is 4 : 7 and the ratio of their expenditure is 6 : 5 respectively. If Jitendra saves Rs.400 out of Rs.2,800 income, then find the savings of Narendra.
SSC CHSL 13/03/2023 (2nd Shift)
(a) Rs. 2,900 (b) Rs. 2,000
(c) Rs. 3,900 (d) Rs, 4,900

Q.202. The ratio of incomes of P and Q is 1 : 2. Ratio of income of Q and R is 3 : 2. If one-third of P's income is Rs. 4400 less than the half of P's income, then what is Q's income?
SSC CHSL 14/03/2023 (2nd Shift)
(a) Rs. 56600 (b) Rs. 52800
(c) Rs. 46600 (d) Rs. 41200

Q.203. If the difference between the two numbers is 20 percent of their sum, then what is the ratio of larger number and smaller number ?
SSC CHSL 14/03/2023 (4th Shift)
(a) 6 : 5 (b) 5 : 4 (c) 4 : 3 (d) 3 : 2

Q.204. The ratio of incomes of C and D is 3 : 4 respectively. The sum of their expenditure is Rs. 12000. Savings of C is the same as that of the expenditure of D. What is the sum of their savings?
SSC CHSL 16/03/2023 (2nd Shift)
(a) Rs. 25000 (b) Rs. 15000
(c) Rs. 20000 (d) Rs. 16000

Q.205. The sum of the present ages of a father and his son is 94 years. 8 years ago their respective ages were in the ratio of 2 : 1. After 10 years what will be the ratio of ages of father and son ?
SSC CHSL 17/03/2023 (4th Shift)
(a) 35 : 22 (b) 14 :13 (c) 25 : 18 (d) 16 :15

Q.206. Rs. 43,120 is divided among P, Q and R such that P's share is $\frac{4}{7}$ of total share of Q and R together and Q's share is $\frac{2}{5}$ of total share of P and R together. What is the share of R ?
SSC CHSL 21/03/2023 (3rd Shift)
(a) Rs.15120 (b) Rs.14220
(c) Rs.16400 (d) Rs.18050

SSC CGL 2022 Tier - 2

Q.207. The ratio of the incomes of two employees is 7 : 4, and the ratio of their expenditures is 3 : 1. If each of them manages to save ₹4,800 per month, find the sum of their monthly incomes (in ₹).
SSC CGL Tier II (02/03/2023)
(a) 21120 (b) 20120 (c) 21150 (d) 18150

Q.208. The ratio of marks obtained by Rajesh, Rakesh and Ramesh in an exam is 2 : 4 : 9. What are the marks obtained by Rakesh and Ramesh, if Rajesh scored 30 marks in the exam?
SSC CGL Tier II (03/03/2023)
(a) Rakesh = 40 , Ramesh = 90
(b) Rakesh = 60 , Ramesh = 135
(c) Rakesh = 120 , Ramesh = 180
(d) Rakesh = 90 , Ramesh = 40

SSC CGL 2022 Tier - 1

Q.209. By mistake, instead of dividing ₹702 among Ram, Ramesh, and Naresh in the ratio $\frac{1}{3} : \frac{1}{4} : \frac{1}{6}$, it was divided in the ratio of 3 : 4 : 6. Who gained the most and by how much?
SSC CGL 02/12/2022 (1st Shift)
(a) Ram ₹158 (b) Ramesh ₹158
(c) Naresh ₹168 (d) Ram ₹168

Q.210. Which smallest positive number should be subtracted from each of 9 and 13 so that 18 is the third proportion to them ?
SSC CGL 03/12/2022 (3rd Shift)
(a) 2 (b) 4 (c) 3 (d) 1

Q.211. A varies directly as the positive square root of B, and inversely as the cube of C. If A = 15, when B = 27 and C = 2, then find B when A = 9 and C = 2.
SSC CGL 05/12/2022 (2nd Shift)
(a) $\frac{281}{42}$ (b) $\frac{243}{25}$ (c) $\frac{264}{37}$ (d) $\frac{275}{51}$

Q.212. The mean proportional of 6 and 54 is _____ more than 15.
SSC CGL 07/12/2022 (1st Shift)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) 3 (b) 6 (c) 4 (d) 5

SSC CPO 2022 Tier - 1

Q.213. Four numbers are in the ratio 1 : 2 : 3 : 5. Two times their sum is 44. Find the ratio of the numbers obtained by subtracting 3 from the cube of each number.
SSC CPO 09/11/2022 (Morning)
(a) 2 : 31 : 204 : 999
(b) 3 : 13 : 208 : 992
(c) 11 : 67 : 219 : 1003
(d) 5 : 61 : 213 : 997

Q.214. The salaries of A, B and C are in ratio of: $\frac{3}{2}, \frac{6}{5}, \frac{4}{3}$. The salary of A and B together is Rs.40,500. By what percentage is the salary of A more than that of C ?
SSC CPO 10/11/2022 (Evening)
(a) 12% (b) 13% (c) 11.5% (d) 12.5%

Q.215. The ratio of a father's age to his Mother's age is 3 : 2 The product of the numbers representing their age is 486. The ratio of their ages after 5 years will be: SSC CPO 10/11/2022 (Evening)
(a) 32:24 (b) 32:21 (c) 32:22 (d) 32:23

SSC CGL 2021 Tier - 2

Q.216. Salaries of B, C, D and E are in the ratio of 2 : 3 : 4 : 5 respectively. Their salaries are increased by 20 percent, 30 percent, 40 percent and 50 percent respectively. If the increased salary of D is ₹560, then what is the sum of the original salaries of B, C, D and E?
SSC CGL Tier II (08/08/2022)
(a) ₹1400 (b) ₹1560 (c) ₹1820 (d) ₹1260

Q.217. The cost of a diamond is directly proportional to the square of its weight. The cost of a 14 gm diamond is ₹2560. This diamond got broken down into two pieces in the ratio of 5 : 9. How much loss percent is incurred due to this breakage? (correct to two decimal places)
SSC CGL Tier II (08/08/2022)
(a) 53.47 percent (b) 49.71 percent
(c) 45.92 percent (d) 55.41 percent

Q.218. A sum of ₹ 1250 has to distributed among A, B, C and D. Total share of B and D is equal to ($\frac{14}{11}$) of total share of A and C. Share of D is half of share of A. Share of C is 1.2 of share of A. What are the shares of A, B, C and D respectively ?
SSC CGL Tier II (08/08/2022)
(a) ₹ 250, ₹ 575, ₹ 300, ₹ 125
(b) ₹ 350, ₹ 525, ₹ 300, ₹ 125
(c) ₹ 250, ₹ 525, ₹ 300, ₹ 125
(d) ₹ 250, ₹ 575, ₹ 300, ₹ 175

SSC Selection Post (Phase - X)

Q.219. If the mean proportional between 5 and 125 is x and the mean proportional between 4^4 and 6^2 is y, find the value of 2x : y.
Graduate Level 04/08/2022 (Shift - 2)
(a) 25 : 48 (b) 25 : 128
(c) 25 : 64 (d) 25 : 96

Q.220. The mean proportional between 75 and x is five times the mean proportional between 15 and 26. The value of x is:
Higher Secondary 05/08/2022 (Shift - 2)
(a) 100 (b) 120 (c) 110 (d) 130

SSC MTS 2021 Tier - 1

Q.221. The ratio of the number of hens to the number of goats in farm A is 5 : 4 and that on farm B is 5 : 7. What could be the ratio of the total number of hens to the total number of goats in farms A and B taken together if total no. of animals in farm A and B are equal ?
SSC MTS 05/07/2022 (Morning)
(a) 35 : 37 (b) 1 : 2 (c) 9 : 11 (d) 7 : 11

Q.222. A person has some coins of ₹10, ₹5, and ₹2 denominations. The ratio of the products of the numbers of ₹10 and ₹ 5 coins, the numbers of ₹5 and ₹2 coins, and the numbers of ₹2 and ₹10 coins is 3 : 4 : 2 respectively. What could be the minimum amount of money this person has ?
SSC MTS 06/07/2022 (Morning)
(a) ₹52 (b) ₹88 (c) ₹68 (d) ₹74

Q.223. In a housing society, the ratio of two - wheelers and 4 - wheelers is 11 : 9, Among the four-wheelers, one-fourth are petrol vehicles and the remaining 81 are diesel vehicles. How many two -wheelers are there in this housing society?
SSC MTS 06/07/2022 (Evening)
(a) 88 (b) 132 (c) 121 (d) 99

Q.224. In a municipal election three candidates, Santosh, Ravi, and Vipin, contested and the valid votes they got were in the ratio of 11 : 4 : 9. If the winner defeated his nearest rival by 8350 votes, then how many valid votes were polled in that election ?
SSC MTS 07/07/2022 (Evening)
(a) 1,02,000 (b) 2,10,000
(c) 1,90,000 (d) 1,00,200

Q.225. A sum of money is distributed among A, B and C in the ratio 8 : 4 : 3. If A divides his part between D and E in the ratio 9 : 7, then what is the ratio of the share of C to that of D ?
SSC MTS 08/07/2022 (Afternoon)
(a) 4 : 5 (b) 3 : 4 (c) 2 : 3 (d) 6 : 7

Q.226. A number when subtracted from 3 times the second number, gives a result equal to $\frac{3}{4}$ of the first number. What is the ratio of the first number to the second number ?
SSC MTS 11/07/2022 (Morning)
(a) 11 : 6 (b) 12 : 7 (c) 9 : 5 (d) 10 : 7

Q.227. In a bag there are coins of ₹5, ₹10 and ₹20 denominations. The total number of coins in the bag is 240. If the number of coins of ₹5, ₹10, ₹20 denominations are in the ratio of 2 : 3 : 5, then what is the total amount of money in the bag ?
SSC MTS 12/07/2022 (Afternoon)
(a) ₹3,540 (b) ₹4,600
(c) ₹4,620 (d) ₹3,360

Q.228. Three numbers a, b, and c are said to be in continued proportion if a : b :: b : c. What number must be added to each of the numbers 1, 7 and 25 so that the resulting sums, in that order, may be in continued proportion?
SSC MTS 14/07/2022 (Evening)
(a) 2 (b) 4 (c) 6 (d) 5

Q.229. A household of three humans has cats and dogs in the ratio 1:2. If the total number of legs in the household is 42, what is the total number of cats in the household ?
SSC MTS 14/07/2022 (Evening)
(a) 12 (b) 6 (c) 9 (d) 3

Q.230. When 8 is added to the numerator of a fraction and 12 is added to its denominator, the fraction becomes $\frac{1}{2}$. When 2 is subtracted from its numerator and denominator, the fraction becomes $\frac{1}{8}$. Find the original fraction.
SSC MTS 15/07/2022 (Morning)
(a) $\frac{9}{19}$ (b) $\frac{3}{10}$ (c) $\frac{4}{7}$ (d) $\frac{5}{11}$

Q.231. If a : b = b : c, then what is the value of $a^6 : b^6$?
SSC MTS 15/07/2022 (Evening)
(a) $a^3 : b^3$ (b) b^3 : ac (c) $a^3 : c^3$ (d) $a^2 : b^2$

Q.232. In a bag there are Rs 5 and Rs 10 coins such that the product of their numbers is 135 and the total amount in the bag is Rs 165, what is the amount

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

from all Rs 10 coins?
SSC MTS 18/07/2022 (Evening)
(a) 90 (b) 85 (c) 80 (d) 95

Q.233. There are a total of 60 students in a class and the ratio of the number of boys to that of the girls is 4 : 1, respectively. If 22 of the boys from this class are vegetarians, then find the number of non-vegetarian boys from the same class.
SSC MTS 19/07/2022 (Evening)
(a) 26 (b) 18 (c) 38 (d) 28

Q.234. The ratio of the quantities imported of steel and iron in 2018 was 3 : 2 and in 2020 it was 1 : 1. The ratio of the quantities imported of steel in 2018 and 2020 was 4 : 3. What was the ratio of the quantities imported of iron in 2018 and 2020 ?
SSC MTS 20/07/2022 (Morning)
(a) 11 : 12 (b) 7 : 5 (c) 8 : 9 (d) 7 : 9

Q.235. On a tree, there are some parrots and some pigeons in the ratio of 7:9 , respectively. After an hour, 8 parrots fly away, and 6 pigeons and 10 sparrows come and sit on the tree. The ratio of the parrots and the pigeons on the tree now is 1 : 4. What is the ratio of the parrots and the sparrows that are now on the tree?
SSC MTS 20/07/2022 (Afternoon)
(a) 1 : 1 (b) 1 : 2 (c) 3 : 5 (d) 4 : 5

Q.236. 4 years ago, the age of Garvit was three times of Yuvansh, but one year ago the age of Garvit was two times that of Yuvansh. What is the difference between the ages of Garvit and Yuvansh?
SSC MTS 21/07/2022 (Morning)
(a) 13 years (b) 11 years
(c) 7 years (d) 6 years

Q.237. The ratio of the number of boys to the number of girls in a class is 2 : 5. If 10 boys leave the class and 20 new girls join the class, then the new ratio of boys and girls in the class becomes 4 : 25. What is the number of boys in the class now?
SSC MTS 22/07/2022 (Morning)
(a) 12 (b) 8 (c) 9 (d) 22

Q.238. Rs 21000 is to be distributed between Raj and Karan such that Raj gets Rs 9000 less than Karan. What is the ratio of the amount received by Raj to that received by Karan?
SSC MTS 22/07/2022 (Evening)
(a) 2 : 5 (b) 3 : 5 (c) 5 : 3 (d) 5 : 2

Q.239. Four years ago, Shyam's age was $\frac{3}{4}$ times that of Ram . Four years hence, Shyam's age will be $\frac{5}{6}$ times that of Ram .What is the present age of Shyam ?
SSC MTS 26/07/2022 (Morning)
(a) 24 years (b) 20 years
(c) 16 years (d) 15 years

SSC CHSL 2021 Tier - 1

Q.240. Soham's initial expenditure and savings were in the ratio 5 : 1. His income increases by 25%, while his savings increase by 20%. If Soham's current expenditure is ₹4,347, what was his initial income?
SSC CHSL 31/05/2022 (Morning)
(a) ₹4,130 (b) ₹4,140
(c) ₹4,150 (d) ₹4,160

Q.241. Two numbers, A and B, are such that the sum of 10% of A and 8% of B is $\frac{3}{5}$th of the sum of 12% of A and 16% of B. The ratio of A : B is :
SSC CHSL 31/05/2022 (Afternoon)
(a) 2 : 3 (b) 4 : 7 (c) 2 : 7 (d) 4 : 3

Q.242. Two numbers X and Y are such that the sum of 18% of X and 8% of Y is one-third of the sum of 22% of X and 36% of Y. Find the ratio of X and Y.
SSC CHSL 02/06/2022 (Afternoon)
(a) 2 : 5 (b) 3 : 11 (c) 3 : 8 (d) 8 : 3

Q.243. If 60% of a number is equal to three-fourth of another number, what is the ratio of the first number to the second number?
SSC CHSL 07/06/2022 (Evening)
(a) 3 : 7 (b) 2 : 5 (c) 7 : 3 (d) 5 : 4

Q.244. P, Q and R are batsmen. The ratio of the runs scored by them in a certain match was P : Q = 16 : 17 and Q : R = 15 : 16. At the end of the match, they scored a total of 956 runs. The number of runs scored by R is (nearest to an integer):
SSC CHSL 09/06/2022 (Afternoon)
(a) 440 (b) 335 (c) 339 (d) 430

Q.245. A varies jointly with B and C. A = 6 when B = 3 and C = 2. Find A when B = 5 and C = 7.
SSC CHSL 10/06/2022 (Evening)
(a) 17.5 (b) 35 (c) 105 (d) 70

SSC CGL 2021 Tier - 1

Q.246. The ratio of the monthly incomes of A and B is 11 : 13 and the ratio of their expenditure is 9 : 11. If both of them manage to save ₹ 4,000 per month, then find the difference in their incomes (in ₹).
SSC CGL 11/04/2022 (Morning)
(a) 2,500 (b) 3,200 (c) 4,000 (d) 3,000

Q.247. At present, A is younger than B by 8 years. If 4 years ago, their ages were in the ratio of 1 : 2, then what is the present age of B (in years)?
SSC CGL 12/04/2022 (Morning)
(a) 11 (b) 20 (c) 12 (d) 18

SSC CGL 2020 Tier - 2

Q.248. If a, b and c are positive numbers such that $(a^2 + b^2) : (b^2 + c^2) : (c^2 + a^2)$ = 34 : 61 : 45, then b - a : c - b : c - a = ____.
SSC CGL Tier II (29/01/2022)
(a) 1 : 2 : 3 (b) 3 : 1 : 2
(c) 2 : 1 : 3 (d) 3 : 2 : 1

Q.249. The income of A is $\frac{2}{3}$ of B's income and the expenditure of A is $\frac{3}{4}$ of B's expenditure. If $\frac{1}{3}$ of the income of B is equal to the expenditure of A, then the ratio of the savings of A to those of B is:
SSC CGL Tier II (29/01/2022)
(a) 3 : 4 (b) 3 : 5 (c) 5 : 3 (d) 4 : 3

Q.250. Alloy A contains metals x and y only in the ratio 5 : 2, while alloy B contains them in the ratio 3 : 4. Alloy C is prepared by mixing alloys A and B in the ratio 4 : 5. The percentage of x in alloy C is:
SSC CGL Tier II (29/01/2022)
(a) $55\frac{4}{9}$ (b) $55\frac{2}{9}$ (c) $55\frac{1}{9}$ (d) $55\frac{5}{9}$

Q.251. One cup has juice and water in the ratio 5 : 2, while another cup of the same capacity has them in the ratio 7 : 4, respectively. If the contents of both the cups (when full) are poured in a vessel, then what will be the final ratio of water to juice in the vessel?
SSC CGL Tier II (29/01/2022)
(a) 25:52 (b) 52:25 (c) 25:26 (d) 26:25

Q.252. The ratio of the incomes of A and B in the last year was 4 : 3. The ratios of their individual incomes in the last year and the present year are 3 : 4 and 5 : 6, respectively. If their total income in the present year is ₹24.12 lakhs, then the sum of the income (in ₹ lakhs) of A in the last year and that of B in the present year is:
SSC CGL Tier II (29/01/2022)
(a) 20.52 (b) 10.98 (c) 22.17 (d) 21.28

Q.253. Let x, y, z be fractions such that x<y<z. If z is divided by x, the result is $\frac{5}{2}$, which exceeds y by $\frac{7}{4}$. If x + y + z = $1\frac{11}{12}$ then the ratio of (z – x) : (y – x) is:

Search on TG @apna_pdf

Search on Telegram @apna_pdf

SSC CGL Tier II (03/02/2022)
(a) 6 : 5 (b) 9 : 5 (c) 5 : 6 (d) 5 : 9

Q.254. In an examination, the number of students who passed and the number of students who failed were in the ratio 25 : 4. If one more student had appeared and passed and the number of failed students was 3 less than earlier, the ratio of passed students to failed students would have become 22 : 3. What is the difference between the number of students who, initially, passed the examination and the number of students who failed the examination?
SSC CGL Tier II (03/02/2022)
(a) 132 (b) 126 (c) 174 (d) 150

SSC MTS 2020 Tier - 1

Q.255. Suman divided a certain sum between her three daughters in the ratio 2 : 3 : 4. Had she divided the sum in the ratio $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$, the daughter who got the least share earlier, would have got ₹3,500 more. The sum was:
SSC MTS 05/10/2021(Afternoon)
(a) ₹14,000 (b) ₹14,500
(c) ₹13,750 (d) ₹14,625

Q.256. In a library, the ratio of the number of mathematics books to that of physics books , is the same as the ratio of the number of physics books to that of chemistry books. If there are 144 mathematics books and 100 chemistry books, then the ratio of the total number of mathematics and physics books to the total number of chemistry and physics books is :-
SSC MTS 05/10/2021 (Evening)
(a) 3 : 2 (b) 6 : 5 (c) 5 : 4 (d) 4 : 3

Q.257. 70 males and 100 females are working in a firm. During one mass recruitment drive, an equal number of males and females are recruited and their ratio becomes 3 : 4. The total number of people working in the firm after recruitment is:
SSC MTS 06/10/2021 (Morning)
(a) 240 (b) 200 (c) 210 (d) 220

Q.258. Between two consecutive years, my income is in the ratio 2 : 5 and expenses are in the ratio 4 : 7. If my income in the second year is ₹75,000 and my expenses in the first year are ₹20,000, then my total savings in the two years together are:
SSC MTS 06/10/2021 (Morning)
(a) ₹55,000 (b) ₹60,000
(c) ₹50,000 (d) ₹40,000

Q.259. A sum of ₹3,780 is divided between A, B and C such that if their shares are decreased by ₹130, ₹150 and ₹200, respectively, then they are in the ratio of 5 : 2 : 4. What is the original share of C ?
SSC MTS 06/10/2021 (Evening)
(a) ₹1,350 (b) ₹1,330 (c) ₹1,400 (d) ₹1,430

Q.260. A, B and C are three boxes containing marbles in the ratio 3 : 5 : 7, and the total number of marbles is 75. If 3 marbles are transferred from B to A, and 5 marbles are transferred from C to B, then the new ratio of the marbles is:
SSC MTS 07/10/2021 (Morning)
(a) 6 : 8 : 11 (b) 5 : 6 : 7
(c) 7 : 9 : 10 (d) 6 : 9 : 10

Q.261. If (a + b) : (b + c) : (c + a) = 7 : 4 : 5, and a + b + c = 16, then $(a^2 + b^2 + c^2) : (ab + bc + ca)$ is equal to :
SSC MTS 08/10/2021 (Evening)
(a) 24 :17 (b) 26 : 19
(c) 27 : 20 (d) 23 : 15

Q.262. Renuka got $1\frac{1}{2}$ times as many marks in Mathematics as in English. Her total marks in Mathematics, English and Science are 190. If the ratio of the marks in Mathematics and Science is 2 : 3, find her Science marks.
SSC MTS 11/10/2021 (Evening)
(a) 92 (b) 90 (c) 85 (d) 88

Q.263. A man ordered 10 physics books and some chemistry books. The price of a chemistry book is twice the price of a Physics book. While preparing the bill the clerk interchanged the number of physics and chemistry books by mistake, which decreased the bill by $12\frac{1}{2}$%. The ratio of the number of physics books to the number of chemistry books in the original order is:
SSC MTS 12/10/2021 (Evening)
(a) 3 : 5 (b) 3 : 4 (c) 4 : 5 (d) 2 : 3

Q.264. The ratio of the monthly income and expenditure of Dinesh is 17 : 14, and his monthly savings are ₹12,000. If his monthly income is increased by ₹10,000 and expenditure is decreased by ₹2,000, then the new ratio of his income and expenditure is:
SSC MTS 12/10/2021 (Evening)
(a) 13 : 8 (b) 13 : 9 (c) 11 : 9 (d) 11 : 7

Q.265. A certain sum is divided among A, B, C and D such that B's share is $\frac{1}{3}$ of A's share, C's share is 40% of B's share, and D's Share is 50% of C's share. If the difference between the shares of B and D is ₹1,600, then the sum is:
SSC MTS 13/10/2021 (Morning)
(a) ₹9,600 (b) ₹9,400 (c) ₹9,000 (d) ₹9,200

Q.266. A, B and C are boxes with marbles in the ratio 2 : 3 : 4. The total number of marbles in the boxes is 360. The above ratio can be changed to 3 : 8 : 7 by which of the following?
(i) By transferring 20 marbles from A to B and 20 marbles from C to B.
(ii) By transferring 20 marbles from A to B and 10 marbles from C to B.
(iii) By transferring 40 marbles from A to B and 20 marbles from C to B
(iv) By transferring 30 marbles from A to B and 30 marbles from C to B.
SSC MTS 18/10/2021 (Morning)
(a) (ii) (b) (iv) (c) (i) (d) (iii)

Q.267. The number of students in three sections of Grade 10 in a school are in the proportion 3 : 5 : 8. If 15, 30 and 15 more students are admitted in the three sections, respectively, the new proportion becomes 4 : 7 : 9. The total number of students before the new admissions is:
SSC MTS 18/10/2021 (Afternoon)
(a) 320 (b) 160 (c) 240 (d) 400

Q.268. The price of a semi-precious stone weighing 48 g, is ₹2,30,400. It is broken into two pieces whose weights are in the ratio 5 : 7. If the price is proportional to the square of the weight, then the loss (in ₹) incurred, is:
SSC MTS 18/10/2021 (Afternoon)
(a) 1,12,000 (b) 40,000
(c) 1,18,400 (d) 78,400

Q.269. x and y are two numbers having opposite signs such that, $x^2 : y^2$ = 49 : 64. What is the value of (5x - 6y) : (6x - 7y)?
SSC MTS 18/10/2021 (Evening)
(a) 44 : 65 (b) 13 : 14
(c) 94 : 117 (d) 83 : 98

Q.270. In an examination, the ratio of the number of candidates who passed to those who failed was 5 : 2. If the number of failed candidates had been 14 more, then the ratio of the number of passed candidates to those who failed would have been 4 : 3. The number of candidates who appeared in the examination was:
SSC MTS 20/10/2021 (Afternoon)
(a) 126 (b) 98 (c) 70 (d) 100

Q.271. The ratio of the number of students in Science to that in Humanities, in Grade 12 of 360 students, is 2 : 3. When some new students are admitted, the number of Science

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

students increases by 18 and the ratio of the Science students to Humanities students changes to 3 : 5. What is the number of new Humanities students admitted?
SSC MTS 20/10/2021 (Evening)
(a) 54 (b) 45 (c) 63 (d) 72

Q.272. The ratio of the present incomes of X and Y is 5 : 8 and the ratios of their individual incomes, in the last year and in the present year, are 2 : 3 and 3 : 4, respectively. If their total income for the last year was ₹56,000, then what is the present income of Y?
SSC MTS 26/10/2021 (Afternoon)
(a) ₹48,000 (b) ₹36,000
(c) ₹40,000 (d) ₹30,000

Q.273. A shopkeeper placed a supply order for jeans, shirts and t-shirts at the rates of ₹500, ₹350 and ₹200 per piece respectively. He buys articles of each type in the ratio 1 : 2 : 3 for ₹46,800. For how many t-shirts did he place the order?
SSC MTS 27/10/2021 (Morning)
(a) 104 (b) 26 (c) 78 (d) 52

Q.274. The present ages of a mother and her son are in the ratio of 6 : 1. When the son becomes as old as his mother now, then the ratio of his father's age to his mother's age is 13 : 11. When the son becomes as old as his father now, then the sum of the ages of the father and son will be 115 years. The present age of the father is:
SSC MTS 27/10/2021(Evening)
(a) 40 years (b) 45 years
(c) 42 years (d) 44 years

Q.275. In an examination, the ratio of the number of candidates who passed, to those who failed was 5 : 2. If the number of failed candidates had been 14 more, then the ratio of the number of passed candidates to those who failed would have been 4 : 3. How many candidates passed the examination?
SSC MTS 02/11/2021 (Afternoon)
(a) 126 (b) 70 (c) 100 (d) 98

Q.276. A batter missed her century by four runs in an innings, in which the scoring shots in the form of sixes, fours, threes, two's and singles, were in the proportion 1 : 3 : 2 : 7 :10. How many runs did she score in singles?
SSC MTS 02/11/ 2021 (Evening)
(a) 20 (b) 16 (c) 10 (d) 12

SSC CGL 2020 Tier - 1

Q.277. A, B and C divide a certain sum of money among themselves. The average of the amounts with them is 4520. Share of A is $10\frac{2}{3}$% more than share of B and $33\frac{1}{3}$% less than share of C. What is the share of B (in rupee)?
SSC CGL 13/08/2021 (Evening)
(a) 3500 (b) 5976 (c) 3600 (d) 3984

Q.278. Alloy A contains metal x and y in the ratio 5 : 2 and alloy B contains these metals in the ratio 3 : 4. Alloy C is prepared by mixing A and B in the ratio 4 : 5. The percentage of y in alloy C is:
SSC CGL 18/08/2021 (Evening)
(a) $44\frac{4}{9}$ (b) $33\frac{4}{9}$ (c) $66\frac{4}{9}$ (d) $55\frac{5}{9}$

Q.279. Monthly salaries of Anil and Kumud are in the ratio 19 : 17, If Anil and Kumud get salary hike of Rs. 2000 and Rs. 1000 respectively, then the ratio in their salaries becomes 8 : 7. What is the present salary of Kumud (in Rs) ?
SSC CGL 24/08/2021 (Afternoon)
(a) 18000 (b) 38000 (c) 34000 (d) 35000

SSC CHSL 2020 Tier - 1

Q.280. A bag contains coins of denominations Rs.1, Rs.2 and Rs.5 in the ratio of 4 : 5 : 8. If the total value of these coins is Rs.432, then what is the number of Rs.2 coins ?
SSC CHSL 05/08/2021 (Morning)
(a) 40 (b) 30 (c) 50 (d) 60

Q.281. The ratio of the incomes of A and B is 7 : 5. A and B save Rs. 4,000 and Rs. 3,500, respectively. If the expenditure of B is half the expenditure of A, then the total income of A and B (in Rs.) will be:
SSC CHSL 05/08/2021 (Afternoon)
(a)10,000 (b) 13,500 (c)12,000 (d) 15,000

Q.282. In a proportion, the product of the first and fourth terms is 70 and that of the second and third items is 3.5y. The value of y is.
SSC CHSL 09/08/2021 (Morning)
(a) 17 (b) 20 (c) 15 (d) 22

SSC CPO 2020 Tier - 1

Q.283. Seven years ago,the ratio of the ages of A and B was 4 : 5. Eight years hence, the ratio of the ages of A and B will be 9 : 10. What is the sum of their present ages in years?
SSC CPO 23/11/2020 (Morning)
(a) 41 (b) 82 (c) 32 (d) 56

Q.284. In a school, $\frac{5}{12}$ of the number of students are girls and the rest are boys, $\frac{4}{7}$ of the number of boys are below 14 years of age, and $\frac{2}{5}$ of the number of girls are 14 years or above 14 years of age. If the number of students below 14 years of age is 1120, then the total number of students in the school is:
SSC CPO 25/11/2020 (Evening)
(a) 1820 (b) 1900 (c) 1920 (d) 1290

Answer Key :-

1.(b)	2.(a)	3.(d)	4.(a)
5.(d)	6.(d)	7.(b)	8.(d)
9.(a)	10.(d)	11.(d)	12.(a)
13.(a)	14.(d)	15.(a)	16.(c)
17.(a)	18.(b)	19.(c)	20.(c)
21.(c)	22.(b)	23.(c)	24.(a)
25.(b)	26.(d)	27.(d)	28.(b)
29.(c)	30.(b)	31.(d)	32.(a)
33.(b)	34.(c)	35.(b)	36.(a)
37.(b)	38.(a)	39.(b)	40.(d)
41.(c)	42.(a)	43.(c)	44.(d)
45.(c)	46.(a)	47.(c)	48.(d)
49.(a)	50.(c)	51.(c)	52.(b)
53.(c)	54.(d)	55.(a)	56.(d)
57.(c)	58.(c)	59.(a)	60.(d)
61.(c)	62.(a)	63.(b)	64.(b)
65.(c)	66.(b)	67.(c)	68.(a)
69.(c)	70.(a)	71.(b)	72.(b)
73.(a)	74.(c)	75.(c)	76.(d)
77.(b)	78.(c)	79.(c)	80.(c)
81.(a)	82.(b)	83.(b)	84.(b)
85.(d)	86.(d)	87.(d)	88.(d)
89.(a)	90.(a)	91.(c)	92.(b)
93.(a)	94.(d)	95.(c)	96.(b)
97.(a)	98.(b)	99.(a)	100.(d)
101.(a)	102.(b)	103.(c)	104.(b)
105.(b)	106.(d)	107.(a)	108.(b)
109.(a)	110.(c)	111.(c)	112.(d)
113.(d)	114.(b)	115.(c)	116.(d)
117.(a)	118.(d)	119.(a)	120.(a)
121.(c)	122.(b)	123.(c)	124.(b)
125.(c)	126.(c)	127.(b)	128.(c)
129.(a)	130.(d)	131.(a)	132.(c)
133.(d)	134.(d)	135.(d)	136.(c)
137.(d)	138.(c)	139.(d)	140.(c)
141.(b)	142.(a)	143.(c)	144.(b)
145.(c)	146.(b)	147.(d)	148.(c)
149.(b)	150.(a)	151.(d)	152.(b)
153.(d)	154.(b)	155.(b)	156.(d)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

157.(a)	158.(c)	159.(a)	160.(c)
161.(d)	162.(a)	163.(c)	164.(d)
165.(a)	166.(c)	167.(d)	168.(a)
169.(a)	170.(d)	171.(d)	172.(d)
173.(a)	174.(c)	175.(d)	176.(b)
177.(b)	178.(c)	179.(a)	180.(d)
181.(a)	182.(a)	183.(d)	184.(a)
185.(c)	186.(d)	187.(a)	188.(b)
189.(c)	190.(b)	191.(b)	192.(c)
193.(b)	194.(d)	195.(d)	196.(b)
197.(c)	198.(c)	199.(c)	200.(c)
201.(a)	202.(b)	203.(d)	204.(d)
205.(a)	206.(a)	207.(a)	208.(b)
209.(c)	210.(d)	211.(b)	212.(a)
213.(d)	214.(d)	215.(d)	216.(a)
217.(c)	218.(a)	219.(a)	220.(d)
221.(a)	222.(c)	223.(b)	224.(d)
225.(c)	226.(b)	227.(d)	228.(a)
229.(d)	230.(b)	231.(c)	232.(a)
233.(a)	234.(c)	235.(c)	236.(d)
237.(a)	238.(a)	239.(c)	240.(b)
241.(b)	242.(c)	243.(d)	244.(c)
245.(b)	246.(c)	247.(b)	248.(c)
249.(b)	250.(d)	251.(a)	252.(a)
253.(a)	254.(b)	255.(d)	256.(b)
257.(c)	258.(c)	259.(c)	260.(d)
261.(b)	262.(b)	263.(d)	264.(b)
265.(d)	266.(c)	267.(c)	268.(a)
269.(d)	270.(b)	271.(a)	272.(a)
273.(c)	274.(a)	275.(b)	276.(a)
277.(c)	278.(a)	279.(c)	280.(a)
281.(c)	282.(b)	283.(a)	284.(c)

Solutions :-

Sol.1.(b) Let marbles initially in each bag = $2x$, $3x$, $4x$

After adding 12 marbles to each bag

Marbles in each bag = $8y$, $11y$, $14y$

According to the question,

$2x + 12 = 8y$

$8y - 2x = 12$------(i)

And, $3x + 12 = 11y$

$11y - 3x = 12$-------(ii)

By the equation (i) × 3 - (ii) × 2 we get;

$24y - 6x - (22y - 6x) = 36 - 24$

$2y = 12 \Rightarrow y = 6$

Putting the value of y in equation (i) we get;

$8 \times (6) - 2x = 12$

$2x = 48 - 12 = 36$ $x = 18$

Now, total marbles initially has

$= (2x + 3x + 4x) = 9x \Rightarrow 9 \times 18 = 162$

Sol.2.(a) Here two values of function is given hence it is of two variable .

According to the question,

$f \propto x$ and $f \propto \frac{1}{y}$

$\Rightarrow f = k_1x + k_2 \times \frac{1}{y}$ ... (i)

Where k_1 and k_2 are constant

On putting $x = 0$, $y = 1$, $f = 15$ in (i) we get

$f = k_1x + k_2 \times \frac{1}{y}$

$k_2 = 15$ ... (ii)

On putting $x = 1$, $y = 15$, $f = 2$ in (i) we get , $f = k_1x + k_2 \times \frac{1}{y}$

$2 = k_1 + 15 \times \frac{1}{15}$ ... [from (ii)]

$k_1 = 1$. Now,

when $x = 5$ and $y = 3$

$\Rightarrow f = 1 \times 5 + 15 \times \frac{1}{3}$

$\Rightarrow f = 5 + 5 = 10$

Sol.3.(d) Let ₹10, ₹5, ₹2 coins be x, y, z respectively.

According to question,

$x + y + z = 25$ ..... (i)

$10x + 5y + 2z = 120$ ... (ii)

Multiply by 2 in equation (i) and subtracting equation (i) from (ii) we get

$8x + 3y = 70$

Now on satisfying the options we find that only option (d) gives positive value of y and no. of coins must be positive.

Hence, no. of ₹10 coins = 8

Sol.4.(a) Mean proportional of 1.21 and 0.09 = $\sqrt{1.21 \times 0.09} = 0.33$

Mean proportional of 0.16 and 0.36

$= \sqrt{0.16 \times 0.36} = 0.24$

Required ratio = 0.33 : 0.24 = 11 : 8

Sol.5.(d) Mean proportion

$= \sqrt{8a^2 \times \frac{18}{a^4}} = \sqrt{\frac{144}{a^2}} = \frac{12}{a}$

Sol.6.(d) Let ₹5, ₹2, ₹1 coins be x, y, z respectively.

According to question,

$x + y + z = 40$ ..... (i)

$5x + 2y + z = 100$ ... (ii)

On subtracting equation (i) from (ii)

$4x + y = 60$

Now on satisfying the options we find that only option (d) gives positive value of y and no. of coins must be positive.

Hence, no. of ₹5 coins = 13

Sol.7.(b) For the fourth proportion

$\frac{\frac{1}{3} \times 27}{\frac{4}{5} \times 30} = \frac{\frac{3}{7} \times 35}{x} \Rightarrow \frac{9}{24} = \frac{15}{x}$

$\Rightarrow x = 40$

Sol.8.(d)

Ratio of their concentration = 10 : 20 : 30

Ratio of their quantity = 2 : 3 : x

∴ Concentration of mixed solution

$= \frac{10 \times 2 + 20 \times 3 + 30 \times x}{5 + x} = 23$

$20 + 60 + 30x = 115 + 23x \Rightarrow 7x = 35$, $x = 5$

Sol.9.(a) Total students = 720

No. of Boys $= \frac{3}{8} \times 720 = 270$

No. of Girls $= \frac{5}{8} \times 720 = 450$

According to question

$\frac{270 + x}{450 + 18} = \frac{2}{3}$

$= 810 + 3x = 2 \times 468 \Rightarrow 3x = 936 - 810$

$x = \frac{126}{3} = 42$

Sol.10.(d) According to the question,

Ram $= \frac{12}{5} = 2.4$, Shyam $= \frac{18}{9} = 2$

Preetham $= \frac{4}{8} = 0.5$, Vinay $= \frac{10}{7} = 1.42$

Sol.11.(d) Let the number of plastic, wood and glass = $2x$, $3x$ and $5x$

According to question,

$= 5x - 3x = 144 \Rightarrow x = 72$

Number of plastic woods = $2x = 144$

Now,

After increasing 25% $= 144 \times \frac{5}{4} = 180$

Sol.12.(a) Fourth proportional

$= \frac{3^{12} \times 4^{12}}{12^{35}} \Rightarrow \frac{3^{12} \times 4^{12}}{3^{35} \times 4^{35}}$

$= 3^{-23} \times 4^{-23} = 12^{-23}$

Sol.13.(a) According to the question,

$\frac{x + 5}{2x + 5} = \frac{2}{3} \Rightarrow x = 5$

Smallest number (x) = 5

Sol.14.(d) Given, $y \propto (x + 3)$

$y = k_1(x + 3)$ .....(I)

When y = 8, and $x = 1$

$\Rightarrow 8 = k_1 \times 4 \Rightarrow k_1 = 2$

$x \propto \frac{1}{z}$

$x = k_2 \times \frac{1}{z}$ .....(II)

$x = 2$ and $z = 6$.

$\Rightarrow 2 = k_2 \times \frac{1}{6} \Rightarrow k_2 = 12$

at $k_2 = 12$ equation (II) become

$x = \frac{12}{z}$, put this value in eq . (I)

$y = 2(\frac{12}{z} + 3) \Rightarrow y = 2(\frac{12 + 3z}{z})$

$\Rightarrow y \times z = 24 + 6z \Rightarrow z(y - 6) = 24$

Sol.15.(a) A : B $= \frac{1}{3} : \frac{1}{5} = 5 : 3$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

B : C = $\frac{1}{7} : \frac{1}{8}$ = 8 : 7

C : D = $\frac{1}{10} : \frac{1}{21}$ = 21 : 10

A	: B	: C	: D
5	: 3	: **3**	: **3**
8	: 8	: 7	: **7**
21	: **21**	: 21	: 10
40	: 24	: 21	: 10

Sol.16.(c) According to the question,
$x + y$ = 96 {let $x < y$ }
So, $\frac{x+3}{96-x} = \frac{11}{20} \Rightarrow 20x + 60$
$= 96 \times 11 - 11x$
$31x = 996 \Rightarrow x = \frac{996}{31} = 32.12$
Largest number (y)
$= 96 - x = 96 - 32.12 \approx 63.87$

Sol.17.(a) Given :-
5 : $3\frac{1}{3}$, $6\frac{1}{4}$: $3\frac{1}{8}$ and 3.5 : 4.5
5 : $3\frac{1}{3}$ = 5 : $\frac{10}{3} \Rightarrow$ 3 : 2 = 1.5
$6\frac{1}{4}$: $3\frac{1}{8} = \frac{25}{4} : \frac{25}{8} \Rightarrow$ 2 : 1 = 2
3.5 : 4.5 = 35 : 45 ⇒ 7 : 9 = 0.78
Required ascending order = 0.78 < 1.5 < 2
OR 3.5 : 4.5 < 5 : $3\frac{1}{3}$ < $6\frac{1}{4}$: $3\frac{1}{8}$

Sol.18.(b)
Let income of P, Q, and R is $9x$, $15x$ and $10x$ and savings of P, Q, and R is $10y$,$15y$,$12y$
According to the question,
$10x - 12y = 10x \times \frac{60}{100}$
$10x - 12y = 6x \Rightarrow \frac{x}{y} = \frac{3}{1}$
Ratio of expenditure of P, Q, and R
= ($9x$ - $10y$) : ($15x$ - $15y$) : ($10x$ − $12y$)
= (27 - 10) : (45 -15) : (30 − 12)
= 17 : 30 : 18

Sol.19.(c) Fourth proportional
$= \frac{(a^3+b^3)\times(a^2-b^2)}{(a+b)^2\times(a^3-b^3)}$
$= \frac{(a+b)\,(a^2-ab+b^2)\times(a+b)\,(a-b)}{(a+b)^2\,(a-b)\,(a^2+ab+b^2)}$
$= \frac{(a^2-ab+b^2)}{(a^2+ab+b^2)}$

Sol.20.(c) According to the question,
(A × 6% + B × 4%)
= (A × 7% + B × 11%) × $\frac{2}{5}$
A × 30% + B × 20% = A × 14% + B × 22%
A × 16% = B × 2% ⇒ A : B = 1 : 8

Sol.21.(c)

Ratio →	A	:	B
Initial →	8x	:	5x = 13
Final →	5x	:	8x = 13

According to the question,
Difference in A's share $8x - 5x$ = 300
$x = \frac{300}{3}$ = 100
Total sum = ($8x + 5x$) = $13x$ = ₹1300

Sol.22.(b)
Required number = $\frac{ad-bc}{(a+d)-(b+c)}$
$= \frac{8\times9-6\times2}{(8+9)-(6+2)} = \frac{72-12}{9} = \frac{20}{3}$
Now , ($3P - 6$) = 14 and ($9P - 4$) = 56
Mean proportional = $\sqrt{14\times56}$ = 28

Sol.23.(c) A : B : C = 3 : 2 : 5
Difference between share of C and B
= 3 units ⇒3 units = ₹ 300
Share of A more than B = 1 units = ₹ 100

Sol.24.(a) Mean proportional
$= \sqrt{(a+b)(a-b)^3\times(a-b)(a+b)^3}$
$= \sqrt{(a-b)^4\times(a+b)^4}$
$= (a-b)^2\times(a+b)^2$

Sol.25.(b)

Ratio -	Maths	: English	: Chemistry
Initial -	6	: 4	: 7
Final -	7.2	: 5.6	: 11.2

Required ratio = 7.2 : 5.6 : 11.2
= 9 : 7 : 14

Sol.26.(d)

Ratio	- 0.5 ₹	: 0.25₹	: 0.20 ₹
Coins	- 2	: 3	: 5

Amount - 1 : 0.75 : 1
Required difference = (1 − 1) = ₹ 0

Sol.27.(d)
$Blue_{(men)}$: $Red_{(women)}$ = 3x : 7x ;
$Red_{(men)}$: $Blue_{(women)}$ = 2y : y ;
$\frac{3x+y}{7x+2y} = \frac{35}{76}$
$\Rightarrow 228x + 76y = 245x + 70y \Rightarrow \frac{x}{y} = \frac{6}{17}$
Number of men = $3x + 2y$ = 52
Number of women = $7x + y$ = 59
Required ratio = 52 : 59

Sol.28.(b)

Ratio	→	P	:	Q
Income	→	40	:	16
Expenditure	→	18	:	10

Savings	→	11	:	3

Therefore, the ratio of the savings of P And Q = 11 : 3

Sol.29.(c) % decrease (X) in the number of units manufactured by company A
$= \frac{12500-10625}{12500} \times 100$
$= \frac{1,875}{12500} \times 100$ = 15%
% decrease (Y) in the number of units manufactured by company
B = $\frac{34,000-30,600}{34,000} \times 100$
$= \frac{3,400}{34,000} \times 100$ = 10%
Required ratio = 15 : 10 = 3 : 2

Sol.30.(b)

Ratio →	A	:	B	:	C
No of officers →	5	:	4	:	1

Average → (600) : (600+150) : (600+400)
So, the average of 40 officers →
$= 600 + \frac{(150\times4)+(400\times1)}{(5+4+1)}$
$= 600 + \frac{1000}{10}$ = 700
So, the monthly salary of an officer
= 700 × 30 = ₹21,000

Sol.31.(d)

Ratio →	Income	=	exp.	+	Savings	
A	⇒ 12	=	5	+	7	) **× 4 × 5**
B	⇒ 15	=	7	+	8	) **× 3 × 4**

Difference b/w their expenditure →
(4 × 5 × 5) − (3 × 4 × 7) units = 4500 Rs.
16 units = 4500 Rs.
Income of B(3 × 4 × 15) units
$= \frac{4500}{16} \times 180$ = 50625 Rs.

Sol.32.(a)
Share of A = $\frac{18400}{46800} = \frac{46}{117}$ of the sum.
Let total sum be 117a, share of A = 46a
Share of A + D = $\frac{8}{13}$ × 117a = 72a
Share of D = 72a - 46a = 26a
Share of B + C = $\frac{5}{13}$ × 117a = 45a
Given, share of B : share of C = 5 : 4
So, share of B = 25a
and share of C = 20a
x = difference of share of A and B
= 46a - 25a = 21a.
y = Difference of share of C and D
= 26a - 20a = 6a
x - y = 21a - 6a = 15a
117a = 46,800, a = 400
So, 15a = 15 × 400 = 6000

Sol.33.(b) Let price of one pen = x
and price of one pencil = y
So, 5x + 3y = 44 .....(1)
3x + 5y = 36 .....(2)
On solving (1) and (2), we get
x = 7 and y = 3
So required ratio = 7 : 3

Sol.34.(c)

Denomination	→	₹ 2	:	₹5	:	₹10
Number of coins	→	5	:	4	:	1

Amount Ratio →	10	:	20	:	10

Total Amount = 40 unit = 80Rs
1 unit = 2Rs.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Number of 5 rupees coin = 4 × 2 = 8

Sol.35.(b) Number of boys = $\frac{5}{8}$

Boys Below 10 years = $\frac{5}{8} \times \frac{1}{3} = \frac{5}{24}$

Girls Below 10 years = $\frac{3}{8} \times \frac{2}{3} = \frac{6}{24}$

Students Below 10 years = $\frac{11}{24}$

Students Above 10 years = $\frac{13}{24}$

Total students = $260 \times \frac{24}{13} = 480$

Number of boys = $480 \times \frac{5}{8} = 300$

Sol.36.(a) Go through option (a)

$\frac{5+3}{7+5} = \frac{8}{12} = \frac{2}{3}$ (which satisfy)

$\frac{5-1}{7+3} = \frac{4}{10} = \frac{2}{5}$ (which satisfy)

Sol.37.(b)

Ratio ⇒ Income = expenditure + saving

A (80%) ⇒ 5 = 4 + 1) × 8

B (85%) ⇒ 20 = 17 + 3) × 3

C (75%) ⇒ 4 = 3 + 1) × 20

According to question , Difference of income of A and C (80 - 40) units

⇒ (40 units) = 18000 Rs.

Then , Income of B (60 units) = 27000 Rs

Sol.38. (a)

Ratio → A : B

Last year Income → 4 : 3

Now ,

	Last Year	:	Present Year	
A →	(3	:	4)	**× 4 × 5**
B →	(5	:	6)	**× 3 × 3**

	Last Year	:	Present Year
A →	**60**	:	80
B →	**45**	:	54

According to the question ,

(80 + 54) units = 8.04 lakh

1 unit = 0.06 lakh

Last year income of B (45 units)

= 45 × 0.06 = 2.7 lakh

Sol.39.(b)

Fractional Value → $66\frac{2}{3}\% = \frac{2}{3}$

Ratio →	A	:	B
Income →	5	:	7
Expenditure →	2	:	3

Savings → 4000 : 5000

Now,

(5 × 3)– (7 × 2)units

= (3 × 4000) – (2 × 5000)

⇒ 1 unit = 2000 Rs.

Total income of A and B → (5 + 7) units

12 units = 12 × 2000 = 24000 Rs.

Sol.40. (d)

Ratio → Divisor : Quotient : Remainder

7 : 12

3 : 2

---

21 : 36 : 14

According to the question

14 unit = 14 ⇒ 1 unit = 1

21 unit (Divisor) = 21

Required remainder = $\frac{21 \times 36 + 14}{9}$

= 5 (Rem.)

Sol.41.(c)

Let the age of shyam = 5 units and age of Ravi = 3 units

According to the question

(5 + 3) unit = 32 years ⇒ 1 unit = 4 years

Age of Shyam = 5 × 4 = 20 years and

Age of Ravi = 3 × 4 = 12 years

Now, $\frac{20+x}{12+x} = \frac{7}{5}$

100 + 5x = 84 + 7x ⇒ x = 8 years

Short Trick :-

	Ravi	:	Shyam
Ratio ⇒			
Present ⇒	3	:	5
	+2		+2
After ⇒	5	:	7

According to question ,

Sum of present age (3 + 5) units = 32 yrs.

Then (2 units) = 8 yrs.

Sol.42.(a)

notes worth → 5 : 2 : 1

Amount → 15 : 2 : 3

No. of notes = $\frac{Total\ amount}{note's\ worth}$

Ratio of number of notes

$= \frac{15}{5} : \frac{2}{2} : \frac{3}{1}$ = 3 : 1 : 3

Sol.43. (c) Actual ratio = 3 : 4 : 5 : 8

⇒ (3 + 4 + 5 + 8) unit = 4360

⇒ 20 unit = 4360 ⇒ 1 unit = 218

A's share (3 unit) = 3 × 218 = 654

B's share (4 unit) = 4 × 218 = 872

C's share (5 unit) = 5 × 218 = 1090

D's share (8 unit) = 8 × 218 = 1744

Mistaken ratio = $\frac{1}{3} : \frac{1}{4} : \frac{1}{5} : \frac{1}{8}$

= 40 : 30 : 24 : 15

= (40 + 30 + 24 + 15) unit = 4360

=1 unit = 40

A's share (40 unit) = 40 × 40 = 1600

B's share (30 unit) = 30 × 40 = 1200

C's share (24 unit) = 24 × 40 = 960

D's share (15 unit) = 15 × 40 = 600

Clearly D get 1744 - 600 = Rs.1144 less

Sol.44.(d)

Ratio → A : B : C

7 : 12

8 : 5

---

14 : 24 : 15

According to the question

(15 -14) = 1 unit = 214

Sum (x) 53 unit = (14 + 24 + 15) × 214

= 11342

Sol.45.(c) Let the price of the articles be 400 and 500.

According to the question ,

$$\frac{400 \times \frac{100+x}{100}}{500 \times \frac{100-30}{100}} = \frac{10}{7}$$

$$\Rightarrow \frac{4(100+x)}{5 \times 70} = \frac{10}{7}$$

⇒ 400 + 4x = 500 ⇒ x= 25 %

Sol.46.(a) Let age of three children are p year , q year , r year

According to question ,

Man's age (M) = 4 (p + q + r) ...(i)

After 6 Years

⇒ M + 6 = 2 (p + 6 + q + 6 + r + 6)

⇒ M + 6 = 2 (p + q + r) + 36

From eq (i)

⇒ 4 (p + q + r) + 6 = 2 (p + q + r) + 36

⇒ 2 (p + q + r) = 30 ⇒ (p + q + r) = 15

∴ Man's Present age = 4 × 15 = 60 years

Sol.47.(c) Let number of votes got the contestants are 8x , 7x , 5x

According to question ,

⇒ 7x = 4725 ⇒ x = 675

∴ Total number of valid votes (20x)

= 20 × 675 = 13,500

Sol.48.(d) Let the first part and second part be x and y respectively,

According to question,

$$\Rightarrow \frac{141 \times \frac{x}{8}}{141 \times \frac{y}{9}} = \frac{5}{6}$$

$$\Rightarrow \frac{9x}{8y} = \frac{5}{6} \Rightarrow \frac{x}{y} = \frac{20}{27}$$

Now, 47 units = 141

⇒ 20 units = $\frac{141}{47} \times 20 = 60$

Sol.49.(a)

Ratio of A's and B's salaries = 2 : 3

According to question,

A's expenditure = $\frac{1}{2}$ × A's salary

⇒ (2x - saving of A) = $\frac{1}{2} \times 2x$

⇒ Saving of A = x = Saving of B (given)

Expenditure of B = 3x - x = 2x

Required percentage = $\frac{2x}{3x} \times 100$

= 66.67%

Sol.50.(c) Let the distribution of toffee among Pushkal, Quadir and Rustam be 2 x , 3x and 4x respectively.

According to question,

⇒ 9x = 360 ⇒ x = 40

Pushkal = 80, Quadir = 120 and Rustam = 160

Then, Quadir = $120 \times \frac{20}{100} = 24$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Remaining toffees of Quadir
= 120 - 24 = 96

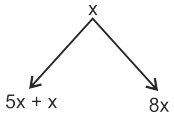
Rustam = 160 × $\frac{25}{100}$ = 40

Remaining toffees of Rustam
= 160 - 40 = 120

Pushkal has toffees = 80 + 24 + 40 = 144

Now, Pushkal : Quadir : Rustam
= 144 : 96 : 120 or 6 : 4 : 5

Sol.51.(c) Let no of invalid votes are = x
According to question ,



B = 6x, A = 8x
⇒ (8x - 6x)unit = 28 ⇒ x = 14
∴ Total no of votes polled (14x)
= 14 × 14 = 196

Sol.52.(b) Mean proportional between p and q = $\sqrt{p \times q}$ = 8
Squaring on both sides = p × q = 64
By checking options , option (b) satisfies i,e. 16 and 4

Sol.53.(c)

Ratio -	Rama	:	Ganga
Income -	$4x$	:	$3x$
Expendi. -	$3y$	:	$2y$

Savings - $4x - 3y$: $3x - 2y$
According to the question,
$4x - 3y = 3x - 2y$
$x = y$
savings of Rama ($4x - 3y$)
= $4x - 3x = x$ = ₹2700
So, expenditure of Rama = $3x$ = ₹8100
And expenditure of Ganga = $2x$ = ₹5400

Sol.54.(d)
Denomination → ₹ 0.5 : ₹0.2 : ₹0.1
Number of coins → 2 : 3 : 4

Amount Ratio → 1 : 0.6 : 0.4
Total amount = 1 + 0.6 + 0.4 = 2 unit
According to the question,
2 unit = ₹1020
So, number of 10 paise coins (4 unit)
= ₹1020 × $\frac{4}{2}$ = ₹2040

Sol.55.(a) Let x be the number added to each the four numbers 5 , 19 , 7 and 25

Formula :- $x = \left|\frac{ad - bc}{(a+d) - (b+c)}\right|$

⇒ x = $\frac{19 \times 7 - 5 \times 25}{(5 + 25) - (19 + 7)}$

= $\frac{133 - 125}{30 - 26} = \frac{8}{4}$ ⇒ x = 2

Sol.56.(d) In 49 : x :: x : 81
$x^2 = \sqrt{49 \times 81}$ ⇒ x = 63
In 64 : y :: y : 169
$y^2 = \sqrt{64 \times 169}$ ⇒ y = 104
Now
$2x + 3y = 2 \times 63 + 3 \times 104$
= 126 + 312 = 438

Sol.57.(c)

Formula :- $x = \left|\frac{ad - bc}{(a+d) - (b+c)}\right|$

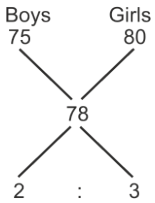
⇒ $x = \left|\frac{2 \times 35 - 3 \times 30}{(2 + 35) - (3 + 30)}\right|$

= $\left|\frac{-20}{4}\right|$ = |− 5| = 5

Now, second largest part of the proportion = (30 + 5) = 35

Sol.58.(c)
Required proportion = 30 : 24 :: 35 : x
30 × x = 24 × 35
$x = \frac{24 \times 35}{30}$ = 28 litres

Sol.59.(a)



Required ratio = 2 : 3

Sol.60.(d) According to the question,
{A = 3B , C = B + 5 } -------- (i)
A + B + C = 75-------- (ii)
By putting the value of A and C from eq .(i) to (ii) we get;
3B + B + (B + 5) = 75
5B = 70 ⇒ B = 14 ⇒ A = 3B = 42
Hence, (B - 5) : (A + 3) = 9 : 45 = 1 : 5

Sol.61.(c)

According to the question, $x \propto \frac{1}{y}$

$x = k \times \frac{1}{y}$ {where k is constant}

Given that x = 2 and y = 6 we get;

$2 = k \times \frac{1}{6}$ ⇒ k = 12

Now, for x = 3

$3 = 12 \times \frac{1}{y}$ ⇒ y = 4

Sol.62.(a) Let the age of Soham be x
Then, age of Ravi = 4x
Age of Mayadevi = 65 + x

Age of Ram = $\frac{1}{3}$(65 + x)

According to question,

$\frac{1}{3}$(65 + x) - 4x = 7

$\frac{65}{3} + \frac{x}{3}$ - 4x = 7 ⇒ - $\frac{11x}{3}$ = 7 - $\frac{65}{3}$

$\frac{11x}{3} = \frac{44}{3}$ ⇒ x = 4

So, the age of Mayadevi = 65 + 4 = 69 yrs

Sol.63.(b) According to question,

$\frac{A}{C} = \frac{B}{D}$ ⇒ $\frac{25}{30} = \frac{40}{D}$ ⇒ D = $\frac{30 \times 40}{25}$ = 48

Sol.64.(b)
Denomination → ₹1 : ₹5 : ₹10
No of coins → $3x$: $5x$: $7x$
Total amount in the bag
= $3x + 5 \times 5x + 10 \times 7x$
= $3x + 25x + 70x = 98x$
Now, $98x = 980$ ⇒ x = 10
No of coins of ₹10 = 7 × 10 = 70

Sol.65.(c) According to the question,
(9 - 2) unit = ₹560
7 unit = ₹560 ⇒ 1 unit = ₹80
Share of S = 80 × 3 = ₹240

Sol.66.(b) Let P's income = 1000
Q's income = 1200
R's income = 900

Q's savings = 1200 × $\frac{1}{4}$ = 300

⇒ Q's expenditure = 1200 - 300 = 900
Ratio of expenditure
P : Q : R
12 : 15 : 8
⇒ 720 : 900 : 480
Hence, P's savings = 280
Q's savings = 300
R's savings = 420
Ratio of savings = 280 : 300 : 420
= 14 : 15 : 21

Sol.67.(c) $2x + x + 3x = 1200$
⇒ $6x = 1200$ ⇒ $x = 200$
Now,
$3(3x) + 2(x) = 11x = 11 \times 200 = 2200$

Sol.68.(a) Let male = 2x
Female = 3x
New ratio
$\frac{2x + 200}{3x} = \frac{5}{6}$ ⇒ 4x + 400 = 5x
⇒ x = 400 ⇒ Female = 3 × 400 = 1200

Sol.69.(c) Mean proportional of 12.96 and 0.16 = $\sqrt{12.96 \times 0.16}$
= $\sqrt{3.6 \times 3.6 \times 0.4 \times 0.4}$
= 3.6 × 0.4 = 1.44

Sol.70.(a) Let the number of gold coins and non gold coins be G and N respectively,
⇒ G = $\frac{1}{4}$ × N ⇒ $\frac{G}{N} = \frac{1}{4}$
G = x and N = $4x$
According to the question,
⇒ $\frac{x + 20}{4x} = \frac{2}{3}$ ⇒ $3x + 60 = 8x$ ⇒ x = 12
Gold coins = 12
Non gold coins = 4 × 12 = 48
Total number of coins in the collection
= 12 + 48 + 20 = 80

Sol.71.(b)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Ratio → Men : Women

5 : 3) 1

5 : 4

According to question

⇒ 1 unit = 150

No of men employee in company (5 unit)

= 5 × 150 = 750

Sol.72.(b) According to the question,

$y \times \frac{18}{100} + b \times \frac{24}{100} = 30$

⇒ $3y + 4b = 500$ .....(i)

And , $3y = 2b + 200$

⇒ $3y - 2b = 200$ .....(ii)

Subtract equation (i) from equation (ii), we get

6b = 300 ⇒ b = 50

Put the value of b in equation (i)

3y + 200 = 500 ⇒ 3y = 300 ⇒ y = 100

Required ratio

$y^2 : b^2$ = 100 × 100 : 50 × 50 = 4 : 1

Sol.73.(a) Mean proportion = $\sqrt{pq}$

$\Rightarrow \frac{1}{5a} = \sqrt{4a^2 \times x}$

Taking square both side,

$\Rightarrow \frac{1}{25a^2} = 4a^2 \times x \Rightarrow x = \frac{1}{100a^4}$

Sol.74.(c) Given, Price $\propto (Weight)^2$

Let the weights of four pieces be $4x$, $3x$, $2x$,$1x$

∴ Total Price of four pieces

$= 16x^2 + 9x^2 + 4x^2 + 1x^2 = 30x^2$

Original weight of unbroken diamond

$= 4x + 3x + 2x + 1x = 10x$

Original price of unbroken diamond

$= (10x)^2 = 100x^2$

Difference between prices

$= 100x^2 - 30x^2 = 70x^2 \Rightarrow 70x^2 = 63000$

$\Rightarrow 1x^2 = 900 \Rightarrow 100x^2$ = ₹90,000

Sol.75.(c) According to the question,

$\frac{5x - 40}{6x + 50} = \frac{8}{11} \Rightarrow 55x - 440 = 48x + 400$

$\Rightarrow 7x = 840 \Rightarrow x = 120$

Hence, the number of girls

= 6 × 120 = 720

Sol.76.(d) Mean proportional = $\sqrt{ab}$

$\Rightarrow 30 = \sqrt{18 \times A}$

Taking square both side,

⇒ 900 = 18 × A ⇒ A = 50

Sol.77.(b)

Ratio → P : Q

Expenditure → 36% of P : 56% of Q

$\frac{Expenditure\ of\ P}{Expenditure\ of\ Q} = \frac{\frac{36}{100} \times salary\ of\ p}{\frac{56}{100} \times salary\ of\ q}$

$\frac{1.5}{1} = \frac{\frac{36}{100} \times salary\ of\ p}{\frac{56}{100} \times salary\ of\ q}$

$\frac{1.5}{1} = \frac{36 \times salary\ of\ p}{56 \times salary\ of\ q}$

$\frac{1.5 \times 56}{36} = \frac{salary\ of\ p}{salary\ of\ q}$

$\frac{salary\ of\ p}{salary\ of\ q} = \frac{7}{3}$ or 7 : 3

Sol.78.(c) $\frac{Circumference}{diameter} = \frac{3}{5}$

$\frac{6}{diameter} = \frac{3}{5}$ ⇒ Diameter = 10 cm

Radius = 5 cm

Sol.79.(c) Given : a : b = c : d = e : f = 5 : 7

Now, (3a + 5c + 11e) : (3b + 5d + 11f)

(3 × 5 + 5 × 5 + 11 × 5) : (3 × 7 + 5 × 7 + 11 × 7)

(15 + 25 + 55) : (21 + 35 + 77)

95 : 133 ⇒ 5 : 7

Sol.80.(c)

Ratio → A : B : C

Income → 2 : 9 : 3

Expense → 3 : 9 : 5

Given condition , A's saving is half of his total income

To satisfy this condition ,

multiply income ratio by 3

Income → 6 : 27 : 9

Expense → 3 : 9 : 5

Saving → 3 : 18 : 4

Sol.81.(a)

Ratio - 5 : 10 : 20

3 : 5 : 7

Final - 15 : 50 : 140

Total amount = 15 + 50 + 140 = 205 units

205 units = ₹ 1845

(required worth) 15 units

$= \frac{1845}{205} \times 15$ = ₹ 135

Sol.82.(b)

Let the age of younger boy be x year

Then, age of older boy = $3x$

Now, according to the question,

$(3x - 9) = 5(x - 9)$

$3x - 9 = 5x - 45 \Rightarrow 2x = 36 \Rightarrow x = 18$

So, the present age of each is 18 yr and 54 yr.

Sol.83.(b)

Ratio - ₹2 : ₹5 : ₹10

Number of coins - $5x$: $2x$: $50 - 7x$

Total amount

$= 10x + 10x + 500 - 70x = 150$

$50x = 350$, $x = 7$

So the number of 10 rupees coins

= 50 - (7 × 7) = 1

Sol.84.(b)

pulse 1st pulse 2nd

ratio → 60 75

overall → 65

10 : 5

Required ratio = 2 : 1

Sol.85.(d) Accordion to the question,

$M \propto \frac{1}{(N^2 + 3)}$

$M = k \times \frac{1}{(N^2 + 3)}$ -------**(i)**

{where k is constant}

Puting M = 3 and N = 3 in equation (i)

$3 = k \times \frac{1}{(3^2 + 3)} \Rightarrow k = 36$

Now, value of M when given that $N^2 = 69$

$M = 36 \times \frac{1}{(69 + 3)} \Rightarrow M = \frac{36}{72} = \frac{1}{2}$

Sol.86.(d) Let numbers be $7x$ and $3x$ respectively,

According to the question,

$7x - 3x = 48 \Rightarrow x = 12$

Sum of numbers = $10x$ = 120

Sol.87.(d) 5 (Part of Ravi)

= 3 (Part of Reeta) =11 (Part of Rahul)

$\frac{ravi}{reeta} = \frac{3}{5}, \frac{reeta}{rahul} = \frac{11}{3}$

Ratio - ravi : reeta : rahul

3 : 5 : **5**

11 : 11 : 3

Final - 33 : 55 : 15

Sol.88.(d) According to the question,

$\frac{3}{4} = 0.75$, $\frac{5}{8} = 0.625$, $\frac{1}{2} = 0.5$,

$\frac{6}{9} = 0.666$

We can clearly see that the greatest ratio is 3 : 4

Sol.89.(a)

Ratio - a : b : c

3 : 7 : **7**

4 : 4 : 9

Final - 12 : 28 : 63

Sol.90.(a) $\frac{8}{11}, \frac{4}{5}, \frac{1}{2}$ and $\frac{1}{11}$

Denominators of given fractions are 11 , 5 , 2 and 11

LCM (11 , 5 , 2 , 11) = 110

Multiply each fraction by 110 we get fractions

$\frac{8}{11} \times 110, \frac{4}{5} \times 110, \frac{1}{2} \times 110, \frac{1}{11} \times 110$

= 80 , 88 , 55 and 10

Here, 88 is the largest among all

Hence, required fraction = $\frac{4}{5}$

Sol.91.(c) Value of $x = \left|\frac{ad - bc}{(a + d) - (b + c)}\right|$

$= \left|\frac{7 \times 23 - 11 \times 18}{(7 + 23) - (11 + 18)}\right|$

$= \left|\frac{161 - 198}{(30) - (29)}\right| = \left|\frac{-37}{1}\right| = 37$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Then, mean proportion of (x - 1) and ($2x$ -10) = $\sqrt{(x - 1)(2x - 10)}$
= $\sqrt{(37 - 1)(74 - 10)}$
= $\sqrt{36 \times 64}$ = 6 × 8 = 48

Sol.92.(b) Required ratio = $\frac{28}{100}$ = 7 : 25

Sol.93.(a) According to the question,
Let the weight of the box and the gift articles is x and $9x$ gram respectively.
$x + 9x = 25 \times 1000$
$10x = 25000 \Rightarrow x = 2500$
So the weight of the articles will be
9 × 2500 = 22500 gram

Sol.94.(d) Third proportion
= $\frac{(48)^2}{36}$ = 8 × 8 = 64

Sol.95.(c)

Ratio →	a :	b :	c :	d
	3 :	**4** :	4 :	4
	2 :	**2 :**	**3** :	3
	5 :	5 :	**5 :**	**6**
	30 :	40 :	60 :	72

Required ratio → 15 : 20 : 30 : 36

Sol.96.(b) According to the question,
M : N : O = ($\frac{1}{3}$: $\frac{1}{4}$: $\frac{1}{5}$) × 60
M : N : O = 20 : 15 : 12

Sol.97.(a) Mean proportion
= $\sqrt{0.14 \times 2.24}$ = $\sqrt{\frac{14}{100} \times \frac{224}{100}}$
= $\sqrt{\frac{14}{100} \times \frac{14 \times 16}{100}}$ = $\frac{56}{100}$ = 0.56

Sol.98.(b) Let the fourth proportion be x
$\Rightarrow \frac{1.25}{5.75} = \frac{3.5}{x} \Rightarrow x = \frac{3.5 \times 5.75}{1.25}$ = 16.1

Sol.99.(a) Sum of numbers = 5 unit = 135
1 unit = 27
So, numbers = 2 × 27 = 54 , 3 × 27 = 81

Sol.100.(d) Mean proportional = $\sqrt{ab}$
Mean proportional of 25 and 81
= $\sqrt{25 \times 81}$ = 45

Sol.101.(a) Let third number = 100
Then, two number = 100 × 130% = 130 and 100× 160% = 160
Ratio of two numbers = 130 : 160
= 13 : 16

Sol.102.(b) Required ratio
= (640 - 400) : 400 = 240 : 400 = 3 : 5

Sol.103.(c) 15% = $\frac{3}{20}$, 25% = $\frac{1}{4}$

Sonu :	Raju :	Ramu
20 :	23	
4	: 5	) ×5
20 :	23 :	25

Required ratio = 23 : 25

Sol.104.(b) Given :- x : y = 5 : 6
2x + 3y : 3x + 5y
= 2(5) + 3(6) : 3(5) + 5(6)
= 10 + 18 : 15 + 30 = 28 : 45

Sol.105.(b)
$\frac{7}{4}$ = 1.7 , $\frac{8}{3}$ = 2.6 , $\frac{2}{3}$ = 0.6 , $\frac{1}{5}$ = 0.2
Clearly, we can see $\frac{8}{3}$ is the greatest of all the fractions given.

Sol.106.(d) No of red sweets in bag
= $\frac{3}{4}$ × 120 = 90

Sol.107.(a) 0.72 : x :: x : 2.85
Product of extreme term = product of mean term
0.72 × 2.85 = $x \times x$
x^2 = 2.052 ⇒ x = 1.4

Sol.108.(b) According to question,
$\frac{5+x}{11+x} = \frac{3}{5}$
25 + 5x = 33 + 3x ⇒ 2x = 8 ⇒ x = 4

Sol.109.(a) Let the no. be 3x and 7x
According to question,
$\frac{3x-11}{7x-11} = \frac{7}{20}$
60x - 220 = 49x - 77 ⇒ 11x = 143 ⇒ x = 13
So, the smaller number = 3x = 3 ×13 = 39

Sol.110.(c)
40% of A = 60% of B = $\frac{1}{6}$ of C
$\frac{2}{5}$ of A = $\frac{3}{5}$ of B = $\frac{1}{6}$ of C = k (Let)
A = $\frac{5}{2}k$, B = $\frac{5}{3}k$, C = $6k$
A : B : C = $\frac{5}{2}k : \frac{5}{3}k : 6k$ = 15 : 10 : 36

Sol.111.(c)

Ratio →	A :	B :	C
	3 :	4	
		4 :	5
Final →	3 :	4 :	5

C - A = 5 - 3 = 2 unit
2 unit = 30 marks
Marks of B (4 unit) = $\frac{30}{2}$ × 4 = 60 marks

Sol.112.(d)

Ratio →	Jeevan :	Praveen :	kanan
	5 :	8 :	
		3 :	2
Final →	15 :	24 :	16

Share of Jeevan
= $\frac{15}{15+24+16}$ × 17,600
= $\frac{15}{55}$ × 17,600 = 4,800

Sol.113.(d)
Mean proportion = $\sqrt{75 \times 12}$ = 30
Required natural number = 30 - 13 = 17

Sol.114.(b) According to question,
a : b :: c : d ⇒ $\frac{a}{b} = \frac{c}{d}$
Option (a) :- b, a, d and c, ⇒ $\frac{b}{a} = \frac{d}{c}$
⇒ $\frac{a}{b} = \frac{c}{d}$ (true)
Option (b) :- c, d, b and a, ⇒ $\frac{c}{d} = \frac{b}{a}$
⇒ $\frac{a}{b} \neq \frac{c}{d}$ (false)
Option (c) :- d, c, b and a, ⇒ $\frac{d}{c} = \frac{b}{a}$
⇒ $\frac{a}{b} = \frac{c}{d}$ (true)
Option (d) :- a, c, b and d, ⇒ $\frac{a}{c} = \frac{b}{d}$
⇒ $\frac{a}{b} = \frac{c}{d}$ (true)

Sol.115.(c)
Mean proportion = $\sqrt{ab}$ = $\sqrt{a \times \frac{4}{a}}$ = 2

Sol.116.(d) S = 75% of T
$\frac{S}{T} = \frac{75}{100} = \frac{3}{4}$ ⇒ S : T = 3 : 4

Sol.117.(a) 20% = $\frac{1}{5}$
Girls = 5 unit, Boys = 6 unit
required ratio of Boy to Girls = 6 : 5

Sol.118.(d) 42% of ranita's income = 56% of Bhaskar's income
$\frac{Income\ of\ Ranita}{Income\ of\ Bhaskar} = \frac{56}{42} = \frac{4}{3}$
According to question,
$\frac{4x}{3x+200} = \frac{5}{4}$ ⇒ 16x = 15x + 1000
x = 1000
Hence, Ranita's Income
= 4 × 1000 = 4000

Sol.119.(a) 25% = $\frac{1}{4}$
Money left after saving
= $\frac{3}{4}$ × 40,000 = 30,000
Money spent on education
= $\frac{2}{5}$ × 30,000 = 12,000
Required % = $\frac{12000}{40000}$ × 100 = 30 %

Sol.120.(a) No of students in high school
= $\frac{324}{4}$ × 3 = 243

Sol.121.(c) Ratio of boys and girls in class A = 11 : 18 = 0.61
Ratio of boys and girls in class
B = 13 : 17 = 0.76

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Ratio of boys and girls in class C = 20 : 9 = 2.22
⇒ class C has the biggest ratio of boys to girls.

Sol.122.(b)
Ratio → cheese : butter
4 : 3
⇒ 4 units = 8
⇒ 3 units = $\frac{8}{4}$ × 3 = 6
So, she used 6 bowls of butter.

Sol.123.(c)

	S	:	F
Salaries →	2	:	3
Savings →	3	:	4

Since, total savings are equal to the salary of S.
Total savings = 3 + 4 =7.
Now,

	S	:	F
Salaries →	2	:	3 (× 7)
Savings →	3	:	4 (× 2)

Hence,

	S	:	F
Salaries →	14	:	21
Savings →	6	:	8
Expenditure →	8	:	13

Sol.124.(b) S ∝ (R + 7)
S = k(R + 7)
Putting, S = 42 and R = 17,
42 = k(17+7) ⇒ 42 = 24k ⇒ k = $\frac{42}{24}$ = $\frac{7}{4}$
Now, putting R = 29 in the above expression, we have ;
S = k(R + 7) ⇒ S = $\frac{7}{4}$(29 + 7)
⇒ S = $\frac{7}{4}$ × 36 = 63

Sol.125.(c) 8 - 7 = 1 unit = ₹4800
7 unit = 4800 × 7 = ₹33,600
So, the price of the washing machine = ₹33,600

Sol.126.(c) Let
Rupees with Pooja = x + 50 Rs.
Rupees with Chameli = x Rs.
Rupees with Anju = 2(x + 50) Rs.
Total Rupees = x + 50 + x + 2x + 100 = 450 Rs.
⇒ 4x + 150 = 450 ⇒ 4x = 300 ⇒ x = 75
Hence,
Pooja's Rupees = 75 +50 = 125 Rs.
Chameli's Rupees = 75 Rs.
Anju's Rupees = 2(75+50) = 250 Rs.

Sol.127.(b) Let first number = $4x$
Second number = $5x$
According to question,
$\frac{4x+3}{5x-7}$ = $\frac{1}{1}$ ⇒ $4x$ + 3 = $5x$ - 7 ⇒ x = 10
Hence, First number = 40
And second number = 50

Sol.128.(c) Mean proportional
= $\sqrt{45\,x^4 \times 5\,y^2}$ = 15 x^2y

Sol.129.(a) According to the question,
⇒ $\frac{4x+8}{7x+8}$ = $\frac{2}{3}$ ⇒ 12x + 24 = 14x + 16
⇒ 2x = 8 ⇒ x = 4
Present age of A and B will be 16 yrs and 28 yrs respectively,
Now, sum of the age of A and B = 16 + 28 = 44 years
Alternate method :-

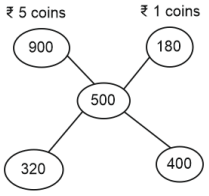
	A		B
Present Age →	4	:	7) × 1
	4	:	7
Age after 8 yrs →	2	:	3) × 3 Diff. 2
	6	:	9

⇒ 2 units = 8 ⇒ 1 unit = 4
⇒ 11 units = 44 years

Sol.130.(d) Given: $\frac{3+x}{11+x}$ = $\frac{4+x}{14+x}$
By putting option one by one, we get x = 1
As $\frac{3+1}{11+1}$ = $\frac{4+1}{14+1}$ ⇒ $\frac{5}{15}$ = $\frac{1}{3}$

Sol.131.(a) Let first number = $4x$
2nd number = $5x$
Given $\frac{4x-17}{5x-17}$ = $\frac{11}{14}$
⇒ 56x - 238 = 55x - 187 ⇒ x = 51
⇒ original ratio = $\frac{51\times4}{51\times5}$ = $\frac{204}{255}$
Hence,
Required ratio = $\frac{204+20}{255+20}$
= $\frac{224}{275}$ or 224 : 275

Sol.132.(c)
Let all coins are of denomination ₹5
⇒ Total value = 180 × 5 = 900 ₹
Let all coins are of denomination ₹1
⇒ Total value = 180 × 1 =180
By allegation



⇒ 4 : 5
⇒ 9 unit → 180 ⇒ 1 unit → 20
Hence,
the number of ₹5 coins in the bag = 4 × 20 = 80.

Sol.133.(d) Let the third proportional = x
$\frac{9}{7}$ = $\frac{x}{14}$ ⇒ 9 × 14 = 7x ⇒ x = 18

Sol.134.(d) Fourth proportional of 42, 56,
63 = $\frac{63\times56}{42}$ = 84
Fourth proportional of 189, 273, 153
= $\frac{153\times273}{189}$ = 221
Required ratio = 84 : 221

Sol.135.(d) According to the question,
$\frac{9}{16}$R = $\frac{3}{4}$S ⇒ $\frac{R}{S}$ = $\frac{3}{4}$ × $\frac{16}{9}$ = $\frac{4}{3}$
Now, 4 + 3= 7 unit = ₹4,760
Then, 3 unit = $\frac{4760}{7}$ × 3 = ₹2040

Sol.136.(c)

Cyrus		Rohan		Mishti
3	:	2	:	**2**
7	:	7	:	12
21	:	14	:	24

According to the question,
24 - 21 = 3 unit = ₹1800
Then, 14 unit = $\frac{1800}{3}$ × 14 = ₹8400

Sol.137.(d) (5^2-3^2) = 16, 5 - 3 =2
Third proportional to 16 and 2
= $\frac{2\times2}{16}$ = $\frac{1}{4}$

Sol.138.(c) According to question,
b = 35 + a ---------- (i)
d = 60 + c ---------- (ii)
Since a,b,c,d are in proportion. Then we have ;
$\frac{a}{b}$ = $\frac{c}{d}$
ad = bc
a(60 + c) = (35 + a)c [from eqn(i)&(ii)]
60a + ac = 35c + ac ⇒ 60a = 35c
$\frac{a}{c}$ = $\frac{35}{60}$ = $\frac{7}{12}$
Let a and c be 7x and 12x
Then, 7x × 12x = 5376
84x^2 = 5376 ⇒ x^2 = $\frac{5376}{84}$ = 64 ⇒ x = 8
Then, a = 7 × 8 = 56, b = 35 + 56 = 91,
c = 12x = 12 × 8 = 96, d = 60 + 96 = 156
So, a + b + c + d = 56 + 91 + 96 + 156 = 399

Sol.139.(d)

Types of coins	₹1		50P		25P
No of coins	3	:	4	:	6

Total amount = 3 × 1 + 4 × $\frac{1}{2}$ + 6 × $\frac{1}{4}$
= 3 + 2 + 1.5 = 6.5
6.5 unit = ₹143
4 unit = $\frac{143}{6.5}$ × 4 = 88

Sol.140.(c) According to question, we have given ratio;

A		B		C		D
1	:	2	:	**2**	:	**2**
3	:	3	:	1	:	**1**
2	:	**2**	:	2	:	3
6	:	12	:	4	:	6 = 3 : 6 : 2 : 3

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Value of C = $\frac{2}{3+6+2+3}$ × 875

= $\frac{1750}{14}$ = 125

Sol.141.(b) Ratio of expenditure and saving = 2 : 1, So income = 3 unit
Now,

Income→3×20% = 60%
Expenditure→2×15% = 30%
Saving→1× ? = 30%

∴ ? = $\frac{30}{1}$ = 30%

% increase in her saving = 30%

Sol.142.(a)
Expenditure = price × consumption
Ratio of price = 3 : 4
Ratio of quantity = 4 : 7

∴ Ratio of expenditure = 12 : 28 or 3 : 7

Sol.143.(c)
A : B = 3 : 4
B : C = 12 : 13

A : B : C = 9 : 12 : 13
Here total amount = 34 unit = ₹ 7786
∴ B's amount = 12 unit
= $\frac{7786}{34}$ × 12 = ₹ 2748

Sol.144.(b)
Area of triangle = $\frac{1}{2} \times base \times height$
Area → 4 : 3
Height → 6 : 5
Then ratio of bases → $\frac{4}{6} : \frac{3}{5}$ = 10 : 9

Sol.145.(c) According to the question,
$\frac{X}{Y} = \frac{3}{1}$ (put the value in equation)
$\frac{2X+3Y}{X-2Y} = \frac{2\times3+3\times1}{3-2\times1}$ = 9

Sol.146.(b) P ∝ $\frac{1}{Q}$ ⇒ P = k × $\frac{1}{Q}$
10 = k × $\frac{1}{6}$ ⇒ k = 60
now, 15 = 60 × $\frac{1}{Q}$ ⇒ Q = 4

Sol.147.(d) Mean proportion
= $\sqrt{(3+2\sqrt{2})^2 \times (3-2\sqrt{2})^2}$
= (3 + 2√2) × (3 − 2√2) ⇒ 9 − 8 = 1

Sol.148.(c) According to the question,
Ratio - A : B : C
Profit - 15x : 6x : 5x
B's share = 29120 × $\frac{6x}{15x+6x+5x}$
= ₹ 6720

Sol.149.(b)
Asha : Bhupinder : Gargi
9 : 5 : **5**
2 : 2 : 1
---
18 : 10 : 5
Hence, shares of Asha
= $\frac{66000}{(18+10+5)}$ × 18 = ₹36,000

Sol.150.(a) According to the question,
5x − 2x = ₹150 ⇒ x = ₹50
Hence, total sum = (2x + 5x + 7x) = 14x
= ₹700

Sol.151.(d) p : q = 5 : 2,
then p² − q² : p² + q² = 25 - 4 : 25 + 4
= 21 : 29

Sol.152.(b)
Marks obtained by the student after studying for one hour = $\frac{60}{4}$ = 15 Marks
So the time taken by him to study to get 75 marks = $\frac{75}{15}$ = 5 hours

Sol.153.(d) According to the question
Let the numbers be 5x, 2x, 7x
According to the question,
$(5x)^2 + (2x)^2 + (7x)^2$ = 3822
= $25x^2 + 4x^2 + 49x^2$ = 3822
= $78x^2$ = 3822 ⇒ x = 7
So the largest no. = 7x = 7 × 7 = 49

Sol.154.(b) According to the question,
(19 + 6) - (7 + 15) units = 72
3 units = 72
Smallest number (6 units)
= $\frac{72}{3}$ × 6 = 144

Sol.155.(b) Let the savings of T = 1 unit
Then income of T = 8 units
Expenditure of T = (8 − 1) = 7 units
Hence, expenditure of T is 7 times of his savings

Sol.156.(d) Total students = 1650
Ratio → Boys : Girls
6 : 5
Number of boys = 1650 × $\frac{6}{11}$ = 900
Number of girls = 1650 × $\frac{5}{11}$ = 750
After Admission -
Total boys = 900 + 124 = 1024
New Ratio → Boys : Girls
4 : 3
4 unit = 1024 , 3 unit = 768
Newly admitted girls = 768 - 750 = 18
So, required ratio = 18 : 124 = 9 : 62

Sol.157.(a) According to the question,
$\frac{x+20}{2x} = \frac{1}{1}$ ⇒ x = 20
Number of student initially = 3x = 60

Sol.158.(c) $\sqrt{A^2+B^2} : \sqrt{C^2-B^2}$
= $\sqrt{9+16} : \sqrt{25-16}$ ⇒ $\sqrt{25} : \sqrt{9}$ = 5 : 3

Sol.159.(a)
3C + 5P = 1080 ₹ ... e.q .(1)
2C + 4P = 840 ₹ ... e.q .(2)

C + P = 240 ₹
⇒ 2C + 2P = 480 ₹ ...e.q .(3)
On solving e.q .(3) and e.q .(2) , we get
2P = 360 ⇒ P = 180 ₹ and C = 60 ₹
Required ratio = 1 : 3

Sol.160.(c) Compound ratio :-
$\frac{3\times6}{4\times7} = \frac{36}{x}$ ⇒ x = 56

Sol.161.(d) Mean proportional (25) = $\sqrt{ab}$
⇒ a = $\frac{625}{b}$
Third proportional (25) = $\frac{b^2}{a}$
⇒ b^2 = 25a = 25 × $\frac{625}{b}$
⇒ b = 25 and a = 25

Sol.162.(a) $\frac{2x+8.5}{x+8.5} = \frac{7}{4}$
x = 8.5 × 3 = 25.5 years

Sol.163.(c) Required ratio
= $(\frac{23+7}{2}) : (\frac{23-7}{2})$ = 15 : 8

Sol.164.(d) $\frac{x+7}{2x+7} = \frac{3}{5}$
x = 7 × 2 = 14
Greatest number (2x) = 28

Sol.165.(a)
Mean proportional = $\sqrt{7\times63}$ = 21
Required difference = 24 − 21 = 3

Sol.166.(c)
$\frac{(6a^2-2b^2)}{(b^2-a^2)} = \frac{(6\times25-2\times49)}{(49-25)}$
= $\frac{(150-98)}{(24)} = \frac{(52)}{(24)} = \frac{(13)}{(6)}$ = 13 : 6

Sol.167.(d)
Fourth proportional = $\frac{3\sqrt{10}\times5\sqrt{8}}{3\sqrt{5}}$
= $\sqrt{2}\times5\sqrt{8}$ = 5 × 4 = 20

Sol.168.(a)
Let their age be 5x and 3x , then
5x × 3x = 960 ⇒ x = 8
Their present age = 40 years and 24 years
Required ratio = 40 + 6 : 24 + 6 = 23 : 15

Sol.169.(a) Given numbers are in proportional , so $\frac{8}{P} = \frac{16}{18}$ ⇒ P = 9
Third proportional = $\frac{12\times12}{9}$ = 16

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.170.(d) Number of male worker
= 960 − 420 = 540
Required ratio = 540 : 420 = 9 : 7

Sol.171.(d) Given:- $x = 45$, $y = 9$, $x = Ky$
45 = $K \times 9$, $K = 5$
Now, $x = ?$, $y = 50$
$x = 5 \times 50 = 250$

Sol.172.(d)

Ratio - X	: Y	: Z
4	: 5	: **5**
7	: 7	: 6

Final - 28 : 35 : 30

Share of Z = $\frac{1488}{(28+35+30)} \times 30$ = ₹480

Sol.173.(a) Ratio :- Boys : Girls = 11 : 15
difference between the number of boys and girls (4 units) = 200
No. of boys (11 units) = $\frac{200}{4} \times 11$
= 550 boys

Sol.174.(c)

Ratio -	Income	=	expenditure	+	savings
Initial -	80	=	50	+	30
Final -	**96**	=	**65**	+	31

Change % in savings = $\frac{1}{30} \times 100$
= $3\frac{1}{3}$ % increased

Sol.175.(d) 48% of male workers
= $\frac{2}{3}$ × female worker
$\frac{Male\ workers}{Female\ workers} = \frac{2}{3} \times \frac{100}{48}$
$= \frac{100}{72} = \frac{25}{18}$
So, required ratio :-
Male worker : female worker = 25 : 18

Sol.176.(b) Let the third number be 100.
According to question,
The two numbers = 117 and 150
Required ratio = 117 : 150 = 39 : 50

Sol.177.(b)
According to question, $\frac{96}{a} = \frac{c}{96}$
Going through all the options, while putting option (b)
a = 32 and c = 288
$\frac{96}{32} = \frac{288}{96} \Rightarrow 3 = 3$ [satisfy]

Sol.178.(c)
Ratio of no. = $\frac{4}{5} : \frac{5}{6} : \frac{9}{10}$ = 24 : 25 : 27
Difference between greatest and smallest = (27 − 24) units ⇒ 3 units = 12
Middle number (25 units) = $\frac{12}{3} \times 25 = 100$

Sol.179.(a) Let the length of colored saffron, white and green be $6x$, $7x$ and $8x$
According to question,
$6x + 7x + 8x = 9030 \Rightarrow x = 430$
Length of green part = $8x = 8 \times 430$
= 3440 cm

Sol.180.(d) Let the number of storey be x
According to question,
$\frac{28}{7} = \frac{48}{x} \Rightarrow x = 12$

Sol.181.(a)
Let the number subtracted be x.
$\frac{(2-x)}{(3-x)} = \frac{(3-x)}{4}$
$\Rightarrow 8 - 4x = 9 + x^2 - 6x$
$\Rightarrow x^2 - 2x + 1 = 0 \Rightarrow (x-1)(x-1) = 0$
⇒ (smallest possible number) $x = 1$

Sol.182.(a) Third proportional to $3x^2$ and
4xy = $\frac{4xy \times 4xy}{3x^2} = \frac{16}{3}y^2$
$\frac{16}{3}y^2 = 48 \Rightarrow y^2 = \frac{48}{16} \times 3 = 9 \Rightarrow y = 3$

Sol.183.(d)
Ratio → Cheese : sauce = 2 : 1
According to the question ,
Sauce used to make pizza (1 unit)
= 15 cups
Cheese to be used (2 unit) = 30 cups

Sol.184.(a) Let total Income = 100 units
Then , Savings = 15 units
Expenditure on health , education and food be 17 units , 34 units and 34 units respectively.
According to the question ,
3 × (34 units) − 100 units = 300 Rs.
2 units = 300 Rs.
Required difference
= (17 units − 15 units) = 2 units = 300 Rs.

Sol.185.(c) M = $\sqrt{16 \times 9}$ = 12
N = $\frac{15^2}{9}$ = 25
5M + 3N = 5 × 12 + 3 × 25 = 60 +75 = 135

Sol.186.(d) Ratio of manufacturing →
Plate : Glasses = 2 : 1
and Glasses : Bowl = 2 : 1
Plate : Glasses : Bowl = 4 : 2 : 1
According to the question ,
Total manufacturing (7 units) = 2380
Required difference (3 units)
= $\frac{2380}{7} \times 3$ = 1020 units

Sol.187.(a) Let the numbers be $7x$ and $6x$
According to question,
$(7x)^2 - (6x)^2 = 637$
$= 49x^2 - 36x^2 = 637$
$= x^2 = 49 \Rightarrow x = 7$
Therefore, the numbers are 49 and 42.

Sol.188.(b) Ratio of Students →
Initially = 2 : 3 : 5
Finally = 4 : 5 : 7
Increase in ratio (2 units) = 20 students
Initially total students (10 units) = 100 students

Sol.189.(c) Let the marks of practical and theory be 300 and 700.
According to question,
Required ratio
= $(700 \times \frac{60}{100}) : (300 \times \frac{80}{100})$
= 420 : 240 = 7 : 4

Sol.190.(b) a : b : c = 4 : 7 : 9) × 4
⇒ a : b : c = 16 : 28 : 36
and b : c : d = 28 : 36 : 21
or a : b : c : d = 16 : 28 : 36 : 21

Sol.191.(b) Let the number of boys and girls in the village be 500 and 300.
According to question,
Total number of boys and girls who appeared in the examination
→ $(500 \times \frac{40}{100}) + (300 \times \frac{60}{100})$ = 380
Total number of boys and girls who did not appear in the examination
→ 800 − 380 = 420
Required ratio = 380 : 420 = 19 : 21

Sol.192.(c) Volume of cylinder = $\pi r^2 h$
Ratio → Initial : Final
$(radius)^2$ → $(2)^2 : (1)^2$
$height$ → 5 : 2

Volume → 20 : 2 = 10 : 1

Sol.193.(b) Let the numbers be = $5x$, $9x$
According to the question,
$9x + 6 = 6(5x - 6)$
$9x + 6 = 30x - 36 \Rightarrow 42 = 21x \Rightarrow x = 2$
So the required numbers = 5 × 2 = 10,
9 × 2 = 18

Sol.194.(d) $\frac{J}{4} = \frac{K}{5} = \frac{L}{3}$
J = 4, K = 5, L = 3
According to the question,
$(L + J)^2 : (J + K)^2 : (K + L)^2$
$(3 + 4)^2 : (4 + 5)^2 : (5 + 3)^2$
49 : 81 : 64

Sol.195.(d) 1st no. : 2nd no. : 3rd no.

3	: 4	: **4**
3	: 3	: 5
9	: **12**	: **20**

According to the question,
($9x \times 20x$) unit = ₹4500
$x^2 = \frac{450}{18} \Rightarrow x = \sqrt{\frac{225}{9}} = 5$
Sum of three numbers = ($41x$) = 41 × 5
= 205

Sol.196.(b) Total amount = 50 × 80

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Number of children = $\frac{50 \times 80}{50}$ = 80

Sol.197.(c)
$(x + y) : (y + z) : (z + x)$ = 3 : 5 : 7
Let, $x + y = 3a$, $y + z = 5a$, $z + x = 7a$
2 $(x + y + z) = 15a$ ----------e.q .(1)
45 = $\frac{15a}{2} \Rightarrow a = 6$
$(x + y) = 3a = 18$
Now, $(x + y + z) = 45$
18 + z = 45 ⇒ z = 27

Sol.198.(c) Let share of r be x.
Then, share of q and p = (x+6) and (x+15)
According to question,
$x + (x + 6) + (x + 15) = 120$
$3x = 99 \Rightarrow x = 33$
Required ratio = 48 : 39 : 33 = 16 : 13 : 11

Sol.199.(c) According to the question,

Ratio →	Income :	expenditure :	savings
Initial →	7 :	4 :	3
Change →		- 1.4	+ 1.4
Final →	7 :	2.6 :	4.4

His savings increased $\frac{1}{5}th$ of their total income and income remains same
Therefore, the new ratio of his expenditure and savings = 2.6 : 4.4 = 13 : 22

Sol.200.(c) Let , weight of Ayush and Abhishek be $8x$ and $5x$ respectively . Increased weight of Abhishek
= $5x \times \frac{140}{100} = 7x$
Overall increased weight
→ $(8x + 5x) \times \frac{160}{100}$ = 20.8 x
According to the question ,
20.8x = 104 kg. ⇒ x = 5 kg.
Increased weight of Ayush
→ 20.8x − 7x = 13.8x
13.8x = 13.8 × 5 = 69 kg.

Sol.201.(a) Let the income of Jitendra and Narendra = 4x and 7x
And expenditure of Jitendra and Narendra = 6y and 5y
According to the question,
4x = 2800 → x = 700
Savings of Jitendra ⇒ 4x - 6y = 400
⇒ y = 400
Savings of Narendra ⇒ 7x - 5y
= 4900 - 2000 = 2900 Rs.

Sol.202.(b) Let income of P = x
According to the question;
$\frac{1}{3}x + 4400 = \frac{1}{2}x \Rightarrow \frac{1}{6}x = 4400$
x = Rs. 26,400
$\frac{P}{Q} = \frac{1}{2}$ ⇒ Q = 26400 × 2 = Rs. 52800

Sol.203.(d) Let the larger number be x and the smaller number be y .
According to question,
$x - y = \frac{20}{100} \times (x + y) \Rightarrow \frac{x-y}{x+y} = \frac{1}{5}$
$x - y = 1$ .....e.q .(1)
$x + y = 5$ .....e.q .(2)
On solving e.q .(1) and (2); we get
x = 3 and y = 2
required ratio, x : y = 3 : 2

Sol.204.(d) Total expenditure = 12000₹
According to the question ,
Expenditure of D = Saving of C = x
Then , Expenditure of C = $(12000 - x)$

Ratio →	C :	D
Income →	3 :	4
Expenditure →	$(12000 - x)$:	x
Saving →	x :	(y)

In 'C' case ⇒ Income − Expenditure = Savings
3 units − $(12000 - x) = x$
⇒ 1 unit = 4000 ₹
Total Income (7 units) = 28000 ₹
Now,
total saving = 28000 − 12000 = 16000 ₹
Short Trick :-

Ratio	→ C :	D
Income	→ 3 :	4
Expenditure	→ 2 :	**1**
Saving	→ **1** :	3

Total expenditure (3 units) = 12000 ₹
Total Savings (4 units) = 16000 ₹

Sol.205.(a) Let current age of father be x and son be y
x + y = 94 --------e.q .(1)
(8 − x) = 2(8 − y)
2y − x = 8 -------e.q .(2)
On adding e.q .(1) and e.q .(2); we get
y = 34 and x = 60
Required ratio = 70 : 44 = 35 : 22

Sol.206.(a) Ratio →
P : Q + R = 4 : 7) × **7**
Q : P + R = 2 : 5) × **11**
Total amount of P, Q, R = 77 units
And R's unit = 77 − (7 × 4 + 11 × 2)
= 27 units
77 units = ₹43120
(R)27 units = $\frac{43120}{77} \times 27$ → ₹15120

Sol.207.(a)

Ratio →	A :	B
Income →	7 :	4) × 2
Expenditure →	3 :	1) × 3

Savings of A = $\{(7 \times 2) - (3 \times 3)\}$
= 5 units ⇒ 5 units = 4800 ₹
Total Income of A and B
= (7 + 4)× 2 = 22 units
22 units → $\frac{4800}{5} \times 22$ = 21120 ₹

Sol.208.(b) Ratio of their marks → 2 : 4 : 9
According to the question ,
Marks obtained by Rajesh (2 units) = 30
Marks obtained by Rakesh (4 units) = 60
Marks obtained by Ramesh (9 units) = 135

Sol.209.(c)
Ram : Ramesh : Naresh
$\frac{1}{3} : \frac{1}{4} : \frac{1}{6} \Rightarrow 4 : 3 : 2$

Ratio →	Ram :	Ramesh :	Naresh	
Initial →	4 :	3 :	2 = 9 units ×13	
Final →	3 :	4 :	6 =13 units × 9	

Make units equal as money divided is same

Ram :	Ramesh :	Naresh	
52 :	39 :	26	= 117 units
27 :	36 :	54	= 117 units
-25u	-3u	+28u	

According to question ,
117 units = Rs. 702
Then , 28 units = Rs 168
Clearly , Naresh got Rs.168 More

Sol.210.(d) If c is the third proportion of the number a and b , then $c = \frac{b^2}{a}$
Let , x be the no. which is subtracted from 9 and 13 so that 18 is the third proportional to them.
According to question ,
$\frac{(13-x)(13-x)}{(9-x)}$ = 18
$169 - 26x + x^2$ = 162 - 18x
7 - 8x + x^2 = 0
$x^2 - 7x - x + 7 = 0$
⇒$(x - 7)(x - 1) = 0 \Rightarrow x = 7$ and $x = 1$
Since, smallest positive number to be subtracted. Hence, x = 1

Sol.211.(b) A ∝ $\sqrt{B} \propto \frac{1}{C^3}$
A = $\frac{k \times \sqrt{B}}{c^3} \Rightarrow 15 = \frac{k \times \sqrt{27}}{2^3}$
k = $\frac{120}{3\sqrt{3}}$ .....e.q .(1)
Again ,
A = $\frac{k \times \sqrt{B}}{c^3} \Rightarrow 9 = \frac{120 \times \sqrt{B}}{3\sqrt{3} \times 2^3}$
$\sqrt{B} = \frac{9\sqrt{3} \times 8}{40} \Rightarrow B = \frac{243}{25}$

Sol.212.(a) Mean proportion of 6 and 54
⇒ $\sqrt{6 \times 54} = 18$
so , 18 is 3 more than 15.

Sol.213.(d)
Let the four no's be x, 2x, 3x and 5x
According to the question,
2(x + 2x + 3x + 5x) = 44
⇒ 11x = 22 ⇒ x = $\frac{22}{11}$ = 2

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

So, the no's are 2, 4, 6 and10

Required ratio = $2^3 - 3 : 4^3 - 3 : 6^3 - 3 : 10^3 - 3$ = 5 : 61 : 213 : 997

Sol.214.(d) LCM of (2, 5, 3) = 30

Then, the ratio of the salary of A, B and C

$= \frac{3}{2} \times 30 : \frac{6}{5} \times 30 : \frac{4}{3} \times 30$

= 45 : 36 : 40

Required percentage = $\frac{45-40}{40} \times 100$

$= \frac{5}{40} \times 100 = 12.5\%$

Sol.215.(d) Let the age of father and mother be 3x and 2x respectively

According to the question,

(3x) × (2x) = 486

$\Rightarrow 6x^2 = 486 \Rightarrow x^2 = \frac{486}{6} = 81$

$\Rightarrow x = \sqrt{81} = 9$ yrs.

Then, the age of father and mother

= 9 × 3 = 27 yrs and 2 × 9 = 18 yrs.

So, the ratio of the ages after 5 yrs.

= (27 + 5) : (18 + 5) = 32 : 23

Sol.216.(a)

Ratio →	B	C	D	E
Initial Salaries →	20	30	40	50
Final salary →	24	39	56	75

According to the question,

Increased salary of D = 56 unit

56 unit = ₹560

Sum of original salaries of B, C, D and E

$= \frac{560}{56} \times 140$ = ₹1,400

Sol.217.(c) It is given that, CP $\propto W^2$

Initial weight of a diamond = $(5 + 9)^2$

$= 14^2 = 196$ unit

After break down, weight of a diamond

$= 5^2 + 9^2 = 25 + 81 = 106$ unit

Required loss% in weight of diamond

$= \frac{196-106}{196} \times 100$

$= \frac{90}{196} \times 100 = 45.918 \sim 45.92\%$

Sol.218.(a) According to the question,

D = $\frac{A}{2}$, C = 1.2A

Also, B + D = $\frac{14}{11}$ (A + C)

B + $\frac{A}{2} = \frac{14}{11}$ (A + 1.2A)

B + $\frac{A}{2} = \frac{14}{11}$ (2.2A)

B + 0.5A = 2.8A ⇒ B = 2.3A

So, ratio of sharing among A : B : C : D

= A : 2.3A : 1.2A : 0.5A = 1 : $\frac{23}{10}$: $\frac{12}{10}$: $\frac{5}{10}$ = 10 : 23 : 12 : 5

Share of A = $\frac{10}{50} \times 1250$ = ₹250

Share of B = $\frac{23}{50} \times 1250$ = ₹575

Share of C = $\frac{12}{50} \times 1250$ = ₹300

Share of D = $\frac{5}{50} \times 1250$ = ₹125

Hence, option (a) is the correct answer.

Sol.219.(a) x = $\sqrt{125 \times 5} = \sqrt{625} = 25$

y = $\sqrt{4^4 \times 6^2} = 4^2 \times 6 = 96$

So, 2x : y = 25 × 2 : 96 = 50 : 96 = 25 : 48

Sol.220.(d) According to question

$\Rightarrow \sqrt{75x} = 5 \times \sqrt{15 \times 26}$

$\Rightarrow 5\sqrt{3x} = 5 \times \sqrt{15 \times 26}$

$\Rightarrow \sqrt{3x} = \sqrt{3} \times \sqrt{5 \times 26} \Rightarrow x = 5 \times 26 = 130$

Sol.221.(a)

	No. of hens	:	No. of goats		
Farm A	5	:	4	= 9)	**× 4**
Farm B	5	:	7	= 12)	**× 3**

No. of hens in farm A and B

= 5 × 4 + 5 × 3 = 20 + 15 = 35

No of goats in farm A and B

= 4 × 4 + 7 × 3 = 16 + 21 = 37

So, the required ratio = 35 : 37

Sol.222.(c) Let the no. of coins of ₹10, ₹5 and ₹2 be a, b, c respectively

According to question,

ab : bc : ca = 3 : 4 : 2

a : b : c = 3 × 2 : 3 × 4 : 4 × 2

= 6 : 12 : 8 or 3 : 6 : 4

So, the minimum amount of money that person has = 3 × 10 + 6 × 5 + 4 × 2

= 30 + 30 + 8 = ₹68

Sol.223.(b)

Ratio → 2 - wheelers : 4 - wheelers

11 : 9

No. of petrol vehicle = 9 × $\frac{1}{4}$ = 2.25 unit

No. of diesel vehicle = 9 - 2.25 = 6.75 unit

6.75 unit corresponds to 81

9 unit corresponds to $\frac{81}{6.75}$ × 9 = 108

11 unit corresponds to $\frac{108}{9}$ × 11 = 132

Number of 2-wheelers in the housing society = 11 unit = $\frac{108}{9}$ × 11 = 132

Sol.224.(d)

Ratio →	Santosh	Ravi	Vipin
Valid Votes →	11	4	9

According to question,

Winner - nearest rival=(11 - 9) unit

= 2 unit

2 unit = 8350 votes

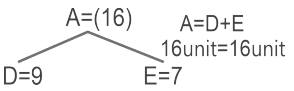
Total valid votes polled = $\frac{8350}{2} \times 24$

= 1,00,200

Sol.225.(c)

A	:	B	:	C	
8	:	4	:	3	(× 2)
16	:	8	:	6	

A divides his parts



Therefore,

C : D = 6 : 9 = 2 : 3

Sol.226.(b) let the first number = a

And second number = b

According to the question ,

3b - a = $\frac{3a}{4} \Rightarrow$ 3b = $\frac{3a}{4}$ + a

$\Rightarrow$ 3b = $\frac{7a}{4} \Rightarrow \frac{a}{b} = \frac{12}{7}$

therefore ratio ⇒ a : b = 12 : 7

Sol.227.(d)

Denomination of coin :	₹5	₹10	₹20
Ratio of coin →	2x	3x	5x
Value →	10x	30x	100x

10x = 240 ⇒ x = 24

Now total amount of money in the bag

= 10x + 30x + 100x

= 140x = 140 × 24 = Rs 3360

Sol.228.(a)

Let x be added to each numbers

$\Rightarrow (1 + x) : (7 + x) :: (7 + x) : (25 + x)$

$\Rightarrow (1 + x)(25 + x) = (7 + x)(7 + x)$

$\Rightarrow 25 + 26x = 49 + 14x$

$\Rightarrow 12x = 24 \Rightarrow x = 2$

Sol.229.(d)

Let the cat be x *and dogs be* $2x$.

$\Rightarrow (4 \times x) + (4 \times 2x) + 3 \times 2 = 42$

$\Rightarrow 12x = 36 \Rightarrow x = 3$

Total number of cats = 3

Sol.230.(b) Let the numerator be x and denominator be y ⇒ $\frac{x+8}{y+12} = \frac{1}{2}$

$\Rightarrow 2x - y = -4$ .....(i)

$\Rightarrow \frac{x-2}{y-2} = \frac{1}{8}$

$8x - y = 14$ .....(ii)

On solving eq (i) and (ii), we get

$x = 3, y = 10$

Original fraction = $\frac{3}{10}$

Sol.231.(c) $\frac{a}{b} = \frac{b}{c}$ ⇒ ac = b^2

Now, $a^6 : b^6 = a^6 : (b^2)^3$

$\Rightarrow a^6 : b^6 = a^6 : (ac)^3$

$\Rightarrow a^6 : b^6 = a^6 : a^3 c^3$

$\Rightarrow a^6 : b^6 = a^3 : c^3$

Sol.232.(a)

Let the ₹5 coin be x and ₹10 coins be y

xy = 135 and 5x + 10y=165

So, $5(\frac{135}{y}) + 10y = 165$

$2y^2 - 33y + 135 = 0$

y = 9 or 7.5 (number of coins cannot be

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

in decimal)
So, amount=10 × 9 = ₹90

Sol.233.(a) Total students = 60
B : G
4 : 1
⇒ 4 + 1 = 5 → 60 (given)
So number of boys = 4 → $\frac{60}{5}$ × 4 = 48
Number of non-vegetarian = 48 - 22 = 26

Sol.234.(c) According to the question,
Ratio of steel (2018 : 2020) = 4 : 3 = 4 : 3

	Steel		iron	
2018 →	(3	:	2)	× 4
2020 →	(1	:	1)	× 3 × 3

Here,

	Steel		iron
2018 →	12	:	8
2020 →	9	:	9

Therefore ratio of iron = 2018 : 2020
8 : 9

Sol.235.(c)
Let the parrots be $7x$ and pigeon be $9x$.
According to the question,
$\frac{7x-8}{9x+6} = \frac{1}{4}$ ⇒ $28x - 32 = 9x + 6$
⇒ $19x = 38$ ⇒ $x = 2$
Initial Numbers of parrots = 7 × 2 =14
Remaining parrots = 14 - 8 = 6
Therefore ratio of parrots and sparrows
⇒ 6 : 10 = 3 : 5

Sol.236.(d)
Let the age of Yuvansh be x year.

Ratio →	Garvit	:	Yuvansh
4 years ago →	3x	:	x
1 year ago →	3x + 3	:	x + 3
Present age →	3x + 4	:	x + 4

According to question ,
3x + 3 = 2× (x + 3) ⇒ $x = 3$
Difference in their age=
(3x + 4) - (x + 4) = 13 - 7 = 6 years.

Sol.237.(a) Let the number of boys be $2x$ and girls be $5x$
Now , $\frac{2x-10}{5x+20} = \frac{4}{25}$ ⇒ $50x - 20x = 330$
⇒ $30x = 330$ ⇒ $x = 11$
Number of boys now = 11 × 2 - 10
= 22 - 10 = 12

Sol.238.(a) Let Karan gets = x
Raj gets = x - 9000
As per question,
⇒ x + x - 9000 = 21000 ⇒ x = 15,000
Rato of Raj : Karan = 6000 : 15000 = 2 : 5

Sol.239.(c) 4 years ago, ratio of age of Shyam : Ram = 3 : 4
4 years hence, ratio of age of
Shyam : Ram = 5 : 6
According to question,
⇒ $\frac{3x+8}{4x+8} = \frac{5}{6}$ ⇒ $18x + 48 = 20x + 40$
$2x = 8$ ⇒ $x = 4$
Present age of Shyam = $3x + 4$ = 3 × 4 + 4
= 16 years

Sol.240.(b) Let the expenditure and savings of Soham be 500 and 100 units

	Income	=	Expenditure	+	Saving
Original →	600	=	500	+	100
New →	750	=	630	+	120

According to question ,
Current expenditure (630 units) → ₹4347
So, his Initial income (600 units) →
$\frac{4347}{630}$ × 600 = ₹4140

Sol.241.(b) According to question ,
10% of A+8% of B = $\frac{3}{5}$ (12% of A+16% of B)
50% of A+40% of B = 36% of A + 48% of B)
14% × A = 8% × B ⇒ $\frac{A}{B} = \frac{4}{7}$

Sol.242.(c) (18x + 8y)% = $\frac{1}{3}$(22x + 36y)%
54x + 24y = 22x + 36y
32x = 12y ⇒ $\frac{x}{y} = \frac{12}{32} = \frac{3}{8}$
So, the ratio of x and y = 3 : 8

Sol.243.(d) Let the number be x and y.
According to question,
60% × x = $\frac{3}{4}$ × y
$\frac{3}{5} \times x = \frac{3}{4} \times y$ ⇒ $\frac{x}{y} = \frac{5}{4}$
So, the required ratio = 5 :4

Sol.244.(c) Ratio → P : Q : R
16 : 17 **) × 15**
15 : 16 **) × 17**
P : Q : R = 240 : 255 : 272
Total run scored by all batsmen =
(240 + 255 + 272) units = 767 units
767 units → 956 Run
Run scored by R (272 units)
= $\frac{956}{767}$ × 272 = $\frac{260032}{767}$ ≈ 339 Run

Sol.245.(b) According to the question,
A varies with B and C
A = B × C ⇒ 6 = 3 × 2
So, A = 5 × 7 = 35

Sol.246.(c) Ratio → A : B
Income → 11 : 13
Expenses → 9 : 11
Savings → 2 : 2
According to question ,
Saving (2 units) = 4000 Rs.
Difference b/w their income (13 – 11) units
→ 2 units = 4000 Rs.

Sol.247.(b) Let the present ages of A and B be a and b years respectively.
According to the question ,
$\frac{a-4}{b-4} = \frac{1}{2}$
2a – 8 = b – 4 ⇒ 2a – b = 4 .....(1)
Also, a = b – 8 ⇒ a – b = – 8 ....(2)
On solving equations (1) and (2), we get
a = 12 and b = 20
So present age of B = 20 years

Sol.248.(c) Given,
$(a^2 + b^2) : (b^2 + c^2) : (c^2 + a^2)$
= 34 : 61 : 45 ,
Adding all we get, $2(a^2 + b^2 + c^2) = 140$
$(a^2 + b^2 + c^2) = 70$.
$c^2 = (a^2 + b^2 + c^2) - (a^2 + b^2)$
= 70 - 34 = 36.
Similarly, $b^2 = 25$ and $a^2 = 9$
So, a : b : c = $\sqrt{9} : \sqrt{25} : \sqrt{36}$ = 3 : 5 : 6
b - a : c - b : c - a
= (5 - 3) : (6 - 5) : (6 - 3) ⇒ 2 : 1 : 3

Sol.249.(b)

	A	:	B
Income	2x	:	3x
Expenditure	3y	:	4y
Savings	(2x - 3y) :		(3x - 4y)

According to the question,
$\frac{1}{3} \times 3x$ = 3y, ⇒ x : y = 3 : 1
Savings ratio = (2x - 3y) : (3x - 4y)
⇒ (2 × 3 - 3 × 1) : (3 × 3 - 4 × 1)
= 3 : 5
Short Trick :-

Ratio →	A	:	B
Income →	2	:	3 **) × 3**
Expenses →	3	:	4 **) × 1**

Savings of A = (2 × 3)–(3 × 1) = 3
Savings of B = (3 × 3) – (4 × 1) = 5
Required Ratio → 3 : 5

Sol.250.(d)

Ratio →	x	:	y	=	Total
Alloy A →	5	:	2	=	7 **) × 4**
Alloy B →	3	:	4	=	7 **) × 5**

Quantity of metal 'x' in Alloy C →
(5 × 4) + (3 × 5) = 35 units
Total quantity of Alloy C →
(7 × 4) + (7 × 5) = 63 units
Required percentage = $\frac{35}{63} \times 100 = 55\frac{5}{9}\%$

Sol.251.(a)

Ratio →	Juice	:	water	=	total
Cup 1 →	5	:	2	=	7 **) × 11**
Cup 2 →	7	:	4	=	11 **) × 7**

Cup 3 ⇒ Juice : Water
(5 × 11) + (7 × 7) : (2 × 11) + (4 × 7)
104 : 50 = 52 : 25
Ratio → water : juice = 25 : 52

Sol.252.(a) Ratio → Last year Income

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

A : B = 4 : 3

Now ,

	Last Year	:	Present Year
A →	× 4 × 5 (3	:	4
B →	× 3 × 3 (5	:	6

	Last Year	:	Present Year
A →	**60**	:	80
B →	**45**	:	54

According to the question ,

(80 + 54) units = 24.12 lakh

1 unit = 0.18 lakh

Last year income of A + Present year income of B = (60 + 54) units = 114 units

114 units = 114 × 0.18 = 20.52 Lakh

Sol.253.(a) $\frac{z}{x} = \frac{5}{2} \Rightarrow z = \frac{5x}{2}$

According to the question ,

$\frac{5}{2} = y + \frac{7}{4} \Rightarrow y = \frac{5}{2} - \frac{7}{4} = \frac{3}{4}$

Also, $x + y + z = 1\frac{11}{12}$

Putting the values of z and y as obtained in above equation, we get

$x + \frac{3}{4} + \frac{5x}{2} = \frac{23}{12}$

$\frac{4x + 3 + 10x}{4} = \frac{23}{12} \Rightarrow 14x + 3 = \frac{23}{3}$

$42x = 23 - 9 \Rightarrow x = \frac{1}{3}$

$z = \frac{5 \times \frac{1}{3}}{2} = \frac{5}{6}$, So, $(z - x) : (y - x)$

$= (\frac{5}{6} - \frac{1}{3}) : (\frac{3}{4} - \frac{1}{3})$

$= \frac{3}{6} : \frac{5}{12} = 6 : 5$

Sol.254.(b) Let , initial passed students be $25x$ and initial failed be $4x$.

According to the question,

$\frac{25x + 1 + 3}{4x - 3} = \frac{22}{3}$

$75x + 12 = 88x - 66$

$13x = 78 \Rightarrow x = 6$

Initial passed − initial failed = $25x - 4x$

$21x = 21 \times 6 = 126$

Sol.255.(d) Let the total sum = ₹x

Old ratio of share → **2** : 3 : 4

New ratio of share → **6** : 4 : 3

According to question,

$\frac{6x}{13} - \frac{2x}{9} = 3500$ Rs.

$\frac{28x}{117} = 3500 \Rightarrow x = 14{,}625$ Rs.

Sol.256.(b) Let number of Mathematics books = M, number of Physics books = P and number of Chemistry books = C

According to question,

$\frac{M}{P} = \frac{P}{C} \Rightarrow P^2 = MC = 144 \times 100 = 14400$

So, $P = 120$

So, required ratio → (M + P) : (C + P)

= (144 + 120) : (100 + 120)

= 264 : 220 = 6 : 5

Sol.257.(c) Let x males and x females are added in the recruitment drive.

According to the question,

$\frac{70 + x}{100 + x} = \frac{3}{4}$

$280 + 4x = 300 + 3x \Rightarrow x = 20$

Total males now = 70 + 20 = 90,

Total females now = 100 + 20 = 120

Total working population = 90 + 120

= 210

Sol.258.(c)

Ratio →	1st year	:	2nd year
Income →	2x	:	5x
Expenses →	4y	:	7y

According to question,

5x = 75000 ⇒ x = 15000

4y = 20000 ⇒ y = 5000

Savings of both years combined

= (2x - 4y) + (5x - 7y)

= (2 × 15000 - 4 × 5000) + (5 × 15000 - 7 × 5000) = 10000 + 40000 = 50000 Rs.

Sol.259.(c) Let the shares of A, B and C be 5x + 130, 2x + 150 and 4x + 200 respectively.

According to the question,

5x + 130 + 2x + 150 + 4x + 200 = 3780

11x + 480 = 3780 ⇒11x = 3300 ⇒ x = 300

Share of C (4x + 200) → 4 × 300 + 200

= 1400 Rs.

Sol.260.(d)

Marbles in Box A : $\frac{3}{15} \times 75 = 15$,

Marbles in Box B : $\frac{5}{15} \times 75 = 25$,

Marbles in Box C : $\frac{7}{15} \times 75 = 35$

On transferring the marbles as per directions given in question, we get

Total marbles in Box A = 15 + 3 = 18

Total marbles in Box B = 25 − 3 + 5 = 27

Total marbles in Box C = 35 − 5 = 30

So, required ratio = 18 : 27 : 30 = 6 : 9 : 10

Sol.261.(b)

Let (a + b) = 7x , (b + c) = 4x, (c + a)=5x

So, according to question

7x + 4x + 5x = 2(a + b + c)

7x + 4x + 5x = 2(16)

16x = 32 ⇒ x = 2

So, a + b = 7x = 14 ,

b + c = 4x = 8 and c + a = 5x = 10

So, a = 8 , b = 6 , c = 2 Now,

$(a^2 + b^2 + c^2) : (ab + bc + ca)$

$(8^2 + 6^2 + 2^2) : 8 \times 6 + 6 \times 2 + 8 \times 2$

$= (64 + 36 + 4) : (48 + 12 + 16)$

$= (104) : (76) = 26 : 19$

Sol.262.(b)

Ratio → Maths : English : Science

3 : 2) × 2

2 : 3) × 3

---

6 : 4 : 9

Total marks (6 + 4 + 9) units = 190

Marks in Science (9 units) = 90

Sol.263.(d) Let the number of chemistry books = x and let the price of each physics book and each chemistry book be 1 and 2 respectively.

So, total correct amount

$= 10 \times 1 + x \times 2 = 10 + 2x$

Total incorrect amount

$= 10 \times 2 + x \times 1 = 20 + x$

According to the question,

$12.5 = \frac{(10 + 2x) - (20 + x)}{10 + 2x} \times 100$

$\frac{1}{8} = \frac{(10 + 2x) - (20 + x)}{10 + 2x}$

$\frac{1}{8} = \frac{x - 10}{10 + 2x} \Rightarrow 10 + 2x = 8x - 80$

$6x = 90 \Rightarrow x = 15$

So, required ratio = 10 : x = 10 : 15 = 2 : 3

Sol.264.(b)

Income = Expenditure + Savings

17 = 14 + 3

According to question ,

Saving (3 units) = 12000 Rs.

⇒ 1 unit = 4000

Income (17 units) = 68000 Rs.

Expenditure (14 units) = 56000 Rs.

Now ,

New income = 68000 + 10000 = ₹78,000

New expenditure = 56000 − 2000

= ₹54,000

Required ratio → 78000 : 54000 = 13 : 9

Sol.265.(d)

Ratio → A : B : C : D

3 : 1

5 : 2

2 : 1

Final → 30 : 10 : 4 : 2

Difference between B and D = (10 - 2)units

8 units = ₹1600 → 1 unit = 200 Rs.

Total sum (30 + 10 + 4 + 2) =

46 units = 46 × 200 = 9200 Rs.

Sol.266.(c) Here we need to check through options, and by doing so we can see that option (c) satisfies the conditions given in question.

Ratio of marbles → A : B : C = 2 : 3 : 4

Total marbles (9 units) = 360

1 unit = 40

Box A = 80 , Box B = 120 , Box C = 160

So on applying option (c), we get

(80 - 20) : (120 + 20 + 20) : (160 - 20)

⇒ 60 : 160 : 140 = 3 : 8 : 7

Sol.267. (c)

If we observe the given ratio we get

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

3 : 5 : 8
4 : 7 : 9
1 : 2 : 1
15 30 15

Clearly, 1 unit = 15,
Number of students before new admissions → (3 + 5 + 8) units = 16 units
Required number of students
=16 × 15 = 240

Sol.268.(a)
Ratio of weight → 5 : 7 = 12
Ratio of Price → $5^2 : 7^2 = 12^2$
Now , According to question ,
Total Price before stone broken = 144 units
144 units = 230400 Rs. ⇒ 1 unit = 1600 Rs
Total Price after stone broke into two parts (25 + 49) units → 74 units
Loss (144 - 74) = 70 units
⇒ 70 units = 112000 Rs.

Sol.269.(d) Given, $x^2 : y^2$= 49 : 64
As x and y have opposite signs, let x be positive and y is negative.
x = + 7 and y = - 8
Putting these values in
(5x - 6y) : (6x - 7y) we get
5 × 7 - 6 × (-8) : 6 × 7 - 7 × (-8)
35 + 48 : 42 + 56 ⇒ 83 : 98

Sol.270.(b)
Passed Failed
5 : 2
4 : 3
-14 +14
15 - 8 = 7
56 - (-42) = 98
Total number of students appeared
= 7 unit = 98

Sol.271.(a) Students in Science = $2x$
Students in Humanities = $3x$
$2x + 3x = 360$, $5x = 360$, ⇒ $x = 72$
Let students added in Humanities be y.
Now, $\frac{2x+18}{3x+y} = \frac{3}{5} \Rightarrow \frac{144+18}{216+y} = \frac{3}{5}$,
162 × 5 = 648 + 3y
3y = 810 - 648 ⇒ y = $\frac{162}{3}$ = 54

Sol.272.(a)
Ratio → X : Y
Present income → 5 : 8
Ratio → Present year : Last year
X → 3 : 2) × **4** × **5**
Y → 4 : 3) × **3** × **8**

Total income for last year of X and Y = 40 unit and 72 unit
40 unit + 72 unit = 112 unit
112 unit = ₹56,000
Present income of y (96 unit)
= $\frac{56000}{112}$ × 96 = ₹48,000

Sol.273.(c)
Ratio → Jeans : Shirts : t-shirts
Quantity → 1 : 2 : 3
Price → 500 : 350 : 200

Total → 500 : 700 : 600
So,Total amount paid = 1800 units
1800 units = 46,800
1 unit = 26
Number of t-shirts (3 unit) = 3 × 26 = 78

Sol.274.(a) Ratio of Present age →
Mother : Son = **6**x : x
After 5x year →
Mother : Son = 11x : **6**x
Father : Mother = 13x : 11x
Present age of father = 13x - 5x = 8x
Again Ratio of Present age →
Father : Mother : Son = **8**x : 6x : x
After 7x year →
Father : Mother : Son = 15x : 13x : **8**x
According to question ,
Sum of father and son (15x + 8x) = 23x
23x = 115 years → x = 5 years
Present age of father = 8x = 8 × 5
= 40 years

Sol.275.(b) Let the number of candidates who passed be 5x and that of who failed be 2x.
According to question,
⇒ $\frac{5x-14}{2x+14} = \frac{4}{3}$
⇒ $5x \times 3 - 14 \times 3 = 4 \times 2x + 14 \times 4$
⇒ $15x - 42 = 8x + 56$
⇒ 7x = 56 + 42, so x = 14.
Number of students who passed = 5x
= 5 × 14 =70
Short Trick:-
Ratio ⇨ Passed : Failed
Before ⇨ 5 : 2
-1 -1
After ⇨ 4 : 3
According to question ,
1 unit = 14 students
Number of students who passed (5 units) → 5 × 14 =70

Sol.276.(a) Ratio →
sixes : fours : threes : twos : singles
1 : 3 : 2 : 7 : 10
Value → 1×6 : 3×4 : 2×3 : 7×2 : 10×1
→ 6 : 12 : 6 : 14 : 10 = 48 units
48 units = 96 runs
Total singles(10 units) = 10 × 2 = 20 runs

Sol.277.(c) $10\frac{2}{3}\% = \frac{32}{300}$
Ratio → A : B = 332 : 300
A : C = 2 : 3
After Balancing the ratio →
A : B : C = 332 : 300 : 498
According to question ,
(332 + 300 + 498) units = 4520 × 3
1130 units = 13560 Rs.
1 unit = 12 Rs.
Share of B(300 units)= 300 × 12 = 3600

Sol.278.(a)
Ratio → X : Y
A → 5 : 2) × **4**
B → 3 : 4) × **5**

C → (20 + 15) : (8 + 20) = 35 : 28
Required % of Y = $\frac{28}{63}$ × 100 = $44\frac{4}{9}$%

Sol.279.(c) Let salary of Anil and Kumud are 19x and 17x.
According to the question
= $\frac{19x+2000}{17x+1000} = \frac{8}{7}$
133x + 14000 = 136x + 8000
3x = 6000 ⇒ x = 2000
Present salary = 17 × 2000 = 34000

Sol.280.(a)
Coins Value → 1 : 2 : 5
Quantity → 4 : 5 : 8

Total Value → 4 : 10 : 40
Total value (54 units) = 432 Rs.
1 unit = 8 Rs. , 10 unit = 80 Rs
Number of Rs.2 coins (5 units) = $\frac{80}{2}$ = 40

Sol.281.(c)
Expenditure ratio of A to B = 2 : 1
$\frac{7x-4000}{5x-3500} = \frac{2}{1}$
7x - 4000 = 10x - 7000
3000 = 3x ⇒ x = 1000
Total Income (7x + 5x) unit = 12x
= 12 × 1000 = 12000 Rs.

Sol.282.(b) When a , b , c and d are in proportion , then ad = bc
According to question ,
ad = 70 and bc = 3.5y
70 = 3.5y ⇒ y = 20

Sol.283.(a)
Ratio A : B
-7 years 4 : 5
+5 +5
+8 years 9 : 10
According to question ,
5 units = 15 years → 1 unit = 3 years
Sum of their present age =
(4 + 5) units + 14 years
= 9 × 3 + 14 = 41 years

Sol.284.(c)
Ratio → Boys : Girls = 7 : 5
Girls below 14 years of age = 5 × $\frac{3}{5}$ = 3
Boys below 14 years of age = 7 × $\frac{4}{7}$ = 4
According to question ,
(3 + 4) = 7 units = 1120
1 unit = 160
Total Students (7 + 5) = 12 × 160 = 1920

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Partnership

When two or more persons join hands for a business to attain profits is called **Partnership** and the persons are called **partners**.

Types of Partners :-

1. Active Partners: The partner who manages the business is known as Active Partner or working partner.

2. Sleeping Partner: A partner, who simply invests his money in the business but does not manage it voluntarily is referred as Sleeping partner.

Every partner invests some amount of money for a certain time to help the partnership firm to get profits.

Types of partnership :-

1. Simple partnership – If all partners invest their different amounts of capital (money) for the same period or the same capital for a different period, then such a partnership is called a simple partnership.

2. Compound partnership – If all the partners invest their different capitals (money) for different periods, then such a partnership is called a compound partnership.

In Compound partnership partners' profit not only depends on their investments but also on the time period.

Case 1. When capital investment is the same for the different time periods :-

$P_1 : P_2 : P_3 = T_1 : T_2 : T_3$

Ex.1 - Aftab, Tarun and Aditya started a business by investing Rs. 8000 each . But after six months Aftab left and after 8 months Tarun left . If at the end of the year, there was a gain of Rs. 7800, then what will be the share of Tarun ?

Sol . Ratio of Profit

→ Aftab: Tarun : Aditya = 6 : 8 : 12

Share of Tarun → $\frac{8}{26}$ × 7800 = 2400 Rs.

Case 2. When capital investment X_1, X_2 and X_3 is different for the different time period T_1, T_2 and T_3.

$P_1 : P_2 : P_3 = X_1T_1 : X_2T_2 : X_3T_3$

Ex.2 - Aman and Bhanu invest some amount in the ratio 4 : 5 in a business. After 8 months, Chandan joins them with an investment equal to thrice that of Bhanu . In what ratio should the yearly profit be shared among Aman , Bhanu and Chandan ?

Sol .

Ratio of profit is equal to the product of investment and time of investment .

Ratio	→ Aman	: Bhanu	: Chandan	
Investment →	4	: 5	: 15	
Time	→ 12	: 12	: 4	

Profit → 48 : 60 : 60 = 4 : 5 : 5

Ex.3 - Rajesh and Sanjay are partners in a business firm. Rajesh puts in Rs. 5000 and Sanjay puts in Rs. 4000. Rajesh receives 10 % of the profit for managing the business as he is the active partner and the rest of the profit is divided in the ratio of their capitals. If the total profit is Rs. 1000, find Rajesh's total share.

Sol .

Here the investment time is the same , then the profit will be shared in the ratio of their investment .

Rajesh gets 10% of total profit as he is active partner → $1000 \times \frac{10}{100}$ = 100 Rs.

Remaining Profit = 900 Rs.

Ratio of Profit → 5000 : 4000 = 5 : 4

Rajesh total share → 100 + 500 = 600 Rs.

Variety Questions

Q.1. Mayur and Aham enter into a partnership by making investments in the ratio 2: 3. 10% of the total profit goes to charity. If Aham's share is ₹4,860, then what is the total profit (in ₹) earned ?

SSC MTS 11/09/2023 (3rd Shift)

(a) 7,200 (b) 9,000 (c) 8,500 (d) 11,000

Q.2. Nikita made two investments; she earns 10% on one investment and lost 20% on the second investment. If the investments were in the ratio 2 : 3, then she got a :

SSC MTS 05/09/2023 (2nd Shift)

(a) loss of 8% (b) profit of 15%
(c) profit of 8% (d) loss of 15%

Q.3. A lady invests ₹27,600 in three shares in the ratio 3 : 4 : 5 which pay dividends of 20%, 15% and 5% on her investment for that year, respectively. What is the total dividend ?

SSC MTS 04/09/2023 (1st Shift)

(a) ₹3,852 (b) ₹3,335
(c) ₹3,125 (d) ₹2,535

Q.4. Swati starts a business with ₹ 4,200 and after 5 months, Bani joins Swati as her partner. After a year, the profit is divided among Swati and Bani in the ratio 2 : 5. What is Bani's contribution ?

SSC MTS 01/09/2023 (3rd Shift)

(a) ₹18,000 (b) ₹17,050
(c) ₹19,000 (d) ₹16,500

Q.5. Three persons A, B and C invested some money in a business. The share of A is twice the share of B, and the share of B is thrice the share of C. After 1 year, they earned ₹6,000. Find the money A received.

SSC CHSL 11/08/2023 (4th Shift)

(a) ₹3,200 (b) ₹3,000
(c) ₹3,600 (d) ₹3,500

Q.6. Three partners P, Q and R invest ₹ 1,000, ₹1,200 and ₹1,500, respectively, in a business. What should be the share of Q if the total profit is ₹666?

SSC CHSL 10/08/2023 (2nd Shift)

(a) ₹216 (b) ₹275 (c) ₹252 (d) ₹284

Q.7. Kapil initiated a business with an investment of ₹30,00,000 in April 2022. After six months, his friend Kunal joined him with an investment of ₹25,00,000. In February 2023, Kapil's Ex-Class fellow Saloni also invested an amount equal to the total investment made by the earlier two partners. In what ratio the profit earned after 3 years from the date on which Kapil initiated the business, will be distributed ?

SSC CHSL 02/08/2023 (4th Shift)

(a) 332 : 200 : 50 (b) 108 : 75 : 143
(c) 432 : 300 : 55 (d) 432 : 400 : 55

Q.8. A is a working partner and B is a sleeping partner in a business. A invested ₹30,000 and B invested ₹50,000. A receives 20% of the profit for managing the business and the rest is divided in proportion to their capital. What does B get out of the profit of ₹10,000?

SSC CHSL 02/08/2023 (2nd Shift)

(a) ₹5,500 (b) ₹5,000
(c) ₹4,500 (d) ₹4,000

Q.9. X, Y and Z enter into a partnership. X invests some money at the beginning. Y invests thrice the amount of X after 4 months and Z invest double the amount of Y after 9 months from the beginning. If the annual gain be Rs. 450000, then what is the share of Y ?

SSC MTS 08/05/2023 (Morning)

(a) Rs. 200000 (b) Rs. 150000
(c) Rs. 100000 (d) Rs. 300000

Q.10. P invested Rs. 4000 for one year. Q joined him with an investment of Rs. 6000 after a few months. If at the end of one year the ratio of profits of P and Q is 4 : 3, then Q joined after how many months?

SSC CHSL 14/03/2023 (1st Shift)

(a) 4 months (b) 3 months
(c) 8 months (d) 6 months

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.11. A, B and C started a business with initial investments of ₹ 20000, ₹25000 and ₹10000, respectively. After 5 months from start, A invested ₹ 4000 more. After 6 months from start, C invested ₹ 8000 more. After 4 months from start, B withdrew ₹ 8000. At the end of the year, they will receive a profit of ₹ 'x'. In what ratio will they share the profits?
SSC CGL Tier II (08/08/2022)
(a) 71 : 57 : 42 (b) 71 : 59 : 42
(c) 59 : 68 : 42 (d) 67 : 59 : 42

Q.12. A, B and C started a business with their capitals in the ratio 2 : 3 : 5. A increased his capital by 50% after 4 months, B increased his capital by $33\frac{1}{3}$ % after 6 months and C withdrew 50% of his capital after 8 months, from the start of the business. If the total profit at the end of a year was Rs. 86,800, then the difference between the shares of A and C in the profit was :
SSC CGL Tier II (13/09/2019)
(a) Rs.12,600 (b) Rs.7,000
(c) Rs.9,800 (d) Rs.8,400

Q.13. A, B and C started a business by investing Rs 1,37,500 and Rs 1,62,500 and Rs 1,87,500 respectively. A is a working partner and gets 20% of the profit as working allowance and remaining is distributed in the proportion of their investment. If the total profit is Rs 2,19,375. What is the share of C?
SSC CPO 13/03/2019 (Evening)
(a) Rs 88,600 (b) Rs 64,500
(c) Rs 67,500 (d) Rs 62,700

Practice Questions

SSC CHSL 2024 Tier - 2

Q.14. A. B and C jointly started a business in which A invested ₹7,000 for 12 months, B invested ₹8,000 for 10 months and C invested ₹12,000 for 6 months. A was the working member for which he received 20% of the profits as his remuneration. The total profit earned at the end of one year was ₹14,750. What is C's share (in ₹) in the profit?
SSC CHSL Tier II (18/11/2024)
(a) 4,000 (b) 2,950
(c) 3,600 (d) 4,200

SSC CGL 2024 Tier - 1

Q.15. A, B and C invested money in a business such that 2 times A's share, 4 times B's share and 6 times C's share are all equal. If they earned ₹44,000, find the share of A.
SSC CGL 24/09/2024 (1st Shift)
(a) ₹22,000 (b) ₹12,000
(c) ₹24,000 (d) ₹20,000

SSC Selection Post (Phase - XII)

Q.16. Three partners decided to start a business. They decided to donate 10% of the profit to a charity organisation and then the remaining profit would be shared among first, second and third partner in the ratio 1 : 2 : 2. The total profit received was ₹1,80,000. Find the share of the first partner.
Matriculation Level 26/06/2024 (Shift - 1)
(a) ₹32,400 (b) ₹31,800
(c) ₹33,200 (d) ₹29,600

SSC CHSL 2023 Tier - 2

Q.17. A and B enter into a partnership with ₹25,000 and ₹50,000, respectively, in a company for a year. After 7 months, C gets into a partnership with them with ₹30,000 and A withdraws his contribution after 9 months. What would be C's share in the profit, assuming a total profit of ₹3,900 at the end of the year?
SSC CHSL Tier II (02/11/2023)
(a) ₹600 (b) ₹800 (c) ₹1,200 (d) ₹1,000

SSC MTS 2023 Tier - 1

Q.18. Arvind, Bilal. Carmen invest ₹49,000 towards a business. Arvind invests ₹5,000 more than Bilal and Bilal invests ₹4,000 more than Carmen Out of a total profit of ₹98,000, how much does Bilal receive?
SSC MTS 11/09/2023 (1st Shift)
(a) ₹34,400 (b) ₹33,200
(c) ₹30,500 (d) ₹32,000

Q.19. A, B and C started a business. A's capital is 7 times the capital of C and B's capital is 2 times the capital of A. If the profit is ₹7,920, then find the share of C (in ₹).
SSC MTS 13/09/2023 (3rd Shift)
(a) 350 (b) 360 (c) 365 (d) 355

SSC CHSL 2023 Tier - 1

Q.20. Anam and Bikash invest in a business in the ratio 3 : 2. If in a particular month, Anam gets ₹3,840 as profit, the total profit is:
SSC CHSL 04/08/2023 (2nd Shift)
(a) ₹5,800 (b) ₹6,300
(c) ₹6,550 (d) ₹6,400

Q.21. A, B and C started a business by investing ₹9,000, ₹18,000 and ₹ 21,000, respectively. If B's share in the profit earned by them is ₹759, then the total profit earned by them together is:
SSC CHSL 10/08/2023 (3rd Shift)
(a) ₹2,808 (b) ₹2,024
(c) ₹2,504 (d) ₹2,208

SSC CGL 2023 Tier - 1

Q.22. A and B invested money in a business in the ratio of 7 : 5. If 15% of the total profit goes for charity, and A's share in the profit is Rs.5,950, then what is the total profit?
SSC CGL 18/07/2023 (4th shift)
(a) Rs.12,500 (b) Rs.12,000
(c) Rs.10,500 (d) Rs.11,750

SSC Selection Post (Phase - XI)

Q.23. A starts a business with ₹45,000 and was joined afterwards by B with ₹30,000. When did B join if the profit at the end of the year was divided in the ratio 2 : 1 ?
Matriculation Level 30/06/2023 (Shift - 4)
(a) After 6 months (b) After 12 months
(c) After 3 months (d) After 9 months

SSC CHSL 2022 Tier - 2

Q.24. A and B jointly start a business. The investment of A is equal to seven times the investment of B. Find the share of A (in ₹) in the annual profit of ₹2,75,000.
SSC CHSL Tier II (26/06/2023)
(a) 2,40,625 (b) 2,45,625
(c) 2,42,365 (d) 2,41,225

SSC MTS 2022 Tier - 1

Q.25. Rs.1200 are divided among X, Y and Z such that Y's share is Rs.200 more than X's share. Y's share is also Rs.200 less than Z's share. The share of Y is:
SSC MTS 12/05/2023 (Evening)
(a) Rs.200 (b) Rs.600
(c) Rs.800 (d) Rs.400

Q.26. A and B started a business with Rs.15000 and Rs.30000 respectively. If A and B share profit in the ratio of 1: 5 respectively, then what is the ratio of the time period of investment for A and B respectively ?
SSC MTS 11/05/2023 (Afternoon)
(a) 1 : 2 (b) 2 : 5 (c) 2 : 3 (d) 2 : 7

Q.27. Three partners P, Q and R invested a total of Rs. 52,000 in a business. At the end of the year, P got Rs. 1430, Q got Rs.1870 and R got Rs. 2420 as the share of profit. How much amount did Q invest

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

in the business ?
SSC MTS 13/06/2023 (Evening)
(a) Rs. 17000 (b) Rs. 20400
(c) Rs. 15300 (d) Rs. 18700

SSC CHSL 2022 Tier - 1

Q.28. P, Q and R are partners and invest in a business. P invests $\frac{1}{5}$ th of the total investments and Q invests $\frac{1}{4}$ th of the total investments. What is the ratio of investments of P, Q and R respectively?
SSC CHSL 13/03/2023 (1st Shift)
(a) 4 : 8 : 11 (b) 4 : 5 : 11
(c) 4 : 7 : 11 (d) 4 : 5 : 9

Q.29. X, Y and Z invested Rs.4,000, Rs.6,000 and Rs.8,000 respectively in a business. They invested the money for 3,2 and 4 years respectively. If the total profit is Rs.56,000, then what is the share of Y in the profit?
SSC CHSL 15/03/2023 (2nd Shift)
(a) Rs.18,000 (b) Rs.12,000
(c) Rs.15,000 (d) Rs.9,000

Q.30. Nikhil and Neha invested capital in the ratio 5 : 4. The time Neha invested her money for was one year more than that invested by Nikhil. The ratio of their profits is in the ratio 6: 5. Find the time Neha invested the money for.
SSC CHSL 21/03/2023 (1st Shift)
(a) 26 years (b) 23 years
(c) 24 years (d) 25 years

SSC CGL 2022 Tier - 2

Q.31. A, B and C did certain investments and the ratio of their time periods is 3 : 2 : 7 respectively. Ratio of the profits of A, B and C is 4 : 3 : 14 respectively. What is the ratio of the investments of A, B and C ?
SSC CGL Tier II (02/03/2023)
(a) 1 : 3 : 4 (b) 7 : 9 : 11
(c) 8 : 9 : 12 (d) 2 : 3 : 11

Q.32. Suresh, Dinesh and Ramesh became partners in a business by investing money in the ratio of 3 : 6 : 8. If their investments are increased by 5%, 15% and 20%, respectively, then what will be the ratio of their profits for one year ?
SSC CGL Tier II (03/03/2023)
(a) 7 : 46 : 64 (b) 19 : 46 : 64
(c) 21 : 46 : 64 (d) 35 : 46 : 64

Q.33. A starts a business with ₹75,000 and B joins the business 5 months later with an investment of ₹80,000. After 1 year, they earn a profit of ₹4,08,800. Find the share of A and B (in ₹).
SSC CGL Tier II (07/03/2023)
(a) 2,52,000 and 1,56,800
(b) 2,50,000 and 1,58,800
(c) 2,48,000 and 1,60,800
(d) 2,49,500 and 1,59,300

SSC CGL 2021 Tier - 2

Q.34. A,B and C started a business with the investment of ₹ 100000 , ₹ 140000 , ₹ 200000 respectively. After 3 months, C left the business, 7 months after C left the business, B also left the business. B and C took their investment with them. At the end of the year, C received his share of profit as ₹ 1155. What is the total share of profits of A and B ?
SSC CGL Tier II (08/08/2022)
(a) ₹ 6150 (b) ₹ 5005
(c) ₹ 4995 (d) ₹ 5555

SSC MTS 2020 Tier - 1

Q.35. The profit earned by a company is to be divided among three friends who invested their money in the company, in the proportion of 6 : 9 : 11. If the share of the person who invested the most is ₹2,310, then what is the sum of the money (in ₹) received by the other two friends?
SSC MTS 22/10/2021(Morning)
(a) 1,890 (b) 3,150 (c) 5,460 (d) 1,260

SSC CGL 2020 Tier - 1

Q.36. Keshav, Surjeet and Thomas started a business with investments in the ratio 2 : 3 : 4. The ratio of their period of investments is 5 : 6 : 9. Twenty percent of the profit was spent on rent and maintenance of the office. Remaining profit was distributed among themselves. If the difference in the share of profit of Keshav and Surjeet is Rs.7264 then how much is the total profit (in Rs.)?
SSC CGL 18/08/2021(Evening)
(a) 51060 (b) 58112 (c) 46490 (d) 72640

SSC CPO 2020 Tier - 1

Q.37. A, B, C subscribe a sum of Rs.75,500 for a business. A subscribes Rs.3,500 more than B, and B subscribes Rs. 4,500 more than C. Out of a total profit of Rs.45,300 how much (in Rs.) does A receive ?
SSC CPO 25/11/2020 (Evening shift)
(a) 12,600 (b) 15,000
(c) 17,400 (d) 14,700

Answer Key :-

1.(b)	2.(a)	3.(b)	4.(a)
5.(c)	6.(a)	7.(b)	8.(b)
9.(a)	10.(d)	11.(d)	12.(a)
13.(c)	14.(c)	15.(c)	16.(a)
17.(a)	18.(d)	19.(b)	20.(d)
21.(b)	22.(b)	23.(c)	24.(a)
25.(d)	26.(b)	27.(a)	28.(b)
29.(b)	30.(d)	31.(c)	32.(c)
33.(a)	34.(b)	35.(b)	36.(d)
37.(c)			

Solutions :-

Sol.1.(b) Let the total profit is ₹x
According to the question,
$x \times \frac{9}{10} \times \frac{3}{5}$ = ₹4860 ⇒ x = ₹9,000

Sol.2.(a)
Let the investment 200 and 300 units
According to the question,
$200 \times \frac{11}{10}$ = 220 units
$300 \times \frac{4}{5}$ = 240 units
Total investment = 200 + 300 = 500 units
Total earning = 220 + 240 = 460 units
Loss % = $\frac{500-460}{500} \times 100$ = 8 %

Sol.3.(b) Amount invested in first share
= $27{,}600 \times \frac{3}{12}$ = 6900
Amount invested in second share
= $27{,}600 \times \frac{4}{12}$ = 9200
Amount invested in third share
= $27{,}600 \times \frac{5}{12}$ = 11500
Total dividend = $6900 \times \frac{1}{5} + 9200 \times \frac{3}{20}$
$+ 11500 \times \frac{1}{20}$ = ₹3,335

Sol.4.(a) Let Bani's contribution is x
$4200 \times 12 : x \times 7 = 2 : 5$
$x = \frac{4200 \times 12 \times 5}{7 \times 2}$ = ₹18000

Sol.5.(c) Let the investment of C = Rs. x
B's investment = Rs. 3x then A's investment = Rs. 6x
Since, they invest their money for 1 year,
Their profit ratio = 6 : 3 : 1
Hence, money received by A
= $\frac{6}{10} \times 6000$ = Rs. 3,600

Sol.6.(a) Investment time is the same ,
So ratio of investment is equal to the ratio of profit .
Their investment ratio :-

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

P : Q : R = 10 : 12 : 15

Share of Q = $666 \times \frac{12}{37}$ = 18 × 12 = ₹216

Sol.7.(b) Ratio = kapil : kunal : saloni

Amount = 30 : 25 : 55

Time = 36 : 30 : 26

Profit = 108 : 75 : 143

Sol.8.(b) A receive 20% of the profit for managing the business .

Remaining profit excluding A's managing profit = 10,000 × 80% = 8,000

B's profit = 8,000 × $\frac{5}{8}$ = 5,000 Rs.

Sol.9.(a)

Ratio → X : Y : Z

profit → $x \times 12 : 3x \times 8 : 6x \times 3$

Total profit = $12x + 24x + 18x = 54x$

$54x$ = ₹ 450000

Share of Y ($24x$) = $\frac{450000}{54x} \times 24x$

= ₹ 200000

Sol.10.(d)

Ratio →	P	:	Q
Investment	4	:	6
Time	1	:	x

Profit → 4 : 3

Let Q joined for x year

As we know profit = investment × time

Then, 4 × 1 : 6 × x = 4 : 3 ⇒ $\frac{4}{6x} = \frac{4}{3}$

⇒ x = $\frac{3}{6} = \frac{1}{2}$

Here, Q joined for 6 months then, Q joined after (12 - 6) = 6 month

Sol.11.(d) Total amount invested by A

= 20000 × 5 + (20000 + 4000) × 7

= 100000 + 168000 = 268000

Total amount invested by B

= 25000 × 4 + (25000 - 8000) × 8

= 100000 + 136000 = 236000

Total amount invested by C

= 10000 × 6 + (10000 + 8000) × 6

= 60000 + 108000 = 168000

So, the ratio of their profit

= 268 : 236 : 168 = 67 : 59 : 42

Sol.12.(a) 50% = $\frac{1}{2}$, $33\frac{1}{3}\% = \frac{1}{3}$

Ratio → A : B : C

Initial → 2 × 4 : 3 × 6 : 5 × 8

Final → 3 × 8 : 4 × 6 : 2.5 × 4

Profit → 32 : 42 : 50

Total Profit (32 + 42 + 50) = 124 units

124 units = 86800 Rs.

1 unit = 700 Rs.

Difference b/w share of A and C →

(50 – 32) units = 18 units

18 units = 18 × 700 = 12600 Rs.

Sol.13.(c)

Ratio → A : B : C

Investment → 137500 : 162500 : 187500

11 : 13 : 15

Therefore, C's share :-

219375 × $\frac{4}{5} \times \frac{15}{39}$ = Rs. 67500

Sol.14.(c)

Share → A : B : C

Investment → 7000 : 8000 : 12000

Time → 12 : 10 : 6

Ratio → 84 : 80 : 72

21 : 20 : 18

A received 20% of the profits as his remuneration

Remaining profit = 14,750 × $\frac{4}{5}$ = 11800

59 unit = ₹ 11800

C's share (18 unit) = $\frac{11800}{59}$ × 18 = ₹3600

Sol.15.(c) If 2 times A's share, 4 times B's share and 6 times C's share are all equal

∴ 2A = 4B = 6C

Hence , A : B : C = 6 : 3 : 2

Now , A's share = $\frac{6}{11}$ × 44000 = ₹24,000

Sol.16.(a)

Total profit distributed among partners in business = 1,80,000 × 90% = ₹1,62,000

Share of the 1st partner

= ($\frac{1}{1+2+2}$) × 1,62,000

= $\frac{1,62,000}{5}$ = ₹32,400

Sol.17.(a)

Ratio of their money contribution

A : B : C = 5 : 10 : 6

Ratio of their time

A : B : C = 9 : 12 : 5

∴ Ratio of their profit = 45 : 120 : 30

= 3 : 8 : 2

Hence,

C's share in profit = $\frac{3900}{13}$ × 2 = 600

Sol.18.(d) Let investment of Bilal be x

According to the question,

$x + (x + 5000) + (x - 4000) = 49000$

$3x = 48000$, $x = 16000$

Then, investment of Bilal : Arvind : Carmen

= 16000 : 21000 : 12000

= 16 : 21 : 12

Share of profit of Bilal

= $\frac{98000}{16+21+12} \times 16$ = ₹32,000

Sol.19.(b) Concept :- profit is divided in the ratio of capital

Ratio of profit of A , B , and C = 7 : 14 : 1

Share of C = 7920 × $\frac{1}{(7+14+1)}$ = 360

Sol.20.(d) 3 units = 3840 ₹

Total profit (5 units) = $\frac{3840}{3} \times 5$ = 6400 ₹

Sol.21.(b) Their investment time is same , so the ratio of profit is equal to the ratio of investment.

Ratio of investment :-

A : B : C = 3 : 6 : 7

B's share of profit (6 units) = ₹759

Total profit (16 units) = $\frac{759}{6} \times 16$

= 253 × 8 = ₹2024

Sol.22.(b) Let the investment of A and B be $7x$ and $5x$.

If investment time is equal , then the ratio of profit is equal to the ratio of investment .

According to the question,

$7x$ = 5950 Rs.

$12x$ = 5950 × $\frac{12}{7}$ = 10200 Rs.

Total profit = 10200 × $\frac{100}{(100 - 15)}$

= 12000 Rs.

Sol.23.(c)

Ratio → A : B

Investment → 3 : 2

Time → 12 : x

Profit → 2 : 1

x (time for which B invested)

= $\frac{12 \times 3}{2 \times 2}$ = 9 month

Required time after which B invested

= 12 – 9 = 3 months

Sol.24.(a) If investment time is equal , then the ratio of profit is equal to the ratio of investment .

Ratio → A : B

Invest → 7 : 1

Profit → 7 : 1

Share of A = 275000 × $\frac{7}{8}$ = 240625 ₹

Sol.25.(d)

Ratio → X : Y : Z

Amount → a : a + 200 : a + 400

Total amount = 3a + 600

3a + 600 = ₹ 1200

a = $\frac{1200 - 600}{3}$ = ₹ 200

Share of Y = a + 200 = 200 + 200 = ₹ 400

Sol.26.(b)

Ratio → A : B

Investment → 1 : 2

Time → x : y

Profit → 1 : 5 ⇒ $\frac{1x}{2y} = \frac{1}{5}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Required Ratio of time period = x : y = 2 : 5

Sol.27.(a) As we know :-
profit = time × investment
If investment time is equal , then the ratio of profit is equal to the ratio of investment .
According to the question,
Total profit of P, Q and R = Rs. 5720
Investment of Q = $\frac{1870}{5720} \times 52000$
= Rs.17000

Sol.28.(b) Let the total investment = 100
Then, Investment of P = 20 and investment of Q = 25
So, investment of R = (100 - 45) = 55
Therefore, ratio of investment of
(P : Q : R) = 20 : 25 : 55 ⇒ 4 : 5 : 11

Sol.29.(b)

Ratio	→	X	:	Y	:	Z
Amount	→	2	:	3	:	4
Time	→	3	:	2	:	4

---
profit → 6 : 6 : 16
the share of Y = 56,000 × $\frac{6}{28}$
= Rs 12000

Sol.30.(d)

Ratio	→	Nikhil	:	Neha
Investment	→	5	:	4
Time	→	x	:	$x + 1$

Profit → 6 : 5
Now ,
$\frac{5x}{4(x+1)} = \frac{6}{5} \Rightarrow 25x = 24x + 24$
⇒ x = 24 years
So Neha invested for (x + 1) years
= 25 years

Sol.31.(c) Let , the investments of A, B and C be x, y, z respectively.
Total Investment × Total time = Profit
Ratio → A : B : C
Profit → $3x : 2y : 7z$ = 4 : 3 : 14
⇒ $x : y : z = \frac{4}{3} : \frac{3}{2} : \frac{14}{7}$
= 8 : 9 : 12

Sol.32.(c)
Ratio → Suresh : Dinesh : Ramesh
Investment → 300 : 600 : 800
Increased investment →
315 : 690 : 960 or 21 : 46 : 64

Sol.33.(a) Profit = Investment × Time
75000 x 12 : 80000 × 7 ⇒ 45 : 28
73 units = ₹ 4,08,800
45 units = ₹ 2,52,000
28 units = ₹ 1,56,800
Therefore Profit of A and B will be ₹ 2,52,000 and ₹ 1,56,800 respectively.

Sol.34.(b) Ratio of investment of A : B : C
= 100000 : 140000 : 200000 = 5 : 7 : 10
According to the question,
A works for 12 months, B works for 3 + 7 = 10 months, C works for 3 months.
Profit sharing ratio among A : B : C =
(5 × 12) : (7 × 10) : (10 × 3) = 30 : 35 : 15
Let total profit be y.
Now, $\frac{15}{80}$ × y = 1155 ⇒ y = ₹6,160
So, total profit of A and B
= $\frac{65}{80}$ × 6160 = ₹5,005

Sol.35.(b) Ratio of investment = 6 : 9 : 11.
Let the shares of profit be
6x, 9x and 11x.
According to the question,
11x = 2310 ⇒ x = 210.
The shares of the other two
= 6x + 9x = 15x = 15 × 210 = 3,150.

Sol.36.(d)

Investments	→	2	:	3	:	4
Time period	→	5	:	6	:	9

Profit → 10 : 18 : 36
According to question ,
Profit difference of Keshav and Surjeet →
(18 – 10)units = 8 units = 7264 Rs.
1 unit = 908 Rs.
Total Profit (10 + 18 + 36) = 64 units
64 units = 58112 Rs.
Let , total profit = 100%
Profit shared = 80%
80% → 58112 Rs. ⇒ 100% → 72640 Rs.

Sol.37.(c)
Total sum of A, B and C = 75,500 Rs.
B = C + 4500
A = B + 3500 or C + 8000
According to the question
(C + 8000) + (C + 4500) + C = 75,500
3C + 12,500 = 75,500
C = 21,000 Rs. , A = 29,000 Rs.
Share of A = $\frac{29,000}{75,500}$ × 45,300
= 2900 × 6 =17,400 Rs.

Search on TG: @apna_pdf

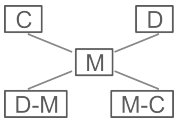
Search on Telegram @apna_pdf

Mixture and Alligation

Mixture : when two or more than two substances mixed together in any ratio to produce a product is called mixture .

Mean price : the average of all the given prices of the known items is called Mean Price .

1. Alligation rule : It is used to find the ratio in which two or more substances at their respective prices should be mixed to produce a mixture at a given price.



where
C = Cost price of cheaper
D = Cost price of dearer
M = Mean price
(D - M) = Cheaper quantity
(M - C) = Dearer quantity

2. Quantity of pure liquid = $x(\frac{x-y}{x})^n$

where, x = Quantity of original liquid, y = Quantity to be carried out and replaced, n = Number of times the operation is conducted

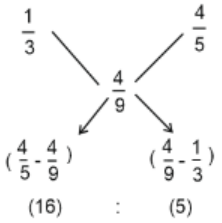
Important Cases :-

Case 1 :
Ratio of milk and water in container A, B and C are 1 : 2, 4 : 1 and 4 : 5 respectively. Find the ratio in which containers A and B are mixed to get 4 : 5 in container C ?

Soln : Fraction of milk in container A = $\frac{1}{3}$

Fraction of milk in container B = $\frac{4}{5}$

Fraction of milk in container C = $\frac{4}{9}$



So, the required ratio = 16 : 5

Case 2 :
Ratio of milk and water in container A and B are 3 : 1 and 4 : 1 respectively. Ratio in which container A and B are to be mixed is 2 : 1. Find the ratio of quantity of milk and water in container C.

Soln :

Fraction of milk in container A = $\frac{3}{4}$

Fraction of milk in container B = $\frac{4}{5}$

Ratio in which container A and B are to be mixed is 2 : 1. So, let the quantity in container A and B be 2 litre and 1 litre respectively.

So, the required ratio =

$[\frac{3}{4} \times 2] + [\frac{4}{5} \times 1] : [\frac{1}{4} \times 2] + [\frac{1}{5} \times 1]$

$= \frac{3}{2} + \frac{4}{5} : \frac{1}{2} + \frac{1}{5} = \frac{23}{10} : \frac{7}{10} = 23 : 7$

Case 3 : Two varieties costing ₹4/kg and ₹5/kg respectively are mixed in 3 : 2. Find the cost price per kg of the resultant mixture ?

Soln:

$A_{wt} = \frac{A1W1 + A2W2}{W1 + W2} = \frac{4 \times 3 + 5 \times 2}{3 + 2}$

$= \frac{12 + 10}{5} = \frac{22}{5} = 4.4$ kg

Variety Questions

Q.1 A solution of phenyl and water is 28 litres, with phenyl and water in ratio 4 : 3. 21 litres phenyl-water solution which has phenyl to water ratio as 2 : 1 is added to the 28 litres phenyl-water solution. Again 51 litres phenyl-water solution that has phenyl to water ratio as 9 : 8 is added to this. What is ratio of water to phenyl in the final mixture ?
SSC MTS 09/10/2024 (Evening)
(a) 57 : 43 (b) 59 : 41
(c) 41 : 59 (d) 43 : 57

Q.2. Two different quantities of the same solution having ingredients A and B are stored in two different containers. In the first container, there are 252 litre of A and 441 litre of B. In the second container, the total quantity of the solution was 1188 litre. How much of the solution in the second container was made up of ingredient B ?
SSC CGL 13/09/2024 (2nd Shift)
(a) 765 litre (b) 756 litre
(c) 752 litre (d) 760 litre

Q.3. A bucket contains a mixture of milk and water in the proportion of 7 : 5. If 9 litres of milk is replaced by water, then the ratio becomes 7 : 9. How much milk was there in the bucket initially ?
SSC CHSL 10/07/2024 (4th Shift)
(a) 36 litres (b) 30 litres
(c) 25 litres (d) 35 litres

Q.4. A drink is made by mixing water and juice in the ratio 9 : 7. If x litres of water and 2x litres of juice are mixed in 160 litres of drink, then the new ratio becomes 13 : 15. The quantity of drink (in litres) is:
SSC CPO 29/06/2024 (2nd Shift)
(a) 240 (b) 280 (c) 300 (d) 260

Q.5. 80 litres of a mixture of spirit and water in the ratio 7 : 9 is present in a container A. 20 litres of the mixture is transferred to another container B. Then the container A is filled with 20 litres of water. Then 32 litres of the mixture is again transferred to container B. The ratio of water to spirit of the mixture in container B is equal to:
SSC CGL Tier II (26/10/2023)
(a) 41 : 87 (b) 87 : 41
(c) 131 : 77 (d) 77 : 131

Q.6. At a certain time in a park, the number of heads and the number of legs of monkeys and human visitors were counted, and it was found that there were 54 heads and 148 legs. Find the number of monkeys in the park.
SSC CGL Tier II (26/10/2023)
(a) 20 (b) 16 (c) 18 (d) 14

Q.7. A milk vendor has 2 vessels of milk and water. The first contains 80% milk and the rest is water. The second contains 50% milk. How much mixture (in L) should he mix from each of the vessels so as to get 9 litres of mixture such that the ratio of water to milk is 1 : 2 ? (Write your answer in the order of vessel 1 and vessel 2)
SSC MTS 13/09/2023 (1st Shift)
(a) 6, 3 (b) 4, 5 (c) 3, 6 (d) 5, 4

Q.8. A blended tea in a barrel contains Assam, Darjeeling and Nilgiri Hills in the ratio 2 : 3 : 1. Another barrel contains Darjeeling, Nilgiri Hills and Kangra Valley in the ratio 5 : 4 : 3. If equal weights of both blended tea mix together to make a new brand, then the weight of Kangra Valley per kilogram in the new brand is:
SSC CHSL 10/08/2023 (3rd Shift)
(a) 500 gm (b) 100 gm
(c) 250 gm (d) 125 gm

Q.9. From a cask of milk containing 64 liters, 8 liters are drawn out and the cask is filled up with water. If the same process is repeated a second, then a third time, what will be the proportion of milk to water in the resulting mixture ?
SSC CHSL 09/08/2023 (2nd Shift)
(a) 343 : 179 (b) 333 : 169
(c) 443 : 179 (d) 343 : 169

Q.10. A jar contains 35% syrup in the mixture of syrup and water. A part of this mixture is replaced by another mixture containing 20% syrup. Now, in the new mixture, the percentage of syrup is found to be 24%. What is the ratio in which these mixtures were mixed to obtain the new mixture ?
SSC CHSL 07/08/2023 (2nd Shift)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) 3 : 14 (b) 4 : 11 (c) 5 : 13 (d) 7 : 10

Q.11. In a solution of water and milk, the quantity of milk is double the quantity of water. To pass the quality standards, the solution must contain 90% milk in it. If the volume of the solution is v, then how much pure milk in litres is to be added to the solution to pass the quality standard.
SSC CHSL 02/08/2023 (2nd Shift)
(a) $\frac{4}{3}$v (b) $\frac{3}{4}$v (c) $\frac{7}{4}$v (d) $\frac{7}{3}$v

Q.12. Alloy X contains 70% copper and 30% zinc. Alloy Y contains 40% copper, 25% zinc and 35% aluminum. Alloy X and Y are mixed in the ratio of 1 : 3. What is the ratio of copper and zinc in the newly formed alloy ?
SSC MTS 17/05/2023 (Afternoon)
(a) 19 : 33 (b) 11 : 32
(c) 38 : 21 (d) 19 : 21

Q.13. A jar contains a mixture of milk and water, having 50% water. A part of this mixture is replaced by another mixture having 29% water. The percentage of water in the jar after replacement is 36%. What fraction of the original mixture was replaced ?
SSC MTS 10/05/2023 (Afternoon)
(a) $\frac{3}{2}$ (b) $\frac{4}{5}$ (c) $\frac{1}{3}$ (d) $\frac{2}{3}$

Q.14. Two vessels of equal capacity, and both completely filled, contain mixtures of milk and water in the ratio 5 : 1 and 6 : 5, respectively. Both the mixtures are now mixed thoroughly. What is the ratio of milk to water in the new mixture so obtained ?
SSC MTS 13/07/2022 (Evening)
(a) 105 : 67 (b) 57 : 41
(c) 91 : 41 (d) 28 : 43

Q.15. Babulal runs a juice corner outside a park and sells giloy juice (giloy + water) in the morning. Initially he had 19 litres of juice, which had giloy and water in the ratio 2 : 9. He sold $2\frac{1}{2}$ litres of juice. Later, in order to dilute it, he added some water and the ratio of giloy and water became 1 : 5. How much water was added ?
SSC MTS 27/10/2021 (Morning)
(a) $1\frac{1}{2}$ litres (b) $\frac{1}{2}$ litre
(c) 2 litres (d) 1 litre

Q.16. Alloy A contains metal x and y only in the ratio 5 : 2 and alloy B contains these metals in the ratio 3 : 4. Alloy C is prepared by mixing A and B in the ratio 4 : 5. The percentage of x in alloy C is:
SSC CGL Tier II (16/11/2020)
(a) $44\frac{4}{9}$ (b) 56 (c) 45 (d) $55\frac{5}{9}$

Q.17. Two bottles of same capacity are 35% and $33\frac{1}{3}$% full of orange juice, respectively. They are filled up completely with apple juice and then the contents of both bottles are emptied into another vessel. The percentage of apple juice in the mixture is:
SSC CGL 03/03/2020 (Afternoon)
(a) $34\frac{1}{6}$ (b) $64\frac{1}{3}$ (c) $60\frac{2}{3}$ (d) $65\frac{5}{6}$

Q.18. A vessel contains a 32 litre solution of acid and water in which the ratio of acid and water is 5 : 3. If 12 litres of the solution are taken out and $7\frac{1}{2}$ litres of water are added to it, then what is the ratio of acid and water in the resulting solution ?
SSC CGL Tier II (13/09/2019)
(a) 4 : 7 (b) 5 : 6 (c) 4 : 9 (d) 8 : 11

Q.19. The ratios of copper to Zinc in alloys A and B are 3 : 4 and 5 : 9 respectively. A and B are taken in the ratio 2 : 3 and melted to form a new alloy C. What is the ratio of copper to Zinc in C ?
SSC CGL Tier II (11/09/2019)
(a) 8 : 13 (b) 3 : 5 (c) 9 : 11 (d) 27 : 43

Q.20. A milkman uses three containers for selling milk, their capacities being 40L, 30L and 20L respectively. He fills respectively 87.5%, 80% and 90% of the containers with a mix of milk and water in the ratios, 3 : 2, 5 : 1 and 7 : 2 respectively. What is the ratio of total quantity of milk to that of water carried by him ?
SSC CHSL 10/07/2019 (Evening)
(a) 7 : 2 (b) 31 : 12 (c) 35 : 9 (d) 5 : 2

Q.21. Fresh fruit contains 68% water and dry fruit contains 20% water. How much dry fruit can be obtained from 100 kg of fresh fruit
SSC CPO 16/03/2019 (Morning)
(a) 80 (b) 60 (c) 40 (d) 20

Practice Questions

SSC MTS 2024 Tier - 1

Q.22. If two kinds of resins costing ₹160 per kg and ₹210 per kg are mixed in the ratio of 2 : 3, then find the cost (in ₹) of the mixture per kg.
SSC MTS 17/10/2024 (Evening)
(a) 185 (b) 190 (c) 200 (d) 180

Q.23. A chef has two cans of acids and water mixture. He combines the contents of both cans in a beaker. The resulting mixture has half water and half acid. What is the quantity in which he mixed the contents of can 1 and can 2, given that can 2 has an acid-to-water ratio of 2 : 3 and can 1 has an acid-to-water ratio of 5 : 3 ?
SSC MTS 18/10/2024 (Afternoon)
(a) 2 : 3 (b) 4 : 5 (c) 4 : 7 (d) 3 : 7

Q.24. A vessel contains 80 litres of a mixture of alcohol and water in the ratio of 3 : 7. If 40 litres of the mixture is taken out from the vessel and replaced with 40 litres of water, then the ratio of alcohol and water becomes:
SSC MTS 21/10/2024 (Morning)
(a) 3 : 17 (b) 1 : 11 (c) 3 : 23 (d) 2 : 15

Q.25. A can contains a mixture of two liquids, grape juice and pineapple juice in the ratio 13 : 11. When 8 litres of the mixture is drawn off, and the can is filled with pineapple juice, the ratio becomes 13 : 14. How many litres of pineapple juice was initially contained in the can ?
SSC MTS 21/10/2024 (Afternoon)
(a) 14 litres (b) 28 litres
(c) 11 litres (d) 33 litres

Q.26. A shopkeeper of a subsidised canteen mixed three varieties of rice, X, Y and Z, in the ratio of 4 : 1 : 3 to make a packet of 4 kg of rice. The cost prices per kg of X, Y and Z varieties of rice are ₹2, ₹4 and ₹6, respectively. What is the cost price (in ₹) of the packet of rice ?
SSC MTS 13/11/2024 (Morning)
(a) 10 (b) 15 (c) 30 (d) 18

Q.27. Rice worth ₹84 per kg and ₹96 per kg is mixed with a third variety of rice in the ratio 1 : 1 : 2. If the mixture is worth ₹99 per kg, the price of the third variety per kg is:
SSC MTS 14/11/2024 (Afternoon)
(a) ₹108 (b) ₹115 (c) ₹112 (d) ₹110

SSC CGL 2024 Tier - 1

Q.28. The concentrations of three acids, A, B, and C, are specified as 20%, 30%, and 40%, respectively. They are blended in a ratio of 3 : 5 : a, yielding a solution with a concentration of 30%. What is the value of 'a' ?
SSC CGL 10/09/2024 (2nd Shift)
(a) 3 (b) 1 (c) 2 (d) 4

Q.29. A merchant mixes two varieties of sugar of 5 kg and 3 kg, which costs him ₹4 and ₹6 per kg, respectively. What is the cost price (in ₹) of the mixture per kg
SSC CGL 12/09/2024 (3rd Shift)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) 4.35 (b) 4.45 (c) 4.75 (d) 4.21

Q.30. A shopkeeper mixes two types of rice costing ₹250/5 kg and ₹280/5 kg in the ratio 7 : 8. Find the net cost of the resultant mixture (per kg).
SSC CGL 13/09/2024 (1st Shift)
(a) ₹32.50 (b) ₹53.20
(c) ₹52.30 (d) ₹25.30

Q.31. 2 varieties of tea powders worth ₹250/kg and ₹300/kg are mixed with a third variety of tea powder in the ratio 1 : 1 : 2. If the mixture is worth ₹350/kg, find the price of the third variety tea powder.
SSC CGL 13/09/2024 (2nd Shift)
(a) ₹450/kg (b) ₹400/kg
(c) ₹425/kg (d) ₹500/kg

Q.32. 15 kg of ₹10 per kg wheat is mixed with 5 kg of another type of wheat to get a mixture costing ₹30 per kg. Find the price (per kg) of the costlier wheat.
SSC CGL 19/09/2024 (1st Shift)
(a) ₹70 (b) ₹80 (c) ₹60 (d) ₹90

Q.33. A mango juice is made by mixing water and mango concentrate in the ratio 9 : 7. If x litres of water and 3x litres of mango concentrate is mixed in 160 litres of mango juice, then the new ratio becomes 13 : 14. What is the quantity of the new mango juice (in litres)?
SSC CGL 23/09/2024 (2nd Shift)
(a) 197 (b) 212 (c) 206 (d) 216

Q.34. In what ratio, sugar costing ₹78 per kg be mixed with sugar costing ₹46 per kg such that by selling the mixture at ₹75 per kg there is a gain of 20% ?
SSC CGL 24/09/2024 (1st Shift)
(a) 33 : 37 (b) 31 : 29
(c) 37 : 31 (d) 33 : 31

Q.35. A man buys 10 kg of wheat at a rate of ₹26/kg. The wheat is mixed with 6 kg of other good quality of wheat to get a mixture at a price of ₹35/kg. The price of good quality wheat per kg (in ₹) is:
SSC CGL 24/09/2024 (2nd Shift)
(a) 38 (b) 42 (c) 50 (d) 46

Q.36. Half litre of a solution contains 15% of alcohol. To change the alcohol concentration to 50%, find the quantity of alcohol to be mixed.
SSC CGL 26/09/2024 (2nd Shift)
(a) 250 ml (b) 350 ml
(c) 175 ml (d) 400 ml

SSC CHSL 2024 Tier - 1

Q.37. How much water should be added to 60 liters of milk at $1\frac{1}{2}$ liters a rupee so as to have a mixture worth $1\frac{7}{8}$ liters a rupee ?
SSC CHSL 02/07/2024 (1st Shift)
(a) 15 liters (b) 20 liters
(c) 27 liters (d) 12 liters

Q.38. Ramu mixes 2 litres of water at 100° C and 18 litres of water at 32° C. What temperature will the water have after mixing ?
SSC CHSL 08/07/2024 (3rd Shift)
(a) 40°C (b) 20°C (c) 38.8°C (d) 66°C

Q.39. Pomegranate juice contains 10% sugar solution and orange juice contains 30% sugar solution. What is the percentage of sugar solution in a mixture of two litres of pomegranate juice and three litres of orange juice ?
SSC CHSL 11/07/2024 (2nd Shift)
(a) 22% (b) 20% (c) 40% (d) 25%

SSC CPO 2024 Tier - 1

Q.40. A 12 litre solution of acid and water contains 30% acid. How much water (in litres) must be added to get a solution having 20% acid ?
SSC CPO 27/06/2024 (1st Shift)
(a) 6 (b) 3 (c) 5 (d) 4

Q.41. A mixture of 750 kg of alloy of copper and tin contains 25% tin. How much tin must be added so that it becomes 70% of the mixture ?
SSC CPO 27/06/2024 (2nd Shift)
(a) 895 kg (b) 1125 kg
(c) 956 kg (d) 1097 kg

Q.42. In alloys A and B, the ratio of lead to tin is 5 : 3 and 3 : 1, respectively. 80 kg of alloy A and 100 kg of alloy B are mixed together to form a new alloy. What is the amount of tin (in kg) in the new alloy ?
SSC CPO 27/06/2024 (3rd Shift)
(a) 90 (b) 55 (c) 68 (d) 81.3

Q.43. A vessel contains 18 litres mixture of milk and water in the ratio 5 : 1. If 3 litres of milk is added to the vessel, then how much water (in litres) should be added to the vessel to have milk and water in the ratio 9 : 2 ?
SSC CPO 28/06/2024 (3rd Shift)
(a) 2 (b) 1.5 (c) 0.5 (d) 1

Q.44. An alloy contains the metals A, B and C in the ratio 2 : 3 : 1 and another contains the metals B, C and D in the ratio 5 : 4 : 3. If equal weights of both alloys are mixed together to form a third alloy, then how much part of the metal B is in the new alloy ?
SSC CPO 29/06/2024 (3rd Shift)
(a) $\frac{1}{8}$ (b) $\frac{1}{6}$ (c) $\frac{3}{24}$ (d) $\frac{11}{24}$

SSC Selection Post (Phase - XII)

Q.45. A chemistry laboratory requests for a 25% solution of ferrous sulphate. A supplier has 40 millilitres of 20% solution. How many millilitres of 40% solution should be added to make it a 25% solution (correct to two decimal places) ?
Matriculation Level 20/06/2024 (Shift - 1)
(a) 16.40 (b) 15.20
(c) 13.33 (d) 14.30

Q.46. Two containers of equal capacity are full of mixture of milk and water. In the first, the ratio of milk to water is 3 : 7 and in the second it is 7 : 9, Now both the mixtures are mixed in a bigger container. What is the resulting ratio of milk to water ?
Matriculation Level 24/06/2024 (Shift - 1)
(a) 59 : 101 (b) 57 : 107
(c) 61 : 97 (d) 58 : 103

Q.47. There are two types of rice. Type 1 rice costs ₹20 per kg and type 2 rice costs 25 per kg. Both the rice are mixed in the ratio 2 : 3. Find the cost (in ₹) of the mixed rice per kg.
Matriculation Level 24/06/2024 (Shift - 4)
(a) 23 (b) 23.50 (c) 22 (d) 22.50

Q.48. The rice sold by a grocer contained 20% of low-quality rice. What quantity of good- quality rice should be added to 175 kg of mixed rice so that the percentage of low- quality rice remains 10% ?
Matriculation Level 24/06/2024 (Shift - 4)
(a) 175 kg (b) 150 kg
(c) 100 kg (d) 125 kg

Q.49. The initial ratio of water and milk in a mixture of 84 litres is 2 : 5. What quantity of water (in litres) should be added to the mixture so that the resulting mixture has 50% of water ?
Matriculation Level 25/06/2024 (Shift - 1)
(a) 16 (b) 32 (c) 36 (d) 18

Q.50. From a container having pure milk, 40% is replaced by water and the process is repeated thrice. At the end of the third operation, the purity of milk is:
Matriculation Level 26/06/2024 (Shift - 1)
(a) 18.6% (b) 23.4% (c) 22.7% (d) 21.6%

Q.51. A person mixes two liquids, x and y. One litre of x weighs approximately 900 g, and one litre of y weighs approximately 750 g. If one litre of the mixture weighs approximately 800 g, then the percentage of x in the mixture is:
Higher Secondary 25/06/2024 (Shift - 4)
(a) 30% (b) $33\frac{1}{3}$% (c) 50% (d) $27\frac{1}{2}$%

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CPO 2023 Tier - 1

Q.52. Two mixtures A and B have the following compositions: Mixture A has copper and tin in a ratio of 1 : 2 Mixture B has copper and tin in a ratio of 1 : 3 If equal quantities of mixtures A and B are used for producing mixture C, then find the ratio of copper and tin in mixture C.
SSC CPO 04/10/2023 (3rd Shift)
(a) 2 : 5 (b) 7 : 17 (c) 7 : 12 (d) 1 : 5

SSC MTS 2023 Tier -1

Q.53. In what ratio must a grocer mix two varieties of pulses costing ₹18 per kg and ₹22 per kg, respectively, so as to get a mixture worth ₹19.50 per kg ?
SSC MTS 01/09/2023 (3rd Shift)
(a) 5 : 3 (b) 5 : 1 (c) 1 : 5 (d) 5 : 2

Q.54. How many kilograms of sugar at ₹3.80 per kg must be mixed with 60 kg of sugar at ₹4.60 per kg, so that by selling the mixture at ₹5.20 per kg there may be a gain of 30%?
SSC MTS 01/09/2023 (3rd Shift)
(a) 170 kg (b) 120 kg (c) 160 kg (d) 180 kg

Q.55. If two varieties of a grain worth ₹202 per kg and ₹250 per kg, respectively, are mixed in the ratio of 7 : 5, then what is the cost (in ₹) of the resulting mixture per kg ?
SSC MTS 05/09/2023 (1st Shift)
(a) 225 (b) 218 (c) 222 (d) 220

Q.56. There are two varieties of rice. Variety 1 costs ₹100 per kg and variety 2 costs ₹120 per kg. The vendor mixed both the varieties and sold for ₹121 per kg and gained 10%. Find the ratio of variety 1 to variety 2 rice in the mixture.
SSC MTS 08/09/2023 (1st Shift)
(a) 1 : 1 (b) 3 : 1 (c) 2 : 1 (d) 1 : 3

Q.57. Tea leaves worth ₹108 per kg and ₹120 per kg are mixed with a third variety in the ratio 2 : 3 : 5. If the mixture is worth ₹125 per kg, the price (in ₹, rounded off to the nearest integer) of the third variety of tea leaves per kg will be:
SSC MTS 08/09/2023 (3rd Shift)
(a) 130 (b) 128 (c) 135 (d) 133

SSC CHSL 2023 Tier - 1

Q.58. A bottle is filled with liquid of which 4 parts are water and 5 parts are fruit extract. How much of the mixture must be drawn off and replaced with water so that the mixture may be half water and half fruit extract ?
SSC CHSL 03/08/2023 (3rd Shift)
(a) $\frac{1}{10}$ (b) $\frac{9}{10}$ (c) $\frac{4}{9}$ (d) $\frac{5}{9}$

Q.59. In two alloys, the ratio of Aluminium to Zinc are 5 : 6 and 3 : 5. If 242 kg of the first alloy and 144 kg of the second alloy are mixed, then the ratio of Aluminium and Zinc in the new alloy will be:
SSC CHSL 07/08/2023 (4th Shift)
(a) 76 : 117 (b) 82 : 111
(c) 93 : 100 (d) 68 : 125

Q.60. How many kilograms of rice costing ₹52 per kg must be mixed with 35 kg of rice costing ₹45 per kg so as to get a gain of 10% by selling the resulting mixture of rice at the rate of ₹55 per kg ?
SSC CHSL 11/08/2023 (2nd Shift)
(a) 87.5 kg (b) 90.0 kg
(c) 85.0 kg (d) 82.5 kg

Q.61. Two jars A and B are containing the solutions of two liquids P and Q . The ratio of the liquids P and Q in the jars A and B are 2 : 19 and 1 : 11, respectively. If 7 litres of the solution of jar A and 4 litres of the solution of jar B are mixed, what is the ratio of the solutions P and Q in the new mixture ?
SSC CHSL 11/08/2023 (4th Shift)
(a) 10 : 1 (b) 1 : 9 (c) 9 : 1 (d) 1 : 10

Q.62. A mixture of 70 litres of wine and water contains 10% of water. How much water must be added to make the water $12\frac{1}{2}$% of the resulting mixture ?
SSC CHSL 14/08/2023 (4th Shift)
(a) 5 litres (b) 3 litres
(c) 2 litres (d) 4 litres

Q.63. A cask having a capacity of 600 litres is initially filled with wine. From this cask y litres of wine are first drawn and replaced with water. From the mixture, 120 litres are drawn and replaced with water. From this further diluted mixture, 120 litres are drawn again and replaced with water. The ratio of wine to water in the cask is now 12 : 13. What is the value of y ?
SSC CHSL 17/08/2023 (1st Shift)
(a) 125 (b) 150 (c) 200 (d) 100

SSC CGL 2023 Tier - 1

Q.64. In what ratio must water be mixed with milk, costing ₹32 per litre, in order to get a mixture costing ₹28 per litre ?
SSC CGL 14/07/2023 (2nd shift)
(a) 8 : 1 (b) 1 : 7 (c) 1 : 8 (d) 7 : 1

Q.65. One quality of rice at ₹45 per kg is mixed with another quality at a certain rate in the ratio of 3 : 2. If the mixture so formed is worth ₹50 per kg, what is the rate per kg of the second quality of rice?
SSC CGL 17/07/2023 (3rd shift)
(a) ₹57 (b) ₹57.5 (c) ₹58 (d) ₹58.5

Q.66. Rice worth ₹126 per kg and ₹135 per kg are mixed with a third variety in the ratio of 1 : 1 : 2. If the mixture is worth ₹153 per kg, then the price of the third variety per kg (in ₹) is:
SSC CGL 21/07/2023 (2nd shift)
(a) 182.5 (b) 195.5 (c) 133.5 (d) 175.5

SSC Selection Post (Phase - XI)

Q.67. If 36 litres of 20% milk solution is mixed with 48 litres of 10% milk solution, then what will be the percentage concentration of milk in the final solution
Higher Secondary 27/06/2023 (Shift - 3)
(a) 14.28% (b) 15.48%
(c) 12.38% (d) 13.36%

Q.68. A merchant bought two qualities of rice at the rate of Rs.120/kg and Rs.220/kg. In 72kg of the second quality rice, how much rice (in kg) of the first quality should be mixed so that the resulting mixture may be sold at the rate of Rs.280/kg to earn a profit of 40%
Matriculation Level 27/06/2023 (Shift - 2)
(a) 20 (b) 22 (c) 15 (d) 18

SSC MTS 2022 Tier - 1

Q.69. In A mixture of 180 litres, the ratio of milk and water is 5 : 1. If this ratio is to be 3 : 2, then find the quantity of water to be further added ? (in litres)
SSC MTS 03/05/2023 (Afternoon)
(a) 66 (b) 70 (c) 88 (d) 72

Q.70. There are three cups of mixture of milk and water in ratio 4 : 5, 5 : 6, 9 : 7. 36 liters of first and 44 liters of second cup are taken. How much quantity from third cup is to be taken so that final mixture from the three cups will have milk and water in ratio 1 : 1 ? (in litres)
SSC MTS 10/05/2023 (Afternoon)
(a) 32 (b) 64 (c) 54 (d) 60

Q.71. 135 kg of an alloy A is mixed with 72 kg of alloy B to get a new alloy. If alloy A has zinc and copper in the ratio 4 : 5 and alloy B has zinc and copper in ratio 7 : 5, then what is the weight of zinc in the new alloy ?
SSC MTS 13/06/2023 (Morning)
(a) 102 kg (b) 115 kg (c) 85 kg (d) 92 kg

Q.72. An alloy contains copper, zinc and nickel in the ratio of 3 : 2 : 5 respectively. What quantity of nickel (in kg) must be

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

added to 100 kg of this alloy to have the new ratio of copper, zinc and nickel 3:2:6 respectively ?
SSC MTS 20/06/2023 (Afternoon)
(a) 20 kg (b) 10 kg (c) 8 kg (d) 15 kg

SSC CHSL 2022 Tier - 1

Q.73. In a mixture, milk and water are in ratio of 1 : 4. Some milk is added to the mixture because of which ratio of milk and water becomes 2 : 1. How much milk was added as a percentage of the initial mixture ?
SSC CHSL 10/03/2023 (3rd Shift)
(a) 140 % (b) 700 % (c) 240 % (d) 400 %

SSC CGL 2022 Tier - 2

Q.74. 40 litres of milk are kept in a container. 4 litres of milk were removed from this container and replaced with water. This procedure was performed two more times. How much milk does the container now hold?
SSC CGL Tier II (02/03/2023)
(a) 30 litres (b) 34.23 litres
(c) 29.16 litres (d) 32 litres

Q.75. How many kilograms of rice costing Rs.60 per kg must be mixed with 24 kg of rice costing Rs.42 per kg so that there may be a gain of 12% by selling the mixture at Rs.56 per kg ?
SSC CGL Tier II (07/03/2023)
(a) 22 kg (b) 20 kg (c) 19.2 kg (d) 21.2 kg

SSC CGL 2022 Tier - 1

Q.76. A can of water and milk mixture contains 60% milk. A part of this mixture is replaced by another mixture containing 50% milk and the percentage of milk was found to be 52%. The quantity of mixture replaced is:
SSC CGL 13/12/2022 (2nd Shift)
(a) $\frac{1}{5}$ (b) $\frac{3}{5}$ (c) $\frac{4}{5}$ (d) $\frac{2}{5}$

Q.77. P and Q are two alloys of aluminium and copper. The ratios of aluminium and copper in P and Q are 5 : 11 and 3 : 5, respectively. If a third alloy is formed by mixing alloys P and Q in the ratio of 1 : 3, then aluminium is what percentage (rounded off to the nearest integer) of the copper in the third alloy ?
SSC CGL 13/12/2022 (4th Shift)
(a) 63 Percent (b) 52 Percent
(c) 48 Percent (d) 56 Percent

SSC CGL 2021 Tier - 2

Q.78. The ratio of milk to water in a 100 litres mixture is 2 : 3. 10 liters of this mixture is withdrawn and replaced with milk. This process is repeated 2 more times. What is the percentage of milk in the final mixture ?
SSC CGL Tier II (08/08/2022)
(a) 56.26 percent (b) 54.27 percent
(c) 58.21 percent (d) 51.24 percent

SSC MTS 2021 Tier - 1

Q.79. A solution of 45% alcohol is mixed with a solution of 60% alcohol in the ratio of 2 : 3. In what ratio should the resultant solution be mixed with a 72% alcohol solution to get a 66% alcohol solution ?
SSC MTS 07/07/2022 (Morning)
(a) 4 : 7 (b) 1 : 3 (c) 1 : 2 (d) 2 : 3

Q.80. An alloy contains a mixture of two metals X and Y in the ratio of 2 : 3. The second alloy contains a mixture of the same metals, X and Y, in the ratio 7 : 3. In what ratio should the first and second alloys be mixed so as to make a new alloy containing 50% of metal X ?
SSC MTS 12/07/2022 (Afternoon)
(a) 3 : 4 (b) 3 : 1 (c) 5 : 6 (d) 2 : 1

Q.81. $\frac{1}{2}$ of 4 kg of an alloy is lead and rest of it is tin. $\frac{1}{6}$ of 5 kg of another alloy is lead and the rest of it is tin. Find the ratio of lead and tin in the mixture of the given quantities of these two alloys.
SSC MTS 14/07/2022 (Afternoon)
(a) 4 : 9 (b) 2 : 3 (c) 17 : 37 (d) 13 : 17

SSC CHSL 2021 Tier - 1

Q.82. A beaker is filled with a liquid, 3 parts of which are water and 7 parts some medicine. What part of the mixture should be replaced with water so that the resultant mixture has water and medicine in a ratio 1 : 1 ?
SSC CHSL 02/06/2022(Morning)
(a) $\frac{2}{7}$ (b) $\frac{1}{7}$ (c) $\frac{2}{5}$ (d) $\frac{1}{5}$

SSC CGL 2020 Tier - 2

Q.83. A vessel contained a solution of acid and water, in which water was 64%. Four litres of the solution was taken out of the vessel and the same quantity of water was added. If the resulting solution contains 30% acid, the quantity (in litres) of the water in the solution, at the beginning in the vessel, was:
SSC CGL Tier II (03/02/2022)
(a) 11.36 (b) 15.36 (c) 8.64 (d) 12.64

SSC MTS 2020 Tier - 1

Q.84. A liquid of 900g is the mixture of flour, sugar and butter. In this solution flour is three times as much as sugar and sugar is two times as much as butter. Find the quantity of flour in grams.
SSC MTS 08/10/2021(Morning)
(a) 600 (b) 550 (c) 750 (d) 500

Q.85. A large container has a 50 litre mixture of juice and water in the ratio 3 : 2. To this , 60 litre juice and water mixture is added, which has a juice to water ratio of 2 : 1. After this , 11 litres of the solution is replaced with pure juice. What is the ratio of water to juice in the final mixture ?
SSC MTS 11/10/2021 (Morning)
(a) 37 : 18 (b) 29 : 81
(c) 4 : 7 (d) 18 : 37

Q.86. Kulbhushan started a juice (syrup + water) counter. Initially, he had 140 litres of juice which had 40% water in it. He sold 30 litres of the juice. Then he added equal amounts of syrup and water. Now the ratio of water to syrup became 3 : 4. What quantity of water was added?
SSC MTS 13/10/2021 (Afternoon)
(a) 24 litres (b) 28 litres
(c) 26 litres (d) 22 litres

Answer Key :-

1.(d)	2.(b)	3.(a)	4.(b)
5.(c)	6.(a)	7.(d)	8.(d)
9.(d)	10.(b)	11.(d)	12.(c)
13.(d)	14.(c)	15.(a)	16.(d)
17.(d)	18.(b)	19.(d)	20.(d)
21.(c)	22.(b)	23.(b)	24.(a)
25.(d)	26.(b)	27.(a)	28.(a)
29.(c)	30.(b)	31.(c)	32.(d)
33.(d)	34.(d)	35.(c)	36.(b)
37.(a)	38.(c)	39.(a)	40.(a)
41.(b)	42.(b)	43.(d)	44.(d)
45.(c)	46.(a)	47.(a)	48.(a)
49.(c)	50.(d)	51.(b)	52.(b)
53.(a)	54.(d)	55.(c)	56.(a)
57.(c)	58.(a)	59.(b)	60.(a)
61.(d)	62.(c)	63.(b)	64.(b)
65.(b)	66.(d)	67.(a)	68.(d)
69.(b)	70.(b)	71.(a)	72.(b)
73.(a)	74.(c)	75.(c)	76.(c)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

77.(d)	78.(a)	79.(c)	80.(d)
81.(c)	82.(a)	83.(b)	84.(a)
85.(d)	86.(d)		

Solutions :-

Sol.1.(d) According to question,
Ratio of solution → phenyl : water
28 litres → 16 : 12
21 litres → 14 : 7
51 litres → 27 : 24
Final mixture → 57 : 43
Hence, Required ratio = 57 : 43

Sol.2.(b) In 1st container -
Ratio of ingredients A and B = 252 : 441
= 12 : 21
In 2nd container -
Quantity of ingredient B = $\frac{21}{33} \times 1188$
= 756 litre

Sol.3.(a) Let the fraction reduced by 'f'
$\frac{7}{12} \times f = \frac{7}{16} \Rightarrow f = \frac{12}{16} = \frac{3}{4}$
Quantity of milk replaced by water = $\frac{1}{4}$
According to question,
$\frac{1}{4}$ = 9 litres
So, the initial quantity of milk
= 4 × 9 = 36 litres

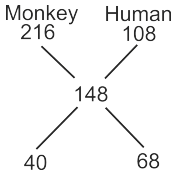
Sol.4.(b)
Mixture → Water : Juice
160 liter → 90 lit. : 70 lit.
↓+x lit. : ↓+$2x$ lit.
Final → 13 : 15
$\frac{90+x}{70+2x} = \frac{13}{15}$
1350 + 15x = 910 + 26x
11x = 440 ⇒ x = 40
Water + juice added = $x + 2x$ = 40 + 80
= 120 litres
Total quantity of drink = 160 + 120
= 280 litres

Sol.5.(c) when 20 litres of the mixture is transferred to another container B. then,
Quantity of spirit in container B = $\frac{7}{16}$
After replacement with 20 liter water, Quantity of spirit in container A = $\frac{7}{16} \times \frac{3}{4} = \frac{21}{64}$
Again 32 litres of this mixture is transferred to container B.
Then,
Quantity of spirit in container B = $\frac{21}{64}$
So, the ratio of the quantity of two types of mixture in container B = 20 : 32 = 5 : 8
Now, using weighted average , we have ;
Quantity of spirit

$= \frac{5 \times \frac{7}{16} + 8 \times \frac{21}{64}}{5+8} = \frac{308}{64 \times 13} = \frac{77}{208}$

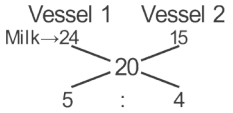
The ratio of water and spirit in container B = 208 - 77 : 77 = 131 : 77

Sol.6.(a)



So, the ratio of the no of monkey and human = 40 : 68 = 10 : 17
10 + 17 = 27 unit = 54
10 unit = $\frac{54}{27} \times 10 = 20$

Sol.7.(d) According to the question,
Ratio - milk : water
1st vessel - 4 : 1 = 5) × 2 × 3 = 6
2nd vessel - 1 : 1 = 2) × 5 × 3 = 15
3rd vessel - 2 : 1 = 3) × 2 × 5 = 10
1st vessel Milk = 2 × 3 × 4 = 24
2nd vessel Milk = 5 × 3 × 1 = 15
3rd vessel Milk = 2 × 5 × 2 = 20

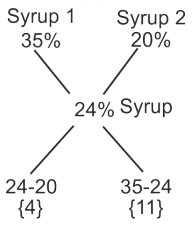


Required quantity = 5 , 4

Sol.8.(d)
Ratio → Assam : Darjeeling : Nilgiri hills
Tea → 2 : 3 : 1
or 4 : 6 : 2 = 12 unit
Ratio → Darjeeling : Nilgiri : kangra
Tea → 5 : 4 : 3 = 12 unit
Ratio after blended tea are mixed :-
A : D : N : K = 4 : (6 + 5) : (2 + 4) : 3
= 4 : 11 : 6 : 3 = 24 units
Weight of kangra valley tea per kg
= $\frac{3}{24} \times 1000$ = 125 gm

Sol.9.(d) $\frac{Left\ quantity\ of\ milk}{Total\ mixture}$
= $(1 - \frac{8}{64})^3 = (\frac{7}{8})^3$
$\frac{Left\ quantity\ of\ milk}{Total\ mixture} = \frac{343}{512}$
Required ratio = 343 : (512−343)
= 343 : 169

Sol.10.(b)

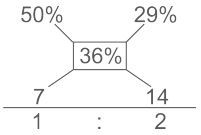


Sol.11.(d)
Ratio = Milk : Water
Initial = **2** : 1
Final = **9** : 1

Required amount of milk to be added
= $\frac{9-2}{2+1} \times v = \frac{7}{3}$ v

Sol.12.(c)
Ratio of copper and zinc in alloy X = 7 : 3
Ratio of copper, zinc and aluminum in alloy Y = 8 : 5 : 7
Ratio - copper : zinc : Al
In X - 7 : 3 = 10) **× 2 × 1**
In Y - 8 : 5 : 7 = 20) **× 3**
Ratio of copper and zinc
= (7 × 2) + (8 × 3) : (3 × 2) + (5 × 3)
⇒ 38 : 21

Sol.13.(d)



Total quantity = 1 + 2 = 3 unit
Replaced quantity = 2 unit
fraction of the original mixture was replaced = $\frac{2}{3}$

Sol.14.(c) According to the question quantity of both the mixture is same
So maintaining the ratio we multiply first mixture with 11 and second with 6

Milk : Water	Milk : water
(5 : 1) × 11	55 : 11
(6 : 5) × 6	36 : 30
	91 : 41

Sol.15.(a) After selling 2.5 litres of juice from total of 19 litres , remaining quantity of juice = 19 - 2.5 = 16.5 litres
Out of 16.5 litres, the quantity of giloy
=16.5 × $\frac{2}{11}$ = 3 litres
Quantity of water = 16.5 - 3 = 13.5 litres
Let the quantity of water added be x
ATQ, $\frac{3}{13.5+x} = \frac{1}{5}$
⇒ 15 = 13.5 + x ⇒ x = 1.5 litres

Sol.16.(d) Metal x in Alloy A = $\frac{5}{7}$,
Metal x in alloy B = $\frac{3}{7}$
Metal x in alloy C = $\frac{\frac{5}{7} \times 4 + \frac{3}{7} \times 5}{4+5}$
$= \frac{\frac{20}{7} + \frac{15}{7}}{9} = \frac{35}{7 \times 9} = \frac{5}{9}$
Required percentage = $\frac{5}{9} \times 100 = 55\frac{5}{9}\%$

Sol.17.(d) 35% = $\frac{7}{20}$, $33\frac{1}{3}\% = \frac{1}{3}$

	Orange	:	Apple	
Bottle 1 →	7	:	13	= 20) × 3
Bottle 2 →	1	:	2	= 3) × 20

Balancing the given ratio we have :

	Orange	:	Apple
Bottle 1 →	21	:	39

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Bottle 2 → 20 : 40

41 : 79

Required percentage = $\frac{79}{41+79}$ × 100

= $\frac{79}{120}$ × 100 = $65\frac{5}{6}$%

Sol.18.(b) since, 12 litres of the solution is taken out, then the left out solution in vessel = 32 - 12 = 20 litres
Now, Let the quantity of acid and water be 5 unit and 3 unit respectively
ATQ , (5 + 3) unit = 20
8 unit = 20 ⇒ 1 unit = $\frac{20}{8}$ = 2.5
Then, 3 unit = 2.5 × 3 = 7.5 litres
Now, 7.5 litres of water are added to it.
Then, the required ratio = 5 : (3 + 3)= 5 : 6

Sol.19.(d)

	Copper	:	Zinc		
A →	3	:	4	=	7) × 2 × **2**
B →	5	:	9	=	14) × **3**

Balancing the given ratio, we have :

	Copper	:	Zinc
A →	12	:	16
B →	15	:	27
	27	:	43

The ratio of copper and Zinc in alloy C = 27 : 43

Sol.20.(d) The quantity filled in container 1 = 87.5% of 40 = 35 litres
The quantity filled in container 2 =80% of 30 = 24 litres
The quantity filled in container 3 = 90% of 20 = 18 litres
Total quantity of milk
= 35 × $\frac{3}{3+2}$ + 24× $\frac{5}{5+1}$ +18×$\frac{7}{7+2}$
= 21 + 20 + 14= 55 litres
Total quantity of water
= (35 + 24 + 18) - 55 = 22 litres
Required ratio = 55 : 22 = 5 : 2

Sol.21.(c) 68% = $\frac{17}{25}$ and 20% = $\frac{1}{5}$

	Pulp	:	Water
Fresh fruit →	8	:	17
Dry fruit →	4	:	1) × 2

Balancing the ratio for pulp

	Pulp	:	Water
Fresh fruit →	8	:	17
Dry fruit →	8	:	2

According to the question
(17 + 8) = 25 unit = 100 kg
Then,1 unit = $\frac{100}{25}$ = 4 kg
Required quantity of dry fruits = (8 + 2)
= 10 unit = 10 × 4 = 40 kg

Sol.22.(b) Cost of the mixture per kg
= $\frac{160\times2+210\times3}{2+3}$ = $\frac{950}{5}$ = ₹190

Sol.23.(b) For can 1 :- acid : water = 5 : 3
Acid = $\frac{5}{8}x$, water = $\frac{3}{8}x$
For can 2 :- acid : water = 2 : 3
Acid = $\frac{2}{5}y$, water = $\frac{3}{5}y$
Total acid = $\frac{5}{8}x+\frac{2}{5}y$
Total water = $\frac{3}{8}x+\frac{3}{5}y$
According to the question,
$\frac{5}{8}x+\frac{2}{5}y=\frac{3}{8}x+\frac{3}{5}y$
$\frac{2}{8}x=\frac{1}{5}y$
$10x = 8y \Rightarrow x : y = 4 : 5$
Required ratio = 4 : 5

Sol.24.(a) According to question,
⇒ 10 units = 40 litres
⇒ 1 unit = 4 litres
Alcohol = 12 litres and water = 28 litres
Now,
Required ratio → 12 : (28 + 40)
= 12 : 68 = 3 : 17

Sol.25.(d)

Grape juice	:	Pineapple juice	
Initial - 13	:	11	3 unit = 8 ltr
Final - 13	:	14	

As per figure,
1 unit = $\frac{8}{3}$ ltr.
Amount of pineapple juice in the remaining mixture before adding new pineapple juice
= 11 unit = 11 × $\frac{8}{3}$ = $\frac{88}{3}$ ltr
Now, pineapple juice in 8 ltr mixture
= $\frac{11}{11+13}$ × 8 = $\frac{11}{3}$ ltr
So, total pineapple juice initially in the can = $\frac{88}{3}+\frac{11}{3}=\frac{99}{3}$ = 33 ltr.

Sol.26.(b) Let the three varieties of rice be X = $4a$, Y = a and Z = $3a$
According to question,
⇒ $8a$ = 4 kg ⇒ a = 0.5 kg
Then,
X = 4 × 0.5 = 2 kg , Y = 0.5kg and Z = 3 × 0.5 = 1.5 kg
Now,
Cost of the packet = 2 × ₹ 2 + 0.5 × ₹ 4 + 1.5 × ₹ 6 = 4 + 2 + 9 = ₹ 15

Sol.27.(a)
Price → 84 : 96 : x
Quantity → 1 : 1 : 2

Total → 84 : 96 : $2x$
According to question,
84 + 96 + $2x$ = (1 + 1 + 2) × 99
$2x$ = 396 - 180
x = $\frac{216}{2}$ = ₹ 108

Sol.28.(a) Given: concentration in new solution = 30%

Acid	→	A	:	B	:	C
Ratio	→	3	:	5	:	a
Concentration(%)	→	20	:	30	:	40
Deviation	→	-10	:	0	:	+ 10

According to question
$\frac{20\times3+30\times5+40\times a}{3+5+a}$ = 30
$\frac{60+150+40a}{8+a}$ = 30
210 + 40a = 240 + 30a
10a = 30 ⇒ a = 3

Sol.29.(c) By using alligation method
Let cost price of mixture = ₹x

₹4		₹6
	x	
5kg		3kg

x = $\frac{4\times5+6\times3}{5+3}$ = $\frac{38}{8}$ = ₹4.75

Sol.30.(b) Cost of type 1 rice(1 g)
= $\frac{250}{5}$ = ₹50
Cost of type 2 rice (1 g) = $\frac{280}{5}$ = ₹56
According to the question,
Net cost of resultant mixture
= $\frac{50\times7+56\times8}{7+8}$ = $\frac{350+448}{15}$ = $\frac{798}{15}$
= ₹53.20

Sol.31.(c) Let the third variety of tea powder be x
According to the question,
250 × 1 + 300 × 1 + 2 × x = 350 × 4
550 + 2x = 1400
2x = 850 ⇒ x = ₹ 425 /kg

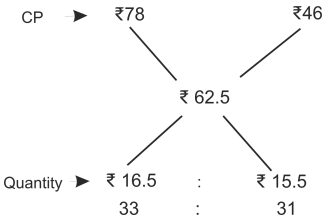
Sol.32.(d)
Let second type wheat ₹x per kg
15 × 10 + x × 5 = 30 × 20
150 + 5x = 600 ⇒ 5x = 450 ⇒ x = ₹90

Sol.33.(d) Let the quantity of water and mango a in juice be 9a and 7a respectively,
According to the question,
16a = 160 ⇒ a = 10
9a = 90 and 7a = 70
Then, ⇒ $\frac{90+x}{70+3x}=\frac{13}{14}$
⇒ 1260 + 14x = 910 + 39x
⇒ 350 = 25x ⇒ x = $\frac{350}{25}$ = 14
Quantity of the new mango juice
= (90 +14) + (70 + 3 × 14) = 216 litre

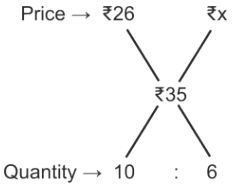
Sol.34.(d) Selling Price of sugar = ₹75
Cost price of mixed sugar = 75 × $\frac{100}{120}$
= ₹62.5
Now By alligation Method ,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf



Sol.35.(c) By using allegation method



$\Rightarrow \frac{26 \times 10 + 6x}{16} = 35$

$\Rightarrow$ 260 + 6x = 35 × 16

$\Rightarrow$ 6x = 300 $\Rightarrow$ x = 50

$\therefore$ price of good quality wheat per kg = ₹50

Sol.36.(b)

Ratio → Alcohol : Water

Initial → 3 : 17 → total = 20 unit

Final → 1 : 1) × 17 = 17 : 17

Part of the alcohol that was added = 17 - 3 = 14 units

20 unit = 500 ml

14 unit = $\frac{500}{20}$ × 14 = 25 × 14 = 350 ml

Sol.37.(a) Let x liter water be added

According to the question,

$\frac{60}{60+x} = \frac{\frac{3}{2}}{\frac{15}{8}}$

$\frac{60}{60+x} = \frac{3}{2} \times \frac{8}{15} \Rightarrow \frac{60}{60+x} = \frac{4}{5}$

300 = 240 + 4x $\Rightarrow$ 4x = 60 $\Rightarrow$ x = 15

Sol.38.(c) Required temperature

$= \frac{(2 \times 100) + (18 \times 32)}{2 + 18}$

$= \frac{200 + 576}{20}$ = 38.8° C

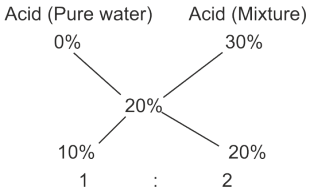
Sol.39.(a)

	Pomegranate		Orange
Quantity	2	:	3
% of solution	10%		30%

Overall % = $\frac{2 \times 10\% + 3 \times 30\%}{2 + 3}$

$= \frac{20\% + 90\%}{5} = \frac{110}{5}\% = 22\%$

Sol.40.(a)

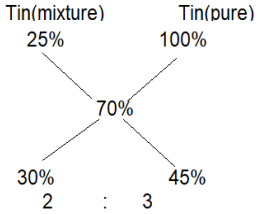


2 unit ---------- 12 L

1 unit ---------- $\frac{12}{2}$ = 6 L

Required quantity of water to be added = 6 L

Sol.41.(b)



According to question,

2 unit ---------- 750 kg

Then, 3 unit ---------- $\frac{750}{2}$ × 3 = 1125 kg

Sol.42.(b)

Tin in alloy A = $\frac{3}{8}$ × 80 = 30 kg

Tin in alloy B = $\frac{1}{4}$ × 100 = 25 kg

Total tin in new alloy = 30 + 25 = 55 kg

Sol.43.(d)

The initial quantity of milk = 18 × $\frac{5}{5+1}$

= 15 liters

New quantity of milk = 15 + 3 = 18 liter

Initial quantity of water = (18 - 15)

= 3 liters.

Let the quantity of water added be x liters

New quantity of water = 3 + x

According to the question ,

$\frac{18}{3+x} = \frac{9}{2} \Rightarrow$ 36 = 27 + 9x $\Rightarrow$ x = 1 liters

Sol.44.(d)

Ratio → A : B : C : D

$Alloy_1$ → 2 : 3 : 1) × 2

$Alloy_2$ → : 5 : 4 : 3

For equal weight,

Ratio → A : B : C : D

$Alloy_1$ → 4 : 6 : 2

$Alloy_2$ → : 5 : 4 : 3

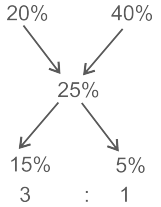
Mixture → 4 : 11 : 6 : 3

Part of metal B in new alloy

$= \frac{11}{4+11+6+3} = \frac{11}{24}$

Sol.45.(c)

Using Alligation method, we have ;



$\Rightarrow$ 3 unit = 40 mililitres

$\Rightarrow$ 1 unit = $\frac{40}{3}$ = 13.33 milliliters

Sol.46.(a)

Milk : Water : Total

First mixture → (3 : 7 : 10) × 8

24 : 56 : 80

Second mixture → (7 : 9 : 16) × 5

35 : 45 : 80

Final mixture → 59 : 101

Sol.47.(a)

Quantity 2 : 3

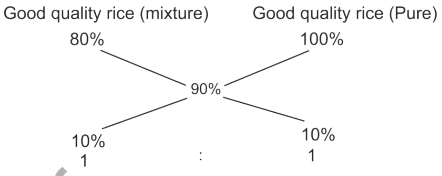
Price/kg 20 (20 + 5)

Cost of the mixed rice

= 20 + $\frac{5 \times 3}{2+3}$ = 20 + $\frac{15}{5}$ = ₹23/kg

Sol.48.(a)

Using Alligation method, we have ;



1 unit ---------- 175 kg

So, the required quantity of good- quality rice = 175 kg

Sol.49.(c)

Quantity of water = $\frac{2}{2+5}$ × 84 = 24 litres

Quantity of milk = $\frac{5}{2+5}$ × 84 = 60 litres

Let the quantity of water added be x

According to question $\Rightarrow \frac{60}{24+x} = \frac{1}{1}$

24 + x = 60 $\Rightarrow$ x = 60 - 24 = 36

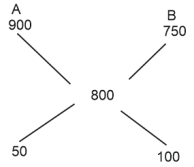
Sol.50.(d) 40% = $\frac{2}{5}$

Let the initial quantity of milk be 100 litres

Quantity of milk at the end of the third operation = 100 × $(\frac{5-2}{5})^3$ = 100 × $(\frac{3}{5})^3$

$= \frac{2700}{125}$ = 21.6 %

Sol.51.(b)



$\Rightarrow$ ratio of x and y = 1 : 2

Hence,

Percentage of x in the mixture

= $\frac{1}{3}$ × 100 = 33$\frac{1}{3}$%

Sol.52.(b)

Balancing the ratio that we have;

	Copper	:	Tin
A -	1	:	2 = 3) × 4 = 4 : 8
B -	1	:	3 = 4) × 3 = 3 : 9

Mix C = 7 : 17

So, required ratio = 7 : 17

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.53.(a)

Rs.18/kg Rs.22/kg

Rs. 19.5/kg

5 : 3

Required ratio = 5 : 3

Sol.54.(d) Cost price of mixture

$= 5.2 \times \frac{10}{13} =$ ₹4/kg

Rs.3.8/kg Rs.4.6/kg

Rs. 4/kg

3 : 1

1 unit = 60kg

Required quantity (3 units) = 180 kg

Sol.55.(c) Let the cost of the resulting mixture is ₹x/kg

I variety 202 Rs./kg II variety 250 Rs./kg

x Rs./kg

7 : 5

$\frac{x-202}{250-x} = \frac{5}{7} \Rightarrow 7x - 1414 = 1250 - 5x$

$12x = 2664 \Rightarrow x = 222$

Sol.56.(a) Cost price of the rice

$= 121 \times \frac{100}{110} =$ ₹110 per kg

So, required ratio,

= (110 – 100) : (120 – 110) = 1 : 1

Sol.57.(c) Let the price of the third variety of tea leaves = ₹x/kg

According to the question,

$\frac{108 \times 2 + 120 \times 3 + 5x}{2+3+5} = 125$

$\frac{216 + 360 + 5x}{10} = 125 \Rightarrow 576 + 5x = 1250$

$5x = 1250 - 576$

$x = \frac{674}{5} = 134.8 \approx 135$

Sol.58.(a)

Initial ratio :- Water : Fruit extracts = 4 : 5

Ratio after x units mixture drawn off :-

Water : Fruit extracts = 4 : 5

Now, x units water added ,

Final ratio = Water : Fruit extracts = 1 : 1 or 5 : 5 = 10 units

⇒ water added = (5 – 4) = 1 unit

Total quantity of mixture = 10 units and replaced mixture = 1 unit

So , required fraction = $\frac{1}{10}$

Sol.59.(b) In 1st alloy : -

Aluminium = $242 \times \frac{5}{11} = 110$ kg

Zinc = 242 – 110 = 132 kg

In 2nd alloy: -

Aluminium = $144 \times \frac{3}{8} = 54$ kg

Zinc = 144 – 54 = 90 kg

Required ratio = 110 + 54 : 132 + 90

= 82 : 111

Sol.60.(a)

C.P. of the mixture = $55 \times \frac{100}{110} = 50$ ₹/kg

1st type 52 Rs./kg 2nd type 45 Rs./kg

50 Rs./kg

5 : 2

2 units = 35 kg

Then 5 units = $\frac{35}{2} \times 5 = 87.5$ kg

Sol.61.(d) P Q

Jar A → 2 : 19 {× 12 × 7}

Jar B → 1 : 11 {× 21 × 4}

Mixture → (168 + 84) : (1596 + 924)

Ratio of the new mixture formed

= 252 : 2520 or 1 : 10

Sol.62.(c) According to the question,

Quantity of the water = $70 \times \frac{1}{10} = 7$ liter

Quantity of the Wine = 70 –7 = 63 liter

Let the added quantity of the water = x liter

$\frac{7+x}{63} = \frac{1}{7} = 49 + 7x = 63$

$x = \frac{14}{7} = 2$ liter

Sol.63.(b) According to the question ,

Let the quantity of wine drawn first time = y litre

$\{1 - \frac{y}{600}\}(1 - \frac{120}{600})^2 = \frac{12}{(12+13)}$

$\{\frac{600-y}{600}\} = \frac{12}{25} \times \frac{25}{16}$

$\{\frac{600-y}{600}\} = \frac{3}{4} \Rightarrow y = 150$ litre

Sol.64.(b)

Water 0 Rs./litre Milk 32 Rs./litre

28 Rs./litre

4 (1) : 28 (7)

Required ratio = 4 : 28 = 1 : 7

Sol.65.(b)

Rice I 45₹/kg Rice II x₹/kg

50₹/kg

Ratio → 3 : 2

According to the figure,

2 unit = (50 – 45) kg

then, 3 unit = $\frac{5}{2} \times 3 = 7.5$ kg

Hence, $x = 50 + 7.5 = 57.5$ kg

Sol.66.(d) Let the price of third variety of rice = Rs. C

Ratio of all types of mixtures mixed = 1 : 1 : 2

According to question,

$153 = \frac{126 \times 1 + 135 \times 1 + C \times 2}{4}$

$\Rightarrow 2C = 612 - 261$

$\Rightarrow 2C = 351 \Rightarrow C = 175.5$

Hence, the price of the third variety of rice = Rs. 175.5

Sol.67.(a) According to question,

Total quantity of milk in final solution

$= \frac{36 \times 20}{100} + \frac{48 \times 10}{100} = 12$ liter

Total quantity of water in final solution

= 84 – 12 = 72 liter

Required % = $\frac{12}{(72+12)} \times 100 = 14.28\%$

Sol.68.(d) C.P. for resulting mixture

$= 280 \times \frac{100}{140} = 200$ ₹/kg

1st type 120 ₹/kg 2nd type 220 ₹/kg

200 ₹/kg

20 : 80

1 : 4

Quantity of 2nd type rice (4 units) = 72 kg.

Quantity of 1st type rice (1 unit) = 18 kg.

Sol.69.(b)

Quantity of milk = $180 \times \frac{5}{5+1} = 150$ liter

Quantity of water = $180 \times \frac{1}{5+1} = 30$ liter

According to the question,

Let the added quantity of the water = x liter

$\frac{150}{30+x} = \frac{3}{2} \Rightarrow 300 = 90 + 3x$

Added quantity of the water $(x) = 70$ liter

Sol.70.(b)

1st cup Milk:Water (4:5)=36 liter	2nd cup Milk:Water (5:6)=44 liter	3rd cup Milk:Water (9:7)=16x liter
16 liter,20 liter	20 liter,24 liter	9x liter,7x liter

Quantity taken

According to the question,

$\frac{16 + 20 + 9x}{20 + 24 + 7x} = \frac{1}{1} \Rightarrow 2x = 8 \Rightarrow x = 4$

quantity from third cup is to be taken = $(9x + 7x) = (16x) = 64$ liter

Sol.71.(a) Weight of zinc in Alloy A

$= \frac{135 \times 4}{(4+5)} = 60$ kg

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Weight of zinc in Alloy B = $\frac{72 \times 7}{12}$ = 42 kg

Total weight of zinc in new Alloy
= 60 + 42 = 102 kg

Sol.72.(b)

Initial quantity of zinc = $\frac{100}{10} \times 2$ = 20 kg

Initial quantity of nickel = $\frac{100}{10} \times 5$= 50 kg

According to the question,

$\frac{20}{50+x} = \frac{2}{6}$

quantity of nickel to be added (x) = 10 kg

Sol.73.(a) Ratio → Milk : Water
Initially → 1 : 4
Finally → 2 : 1 **) × 4**

Initially quantity of mixture → 5 units
Increased quantity of milk → $(2 \times 4) - 1$ = 7 units
Required Percentage

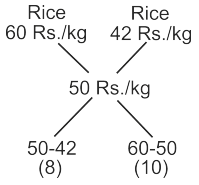
= $\frac{7}{(1+4)} \times 100$ = 140%

Sol.74.(c) Left quantity of pure milk = Initial quantity× (1 - $\frac{quantity\ taken\ out}{capacity\ of\ vessel}$)^n

Left quantity of pure milk =

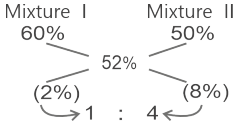
40 × (1− $\frac{4}{40}$)^3 = 40 × $\frac{729}{1000}$ = 29.16 litres.

Sol.75.(c)



SP of mixed rice per kg = 56 Rs
CP of mixed rice per kg = 50 Rs
Ratio of Quantity of Rice to be mixed
= 8 : 10 ⇒ 10 = 24 kg ⇒ 8 = 19.2 kg.
19.2 kg of rice must be mixed with 24 kg of rice.

Sol.76.(c) Using Alligation method, we have :



The quantity of mixture replaced

= $\frac{4}{1+4} = \frac{4}{5}$

Sol.77.(d)

Balancing the given ratio, we have :
Ratio of aluminium and copper in P
= (5 : 11 = 16) × **1** = 5 : 11
Ratio of aluminium and copper in Q
= (3 : 5 = 8) × 2 × **3** = 18 : 30
Final ratio of aluminium and copper
= 18 + 5 : 11 + 30 = 23 : 41

Required percentage = $\frac{23}{41}$ × 100 ≈ 56%

Sol.78.(a) The quantity of water in the mixture = $\frac{3}{5}$ × 100 = 60 litres

Since, 10 liter of this mixture is replaced with milk and this process is carried out 2 more times.

So, The percentage of water in the final mixture = $\left(\frac{9}{10}\right)^3$ × 60 = $\frac{729}{1000}$ × 60

= 0.729 × 60 = 43.74 liter

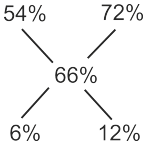
Therefore, the percentage of milk in the final mixture

= $\frac{(100-43.74)}{100}$×100= 56.26%

Sol.79.(c) Total quantity of alcohol mixed in solution = 2 × 45% + 3 × 60% = 90 + 180 = 270% = 2.7unit

Now, the percentage of alcohol in a solution = $\frac{2.7}{5}$ × 100 = 54%

Using Alligation method,

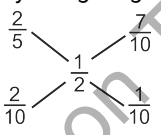


So, the required ratio = 6 : 12 = 1 : 2

Sol.80.(d) Amount of Metal X present in Alloy A and Alloy B

Mixture A = $\frac{2}{5}$ and Mixture B = $\frac{7}{10}$

By using Alligation method:



So, Ratio is 2 : 1.

Sol.81.(c) Lead Tin
Alloy 1= 2 : 2) × 6
Alloy 2= $\frac{5}{6}$: $\frac{25}{6}$) × 6

So, 17 : 37

Sol.82.(a) As the part of medicine in the mixture is same in both the cases, we have:

Water Medicine
Initial mixture → 3 : 7
Final mixture → 1 : 1) × 7 = 7 : 7
Part of the mixture that was replaced with water = 4 units
So, part of the mixture taken out

= $\frac{4}{3+4+7} = \frac{4}{14} = \frac{2}{7}$

Sol.83.(b) Final quantity = Initial Quantity × (1 - $\frac{quantity\ taken\ out}{capacity\ of\ vessel}$)^n

ATQ, 30% = 36%(1 - $\frac{4}{x}$)^1

$\frac{5}{6}$ = (1 - $\frac{4}{x}$) ⇒ $\frac{1}{6} = \frac{4}{x}$ ⇒ x = 24 L

The initial quantity of water in the solution = 24 × 64% = 15.36L

Alternate method : Let the initial quantity of the solution be x + 4 litres
Percentage of acid initially = (100 -64)= 36%
According to the question,
36% × (x) = 30% × (x + 4)
6x = 120 = x = 20 litres.
Quantity of water initially = 64% of (20 + 4) litres = 15.36 litres.

Sol.84.(a)

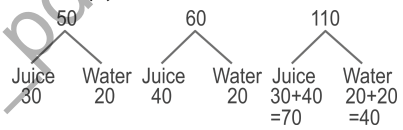
Balancing the given ratio, we have :

Flour	:	Sugar	:	Butter
3	:	1	:	**1**
2	:	2	:	1
6	:	2	:	1

So, the quantity of flour

= $\frac{6}{6+2+1}$ × 900 = $\frac{6}{9}$ × 900 = 600g

Sol.85.(d)



Ratio of water to juice in final mixture after replacing 11 litres of solution with pure juice

= $\frac{40 - 11 \times \frac{4}{11}}{70 - 11 \times \frac{7}{11} + 11}$

= $\frac{40-4}{70-7+11} = \frac{36}{74} = \frac{18}{37}$

Sol.86.(d) Remaining Juice after selling 30 litres = 140 – 30 = 110 litres
Quantity of water in the juice of 110 litres = 40% of 110 = 44 litres
Quantity of syrup in the juice of 110 litres = 110 – 44 = 66 litres
Let the equal quantity of water and syrup added be x litres

So, $\frac{44+x}{66+x} = \frac{3}{4}$

176 + 4x = 198 + 3x ⇒ x = 22 litres

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Work and Time

Time :- Time is the duration during which any activity or work happens or continues.
Work :- Work is a task or set of activities to achieve a certain result.
Efficiency :- Efficiency is inversely proportional to the Time taken when the amount of work done is constant.

$$\text{Efficiency} \propto \frac{1}{time\ taken}$$

The efficiency of work means, "How much work one person can do in one day (expressed in percentage)". For example, a person can do a job in 2 days. In other words, we can say that he can do 50% of the work in one day. Therefore, his efficiency will be 50%.

We can define happening of work as:
(1.) If a person A completes a work in X days, then the amount of work completed by him in 1 day will be = $\frac{1}{X}$
(2.) if a person B completes work in Y days, then the amount of work completed by him in 1 day will be = $\frac{1}{Y}$
(3.) From the above two points, we can say that in one day A and B together can complete ($\frac{1}{X}$ + $\frac{1}{Y}$) amount of work. Thus, together A and B can complete the work in ($\frac{XY}{X+Y}$) days.
Here, we have assumed total work as 1 unit. Similarly, we can assume our total work as anything as per our convenience. The best assumption for easing out our calculations of the total work is assuming work as 100% or LCM of time taken by all the persons.

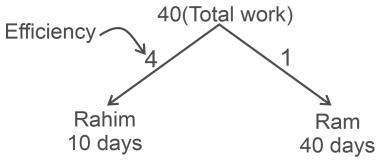
The complete work can also be considered as 1 unit. Then if A takes 4 days to finish a work, it means he can finish 1/4th of the work in 1 day.

Example :- Rahim can finish the work in 10 days and Ram can finish the same work in 40 days. If Ram and Rahim both work together then what is the total number of days taken ?
Sol:- The problem can be solved in three different approaches.

Approach 1: Using Fractions
Ram can finish the work in 10 days i.e. in one day he will do $\frac{1}{10th}$ of the work.
Rahim can finish the work in 40 days i.e. in one day he will do $\frac{1}{40th}$ of the work.
So, in one day, both working together can finish = ($\frac{1}{10}$) + ($\frac{1}{40}$) = $\frac{5}{40}$ = $\frac{1}{8th}$ of the work. So, to complete the work they will take 8 days.

Approach 2 : Using Percentage (Shortcut - Recommended)
Rahim can finish 100 % of work in 10 days i.e. in one day he finishes 10% of the work.
Ram can finish 100% of the work in 40 days i.e. in one day he finishes 2.5 % of the work.
So, working together, in a single day they can finish 12.5% of the work. So, to complete 100% of the work, it will take 100/12.5 = 8 days.

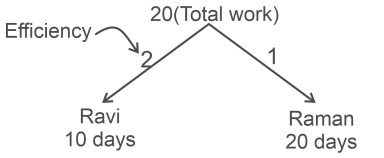
Approach 3 : using unitary method



LCM of days (10 , 40) = 40 = (Total work)
Efficiency of (Ram + Rahim) = 4 + 1=5
Ram and Rahim both work together then total number of days taken = 40/5 = 8 days.

Example :- Ravi can do a job in 10 days. Raman can do the same job in 20 days. They together start doing the job but after 4 days Raman leaves. How many more days will be required by Ravi to complete this job alone ?
Sol:-
Approach 1 :- Ravi can finish a job in 10 days i.e in one day he can finish 10 % of the job.
Raman can finish the same job in 20 days i.e. in one day he can finish 5 % of the job.
So, working together, in a day they can do 10 + 5 = 15 % of the job.
In the 4 days, if they worked together, they would have finished 4 × 15% = 60% of the job.
So, Work left = 100 – 60 = 40%. This work has to be done by Ravi who does 10 % of the job in a day. So, to finish the remaining 40%, he will take 40/ 10 = 4 more days.

Approach 2 :-



LCM of days (10 , 20) = 20 = Total work
Efficiency of Ravi = 2
Efficiency of Raman = 1
Work done by Ravi and Raman in 4 days = 3 × 4 = 12 units
Remaining work = 20 - 12 = 8 units
No of days required by Ravi to complete this work = $\frac{8}{2}$ = 4 days

Concept 1
- If A takes 'a' days more to complete a work than the time taken by (A + B) to do same work and B takes 'b' days more than the time taken by (A + B) to do the same work. Then (A + B) do the work in $\sqrt{ab}$ days

We will take some examples to understand this concepts

Example : A and B alone complete a piece of work in 12 days and 3 days more respectively than time taken by A and B together, then Find in how many days A alone can complete the work ?
Sol:- (A+B) complete the work in $\sqrt{12 \times 3}$ = $\sqrt{36}$ = 6 days
So, time taken by A alone to complete the whole work in (6 + 12) = 18 days

Example : A can complete a work in 5 more days than B while A does the same work in 9 more days than C.if (A + B) can complete the whole work in same time in work done by C alone does the whole work . In how many days A alone could complete the same work ?
Sol:- Let the time taken by C to complete the work in x days
Then, time taken by A = (x + 9)days
Time taken by B = (x + 9) - 5 = (x + 4) days.
Time taken by C, which is equal to that of (A + B) = $\sqrt{9 \times 4}$ = $\sqrt{36}$ = 6 days
So, time taken by A alone to complete the work = 6 + 9 = 15 days

MDH Formula

MDH formula is used to compare the works of the same nature done at two different times using different manpower. The MDH formula can be represented as

$$\frac{M_1 D_1 H_1 E_1}{W_1} = \frac{M_2 D_2 H_2 E_2}{W_2}$$

Where , M = denotes the number of men/women, D = denotes the number of days, H = denotes the number of hours in a day, E = denotes the efficiency of 1 man, and W = denotes part of work done

Alternate Days

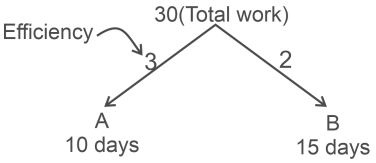
Example :- A can complete a work in 10

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

days while B can complete the same work in 15 days. In how many days will the work be completed if they work alternatively? (Given : A starts the work)

Solution:-



Work done in 2 days = 3 + 2 = 5 units,
5 units work = in 2 days
5 × 6 units work = 2 × 6 = 12 days.

Example :- To do a certain work , A and B work on alternate days, with B beginning the work on the first day. A can finish the work alone in 27 days. If the work gets completed in $9\frac{1}{2}$ days, then B alone can finish 5 times the same work with half efficiency in :

Solution:- As B starts the work, he will work for 5 days and A will work for $4\frac{1}{2}$ days,

Part of work done by A in $4\frac{1}{2}$ days

$= \frac{9}{2 \times 27} = \frac{1}{6}$

So, Part of work done by B in 5 days

$= 1 - \frac{1}{6} = \frac{5}{6}$

Time taken by B to complete the work

$= 5 \times \frac{6}{5} = 6$ days.

Time taken by B to finish 5 times the work with half efficiency = 6 × 5 × 2 = 60 days.

(As efficiency becomes $\frac{1}{2}$, number of days will be multiplied by 2 because efficiency and time are inversely proportional).

Variety Questions

Q.1. A can complete a piece of work alone in 200 days, while B can complete the same piece of work alone in 100 days. In every three-day cycle, both A and B work on day 1, only A works on day 2, and only B works on day 3. This cycle continues till the work is completed. How many days in all does it take the duo to complete the work?
SSC CPO 27/06/2024 (1st Shift)
(a) $100\frac{1}{3}$ (b) $99\frac{2}{3}$ (c) $100\frac{1}{2}$ (d) 100

Q.2. Two workers - Sagar and Manish - are working on a heavy machine to melt waste metal. Sagar can complete the work in 15 days while both workers on alternate basis can complete the work in 12 days. In how many days can Manish alone complete the work ?
Matriculation Level 25/06/2024 (Shift - 1)
(a) 10 (b) 30 (c) 9 (d) 18

Q.3. A and B can complete a job together in 12.5 days; B and C can complete the same job together in 18.75 days, while C and A can complete the same job together in 15 days. In how many days will A, B and C together be able to complete the same job alongside D, who is only 40% as efficient as C ?
SSC CGL Tier II (26/10/2023)
(a) $9\frac{1}{3}$ (b) $9\frac{2}{3}$ (c) $9\frac{7}{27}$ (d) $9\frac{17}{27}$

Q.4. A and B are equally efficient, and each can individually complete a piece of work in 36 days, if none takes any holiday. A and B started working together on this piece of work, but A took a day off after every five days of work, while B took a day off after every seven days of work. If the duo had started work on 1 July 2021, on which date was the work completed ?
SSC CPO 05/10/2023 (3rd Shift)
(a) 19 July 2021 (b) 20 July 2021
(c) 22 July 2021 (d) 21 July 2021

Q.5. A can do $\frac{1}{5}$ of a piece of work in 20 days, B can do 30% of the same work in 36 days, while C can do 80% of the same work in 160 days. B and C together started and worked for x days. After x days B left the work, and A joined C and both completed the remaining work in (x – 41) days. If the ratio between the work done by (B + C) together to the work done by (A + C) together is 19 : 6, then what fraction of the same work can be completed by C alone in 2x days ?
SSC CPO 05/10/2023 (1st Shift)
(a) $\frac{57}{100}$ (b) $\frac{19}{25}$ (c) $\frac{13}{25}$ (d) $\frac{6}{25}$

Q.6. When A alone does a piece of work, he takes 25 days more than the time taken by A and B to do the work together. On the other hand, B alone takes 16 days more than the time taken by A and B to do the work together. How many days will A and B, working together, take to do the work ?
SSC CPO 04/10/2023 (1st Shift)
(a) 22 (b) 20 (c) 24 (d) 23

Q.7. A hostel mess requires 217 eggs for a week. How many eggs will it require in total for the months of July, August and September?
SSC CPO 03/10/2023 (2nd Shift)
(a) 2821 (b) 2790 (c) 2852 (d) 2883

Q.8. A man and woman working on alternate days can finish a work in 15 days if the man works on the first day. The same work is finished in 14.5 days if they work on alternate days and if the woman starts on the first day. The work will be finished by a man alone _____in days.
SSC MTS 08/09/2023 (1st Shift)
(a) 25 (b) 21 (c) 15 (d) 22

Q.9. P, Q and R can complete a piece of work in 6 days, 12 days and 15 days, respectively. P starts working alone on 1st, 4th, 7th ..., Q works alone on 2nd, 5th, 8th ... and R works alone on 3rd, 6th, 9th ... This pattern is continued till the work is completed. In how much time (in days) is the entire work done ?
SSC MTS 06/09/2023 (3rd Shift)
(a) $10\frac{3}{5}$ (b) $9\frac{3}{10}$ (c) $9\frac{1}{2}$ (d) $10\frac{1}{2}$

Q.10. A can complete a task in the same time in which B and C work together. If A and B could complete it jointly in 10 days and C alone in 50 days, then B could complete it independently in :
SSC CHSL 17/08/2023 (4th Shift)
(a) 26 days (b) 27 days
(c) 25 days (d) 23 days

Q.11. A can finish a work in 24 days and B in 30 days, individually. They work together for 11 days. The percentage of the work still to be finished will be:
SSC CHSL 10/08/2023 (4th Shift)
(a) 18% (b) 16% (c) 17.5% (d) 12.5%

Q.12. In an army camp, there is food provision for 500 cadets for 25 days. If 125 more persons join the army camp on the first day itself, then for how many days will the provision last ?
SSC CHSL 08/08/2023 (3rd Shift)
(a) 20 (b) 15 (c) 10 (d) 25

Q.13. A can do a piece of work in 24 days and B can do the same work in 30 days. If they work on it together for 8 days, then the fraction of the work that is left is:
SSC CHSL 04/08/2023 (4th Shift)
(a) $\frac{2}{3}$ (b) $\frac{2}{5}$ (c) $\frac{3}{5}$ (d) $\frac{1}{3}$

Q.14. Disha takes 12 hours to copy a 75 - page manuscript, while Mohit can copy the same manuscript in 10 hours. How many hours will it take for them to copy a 150 - page manuscript if they work together?
SSC CHSL 03/08/2023 (4th Shift)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) $10\frac{10}{11}$ (b) $9\frac{9}{11}$ (c) $8\frac{9}{11}$ (d) $11\frac{8}{11}$

Q.15. A man and a woman can finish a work together in half the time taken by a woman and a boy together. A boy can finish the work alone in 20 days and 2 women together can finish it in 30 days. In how many days will the work be finished by 4 men ?
SSC CGL 18/07/2023 (4th shift)
(a) 2 (b) 2.14 (c) 2.5 (d) 3

Q.16. A, B and C can finish a work in 15 days working alternately in the same order. The efficiency of A is the same as that of B, and the efficiency of C is equal to that of A. In how many days will the work be finished if they work alternately in the order C, A and B ?
SSC CGL 26/07/2023 (3rd shift)
(a) 12 (b) 14 (c) 15 (d) 16

Q.17. A can do $\frac{1}{3}$ of a piece of work in 32 days, B can do $37\frac{1}{2}$% of the same work in 24 days, while C can do 60% of the same work in 48 days. B and C together started and worked for x days. After x days, B left the work and A joined C and both completed the remaining work in (x + 8) days. If the ratio of the work done by (B + C) together to the work done by (A + C) together is 9 : 11, then what fraction of the same work can be completed by C alone in 3.5 x days ?
SSC CGL 25/07/2023 (2nd shift)
(a) $\frac{18}{25}$ (b) $\frac{4}{5}$ (c) $\frac{7}{10}$ (d) $\frac{3}{4}$

Q.18. (N + 18) persons, each working for 7.5 hours a day, can complete 48% of a work in 20 days. (N + 12) persons can complete the remaining work in 30 days, if each of them works for 6.5 hours per day. Determine the value of N.
SSC CGL 19/07/2023 (1st shift)
(a) 18 (b) 16 (c) 20 (d) 22

Q.19. Suresh and Anil are working on a special project. Suresh takes 5 hours to type 40 pages and Anil needs 6 hours to type 32 pages on a computer. How much time will it take them to type a 110-page assignment if they work on two different computers ?
SSC CGL 18/07/2023 (4th shift)
(a) 8 hours 15 minutes
(b) 8 hours
(c) 7 hours 35 minutes
(d) 8 hours 40 minutes

Q.20. Raja and Rocky together can complete painting work in 5 days. Together they both start painting, but after 2 days, Rocky falls sick and leaves the work. If Raja completes the remaining painting in 4 days, find the number of days in which Rocky alone can do the work.
SSC CGL 18/07/2023 (2nd shift)
(a) 12 (b) 15 (c) 20 (d) 10

Q.21. To do a certain work, Ajay and Bharat work on alternate days, with Bharat starting the work on the first day. Ajay can finish the work alone in 32 days. If the work gets completed in exactly 8 days, then Bharat alone can finish 7 times the same work in _____days.
SSC CGL 14/07/2023 (4th shift)
(a) $\frac{28}{8}$ (b) 4 (c) $\frac{32}{7}$ (d) 32

Q.22. 5 women and 9 girls earn a total of ₹18,720 in 9 days, while 9 women and 16 girls earn a total of ₹52,080 in 14 days. How much will 12 women and 7 girls together earn (in ₹) in 13 days ?
SSC CGL 14/07/2023 (2nd shift)
(a) 42510 (b) 41990 (c) 42380 (d) 42120

Q.23. After working alone for 12 days, Reena finds that only 10 percent of the work is completed. She employs Priya who is 40 percent more efficient than Reena. How many more days will they together take to complete the remaining work?
SSC MTS 15/06/2023 (Morning)
(a) 30 days (b) 50 days
(c) 45 days (d) 40 day

Q.24. S does half as much work as T in $\frac{1}{8}$ of the time taken by T. If they together complete a work in 60 days, then how many days shall S alone take to complete that work ?
SSC CHSL 17/03/2023 (3rd Shift)
(a) 80 (b) 90 (c) 75 (d) 100

Q.25. A civil contractor planned to build an over bridge of 3 km distance in 600 days. For this purpose, he employed 90 workers. After 200 days of work, it was observed that only 0.5 km of the bridge was completed. What is the number of extra workers required to complete the work in time ?
SSC CGL 07/12/2022 (3rd Shift)
(a) 100 (b) 140 (c) 125 (d) 135

Q.26. 1 man and 4 women can complete a work in $\frac{65}{4}$ days, while 3 men and 4 women can complete it in $\frac{13}{2}$ days. In how many days will 13 women complete the same ?
SSC CGL 06/12/2022 (4th Shift)
(a) 20 (b) 16 (c) 14 (d) 18

Q.27. A alone can do 2/5 of a work in 12 days, B is 25 percent more efficient than A. C alone can do the same work in 12 days less than B. D is 25 percent less efficient than C. If they all work together, then the work will be completed in how many days?
SSC CGL Tier II (08/08/2022)
(a) $\frac{240}{53}$ (b) $\frac{180}{43}$ (c) $\frac{200}{51}$ (d) $\frac{300}{47}$

Q.28. A man and a boy together can do a certain amount of digging in 24 days. Their speeds in digging are in the ratio of 4 : 3. How many days will the boy take to complete the work if engaged alone ?
SSC CHSL 27/05/2022 (Morning)
(a) 52 (b) 26 (c) 60 (d) 56

Q.29. Fourteen persons can do a work in 18 days. After 5 days of work, 6 workers left the work, and joined back on the last day of the work. In how many days the work got completed ?
SSC CGL 20/08/2021 (Morning)
(a) 24 (b) 12 (c) 21 (d) 27

Q.30. Each one of five men independently can complete a work in 20 days. The work is started by one person. The next day one more person joins and every next day one more person joins. From the fifth day, five persons continued working as a team. In how many days, will the work be completed ?
SSC CGL 17/8/2021 (Evening)
(a) 2 (b) 6 (c) 3 (d) 5

Q.31. Eight persons can finish work in 20 days. After 5 days they were requested to complete the work in the next 8 days. How many more persons should join the group to fulfill the requirement?
SSC CGL 09/03/2020(Evening)
(a) 23 (b) 15 (c) 7 (d) 12

Q.32. A and B together can do a certain amount of work in x days. Working alone, A and B can do the same work in (x + 8) and (x + 18) days, respectively . A and B together will complete $\frac{5}{6}$ of the same work in:
SSC CPO 11/12/19 (Morning)
(a) 9 days (b) 8 days
(c) 10 days (d) 12 days

Q.33. 25 persons can complete a work in 60 days. They started the work. 10 people left work after x days. If the whole work was completed in 80 days, then what is the value of x ?
SSC CGL TIER II (13/09/2019)
(a) 30 (b) 8 (c) 12 (d) 15

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.34. A is as efficient as B and C together. Working together A and B can complete a work in 36 days and C alone can complete it in 60 days. A and C work together for 10 days. B alone will complete the remaining work in :
SSC CGL TIER II (13/09/2019)
(a) 110 days (b) 88 days
(c) 84 days (d) 90 days

Q.35. 4 men and 5 women can complete a work in 15 days, whereas 9 men and 6 women can do it in 10 days. To complete the same work in 7 days, how many women should assist 4 men?
SSC CGL TIER II (12/09/2019)
(a) 11 (b) 14 (c) 12 (d) 13

Q.36. To do a certain work, the ratio of the efficiencies of X and Y is 5 : 4. Working together, they can complete the same work in 10 days. Y alone starts the work and leaves after 5 days. The remaining work will be completed by X alone in :
SSC CGL TIER II (12/09/2019)
(a) 14 days (b) 12 days
(c) 15 days (d) 10 days

Q.37. A certain number of persons can complete a work in 34 days working 9 hours a day. If the number of persons is decreased by 40%, then how many hours a day should the remaining persons work to complete the work in 51 days ?
SSC CGL TIER II (11/09/2019)
(a) 9 (b) 8 (c) 12 (d) 10

Q.38. A and B have to do $\frac{13}{15}$ part of a work together and B and C have to do $\frac{11}{20}$th part of the work together. If the difference between the wages of A and C is Rs. 7600, then the total wages of A, B and C is :
SSC MTS 21/08/2019(Afternoon)
(a) Rs. 24000 (b) Rs. 18000
(c) Rs. 36000 (d) Rs. 56000

Q.39. It is given that men are twice as efficient than women in respect to doing work. If three men and two women can complete the work in 2 days, then in how many days can a woman working alone complete the work?
SSC CHSL 10/07/2019 (Evening)
(a) $12\frac{1}{2}$ (b) 16 (c) $10\frac{1}{3}$ (d) 8

Q.40. Rs. 10,000 has to be distributed among 3 craftsmen, 5 helpers and 6 labourers such that each helper receives the amount twice as much as a labourer receives and each craftsman receives the amount thrice as much as a labourer receives. What is the amount received by the three craftsmen ?
SSC CHSL 10/07/2019 (Afternoon)
(a) Rs. 2400 (b) Rs. 4000
(c) Rs. 3600 (d) Rs. 2700

Q.41. A , B and C can finish a task in 42 days, 84 days and 28 days, respectively. A started the work. B joined him after 3 days. If C joined them after 5 days from the beginning, then for how many days did A work till the completion of the task?
SSC CHSL 02/07/2019 (Afternoon)
(a) 20 (b) 15 (c) 17 (d) 18

Q.42. A earns Rs 180 per hour and works for 7 hours per day. B earns Rs. 160 per hour and works for 5 hours per day. what is the ratio of per day wages of A and B?
SSC CGL 13/06/2019 (Evening)
(a) 40 : 61 (b) 33 : 20
(c) 20 : 30 (d) 63 : 40

Q.43. 3 men, 4 women and 6 boys together can complete a work in 6 days. A woman does triple the work a man does and a boy does half the work a man does. How many women alone will be able to complete this work in 4 days ?
SSC CGL 13/06/2019 (Evening)
(a) 9 (b) 6 (c) 8 (d) 7

Q.44. A is 40% more efficient than B and C is 20% less efficient than B. Working together, they can finish a work in 5 days. In how many days, will A alone complete 70% of the work ?
SSC CGL 10/06/2019 (Afternoon)
(a) 9 (b) 7 (c) 10 (d) 8

Q.45. To do a certain work , A and B work on alternate days, with B beginning the work on the first day. A can finish the work alone in 48 days. If the work gets completed in $11\frac{1}{3}$ days, then B alone can finish 4 times the same work in :
SSC CGL 07/06/2019 (Afternoon)
(a) 24 days (b) 32 days
(c) 27 days (d) 30 days

Q.46. A can do a work in 20 days, while B can do the same work in 25 days. They started the work jointly. Few days later C also joined them and thus all of them completed the whole work in 10 days. All of them were paid a total of Rs. 700. What is the share of C?
SSC CPO 16/03/2019 (Evening)
(a) 55 (b) 65 (c) 75 (d) 70

Q.47. 36 persons working 8 hours a day can do 3 units of work in 12 days. How many persons are required to do 5 units of that work in 16 days, if they work for 6 hours a day?
SSC CPO 12/03/2019 (Evening)
(a) 50 (b) 55 (c) 60 (d) 45

Practice Questions

SSC CHSL 2024 Tier - 2

Q.48. Ratnesh and Vineet worked on alternate days, starting with Ratnesh. The entire work got completed in $54\frac{3}{4}$ days. If Ratnesh alone can finish the work in 48 days, then in how many days can Vineet alone do the work?
SSC CHSL Tier II (18/11/2024)
(a) 64 (b) 62 (c) 60 (d) 66

SSC MTS 2024 Tier - 1

Q.49. In a company, if 40 workers can make 50 bags in 4 days, then how many bags will 24 workers make in 8 days ?
SSC MTS 09/10/2024 (Morning)
(a) 60 (b) 40 (c) 54 (d) 45

Q.50. A group of 9 people can survive on ₹8,100 for 30 days. How long can a group of 7 people survive on ₹8,400 ?
SSC MTS 14/10/2024 (Evening)
(a) 25 days (b) 43 days
(c) 40 days (d) 31days

Q.51. In a school sports camp, there is food provision for 200 students for 30 days. If 50 more persons join the sports camp on the 1st day then for how many days will the provision last ?
SSC MTS 18/10/2024 (Afternoon)
(a) 24 (b) 26 (c) 22 (d) 20

Q.52. A total of 24 men working 7 hours a day can complete a task in 10 days. In how many days will 21 men working 9 hours a day complete the same task ?
SSC MTS 21/10/2024 (Afternoon)
(a) $7\frac{7}{8}$ days (b) $9\frac{9}{10}$ days
(c) $6\frac{6}{7}$ days (d) $8\frac{8}{9}$ days

Q.53. 16 women can finish a task in 20 days and 20 men take 32 days to finish the same task. How many days will 8 women and 16 men take to finish the same task ?
SSC MTS 12/11/2024 (Afternoon)
(a) 16 (b) 32 (c) 10 (d) 20

SSC CGL 2024 Tier - 1

Q.54. Rajesh, in his printing press, got an order to print some books, out of which he completed $\frac{17}{27}$ of the order in 34 days. In how many days did he complete

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

the entire order of printing?
SSC CGL 09/09/2024 (1st Shift)
(a) 60 (b) 20 (c) 54 (d) 56

Q.55. A and B can do a work in 12 days and 16 days, respectively. If they work together for 6 days, then the fraction of the work left is _____.
SSC CGL 19/09/2024 (2nd Shift)
(a) $\frac{5}{7}$ (b) $\frac{7}{8}$ (c) $\frac{1}{8}$ (d) $\frac{1}{7}$

Q.56. Varun and Raju, working together, can complete a job in 40 hours whereas Varun alone can complete the same job in 50 hours. The number of hours required by Raju to complete the job alone is:
SSC CGL 26/09/2024 (2nd Shift)
(a) 200 (b) 150 (c) 170 (d) 190

SSC CHSL 2024 Tier - 1

Q.57. A and B can do a work in 10 days and 40 days, respectively. How long will it take together to complete the work?
SSC CHSL 01/07/2024 (1st Shift)
(a) 15 days (b) 20 days
(c) 8 days (d) 12 days

Q.58. A and B can do a piece of work in 8 days and B alone can do it in 16 days. In how many days, can A do it alone?
SSC CHSL 01/07/2024 (2nd Shift)
(a) 16 (b) 24 (c) 10 (d) 18

Q.59. A and B can do a piece of work in 9 days and 15 days, respectively. If they work together, then the work will be completed in
SSC CHSL 01/07/2024 (3rd Shift)
(a) $5\frac{5}{8}$ days (b) $2\frac{1}{8}$ days
(c) $3\frac{3}{8}$ days (d) $4\frac{5}{8}$ days

Q.60. Fifteen persons working 12 hours a day earn ₹18,000 per week. How many rupees will 18 persons working 9 hours a day earn per week ?
SSC CHSL 01/07/2024 (4th Shift)
(a) ₹16,020 (b) ₹16,200
(c) ₹12,060 (d) ₹12,600

Q.61. Twelve men working for 9 hours a day complete a piece of work in 24 days. In how many days can 8 men working for 12 hours a day complete the same piece of work?
SSC CHSL 02/07/2024 (1st Shift)
(a) 28 (b) 27 (c) 24 (d) 21

Q.62. 47 masons can dig a 35 m long trench in one day. How many masons should be employed for digging a 105 m long trench of the same type in one day?
SSC CHSL 02/07/2024 (2nd Shift)
(a) 94 (b) 70 (c) 141 (d) 128

Q.63. A, B and C can complete a work in 12, 15 and 20 days, respectively. How many days are required to finish the work if they work together?
SSC CHSL 02/07/2024 (4th Shift)
(a) 4 (b) 3 (c) 5 (d) 6

Q.64. Joey completed the school project in 15 days. How many days will Tim take to complete the same work if he is 25% more efficient than Joey?
SSC CHSL 03/07/2024 (1st Shift)
(a) 12 (b) 16 (c) 8 (d) 10

Q.65. 18 men can complete $\frac{1}{5}$ of a work in 10 days. How many people are required to complete $\frac{2}{5}$ of the same work in 5 days ?
SSC CHSL 03/07/2024 (2nd Shift)
(a) 72 (b) 90 (c) 36 (d) 54

Q.66. A and B can complete a piece of work in 12 days. B and C can complete the same work in 15 days and C and A in 10 days. How many days will A take to complete the work by himself?
SSC CHSL 03/07/2024 (3rd Shift)
(a) $9\frac{1}{8}$ (b) $16\frac{1}{7}$ (c) $17\frac{1}{7}$ (d) $13\frac{3}{7}$

Q.67. Riya and Sangeeta can finish a work in 6 days and 8 days, respectively. Riya started the work alone and then after 3 days, Sangeeta joined Riya. They both finish the remaining work. How long did the total work last ?
SSC CHSL 03/07/2024 (4th Shift)
(a) $4\frac{4}{7}$ days (b) $4\frac{3}{7}$ days
(c) $4\frac{2}{7}$ days (d) $4\frac{5}{7}$ days

Q.68. A and B can complete a piece of work in 15 days. B and C in 30 days and C and A in 45 days. In how many days will they complete the work if they start working together?
SSC CHSL 04/07/2024 (1st Shift)
(a) $16\frac{4}{11}$ (b) $11\frac{1}{3}$ (c) $8\frac{3}{11}$ (d) $11\frac{2}{3}$

Q.69. A can complete a piece of work in 20 days and B can complete the same work in 10 days. With the help of C, working together they completed the work in 5 days. The number of days in which C alone can complete the work is:
SSC CHSL 04/07/2024 (2nd Shift)
(a) 20 (b) 25 (c) 10 (d) 15

Q.70. To finish a work in 12 days, 8 workers are engaged. After 2 days, due to some urgency, the work is to be finished in next 2 days. How many more workers are to be engaged now to finish it on time?
SSC CHSL 04/07/2024 (3rd Shift)
(a) 36 (b) 32 (c) 40 (d) 30

Q.71. Akhil can complete a piece of work in 24 days. Shyam can complete the same piece of work in 12 days. If both of them work together, in how many days can they complete the same piece of work ?
SSC CHSL 04/07/2024 (4th Shift)
(a) 12 days (b) 8 days
(c) 10 days (d) 6 days

Q.72. Sobhita can complete a painting work in 20 hours while Saroj can complete the same work in 15 hours. In how much time (in hours) can the entire work of painting be completed, if both Sobhita and Saroj work simultaneously?
SSC CHSL 05/07/2024 (2nd Shift)
(a) 7 (b) 8 (c) $8\frac{4}{7}$ (d) $7\frac{4}{7}$

Q.73. A work can be done by a man and a woman in 12 days and 8 days, respectively. In how many days will the work be done by 6 men and 4 women ?
SSC CHSL 05/07/2024 (3rd Shift)
(a) 2 (b) $\frac{3}{4}$ (c) 1 (d) $\frac{1}{2}$

Q.74. X and Y can do a job in 18 days; Y and Z can do the same in 24 days. If all the three can finish the job in 12 days, in how many days can X and Z can complete the job?
SSC CHSL 05/07/2024 (4th Shift)
(a) $14\frac{2}{5}$ (b) $12\frac{3}{5}$ (c) 7 (d) 5

Q.75. Rohan takes 10 hours to mow a large lawn. He and Mohan together can mow it in 4 hours. How long will Mohan take to mow the lawn if he works alone?
SSC CHSL 08/07/2024 (2nd Shift)
(a) $\frac{40}{3}$ hours (b) $\frac{10}{3}$ hours
(c) $\frac{20}{3}$ hours (d) $\frac{16}{3}$ hours

Q.76. R can finish a work in 6 days if he works 10 hours a day. S can finish it in 5 days if he works 8 hours a day. If both start a work and work daily for 6 hours, the work will be finished in _____ days.
SSC CHSL 08/07/2024 (3rd Shift)
(a) 5 (b) 4 (c) 3 (d) 6

Q.77. Tanvi can do a work in 25 days, and Tai can complete the same work in 30 days. They started the work together for 5 days. How much work is left?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 08/07/2024 (4th Shift)
(a) $\frac{11}{30}$ (b) $\frac{1}{12}$ (c) $\frac{11}{12}$ (d) $\frac{19}{30}$

Q.78. Rohan can alone finish a work in 12 days and Hari can alone in 16 days. They both work for 3 days and then Rohan left. After that only Hari works and finishes the work. The total work will be completed in:
SSC CHSL 09/07/2024 (1st Shift)
(a) $12\frac{1}{3}$ days (b) 9 days
(c) 12 days (d) $12\frac{2}{3}$ days

Q.79. 30 men working 5 hours a day can do work in 18 days. In how many days will 20 men working 7 hours a day do the same work ?
SSC CHSL 09/07/2024 (2nd Shift)
(a) $19\frac{2}{7}$ (b) $13\frac{1}{7}$ (c) $16\frac{5}{7}$ (d) $11\frac{3}{7}$

Q.80. If 6 engineers can complete a work in 5 days and 5 skilled workers can complete the same work in 7 days, then the time taken (in days) to complete the same work by 7 engineers and 4 skilled workers will be:
SSC CHSL 09/07/2024 (3rd Shift)
(a) $2\frac{64}{70}$ (b) $2\frac{64}{73}$ (c) $2\frac{65}{73}$ (d) $3\frac{64}{73}$

Q.81. To finish a work, P takes half of the number of days required by Q to finish it. If they together can finish the work in 36 days, then in how many days Q alone can finish the Work?
SSC CHSL 10/07/2024 (1st Shift)
(a) 84 (b) 60 (c) 24 (d) 108

Q.82. 55 workers can finish a work in 16 days. For finishing the same work in 10 days, how many more workers are required?
SSC CHSL 10/07/2024 (1st Shift)
(a) 88 (b) 68 (c) 33 (d) 31

Q.83. P and Q can do a work in 12 days and 9 days, respectively. They both worked together and earned ₹63,000. The share of P (in ₹) is:
SSC CHSL 10/07/2024 (2nd Shift)
(a) 21,000 (b) 9,000
(c) 27,000 (d) 36,000

Q.84. Reena and Riya together can complete a piece of work in 36 days. Riya and Geeta together can complete it in 54 days. Reena and Geeta together can complete it in 81 days. In how many days can Reena alone complete the work ?
SSC CHSL 10/07/2024 (3rd Shift)
(a) $82\frac{4}{7}$ days (b) $97\frac{4}{7}$ days
(c) $87\frac{4}{7}$ days (d) $92\frac{4}{7}$ days

Q.85. Nirmal completed the school project in 45 days. How many days will Amit take to complete the same work if he is 25% more efficient than Nirmal ?
SSC CHSL 11/07/2024 (1st Shift)
(a) 30 (b) 25 (c) 36 (d) 38

Q.86. Mira can complete a piece of work in 20 days, Nina in 30 days and Sima in 40 days. Mira and Sima worked together for 4 days and then Mira was replaced by Nina. In how many days, altogether, was the work completed?
SSC CHSL 11/07/2024 (2nd Shift)
(a) 18 (b) 20 (c) 16 (d) 14

Q.87. Teena does half of a task in 6 days. Later, with Shyam's help, she completes the remaining work in 4 days. Shyam alone can finish the entire work in:
SSC CHSL 11/07/2024 (3rd Shift)
(a) 12 days (b) 18 days
(c) 21 days (d) 24 days

Q.88. X, Y and Z can do a work in 24 days, 5 days and 12 days, respectively. In how many days can they do the same work if they work together?
SSC CHSL 11/07/2024 (4th Shift)
(a) $\frac{1}{24}$ (b) $3\frac{1}{13}$ (c) 4 (d) $\frac{7}{24}$

SSC CPO 2024 Tier - 1

Q.89. A can do a work in 20 days and B in 30 days. If they work on it together for 2 days, then what is the fraction of the work that is left ?
SSC CPO 27/06/2024 (1st Shift)
(a) $\frac{5}{7}$ (b) $\frac{5}{8}$ (c) $\frac{5}{6}$ (d) $\frac{3}{5}$

Q.90. A and B can do a work in 13 days and 26 days, respectively. If they work for a day alternately, starting with A, then in how many days will the work be completed?
SSC CPO 27/06/2024 (2nd Shift)
(a) 17 (b) 16 (c) 13 (d) 14

Q.91. If 24 people can build 90 identical walls in 25 days, then how many more days will 27 people require to build 162 such walls?
SSC CPO 27/06/2024 (3rd Shift)
(a) 16 (b) 14 (c) 15 (d) 13

Q.92. 18 workers can complete a piece of work in 96 days. They start working together and after 26 days 10 more workers join them. In how many days in all will the work be completed ?
SSC CPO 27/06/2024 (3rd Shift)
(a) 69 (b) 71 (c) 72 (d) 70

Q.93. A and B together can complete a piece of work in 25 days, B and C together can complete the same piece of work in 36 days, while C and A together can complete it in 30 days. If A, B, C, and D together can complete this piece of work in 18 days, then in how many days can D alone complete this piece of work?
SSC CPO 28/06/2024 (1st Shift)
(a) 225 (b) 210 (c) 200 (d) 180

Q.94. Ravi and Sanju together can do a job in 2 days, Sanju and Mahesh can do it in 4 days, while Ravi and Mahesh can do it in 2 days. What is the number of days required for Ravi to do the same job alone?
SSC CPO 28/06/2024 (1st Shift)
(a) 9 (b) $\frac{8}{3}$ (c) $\frac{5}{3}$ (d) 4

Q.95. Manish, Nakul and Pintoo alone can complete a certain work in 21 days, 28 days and 15 days, respectively. Manish and Pintoo started the work together while Nakul joined them after 5 days and worked with them till the completion of the work. For how many days did Nakul work?
SSC CPO 28/06/2024 (2nd Shift)
(a) $3\frac{1}{2}$ (b) $2\frac{1}{2}$ (c) $5\frac{1}{2}$ (d) $2\frac{6}{7}$

Q.96. Tarun is twice as good as Tripti in doing a work. Together, they can complete the work in 16 days. In how many days can Tripti alone complete the same work ?
SSC CPO 28/06/2024 (3rd Shift)
(a) 24 (b) 48 (c) 25 (d) 50

Q.97. Amita can build a room in the same amount of time that Bina and Sita working together can build. If Amita and Bina together could do it in 25 days and Sita alone in 35 days, then how many days are required for Bina alone to do the same work ?
SSC CPO 29/06/2024 (1st Shift)
(a) 152 (b) 175 (c) 165 (d) 180

Q.98. Akash and Vikash can complete a work in 40 days and 60 days, respectively. In how many days will the entire work be completed if they work on alternate days, starting with Akash ?
SSC CPO 29/06/2024 (1st Shift)
(a) 48 (b) 52 (c) 50 (d) 42

Q.99. Sapna is double efficient as compared to Rakesh. If they both work together on a project and complete it in 48 days, then the number of days in which Sapna alone can complete the project is:

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CPO 29/06/2024 (2nd Shift)
(a) 72 (b) $69\frac{1}{2}$ (c) 68 (d) 52

Q.100. A hostel had food provision for 300 students for a month. After 20 days, 50 students left the hostel. How long would the remaining food last? (1 month = 30 days)
SSC CPO 29/06/2024 (2nd Shift)
(a) 10 days (b) 14 days
(c) 12 days (d) 16 days

Q.101. If 12 people can print 540 identical books in 10 days, then how many more people will be required to print 720 such books in 8 days?
SSC CPO 29/06/2024 (3rd Shift)
(a) 8 (b) 12 (c) 6 (d) 4

SSC Selection Post (Phase - XII)

Q.102. A and B can complete a work in 12 and 15 days, respectively. They started the work alternatively for 1 day each and A started the work first. In how much time will 60% of the work be completed?
Matriculation Level 20/06/2024 (Shift - 1)
(a) 9 days (b) 10 days
(c) 7 days (d) 8 days

Q.103. At a construction site, 15 men or 10 machines can construct a room in 66 days. In how many days can 5 men and 4 machines together complete the work?
Matriculation Level 20/06/2024 (Shift - 4)
(a) 80 (b) 75 (c) 85 (d) 90

Q.104. A garrison of 140 men has provisions for 35 days. At the end of 10 days, 35 more men joined them. How many days can they sustain the remaining provisions?
Matriculation Level 20/06/2024 (Shift - 4)
(a) 10 (b) 20 (c) 25 (d) 35

Q.105. If 108 workers can build a wall in 36 days, then in how many days can 48 workers build the same wall?
Matriculation Level 21/06/2024 (Shift - 1)
(a) 72 (b) 63 (c) 81 (d) 54

Q.106. If 6 people are required to complete a work in 1 hour 20 minutes, then how long will only 5 people take to complete the same work?
Matriculation Level 24/06/2024 (Shift - 1)
(a) 105 minutes (b) 90 minutes
(c) 96 minutes (d) 100 minutes

Q.107. A group of men decided to complete a job in 4 days. However, since 10 men dropped out every day, the job got completed at the end of the 7th day. How many men were there in the beginning ?
Matriculation Level 24/06/2024 (Shift - 4)
(a) 140 (b) 70 (c) 35 (d) 90

Q.108. If 8 men or 16 women or 32 boys can do a piece of work in 8 months, then in how many months can 4 men, 4 women and 4 boys together complete the work ?
Higher Secondary 20/06/2024 (Shift - 2)
(a) $6\frac{3}{7}$ (b) $10\frac{5}{7}$ (c) $9\frac{1}{7}$ (d) $8\frac{2}{7}$

Q.109. 3 men can finish a work in 10 days, 4 women can finish it in 12 days and 10 qualified workers can finish it in 6 days. In how many days is the work finished by 4 men, 4 women and 4 qualified workers, working together every day ?
Higher Secondary 21/06/2024 (Shift - 2)
(a) $\frac{30}{19}$ (b) $\frac{60}{17}$ (c) $\frac{45}{17}$ (d) $\frac{60}{19}$

Q.110. A group of 25 tourists consume 5 containers of food in 8 days in a hotel. How many containers will be required for 10 tourists to eat for 16 days?
Higher Secondary 24/06/2024 (Shift - 2)
(a) 4 (b) 3 (c) 6 (d) 5

Q.111. The one-day work of 2 men is equal to the one-day work of 4 women or the one-day work of 8 qualified workers. 10 qualified workers can finish a work in 8 days. If a man, a woman and a qualified worker work in the same order on three different days, the work is finished in _____ days.
Higher Secondary 24/06/2024 (Shift - 2)
(a) $\frac{166}{5}$ (b) $\frac{203}{6}$ (c) $\frac{131}{4}$ (d) $\frac{135}{4}$

Q.112. A work can be finished by 8 men in 10 days working 6 hours a day or same can be finished by 20 qualified workers in 6 days working 8 hours a day. 2 men and 4 qualified workers work simultaneously 10 hours a day, the work will be finished in _____ days.
Higher Secondary 25/06/2024 (Shift - 2)
(a) 10 (b) 8 (c) 12 (d) 9

Q.113. X and Y can do a piece of work in 18 days and 27 days, respectively. Starting with X, they work on alternate days. The whole number of days to complete the work by X and Y is:
Higher Secondary 25/06/2024 (Shift - 2)
(a) 20 (b) 21 (c) 24 (d) 22

Q.114. A can do a piece of work in 25 days. After working for 5 days, he took help of B and completed the work in 8 days. If both A and B had worked together from the beginning, in how many days would they have completed the work ?
Higher Secondary 25/06/2024 (Shift - 4)
(a) 12 (b) 14 (c) 10 (d) 15

Q.115. Sarthak and Mohan are working on alternate days in a workshop. Sarthak can complete the work in 20 days while Mohan can finish in 25 days. Sarthak works on the 1st day, Mohan on the 2nd day, and so on. How much time (in days) will they take on alternate basis ?
Higher Secondary 25/06/2024 (Shift - 4)
(a) $20\frac{1}{5}$ (b) $22\frac{1}{5}$ (c) 23 (d) $22\frac{1}{3}$

Q.116. Working separately, A and B can complete a work in 15 days and 18 days, respectively. If A starts the work and they work on alternate days, one on each day, then in how many days will the work be completed?
Higher Secondary 26/06/2024 (Shift - 2)
(a) $16\frac{1}{3}$ (b) $17\frac{1}{3}$ (c) $15\frac{2}{3}$ (d) $18\frac{2}{3}$

Q.117. A and B can do a work in 15 days and 30 days, respectively. They start working together, but A leaves after 3 days. How much time will B take to complete the remaining work?
Graduate Level 20/06/2024 (Shift - 3)
(a) 28 days (b) 21 days
(c) 24 days (d) 32 days

Q.118. Eight labourers working 10 hours a day completed a work in 18 days. If only 5 labourers are working, then in how many hours a day should they work to finish the work in 24 days?
Graduate Level 20/06/2024 (Shift - 3)
(a) 9 (b) 8 (c) 10 (d) 12

Q.119. Aman and Rajan are working at a construction site. In some engineering experiment, Aman is constructing a wall, while Rajan is demolishing that wall. Aman can completely build the wall in 15 days, while Rajan will take 20 days to completely demolish the wall. In how many days will the complete wall be built for the first time if they work on alternate days, with Aman working on the 1st day ?
Graduate Level 21/06/2024 (Shift - 3)
(a) 120 (b) 117 (c) 57 (d) 113

Q.120. A, B and C can do the same work in 9 days, 12 days and 18 days, respectively. A started the work and worked for 3 days and left. Then, B joined the work and worked for 3 days and left. Then, C joined the work and completed the work. Find the number of days C took to complete the work.
Graduate Level 24/06/2024 (Shift - 3)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) $7\frac{1}{2}$ (b) 7 (c) 8 (d) $8\frac{1}{2}$

Q.121. A and B can do a piece of work in 10 days. B and C can do the same work in 12 days. C and A can do the same work in 15 days. If all the three work together, find the number of days required to complete the work.
Graduate Level 25/06/2024 (Shift - 3)
(a) 12 (b) 6 (c) 10 (d) 8

Q.122. If 12 students can read 4800 pages of a book in 15 days, then how many students can read 7200 pages of the same book in 10 days ?
Graduate Level 26/06/2024 (Shift - 3)
(a) 24 (b) 27 (c) 33 (d) 30

Q.123. 30 persons working 10 hours a day can do 5 units of work in 12 days. How many people are required to do 8 units of that work in 16 days if they work for 8 hours a day ?
Graduate Level 26/06/2024 (Shift - 3)
(a) 30 (b) 38 (c) 45 (d) 47

Q.124. A and B can do a piece of work separately in 10 days and 8 days, respectively. If they work alternately and A begins the work, in how many days will the work be completed ?
Graduate Level 26/06/2024 (Shift - 4)
(a) 10 (b) 8 (c) 9 (d) 12

SSC CHSL 2023 Tier - 2

Q.125. A and B can complete work in 9 days, while B and C can complete the same work in 18 days. When working together A, B and C, can finish the same work in 8 days. How many days will it take for A and C to complete the work together ?
SSC CHSL Tier II 02/11/2023
(a) 11 (b) 13 (c) 12 (d) 14

SSC CPO 2023 Tier - 1

Q.126. P, Q and R, when working individually, can complete a job in, respectively, 36 days, 48 days and 144 days. P, Q and R start working together. P leaves the job 12 days before completion and Q leaves the job 8 days before completion. R works from the beginning till the end of the job. Determine the total number of days taken to complete the job.
SSC CPO 03/10/2023 (1st Shift)
(a) 30 (b) 24 (c) 27 (d) 25

Q.127. A can do a piece of work in 8 days, while B can do it in 7 days. If they work at it alternately beginning with A, then in how many days will the work be completed ?
SSC CPO 03/10/2023 (2nd Shift)
(a) 7 (b) 8 (c) $8\frac{1}{2}$ (d) $7\frac{1}{2}$

Q.128. P and Q can do a work together in 30 days. Q and R can do the same work together in 24 days and R and P together in 20 days. They started the work together, but Q and R left after 10 days. How many more days will P take to finish the remaining work ?
SSC CPO 03/10/2023 (2nd Shift)
(a) 23 (b) 19 (c) 21 (d) 18

Q.129. If 4 men or 6 boys can finish a piece of work in 20 days, then in how many days can 6 men and 11 boys finish the same work ?
SSC CPO 03/10/2023 (3rd Shift)
(a) 5 (b) 7 (c) 8 (d) 6

Q.130. A and B undertake a project worth ₹36,000. A alone can do the work in 25 days. They worked together for 5 days. For the next five days, B worked alone. After that, A substituted B and completed the remaining work in 5 days. The share of A in the earnings is:
SSC CPO 04/10/2023 (1st Shift)
(a) ₹ 21,600 (b) ₹ 14,400
(c) ₹ 14,600 (d) ₹ 21,400

Q.131. In an office, 75 employees can finish a project in 60 days. After few days, 15 employees left the job and the project was completed in 65 days. After how many days did the 15 employees leave ?
SSC CPO 04/10/2023 (2nd Shift)
(a) 40 (b) 50 (c) 45 (d) 30

Q.132. Akshita and Raina are typing a book, but have only one laptop to work upon. They decided that they will work on alternate basis such that Akshita works for the first day, Raina works for the second day, Akshita for the third day and so on. Akshita alone can finish the typing work in 16 days, while Raina will take 24 days if she works alone on the entire book. How many days will they take to finish the typing work if they work on alternate basis?
SSC CPO 04/10/2023 (2nd Shift)
(a) 19 (b) 15 (c) 17 (d) 18

Q.133. 36 equally efficient workers can paint 25 identical walls in 48 days. In how many days can 45 such workers paint 60 such walls ?
SSC CPO 04/10/2023 (3rd Shift)
(a) 91.96 (b) 92.16 (c) 92.36 (d) 91.16

Q.134. If 2 men or 4 women can build a wall in 34 days, in how many days can 6 men and 5 women build the same wall ?
SSC CPO 05/10/2023 (1st Shift)
(a) 8 (b) 16 (c) 24 (d) 12

Q.135. A and B complete a work in 24 and 30 days, respectively, working 10 hours per day. The work is to be done in two shifts. The morning shift is for 6 hours and the evening shift is for 4 hours. On the first day, A works in the morning and B works in the evening, and they interchange their shifts every day. On which day did the work get completed
SSC CPO 05/10/2023 (1st Shift)
(a) 24th day (b) 27th day
(c) 30th day (d) 21st day

Q.136. Robert takes twice as much time as Tom and thrice as much time as George to complete a work. If working together, they can complete it in 23 hours, then find the time that Tom will take to complete the work.
SSC CPO 05/10/2023 (2nd Shift)
(a) 39 hours (b) 46 hours
(c) 69 hours (d) 11 hours

Q.137. A can do a certain piece of work in 2.4 times the number of days in which B and C together can do it. If A and B together can do the said piece of work in 27 days and C alone can do it in 75 days, then how many days will B take to do this piece of work alone?
SSC CPO 05/10/2023 (2nd Shift)
(a) 42 (b) 54 (c) 48 (d) 45

Q.138. If Arun can complete $\frac{2}{3}$rd of a work in 12 days, then in how many days can he complete $\frac{1}{6}$th of the same work?
SSC CPO 05/10/2023 (3rd Shift)
(a) 4 (b) 5 (c) 2 (d) 3

SSC MTS 2023 Tier - 1

Q.139. A, B and C can do a piece of work in 10, 15, 12 days, respectively. A and B worked alternately for 5 days each and left. Then C joined and completed the work. In how many days did C complete the remaining work ?
SSC MTS 01/09/2023 (1st Shift)
(a) 3 (b) 1 (c) 4 (d) 2

Q.140. Ram can do a piece of work in 18 hours. Shyam and Naresh can do it in 9 hours. Ram and Naresh can do it in 12 hours. How long will Shyam alone take to do it ?
SSC MTS 01/09/2023 (2nd Shift)
(a) 15 hours (b) 9 hours
(c) 12 hours (d) 11 hours

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.141. A and B can do a piece of work in 9 and 18 days, respectively. They started working together. After some days A left the work and B finished the remaining work in 15 days. After how many days did A leave ?
SSC MTS 01/09/2023 (3rd Shift)
(a) 1 (b) 2 (c) 4 (d) 3

Q.142. 20 men can complete a piece of work in 40 days, and 40 women can do the same work in 60 days. If 10 men and 20 women work together, then in how many days will the work be completed ?
SSC MTS 04/09/2023 (2nd Shift)
(a) 60 (b) 50 (c) 48 (d) 40

Q.143. A, B and C can complete a work in 10, 15 and 20 days, respectively. They work on alternate days such that 1st day A, 2nd day B and 3rd day C. Again 4th day A, 5th day B and so on. If they work in the same way, in how many days will the work be completed?
SSC MTS 04/09/2023 (2nd Shift)
(a) $13\frac{1}{4}$ (b) 15 (c) 14 (d) $13\frac{1}{2}$

Q.144. If P can finish a job in 3 hours and Q can finish the same job in 6 hours independently, then they together will finish the job in x minutes. Find the value of x .
SSC MTS 04/09/2023 (3rd Shift)
(a) 160 (b) 100 (c) 150 (d) 120

Q.145. A man can finish a work in 12 days and a woman can finish the same in 10 days. 2 men and 3 women work on alternate days and men start the first day. The work will be finished in ___ days.
SSC MTS 04/09/2023 (3rd Shift)
(a) $\frac{22}{3}$ (b) $\frac{24}{5}$ (c) $\frac{22}{5}$ (d) $\frac{21}{5}$

Q.146. Akash is thrice as good a workman as Arvind and therefore is able to finish a job in 30 days less than Arvind. If they work together, in how many days can they finish the job ?
SSC MTS 05/09/2023 (1st Shift)
(a) $11\frac{1}{4}$ (b) $11\frac{3}{4}$ (c) $12\frac{3}{4}$ (d) $12\frac{1}{4}$

Q.147. Tushar, Megha, Punam and Richa can complete a piece of work in 10 days, 12 days, 15 days and 18 days, respectively. In how many days will the work be completed if each of them work on alternate days starting with Megha on first day, Punam on second day, Richa on third day, Tushar on fourth day and then again Megha on fifth day and so on.
SSC MTS 05/09/2023 (2nd Shift)
(a) 12 (b) 13 (c) 10 (d) 14

Q.148. A man and a boy can do a piece of work in 12 days . If the man works alone for the last 3 days, it is completed in 13 days. How long would the boy take to do it alone ?
SSC MTS 05/09/2023 (3rd Shift)
(a) 36 day (b) 18 day
(c) 72 day (d) 30 day

Q.149. X can type 8 pages in 3 minutes. Y can type 3 pages in 5 minutes. Working together, how many pages can they type in 15 minutes ?
SSC MTS 06/09/2023 (1st Shift)
(a) 42 (b) 40 (c) 46 (d) 49

Q.150. A and B can finish a work in $5\frac{1}{3}$ days. A alone can finish this work in 8 days. A and B worked on alternate days (starting with B) to finish this work. In how many days will the work be finished?
SSC MTS 06/09/2023 (2nd Shift)
(a) 6 days (b) $11\frac{1}{3}$ days
(c) 11 days (d) $6\frac{1}{3}$ days

Q.151. A can complete a piece of work in 20 days. B can complete the same work in 36 days. If A and B work together, then the number of days required to complete the work is:
SSC MTS 08/09/2023 (1st Shift)
(a) $10\frac{6}{7}$ (b) $12\frac{6}{7}$ (c) $12\frac{1}{7}$ (d) $10\frac{1}{7}$

Q.152. A can do a piece of work in 10 days and B can do it in 15 days. They work together for 2 days and then A leaves. How long will B take to finish the remaining work ?
SSC MTS 08/09/2023 (3rd Shift)
(a) 10 days (b) 22 days
(c) 12 days (d) 5 days

Q.153. Mohan can complete a piece of work in 24 days. He worked for 6 days and left the work. Thereafter. Sohan finished the remaining work in 21 days. In how many days can Mohan and Sohan together complete it ?
SSC MTS 11/09/2023 (1st Shift)
(a) $12\frac{12}{13}$ days (b) $12\frac{9}{13}$ days
(c) $12\frac{11}{13}$ days (d) $12\frac{10}{13}$ days

Q.154. In a fort, 160 men had food for 94 days. After 10 days, 20 men left the fort. How long (in days) would the food last at the same rate ?
SSC MTS 11/09/2023 (1st Shift)
(a) 84 (b) 90 (c) 96 (d) 100

Q.155. A is twice as efficient as B at completing a task, and together they can finish the task in 20 days. How many days would A alone take to complete the task ?
SSC MTS 12/09/2023 (1st Shift)
(a) 34 (b) 30 (c) 28 (d) 32

Q.156. 100 workers working 8 hours a day can dig a canal 2000 metres long in 25 days. Find the number of workers required to dig a similar canal of 2800 metres long in 32 days working 5 hours a day.
SSC MTS 12/09/2023 (1st Shift)
(a) 170 (b) 180 (c) 175 (d) 165

Q.157. A and B can do a piece of work in 10 days. B and C can do the same work in 15 days. If A is twice as good a workman as C. find in what time B alone can do the work (in days).
SSC MTS 12/09/2023 (3rd Shift)
(a) 10 (b) 25 (c) 20 (d) 30

Q.158 A certain number of men complete a piece of work in 60 days. If there were 8 more men called, then the work can be finished in 10 days less than usual. The number of men originally was:
SSC MTS 12/09/2023 (3rd Shift)
(a) 40 (b) 30 (c) 60 (d) 50

Q.159. A and B can do a piece of work in 5 days. B and C can do the same work in 8 days, while C and A can do it in 16 days. Find the time (in days) in which A, B and C can finish the work, working together.
SSC MTS 13/09/2023 (2nd Shift)
(a) $5\frac{4}{31}$ (b) $4\frac{5}{31}$ (c) $5\frac{5}{17}$ (d) $5\frac{5}{31}$

Q.160. A can complete a task in 10 days. He worked for 4 days and then stopped. B completed the remaining work in 9 days. In how many days can A and B together complete the task ?
SSC MTS 13/09/2023 (3rd Shift)
(a) 6 days (b) 5 days (c) 4 days (d) 7 days

Q.161. P can complete $\frac{1}{5}$ of a work in 12 days and Q can complete $\frac{1}{6}$ of work in 8 days. In how many days can both P and Q together complete the work?
SSC MTS 13/09/2023 (3rd Shift)
(a) $26\frac{2}{3}$ (b) $24\frac{2}{3}$ (c) $25\frac{4}{5}$ (d) $22\frac{4}{5}$

Q.162. A and B can do a piece of work in 30 days and 40 days, respectively. They began the work together but after a certain time, A leaves off and B completed the remaining work in 25 days. After how many days did A leave ?
SSC MTS 14/09/2023 (1st Shift)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) $6\frac{3}{7}$ (b) $5\frac{3}{7}$ (c) $5\frac{2}{7}$ (d) $6\frac{1}{7}$

Q.163. 30 men can complete a work in 10 days. They started working and after six days, 10 more men joined them. In how many days will the total work be completed ?
SSC MTS 14/09/2023 (3rd Shift)
(a) 8 (b) 9 (c) 6 (d) 7

Q.164. Arin alone can do a piece of work in 6 days and Selvi alone can do the same in 8 days. Aria and Selvi undertook to do it for ₹7,200. With the help of Kevin, they completed the work in 3 days. How much is to be paid to Kevin?
SSC MTS 14/09/2023 (3rd Shift)
(a) ₹900 (b) ₹700 (c) ₹800 (d) ₹600

SSC CHSL 2023 Tier - 1

Q.165. A, B and C can do a piece of work in 20 days, 30 days and 60 days, respectively, working alone. How soon can the work be done if A is assisted by B and C each on every alternate day ?
SSC CHSL 02/08/2023 (1st Shift)
(a) $\frac{40}{3}$ days (b) $\frac{28}{3}$ days
(c) $\frac{37}{4}$ days (d) $\frac{53}{4}$ days

Q.166. A can finish a work in 15 days, B can finish the same work in 25 days. They work together for 5 days. The rest of the work is finished by A and C in 4 days. Then C alone can finish the work in :
SSC CHSL 02/08/2023 (2nd Shift)
(a) 18 days (b) 24 days
(c) 20 days (d) 21 days

Q.167. A and B can do a piece of work in 10 days and 15 days, respectively. They worked together, but 5 days before the completion of the work, A left. In how many days was the work completed ?
SSC CHSL 02/08/2023 (3rd Shift)
(a) 4 (b) 8 (c) 6 (d) 9

Q.168. Babita is 1.25 times as efficient as Deepak. Working together the duo can complete a piece of work in 40 days. In how many days can Deepak alone complete the same piece of work ?
SSC CHSL 03/08/2023 (2nd Shift)
(a) 84 (b) 90 (c) 96 (d) 100

Q.169. A contractor employed 69 workers to complete a work in 20 days. How many more workers he should employ to complete the work in 12 days ?
SSC CHSL 03/08/2023 (2nd Shift)
(a) 115 (b) 46 (c) 51 (d) 64

Q.170. 4 men and 8 women complete a job in 10 days and 5 men and 24 women complete the same work in 4 days. In how many days will 1 man and 1 woman complete the same work?
SSC CHSL 07/08/2023 (1st Shift)
(a) $63\frac{1}{3}$ days (b) $69\frac{7}{9}$ days
(c) $67\frac{1}{3}$ days (d) $62\frac{2}{9}$ days

Q.171. A and B can finish a work in 6 days and 4 days, respectively. A alone worked on it for 2 days. Thereafter, B joined him. How much total time was taken by them to finish the work ?
SSC CHSL 07/08/2023 (2nd Shift)
(a) $3\frac{3}{5}$ days (b) $1\frac{3}{5}$ days
(c) $3\frac{1}{5}$ days (d) $4\frac{1}{5}$ days

Q.172. A and B together can complete a piece of work in 15 days and B alone can complete it in 21 days. In how many days can A complete it alone ?
SSC CHSL 08/08/2023 (2nd Shift)
(a) $41\frac{1}{2}$ days (b) $52\frac{1}{2}$ days
(c) $31\frac{1}{2}$ days (d) $57\frac{1}{2}$ days

Q.173. Three people A, B and C worked together and finished a work in 9 days. If A alone can finish the same work in 18 days, B alone in 30 days, then the number of days C alone will take is:
SSC CHSL 09/08/2023 (4th Shift)
(a) 36 days (b) 45 days
(c) 40 days (d) 54 days

Q.174. X, Y and Z can complete a piece of work in 20, 12 and 28 days, respectively. If all work together, the approximate number of days to complete the work will be:
SSC CHSL 10/08/2023 (2nd Shift)
(a) 6 (b) 7 (c) 4 (d) 5

Q.175. George can do 35% of the total work in 6 days, Jim and George together completed a piece of work in 12 days. In how many days could Jim, working alone, complete the entire task ?
SSC CHSL 10/08/2023 (3rd Shift)
(a) 36 (b) 40 (c) 42 (d) 45

Q.176. 30 women working 5 hours a day can complete a work in 18 days. In how many days will 21 women working 8 hours a day complete the same work?
SSC CHSL 11/08/2023 (1st Shift)
(a) $18\frac{7}{13}$ days (b) $17\frac{11}{13}$ days
(c) $16\frac{1}{14}$ days (d) $13\frac{3}{14}$ days

Q.177. If 18 mechanics can repair 90 cars in 10 days, how many mechanics will be required to repair 150 cars in 12 days ?
SSC CHSL 11/08/2023 (4th Shift)
(a) 25 (b) 30 (c) 20 (d) 27

Q.178. A can finish a work in 25 days, and B can do the same work in 15 days. B worked for 10 days and left the job. A alone can finish the remaining work in how many days ?
SSC CHSL 14/08/2023 (2nd Shift)
(a) $7\frac{1}{3}$ days (b) $6\frac{1}{3}$ days
(c) $8\frac{1}{3}$ days (d) $5\frac{1}{3}$ days

Q.179. Jason can do a piece of work alone in 23.4 days, while Rafique can do the same piece of work alone in 39 days. In how many days can the duo complete the same work if they work together?
SSC CHSL 14/08/2023 (3rd Shift)
(a) 14.750 (b) 14.625
(c) 14.875 (d) 14.375

Q.180. Ram can complete a piece of work in 18 days, Reena can complete the same work in 12 days, and with the help of Shyam, they finish the same work in six days. In how many days can Shyam alone complete the same work ?
SSC CHSL 14/08/2023 (4th Shift)
(a) 42 (b) 36 (c) 30 (d) 24

Q.181. Raju and Akber take 4 hours and 6 hours to type 32 pages and 48 pages, respectively, on a computer. They are given an assignment of typing 256 pages. If they work together, typing on two different computers, starting at the same time, how much time will they take to complete the assignment (in hours)?
SSC CHSL 17/08/2023 (2nd Shift)
(a) 16 (b) 14 (c) 18 (d) 12

SSC CGL 2023 Tier - 1

Q.182. A can complete a piece of work in 25 days while B can complete the same work in 30 days. They work on alternate basis, starting with A. Both A and B follow this pattern for 5 days and then A leaves the work. In how many days will B finish the remaining work?
SSC CGL 14/07/2023 (1st shift)
(a) $24\frac{2}{5}$ (b) $5\frac{2}{5}$ (c) $5\frac{3}{5}$ (d) $24\frac{3}{5}$

Q.183. P is two times more efficient than Q . P is able to complete a piece of work in 40 days less than Q . Working together, the whole number of days taken by them to complete the work is: (Round off to

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

the nearest integer)
SSC CGL 14/07/2023 (2nd shift)
(a) 26 (b) 25 (c) 15 (d) 28

Q.184. A, B and C can separately complete a work in 12, 15 and 20 days, respectively. They worked together for 4 days. What will be the remaining work ?
SSC CGL 14/07/2023 (4th shift)
(a) $\frac{1}{2}$ (b) $\frac{1}{5}$ (c) $\frac{1}{6}$ (d) $\frac{1}{8}$

Q.185. 15 men and 25 women can complete a piece of work in 9.6 days. If 16 women can complete the same work in 27 days, find the number of days in which 16 men can complete the same work.
SSC CGL 17/07/2023 (1st shift)
(a) 22.50 (b) 20.25 (c) 19.20 (d) 21.60

Q.186. A, B and C can do a piece of work in 30 days, 40 days and 50 days, respectively. Beginning with A, if A, B and C do the work alternatively then in how many days will the work be finished ?
SSC CGL 17/07/2023 (2nd shift)
(a) $38\frac{1}{12}$ (b) $36\frac{1}{2}$ (c) 36 (d) $39\frac{1}{12}$

Q.187. 15 men and 21 women, working together, can do a job in 56 days, while 12 men and 24 women, working together, can do the same job in 64 days. In how many days can the same job be done by 18 men and 24 women, working together
SSC CGL 17/07/2023 (4th shift)
(a) $47\frac{6}{19}$ (b) $47\frac{5}{19}$ (c) $47\frac{9}{19}$ (d) $47\frac{3}{19}$

Q.188. A can do 20% of a job in 7 days and B can do 25% of the job in 7 days if they worked alone. How much of the job (in percentage) can they complete in 7 days if they worked together ?
SSC CGL 17/07/2023 (4th shift)
(a) 38% (b) 52% (c) 56% (d) 45%

Q.189. 30 men can complete a work in 12 days. After 6 days, 24 more men joined them. How many days will they now take to complete the remaining work?
SSC CGL 18/07/2023 (1st shift)
(a) $3\frac{1}{3}$ (b) $3\frac{2}{3}$ (c) $3\frac{1}{2}$ (d) $2\frac{1}{3}$

Q.190. A and B are equally efficient and each could individually complete a piece of work in 30 days, if none took any holiday. A and B started working together on this piece of work, but A took a day off after every four days of work, while B took a day off after every five days of work. If the duo had started work on 01 August 2022, on which date was the work completed ?
SSC CGL 18/07/2023 (3rd shift)
(a) 19 August 2022 (b) 17 August 2022
(c) 16 August 2022 (d) 18 August 2022

Q.191. If Mohit can complete $\frac{2}{3}rd$ of a work in 24 days, then in how many days can $\frac{1}{9}th$ of the work be completed by him?
SSC CGL 19/07/2023 (1st shift)
(a) 8 (b) 4 (c) 6 (d) 5

Q.192. 10 women can do a work in 6 days and 6 men can do the same work in 5 days. If all the men and women work together, then how many days will they take to finish this work ?
SSC CGL 19/07/2023 (3rd shift)
(a) $2\frac{8}{11}$ (b) $4\frac{6}{11}$ (c) $1\frac{2}{11}$ (d) $3\frac{4}{11}$

Q.193. (N + 15) persons, each working for 9 hours a day, can complete 36% of a work in 8 days. (N + 9) persons can complete the remaining work in 20 days, if each of them works for 7 hours per day. Determine the value of N.
SSC CGL 19/07/2023 (4th shift)
(a) 55 (b) 52 (c) 64 (d) 50

Q.194. A and B can individually complete a piece of work in 18 days and 30 days, respectively. A and B started working together, but A left $16\frac{2}{3}$ days before the work is completed and B alone completed the rest of the work. For how many days did A work?
SSC CGL 20/07/2023 (1st shift)
(a) 4 (b) 5 (c) 6 (d) 3

Q.195. A, B and C can do a work in 10 days, 15 days, and 20 days, respectively. They finished that work together and got ₹2,600 as wages. Find C's wage.
SSC CGL 20/07/2023 (2nd shift)
(a) ₹550 (b) ₹600 (c) ₹575 (d) ₹625

Q.196. P and Q can do a job in 24 days, Q and R can do it in 30 days, while P and R can do it in 40 days. X is four times as efficient as P, Y is half as efficient as Q, and Z is 2.5 times as efficient as R. Determine the number of days required to complete the same job if X, Y and Z work together.
SSC CGL 20/07/2023 (3rd shift)
(a) 9 (b) 12 (c) 8 (d) 10

Q.197. X, Y and Z completed a work costing ₹3,400. X worked for 5 days, Y for 7 days and Z for 10 days. If their daily wages are in the ratio of 4 : 5 : 3, how much amount will be received by X?
SSC CGL 20/07/2023 (4th shift)
(a) ₹700 (b) ₹900 (c) ₹800 (d) ₹600

Q.198. A works 3.5 times as fast as B, and A takes 45 days less than B to complete a job when each works alone. Calculate the number of days taken to complete the same job if A and B work together.
SSC CGL 21/07/2023 (1st shift)
(a) 10.5 (b) 17.5 (c) 21 (d) 14

Q.199. A is 40% more efficient than B. How much time will they take to work together to complete a job, which A alone could have done in 31 days?
SSC CGL 21/07/2023 (4th shift)
(a) $\frac{217}{12}$ days (b) $\frac{515}{32}$ days
(c) $\frac{215}{12}$ days (d) $\frac{517}{32}$ days

Q.200. P takes twice as long as Q or three times as long as R to complete a task. If they work together, they can complete the task in two days. How long will it take Q to complete the task on his own?
SSC CGL 24/07/2023 (1st shift)
(a) 8 days (b) 6 days
(c) 5 days (d) 7 days

Q.201. A can do a certain piece of work in 1.5 times the number of days in which B and C together can do it. If A and B together can do the said piece of work in 30 days and C alone can do it in 120 days, then how many days will B take to do this piece of work alone?
SSC CGL 24/07/2023 (2nd shift)
(a) 75 (b) 45 (c) 60 (d) 50

Q.202. 4 women and 7 men earn a total of ₹11,480 in 7 days, while 10 women and 17 men earn a total of 36,360 in 9 days. How much will 11 women and 9 men together earn (in ₹) in 13 days ?
SSC CGL 24/07/2023 (3rd shift)
(a) 42770 (b) 42640 (c) 42510 (d) 42900

Q.203. 6 labourers can finish a work in 16 days. 10 labourers are available, but the work is to be finished by 8 days. How many more labourers are to be called to finish the work in time ?
SSC CGL 24/07/2023 (4th shift)
(a) 2 (b) 0 (c) 4 (d) 1

Q.204. R, S and T can finish a work in 20, 15 and 10 days, respectively. R works on all days and S and T work on alternate days with T starting the work on the first day. In how many days is the work finished?
SSC CGL 24/07/2023 (4th shift)
(a) $\frac{61}{7}$ (b) $\frac{50}{7}$ (c) $\frac{52}{7}$ (d) $\frac{57}{8}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.205. P and Q together complete a job in $4\frac{2}{5}$ days. R and S complete the same job in $4\frac{8}{9}$ days. If P, Q, R and S work together, how many days do they need to complete the same job ?
SSC CGL 25/07/2023 (2nd shift)
(a) $2\frac{7}{18}$ (b) $1\frac{7}{18}$ (c) $1\frac{6}{19}$ (d) $2\frac{6}{19}$

Q.206. A group of college students had decided to complete a project in 10 days. As 2 students dropped out every day, the project got completed at the end of the 15th day. The number of students at the beginning of the project was:
SSC CGL 25/07/2023 (4th shift)
(a) 42 (b) 40 (c) 35 (d) 45

Q.207. 20 women and 15 men together can complete a work in 6 days. It takes 150 days for a single woman to complete the same work. In how many days can a single man complete the work ?
SSC CGL 25/07/2023 (4th shift)
(a) 450 (b) 225 (c) 350 (d) 210

Q.208. 4 men's work is equal to 6 women's work, and 4 women's work is equal to 6 boys' work. A boy can finish the work in 60 days. In how many days can the work be finished by a man and a woman together ?
SSC CGL 26/07/2023 (1st shift)
(a) 16 (b) 24 (c) 20 (d) 12

Q.209. A group of men decided to do a job in 11 days but 16 men left the work after each day. The work, as a result, got completed in 15 days. How many men were there initially in the group?
SSC CGL 26/07/2023 (1st shift)
(a) 400 (b) 480 (c) 420 (d) 450

Q.210. 15 men complete a work in 10 days. 15 women complete the same work in 12 days. If all these men and women work together, then the number of days required to complete that work is:
SSC CGL 26/07/2023 (4th shift)
(a) $5\frac{5}{11}$ (b) $4\frac{3}{11}$ (c) $7\frac{2}{11}$ (d) $6\frac{4}{11}$

Q.211. A man, a woman and a boy cancomplete a job in 3, 5 and 15 days, respectively. How many boys must assist 1 man and 1 woman to complete the job in $\frac{1}{5}$ of a day ?
SSC CGL 27/07/2023 (1st shift)
(a) 67 (b) 35 (c) 56 (d) 47

Q.212. A, B and C can do a piece of work in 20, 30 and 60 days, respectively. In how many days can A do the work if he is assisted by both B and C on every third day ?
SSC CGL 27/07/2023 (2nd shift)
(a) 10 (b) 15 (c) 12 (d) 18

Q.213. Benny can do a piece of work in 24 days. Chethan and David can do the same work individually in 36 and 48 days, respectively. All of them begin the work together. However, Benny leaves the work 4 days before the completion of work and Chethan leaves the work 10 days before the completion of the work. David worked till the end and completed the work. Find the number of days in which the work was completed
SSC CGL 27/07/2023 (2nd shift)
(a) 16 (b) 20 (c) 18 (d) 15

SSC Selection Post (Phase - XI)

Q.214. Anita and Anand can complete a work in 12 days and 18 days respectively. They undertook to complete that work for 48,000. With the help of Arun, they completed the work in 6 days. Find the sum of the shares of Anita and Anand (in₹).
Graduate Level 27/06/2023 (Shift - 4)
(a) 40000 (b) 8000 (c) 16000 (d) 24000

Q.215. Maya completes $\frac{7}{10}$ of a work in 15 days and then she completes the remaining work with the help of Suresh in 4 days. In how many days can Maya and Suresh complete the whole work?
Higher Secondary 28/06/2023 (Shift - 2)
(a) $\frac{40}{3}$ (b) $\frac{38}{3}$ (c) $\frac{35}{3}$ (d) $\frac{32}{3}$

Q.216. X,Y and Z can do a piece of work in 4 days, 5 days and 7 days, respectively. They get ₹415 for completing the work. If X,Y and Z have worked together to complete the work, what is X's share ?
Matriculation Level 28/06/2023 (Shift - 1)
(a) ₹275 (b) ₹175 (c) ₹ 200 (d) ₹225

Q.217. 16 men can dig a ditch 24 m long in 18 days, working 6 hours a day. How many more men should be engaged to dig a similar ditch 42 m long in 9 days, each man now working 12 hours per day?
Matriculation Level 30/06/2023 (Shift - 3)
(a) 14 (b) 10 (c) 12 (d) 9

Q.218. Shivam can do a piece of work in 6 days and Vivek in 24 days. They started work together but Shivam left the work 3 days before its completion. In how many days was the work completed ?
Matriculation Level 30/06/2023 (Shift - 3)
(a) $7\frac{4}{5}$ (b) $7\frac{2}{5}$ (c) $7\frac{3}{5}$ (d) $7\frac{1}{5}$

SSC CHSL 2022 Tier - 2

Q.219. A can do a piece of work in 30 days, B in 50 days and C in 40 days. If A is assisted by B on one day and by C on the next day alternately, the work will be completed in :
SSC CHSL Tier II (26/06/2023)
(a) $17\frac{33}{35}$ days (b) $17\frac{32}{35}$ days
(c) $17\frac{31}{35}$ days (d) $17\frac{34}{35}$ days

SSC MTS 2022 Tier - 1

Q.220. P alone can complete a work in 15 days and Q alone can complete the same work in 12 days. They start the work together but after 3 days P leaves the work. How much time will Q take to finish the remaining work?
SSC MTS 03/05/2023 (Morning)
(a) 7.2 days (b) 7.8 days
(c) 8.5 days (d) 6.6 days

Q.221. Suresh alone can do a work in 10 days working 1 hour a day. Shalu alone can do the same work in 2 days working 5 hours a day. How many hours do they need to work together in a day to complete the same work in 10 days ?
SSC MTS 08/05/2023 (Afternoon)
(a) 1.5 hours (b) 0.5 hours
(c) 1 hours (d) 2 hours

Q.222. A and B working together can complete a job in 90 days. The ratio of their efficiencies is 3 : 5. In how many days can the faster person complete the job ?
SSC MTS 09/05/2023 (Afternoon)
(a) 90 (b) 80 (c) 144 (d) 118

Q.223. A, B and C are assigned to complete a work. If the ratio of time taken by A, B and C is 4 : 3 : 6. Find the ratio of their efficiency.
SSC MTS 10/05/2023 (Evening)
(a) 3 : 4 : 2 (b) 4 : 3 : 6
(c) 3 : 4 : 6 (d) 4 : 6 : 8

Q.224. There are 1200 men in a group. They have food for 80 days. After 5 days, 400 men left the group. Remaining food will last for how many days ?
SSC MTS 12/05/2023 (Afternoon)
(a) 125 days (b) 110.5 days
(c) 140.8 days (d) 112.5 days

Q.225. X can do a piece of work alone in 15 days while Y alone can do it in 10 days. They worked together for 3 days and the remaining work is finished by Z in 1 day. If they get paid Rs.4000 for the entire work, then what is the share of Z ?
SSC MTS 12/05/2023 (Evening)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) Rs.2000 (b) Rs.1000
(c) Rs.1200 (d) Rs.800

Q.226. A alone can complete a work in 25 days and B alone can complete the same work in 50 days. If both of them work together, then in 9 days what percent work of the total work will be completed ?
SSC MTS 17/05/2023 (Evening)
(a) 49 % (b) 60 % (c) 45 % (d) 54 %

Q.227. X alone can finish a work in 18 days. Y alone can finish the same work in 9 days. If X, Y and Z together can finish the same work in 4 days, then in how many days Z alone can finish the work ?
SSC MTS 18/05/2023 (Morning)
(a) 12 (b) 10 (c) 14 (d) 16

Q.228. Mohit and Rohit undertook a work for Rs. 2200. Mohit alone can do that work in 10 days and Rohit alone can do the same work in 12 days. If they work together, then what will be the difference in the amount they receive?
SSC MTS 13/06/2023 (Afternoon)
(a) Rs. 500 (b) Rs. 200
(c) Rs. 600 (d) Rs. 400

Q.229. P , Q and R alone can do a piece of work in 5, 6 and 4 days respectively. All three of them began the work together but Q left 1 days before completion of the work. In how many days was the work completed?
SSC MTS 15/06/2023 (Afternoon)
(a) $\frac{70}{37}$ (b) $\frac{100}{27}$ (c) 3 (d) $\frac{80}{23}$

Q.230. B and C can complete a work alone in 10 days and 30 days respectively. They began the work together but B left the work after some days and C completed the remaining work in 10 days. After how many days from the beginning B left the work ?
SSC MTS 15/06/2023 (Evening)
(a) 4 (b) 6 (c) 8 (d) 5

Q.231. Shreyas can complete $\frac{4}{5}$ part of a work in 16 days. Ruchi is 2.5 times as efficient as Shreyas. In how many days will Ruchi alone can complete the same work ?
SSC MTS 19/06/2023 (Morning)
(a) 9 days (b) 12.5 days
(c) 10 days (d) 8 days

Q.232. A is two times as efficient as B. A can complete a work in 20 days less than B. If both of them work together, then in how many days will the same work be completed ?
SSC MTS 20/06/2023 (Afternoon)
(a) $\frac{40}{3}$ (b) $\frac{27}{2}$ (c) 20 (d) 15

SSC CHSL 2022 Tier - 1

Q.233. Mohit and Rohit undertook a work for Rs. 4400. Mohit alone can do that work in 10 days and Rohit alone can do the same work in 15 days. If they work together, then what will be the difference in the amount they receive ?
SSC CHSL 09/03/2023 (4th Shift)
(a) Rs. 800 (b) Rs. 1050
(c) Rs. 900 (d) Rs. 880

Q.234. If A alone can complete a work in 20 days and B alone can complete the same work in 30 days, then which of the following statement(s) is/are correct ?
I. Ratio of efficiency of A and B is 3 : 2.
II.Working together A and B can complete the same work in 12 days.
SSC CHSL 10/03/2023 (2nd Shift)
(a) Neither I nor II (b) Both I and II
(c) Only II (d) Only I

Q.235. A is thrice as good a workman as B and together they can finish a work in 32 days. In how many days will B alone complete the same work ?
SSC CHSL 14/03/2023 (4th Shift)
(a) 96 (b) 104 (c) 112 (d) 128

Q.236. P, Q and R can complete a work alone in 12, 15 and 20 days respectively. They started the work together. P left the work 8 days before the work was completed and Q left the work 5 days after P had left. R completed the remaining work alone. How many days will be required to complete the whole work?
SSC CHSL 15/03/2023 (4th Shift)
(a) $\frac{32}{3}$ (b) 10 (c) $\frac{28}{3}$ (d) $\frac{25}{3}$

Q.237. Rani can do a work in 10 days, Priya can do the same work in 15 days and Guddu can do the same work in 12 days. If they do that work together and they are paid Rs. 9000, then what is the share of Priya ?
SSC CHSL 17/03/2023 (2nd Shift)
(a) Rs.2400 (b) Rs.3000
(c) Rs.3500 (d) Rs.3600

Q.238. A certain number of persons can complete a work in 90 days. If there be 10 persons less, it would have taken 10 days more for the work to be completed. Find the total number of persons in the beginning.
SSC CHSL 20/03/2023 (1st Shift)
(a) 90 (b) 110 (c) 85 (d) 100

Q.239. A alone can complete a work in 20 days with full efficiency. If the efficiency of A decreases by 20 percent. then A alone can do the same work in how many days?
SSC CHSL 20/03/2023 (4th Shift)
(a) 30 (b) 20 (c) 25 (d) 36

Q.240. A can complete $\frac{3}{8}$ part of a work in 36 days. B can complete $\frac{1}{2}$ part of the same work in 27 days. Which of the following statement(s) is/are correct ?
I. A is less efficient than B.
II. A and B working together can complete $\frac{11}{15}$ part of the same work in 36 days.
SSC CHSL 21/03/2023 (1st Shift)
(a) Neither I nor II (b) Only I
(c) Only II (d) Both I and II

SSC CGL 2022 Tier - 2

Q.241. Working for 10 hours per day, 6 men can build a wall in a certain number of days. By working for how many hours/minutes per day can 12 men build the wall in the same days?
SSC CGL Tier II (07/03/2023)
(a) 7 hours 30 minutes (b) 5 hours
(c) 20 hours (d) 10 hours

SSC CGL 2022 Tier - 1

Q.242. A takes 4 times as much times as B or 5 times as much time as C to finish a piece of work. Working together, they can finish the work in 4 days. B can do the work alone in:
SSC CGL 01/12/2022 (3rd Shift)
(a) 10 days (b) 15 days
(c) 12 days (d) 20 days

Q.243. A takes twice as much time as B and thrice as much time as C to finalise a task. Working together, they can complete the task in 8 days. The time (in days) taken by A, B and C, respectively, to complete the task is:
SSC CGL 02/12/2022 (2nd Shift)
(a) 42, 21, 14 (b) 60, 30, 20
(c) 54, 27, 18 (d) 48, 24, 16

Q.244. Ruchi, Khushi and Teju can do a piece of work in 30, 40 and 60 days respectively. In how many days can Ruchi do the work, if she is assisted by both Khushi and Teju on every third day?
SSC CGL 03/12/2022 (1st Shift)
(a) $\frac{550}{12}$ days (b) $\frac{85}{4}$ days
(c) $\frac{71}{2}$ days (d) $\frac{360}{17}$ days

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.245. A contractor decided to complete a work in 80 days and employed 60 men at the beginning and 20 men additionally after 20 days and got the work completed as per schedule. If he had not employed the additional men, how many extra days would he have needed to complete the work (round off to the nearest integer)?
SSC CGL 05/12/2022 (2nd Shift)
(a) 32 (b) 20 (c) 30 (d) 26

Q.246. A group of men decided to do a job in 6 days, but 18 men dropped out every day. If the job was completed in 8 days, then how many men initially decided to do the job.
SSC CGL 06/12/2022 (2nd Shift)
(a) 300 (b) 252 (c) 188 (d) 150

Q.247. In a partnership firm two partners, Vijay and Praveen are working on an assignment. It will take 12 weeks for Vijay to complete the entire assignment alone, while Praveen will take 8 weeks to complete it alone. Due to work pressure, they decided to work on that assignment on the alternate week basis. In the first week Praveen will work and in the second week Vijay will work and so on. In how many weeks the work will be completed if they work on an alternate week basis?
SSC CGL 07/12/2022 (2nd Shift)
(a) 8 (b) 8.5 (c) 9.5 (d) 9

Q.248. 20 men can finish a work in 220 days, but at the end of 90 days, 20 additional men are employed. In how many more days will the work be completed?
SSC CGL 09/12/2022 (2nd Shift)
(a) 50 (b) 60 (c) 65 (d) 55

Q.249. Abha and Anuj working together completed a job in $\frac{40}{9}$ days. If Abha had worked twice as efficiently as she actually did and Anuj had worked $\frac{1}{3}$ of his actual efficiency, then the work would have been completed in $\frac{60}{17}$ days. Find the time Abha would take to complete the work alone.
SSC CGL 09/12/2022 (3rd Shift)
(a) 10 days (b) 8 days
(c) 12 days (d) 6 days

Q.250. Two persons A and B working separately can sanitise a building in 6 and 10 hours, respectively. They work in stretches of one hour alternately. If A begins at 8 a.m., then when will the work be finished ?
SSC CGL 13/12/2022 (3rd Shift)
(a) $9\frac{1}{3}$h (b) $7\frac{1}{3}$h (c) $6\frac{1}{3}$h (d) $8\frac{1}{3}$h

SSC CPO 2022 Tier - 1

Q.251. To do a certain task X would take 3 times as long as Y and Z together; and Z would takes 4 times as long as Y and X together. Three of them together can complete the task in 10 days. How much time is taken by X and Z to complete the task?
SSC CPO 09/11/2022 (Morning)
(a) $18\frac{2}{9}$ days (b) $20\frac{1}{9}$ days
(c) $21\frac{1}{9}$ days (d) $22\frac{2}{9}$ days

Q.252. A group of men committed to completing a task in 20 days. The work was completed in 40 days because 5 workers did not come for work. Determine the number of men who originally agreed to do the work.
SSC CPO 11/11/2022 (Morning)
(a) 15 (b) 10 (c) 12 (d) 18

SSC CGL 2021 Tier - 2

Q.253. A alone can do a work in 14 days. B alone can do the same work in 28 days. C alone can do the same work in 56 days. They start the work together and completed the work such that B was not working on last 2 days and A did not work in last 3 days. In how many days (total) was the work completed?
SSC CGL Tier II (08/08/2022)
(a) $\frac{82}{7}$ (b) $\frac{79}{7}$ (c) $\frac{65}{7}$ (d) $\frac{72}{7}$

Q.254. A alone can do a work in 11 days. B alone can do the same work in 22 days. C alone can do the same work in 33 days. They work in the following manner:
Day 1 : A and B work.
Day 2 : B and C work.
Day 3 : C and A work.
Day 4 : A and B work. And so on.
In how many days will the work be completed?
SSC CGL Tier II (08/08/2022)
(a) 9 (b) 12 (c) 3 (d) 6

SSC Selection Post (Phase - X)

Q.255. On a construction site, Pankaj and Tarun are two workers who have been assigned to break the stones for flooring. Pankaj can complete the work alone in 16 h, while Tarun will take 24 h. They decided to work alternate hours so that they can take rest in between. Pankaj starts in the first hour and then Tarun and so on. In how many hours will they complete the work together if they work on the basis of alternate hours?
Graduate Level 03/08/2022 (Shift - 3)
(a) 21 (b) 19 (c) 22 (d) 23

Q.256. Anjali is designing a wall for a social cause. In 14 days, she completed $\frac{7}{11}$ of the work. In how many days will she complete the remaining work ?
Graduate Level 04/08/2022 (Shift - 4)
(a) 10 (b) 9 (c) 12 (d) 8

Q.257. A, B and C can complete a piece of work in 3 days, 4 days and 6 days, respectively. They get Rs.432 for completing the job. If A, B and C work together to complete the job, A's share is:
Higher Secondary 01/08/2022 (Shift - 3)
(a) Rs.72 (b) Rs.192
(c) Rs.108 (d) Rs.144

Q.258. Suppose every three adults consume 2 litres of milk, 0.5 kg sugar every day and the daily consumption of every five children is double the milk and half of the sugar than what the three adults consume. A family has 5 adults and 8 children. Their expenditure on milk and sugar, for a month of 30 days, if half-litre milk packets costs Rs.25 and one kg sugar packet costs Rs.80, is ___.
Higher Secondary 02/08/2022 (Shift - 2)
(a) Rs.21,960 (b) Rs.17,560
(c) Rs.18,540 (d) Rs.19,630

Q.259. If machine A and B can produce 800 units in 3 hours and 8 hours, respectively, in how many hours can machine A and B working together at these constant rates produce 800 units?
Higher Secondary 05/08/2022 (Shift - 2)
(a) $\frac{26}{11}$ (b) $\frac{25}{11}$ (c) $\frac{24}{11}$ (d) $\frac{27}{11}$

SSC MTS 2021 Tier - 1

Q.260. A piece of work can be completed by P and Q together in 24 days, and the same piece of work can be completed by R alone in 60 days. If P and R together can do the same work in 36 days, then find the time taken by Q to complete this piece of work alone.
SSC MTS 11/07/2022 (Evening)
(a) $8\frac{4}{5}$ days (b) $29\frac{9}{13}$ days
(c) $3\frac{6}{7}$ days (d) $32\frac{8}{11}$ days

Q.261. Ajay, Vijay and Sashi can do a piece of work in 20, 40 and 60 days, respectively. In how many days can Ajay

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

do the work if he is assisted by Vijay and Sashi on every fourth day ?
SSC MTS 12/07/2022 (Evening)
(a) 15 (b) $\frac{50}{3}$ (c) 12 (d) $\frac{44}{3}$

Q.262. D_1 and D_2 can do a piece of work together in 16 days, D_2 and D_3 can do the same work together in 24 days, while D_3 and D_1 can do it together in 48 days. In how many days can all 3, working together , do $\frac{5}{6}$ of the work?
SSC MTS 13/07/2022 (Morning)
(a) $\frac{31}{3}$ (b) $\frac{40}{3}$ (c) $\frac{35}{3}$ (d) $\frac{38}{3}$

Q.263. In a job Z_1, Z_2 and Z_3 work for 8, 10 and 15 days, respectively. The ratio of the daily wages of Z_1, Z_2 and Z_3 is 3 : 4 : 4 respectively. If they receive ₹4,960 as total wages for the work done, then what is the combined share of z_2 and z_3 in the total wages received?
SSC MTS 13/07/2022 (Morning)
(a) ₹4,800 (b) ₹4,000
(c) ₹4,400 (d) ₹4,200

Q.264. Kajal can do a piece of work alone in 24 days, while Neha can do the same work in 40 days. Kajal started the work alone, and then after 12 days, Neha joined her till the completion of the work. How long did the work take to be completed since kajal started to work on it?
SSC MTS 26/07/2022 (Afternoon)
(a) $\frac{37}{4}$ days (b) $\frac{39}{2}$ days
(c) $\frac{37}{2}$ days (d) $\frac{39}{4}$ days

SSC CHSL 2021 Tier - 1

Q.265. The ratio of time taken by Anamika and Bani to complete a work is 1 : 3, respectively. Therefore, Anamika is able to finish a job in 40 days less than Bani. If they work together, they can complete the work in _____ days.
SSC CHSL 31/05/2022 (Evening)
(a) 20 (b) 10 (c) 15 (d) 25

Q.266. In one-sixth of the time that B takes to complete a piece of work, A can complete half of the same work. If working together they take 16 days to complete the work, how much time shall B take to complete it alone?
SSC CHSL 03/06/2022(Afternoon)
(a) 38 days (b) 76 days
(c) 44 days (d) 64 days

Q.267. 40 men can complete a piece of work in 18 days. 9 days after they start working together, 5 more men join them. How many days will they now take to complete the remaining work ?
SSC CHSL 10/06/2022 (Morning)
(a) 9 days (b) 8 days (c) 6 days (d) 7 days

SSC CGL 2021 Tier - 1

Q.268. X, Y and Z can do a piece of work in 46 days, 92 days and 23 days, respectively. X started the work. Y joined him after 2 days. If Z joined them after 8 days from the beginning, then for how many days did X work ?
SSC CGL 11/04/2022(Afternoon)
(a) 16 (b) 21 (c) 18 (d) 13

Q.269. A can complete 25% of a work in 15 days . He works for 15 days and then B alone finishes the remaining work in 30 days. In how many days will A and B working together finish 50% of the same work ?
SSC CGL 12/04/2022(Afternoon)
(a) 24 (b) 20 (c) 12 (d) 25

Q.270. A man, a woman and a boy can complete a work in 3, 4 and 12 days, respectively. How many boys must assist one man and one woman to complete the same work in one day ?
SSC CGL 18/04/2022(Morning)
(a) 5 (b) 7 (c) 4 (d) 9

Q.271. X, Y and Z can complete a piece of work in 46 days, 92 days and 23 days, respectively. X started the work, Y joined him after 7 days. If Z joined them after 8 days from the beginning, then for how many days did Y work ?
SSC CGL 19/04/2022 (Afternoon)
(a) $12\frac{5}{7}$ (b) $11\frac{5}{7}$ (c) $10\frac{5}{7}$ (d) $9\frac{5}{7}$

Q.272. A and B can do a work in 12 days and 18 days, respectively ,they worked together for 4 days after which B was replaced by C and the remaining work was completed by A and C in the next 4 days . In how many days will C alone complete 50% of the same work?
SSC CGL 20/04/2022(Evening)
(a) 24 (b) 18 (c) 21 (d) 36

Q.273. A tyre has two punctures. The first puncture alone would have made the tyre flat in 45 minutes, and the second puncture alone would have done it in 90 minutes. If air leaks out at a constant rate, then how long (in minutes) does it take for both the punctures together to make the tyre flat?
SSC CGL 21/04/2022(Afternoon)
(a) 30 (b) 15 (c) 40 (d) 45

SSC CGL 2020 Tier - 2

Q.274. A and B can do a work in $26\frac{2}{3}$ days. B and C together can complete the same work in 48 days, while A and C together can complete the same work in 30 days. How long (in days) will A alone take to complete 60% of the work?
SSC CGL Tier II (29/01/2022)
(a) 36 (b) 24 (c) 20 (d) 32

Q.275. 4 men and 5 women can complete a work in 15 days, whereas 9 men and 6 women can complete it in 10 days. To complete the same work in 7 days, how many women should assist 4 men?
SSC CGL Tier II (29/01/2022)
(a) 15 (b) 14 (c) 13 (d) 11

Q.276. P can finish a work in 18 days. When he had worked for 5 days, Q joined him. If both of them together completed the remaining work in $\frac{13}{5}$ days, then in how many days can Q alone finish $66\frac{2}{3}$ % of the same work?
SSC CGL Tier II (03/02/2022)
(a) 5 (b) 4 (c) 2 (d) 3

SSC MTS 2020 Tier - 1

Q.277. Four persons, P, Q, R, S were engaged for doing a task, with the condition that P, Q, R, S work, respectively, on (Mondays, Thursdays); (Tuesdays, Fridays); (Wednesdays, Saturdays). (Sundays). The task was began on a Monday, and got completed on the 15th day, which was also a Monday. If the efficiencies of, P Q, R, S in respect of doing this task were in the proportion 1 : 2 : 3 : 4, then in how many days could R complete the task, working alone without break?
SSC MTS 12/10/2021 (Afternoon)
(a) 13 (b) 10 (c) 11 (d) 12

Q.278. Two workers A and B are engaged to do a piece of work. A working alone would take 14 hours more to complete the work than when A and B work together. B working alone would take $3\frac{1}{2}$ hours more than when A and B work together. The time required to finish the work together is:
SSC MTS 12/10/2021 (Evening)
(a) 7 hours (b) 5 hours
(c) 6 hours (d) 8 hours

Q.279. A can do a piece of work in 8 days while B alone can do it in 12 days.

Search on TG : @apna_pdf

Search on Telegram @apna_pdf

They work together for 4 days and the remaining work is completed by C alone in 2 days. They are paid ₹7,200 for the completion of the entire work. The earnings of A, B and C, respectively, are:
SSC MTS 18/10/2021 (Afternoon)
(a) ₹2,400, ₹2,400, ₹2,400
(b) ₹3,600, ₹2,400, ₹1,200
(c) ₹4,000, ₹2,400, ₹800
(d) ₹3,000, ₹3,000, ₹1,200

Q.280. During the rainy season, a huge inflow of water takes place into a reservoir. Measures are taken to clear the reservoir while water keeps flowing into it at a constant rate. It has been observed that seven and five men can clear the reservoir in 20 and 50 days, respectively, with the initial quantity of water in the reservoir being 24 and 36 kilolitres, respectively. What is the rate of inflow of water into the reservoir in litres per day?
SSC MTS 18/10/2021 (Evening)
(a) 480 (b) 540 (c) 600 (d) 640

Q.281. 6 men can do a work in 64 days, and 24 women can do the same work in 32 days. 16 men and 24 women together do this work for 12 days after that 8 men and 8 women leave the work. Find total days to complete the whole work?
SSC MTS 20/10/2021 (Morning)
(a) 18 (b) 6 (c) 3 (d) 15

Q.282. To do a certain work, the ratio of the efficiencies of A and B is 5 : 11. Working together, they can do the same work in $27\frac{1}{2}$ days. A and B work together for 20 days. C alone completes the remaining work in 18 days. C alone can do 75% of the original work in:
SSC MTS 20/10/2021 (Evening)
(a) $56\frac{1}{2}$ days (b) 35 days
(c) 33 days (d) $49\frac{1}{2}$ days

Q.283. X can do a certain work in 40 hours. Y is 25% more efficient than X, and Z is 28% more efficient than Y. Working together, X,Y and Z will complete the same work in:
SSC MTS 26/10/2021 (Afternoon)
(a) $\frac{800}{77}$ hours (b) $\frac{160}{9}$ hours
(c) $\frac{400}{11}$ hours (d) $\frac{200}{13}$ hours

Q.284. X and Y can complete a certain work in 16 days and 24 days, respectively. They work together for 4 days. Z alone completes the remaining work in $10\frac{1}{2}$ days. Y and Z together can complete $\frac{7}{8}$ th part of the same work in:
SSC MTS 27/10/2021(Afternoon)
(a) 10 days (b) 8 days
(c) 9 days (d) 12 days

Q.285. Y takes five days more than X to finish a work. Working together, they finish the work in six days. In how many days can Y finish it working alone ?
SSC MTS 02/11/2021 (Evening)
(a) 16 (b) 12 (c) 15 (d) 10

SSC CGL 2020 Tier - 1

Q.286. To do a certain work. A and B work on alternate days with B beginning the work on the first day. A Alone can complete the same work in 24 days. If the work gets completed in $11\frac{1}{3}$ days, then B alone can complete $\frac{7}{9}th$ part of the original work in:
SSC CGL 13/08/2021 (Morning)
(a) $5\frac{1}{2}$ days (b) 4 days
(c) $4\frac{1}{2}$ days (d) 6 days

Q.287. A can do a certain work in 15 days. B is 25% more efficient than A. Both worked together for 4 days. C alone completed the remaining work in 8 days. A, B and C together will complete the same work in ?
SSC CGL 16/08/2021 (Morning)
(a) 5 days (b) $4\frac{1}{2}$days
(c) $6\frac{1}{2}$days (d) 4 days

Q.288. A and B can complete a work in 15 days and 10 days respectively. They started doing the work together but after 4 days B had to leave. Then A working with a new worker C completed the remaining work in 3 days. If C works alone, in how many days he can do 40% of the same work ?
SSC CGL 16/08/2021 (Afternoon)
(a) 9 (b) 8 (c) 10 (d) $8\frac{1}{2}$

Q.289. Samir and Puneet can complete the same work in 10 days and 15 days respectively. The work was assigned for Rs.4500. After working together for 3 days Samir and Puneet involved Ashok. The work was completed in total 5 days. What amount (in Rs.) was paid to Ashok?
SSC CGL 16/08/2021 (Evening)
(a) 750 (b) 1500 (c) 1071 (d) 800

Q.290. A can complete a work in 60 days, B is 25% more efficient than A. They work together for 15 days. C alone completes the remaining work in 14 days, B and C together will complete $\frac{5}{8}$th part of the original work in:
SSC CGL 18/08/2021 (Afternoon)
(a) 18 days (b) 16 days
(c) 12 days (d) 15 days

Q.291. Five men can complete work in 20 days. Ten women can complete the same work in 15 days. Two men and six women started working together. After 5 days, three women left the work and a new man joined the work. The group continued working together till the end of the work. In how many days will they be able to do the remaining work ?
SSC CGL 18/08/2021 (Evening)
(a) 14 (b) 19 (c) $18\frac{1}{3}$ (d) $16\frac{2}{3}$

Q.292. A can do a piece of work in 2 days, and B can do five times the same work in 15 days when they work for ten hours a day. If they work together, then how many hours in addition to a days' work will they require to complete the work ?
SSC CGL 20/08/2021 (Evening)
(a) 2 (b) 1 (c) 0 (d) 3

Q.293. A can complete a work in $11\frac{1}{2}$ days. B is 25% more efficient than A and C is 50% efficient than B. Working A, B and C will complete the same work.
SSC CGL 24/08/2021 (Morning)
(a) 8 days (b) 4 days
(c) 3 days (d) 5 days

SSC CHSL 2020 Tier - 1

Q.294. A certain number of persons can complete a work in 54 days. If there were 15 persons less, it would take 18 days more for the work to be completed. Initially, the number of persons is:
SSC CHSL 16/04/2021 (Afternoon)
(a) 60 (b) 56 (c) 50 (d) 72

Q.295. A, B and C together can complete a work in x, 30 and 45 days, respectively B and C worked together for 6 days. The remaining work was completed by A alone in 12 days. The value of x is:
SSC CHSL 19/04/2021 (Morning)
(a) 18 (b) 20 (c) 24 (d) 15

Q.296. A can complete a work in 20 days, while B can complete the same work in 25 days. Both worked together for 10 days and then C alone completed the remaining work in 10 days. In how many days will A, B and C together complete

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

the same work?
SSC CHSL 05/08/2021 (Morning)
(a) 10 (b) 5 (c) 8 (d) 12

Q.297. A and B can complete a work in 27 days and 54 days respectively. They completed the work in 9 days with the help of C. How many days will C take to complete eight-ninths of the work alone?
SSC CHSL 12/08/2021 (Afternoon)
(a) 16 (b) 24 (c) 30 (d) 45

SSC CPO 2020 Tier - 1

Q.298. A and B can do a job in 10 days and 5 days respectively. They worked together for two days, after which B was replaced by C and the work was finished in the next three days. How long will C take to finish 60% of the job?
SSC CPO 23/11/2020 (Morning)
(a) 30 days (b) 25 days
(c) 18 days (d) 24 days

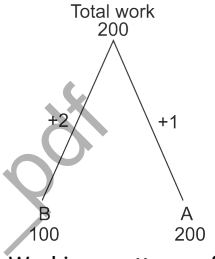
Q.299. X can do a work in 3 day, Y does three times the same work in 8 days, and Z does five times the same work in 12 days. If they have to work together for 6 hours in a day, then in how much time can they complete the work?
SSC CPO 23/11/2020 (Evening)
(a) 4 hours 10 minutes
(b) 4 hours
(c) 5 hours
(d) 5 hours 20 minutes

Answer Key :-

1.(b)	2.(a)	3.(c)	4.(d)
5.(a)	6.(b)	7.(c)	8.(d)
9.(b)	10.(c)	11.(c)	12.(a)
13.(b)	14.(a)	15.(b)	16.(c)
17.(c)	18.(a)	19.(a)	20.(c)
21.(d)	22.(d)	23.(c)	24.(c)
25.(d)	26.(a)	27.(a)	28.(d)
29.(d)	30.(b)	31.(c)	32.(c)
33.(a)	34.(a)	35.(d)	36.(a)
37.(d)	38.(a)	39.(b)	40.(c)
41.(c)	42.(d)	43.(a)	44.(d)
45.(c)	46.(d)	47.(c)	48.(a)
49.(a)	50.(c)	51.(a)	52.(d)
53.(d)	54.(c)	55.(c)	56.(a)
57.(c)	58.(a)	59.(a)	60.(b)
61.(b)	62.(c)	63.(c)	64.(a)
65.(a)	66.(c)	67.(d)	68.(a)
69.(a)	70.(b)	71.(b)	72.(c)
73.(c)	74.(a)	75.(c)	76.(b)
77.(d)	78.(c)	79.(a)	80.(b)
81.(d)	82.(c)	83.(c)	84.(d)
85.(c)	86.(c)	87.(d)	88.(b)
89.(c)	90.(a)	91.(c)	92.(b)
93.(c)	94.(b)	95.(d)	96.(b)
97.(b)	98.(a)	99.(a)	100.(c)
101.(a)	102.(d)	103.(d)	104.(b)
105.(c)	106.(c)	107.(b)	108.(c)
109.(b)	110.(a)	111.(d)	112.(c)
113.(d)	114.(c)	115.(b)	116.(a)
117.(b)	118.(d)	119.(d)	120.(a)
121.(d)	122.(b)	123.(c)	124.(c)
125.(c)	126.(c)	127.(d)	128.(d)
129.(d)	130.(b)	131.(a)	132.(a)
133.(b)	134.(a)	135.(b)	136.(c)
137.(d)	138.(d)	139.(d)	140.(c)
141.(a)	142.(c)	143.(d)	144.(d)
145.(c)	146.(a)	147.(b)	148.(a)
149.(d)	150.(c)	151.(b)	152.(a)
153.(a)	154.(c)	155.(b)	156.(c)
157.(d)	158.(a)	159.(d)	160.(a)
161.(a)	162.(a)	163.(b)	164.(a)
165.(d)	166.(c)	167.(d)	168.(b)
169.(b)	170.(d)	171.(a)	172.(b)
173.(b)	174.(a)	175.(b)	176.(c)
177.(a)	178.(c)	179.(b)	180.(b)
181.(a)	182.(a)	183.(c)	184.(b)
185.(b)	186.(a)	187.(d)	188.(d)
189.(a)	190.(d)	191.(b)	192.(a)
193.(a)	194.(b)	195.(b)	196.(d)
197.(c)	198.(d)	199.(a)	200.(b)
201.(c)	202.(b)	203.(a)	204.(c)
205.(d)	206.(a)	207.(a)	208.(a)
209.(c)	210.(a)	211.(a)	212.(b)
213.(a)	214.(a)	215.(a)	216.(b)
217.(c)	218.(d)	219.(b)	220.(d)
221.(b)	222.(c)	223.(a)	224.(d)
225.(a)	226.(d)	227.(a)	228.(b)
229.(a)	230.(d)	231.(d)	232.(a)
233.(d)	234.(b)	235.(d)	236.(c)
237.(a)	238.(d)	239.(c)	240.(b)
241.(b)	242.(a)	243.(d)	244.(b)
245.(b)	246.(b)	247.(c)	248.(c)
249.(b)	250.(b)	251.(d)	252.(b)
253.(d)	254.(a)	255.(b)	256.(d)
257.(b)	258.(b)	259.(c)	260.(d)
261.(b)	262.(b)	263.(b)	264.(b)
265.(c)	266.(d)	267.(b)	268.(c)
269.(c)	270.(a)	271.(b)	272.(b)
273.(a)	274.(b)	275.(c)	276.(d)
277.(c)	278.(a)	279.(b)	280.(a)
281.(d)	282.(d)	283.(a)	284.(c)
285.(c)	286.(d)	287.(a)	288.(a)
289.(a)	290.(c)	291.(a)	292.(a)
293.(b)	294.(a)	295.(a)	296.(a)
297.(a)	298.(c)	299.(d)	

Solutions:-

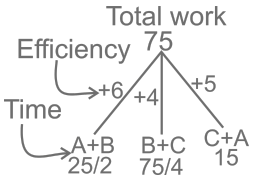
Sol.1.(b)



Working pattern of A & B is (A, B), (A), (B).....
Work done in 1 cycle(3 days)
= (2 + 1) + 1 + 2 = 6 unit
Work done in 33 cycle (99 days)
= 6 × 33 = 198 unit
Remaining work = 200 - 198 = 2 unit
which is completed by (A & B) together in $\frac{2}{3}$ days.
So, the time taken to complete the whole work in $99\frac{2}{3}$ days.

Sol.2.(a)
Let the efficiency of Sagar be 1 unit
Total work = 15 × 1 = 15 unit
Time taken by Sagar and Manish to complete the work in 6 days each.
Now, Work done by Sagar = 6 × 1 = 6 unit
Remaining work = (15 - 6) = 9 unit , which is done by Manish
So, the efficiency of Manish = $\frac{9}{6}$
= 1.5 unit
Now, the time taken by Manish alone to complete the work = $\frac{15}{1.5}$ = 10 days

Sol.3.(c)



Efficiency of (A + B + C)
= $\frac{6+4+5}{2} = \frac{15}{2}$ = 7.5 unit

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

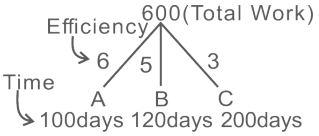
Efficiency of C = eff(A + B + C) - eff(A + B) = 7.5 - 6 = 1.5 unit
Given that , D = 40% of C
= 40% of 1.5 = 0.6 unit
Now, efficiency of (A + B + C + D)
= 7.5 + 0.6 = 8.1 unit
Time taken by all of them to complete the whole work
$= \frac{75}{8.1} = \frac{250}{27} = 9\frac{7}{27}$ days

Sol.4.(d) Let total work = 36 units And the efficiency of both A and B each = 1 units
Work done by A and B in 5 days
= 5 × (1 + 1) = 10 units

Days ⇒	6th day	7th day	8th day	9th day	10th day
Work ⇒	1	1 + 1	1	1 + 1	1 + 1

Work done in 10 days
= 10 + (1 + 2 + 1 + 2 + 2) = 18 units
So 36 units done in 20 days
1 july 2021 + 20 days = 21 july 2021 will be the right answer

Sol.5.(a) Time taken by A to do $\frac{1}{5}$th of work = 20 days
Time taken by A to complete the work
$= 20 \times \frac{5}{1} = 100$ days
Time taken by B to complete the work
$= 36 \times \frac{10}{3} = 120$ days
Time taken by C to complete the work
$= 160 \times \frac{5}{4} = 200$ days



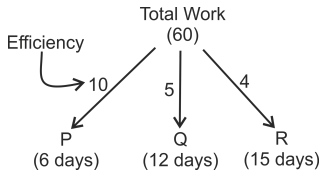
Work done by B + C in x days = (5 + 3)x
= 8x unit
Work done by A + C in (x - 41) days
= (6 + 3)(x − 41) unit
According to question ,
$\frac{8x}{(9)(x-41)} = \frac{19}{6}$
⇒ 48x = 19(9x - 369)
⇒ 48x = 171x - 19 × 369
⇒ 123x = 19 × 369
⇒ $x = \frac{19 \times 369}{123}$ = 57 days
Fraction of Work done by C alone in 2x days = $\frac{2 \times 57 \times 3}{600} = \frac{57}{100}$ days

Sol.6.(b) Time taken to complete the work by A and B together
$= \sqrt{25 \times 16} = 20\ days$

Sol.7.(c) According to the question,
Number of days in july, august and september = 31 + 31 + 30 = 92 days
7 days = 217 eggs
92 days = $\frac{217}{7}$ × 92 = 2852 eggs

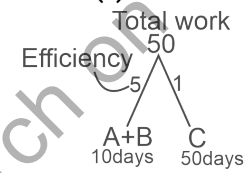
Sol.8.(d) Let the efficiency of man be M and women be W
They works on alternative days
According to the question,
(M + W) × 7 + M = (M + W) × 7 + $\frac{W}{2}$
M = $\frac{W}{2}$ ⇒ M : W = 1 : 2
Total work = (M + W) × 7 + M = 22 unit
So, time taken to man to finish the whole work alone = $\frac{22}{1}$ = 22 days

Sol.9.(b)



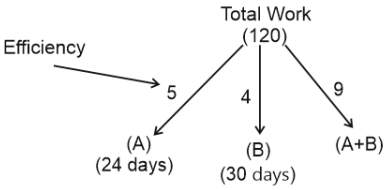
P, Q and R working alternatively
So, work done in 3 days
= (10 + 5 + 4) = 19 units
Work done in 9 days
$= \frac{19}{3} \times 9$ = 57 units
Remaining work = 60 − 57 = 3 unit
10th day P complete the work of 3 unit in $\frac{3}{10}$ days
So, total work completed in $9\frac{3}{10}$ days

Sol.10.(c)



Efficiency of A + B + C = 5 + 1 = 6 unit
According to the question,
Efficiency of A = efficiency of B + C
So, efficiency of A , B and C = 3 , 2 and 1 unit respectively
Therefore, time taken by B to complete the whole work alone = $\frac{50}{2}$ = 25 days

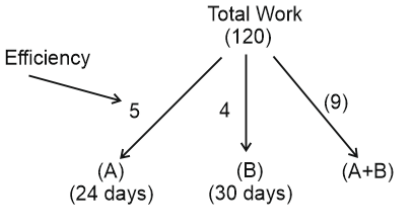
Sol.11.(c)



Work done by (A + B) in 11 days = 9 × 11 = 99 units
Remaining work = 120 − 99 = 21 units
Required % = $\frac{21}{120} \times 100$ = 17.5%

Sol.12.(a)
Let food provisions last for x days
500 × 25 = (500 + 125)× x
$x = \frac{500 \times 25}{625}$ = 20 days

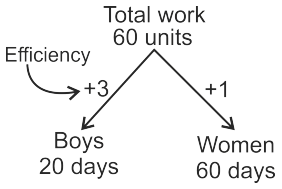
Sol.13.(b)



Work done by (A + B) in 8 days
= 8 × 9 = 72 units
Left fraction of work = $\frac{(120-72)}{120} = \frac{2}{5}$

Sol.14.(a)
Efficiency of Disha = $\frac{75}{12}$ pages/hr
Efficiency of Mohit = $\frac{75}{10}$ pages/hr
Required time = $\frac{150}{\frac{75}{12}+\frac{75}{10}} = \frac{240}{22}$
$= 10\frac{10}{11}$ hours

Sol.15.(b)



On equating the total work :-
1 × (M + W) = 2 ×(W + B)
M + 1 = 2 × (1 + 3)
Efficiency of Man (M) = 7 units
Efficiency of 4 men = 4 × 7 = 28 unit
Required time = $\frac{60}{28}$ = 2.14 days

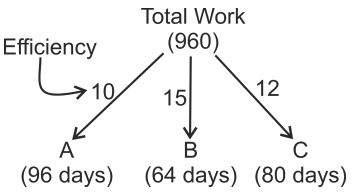
Sol.16.(c) Here , the efficiency of A, B and C are equal.
So, let the efficiency be 1 unit
Series of work = A, B, C, A,....
Then, total work
= (1 + 1 + 1) × 5 cycle = 15 units
According to question,
New series of work = C, A and B .....
Work done in 1 cycle (3 days) = 3 units
Required time = $\frac{15}{3}$ = 5 cycle = 15 days

Sol.17.(c) Time taken by A to complete the work = $\frac{32}{\frac{1}{3}}$ = 96 days
Time taken by B to complete the work
$= \frac{24}{\frac{3}{8}}$ = 64 days
Time taken by C to complete the work

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{48}{\frac{3}{5}}$ = 80 days



Work done by B + C in x days
= (15 + 12)x = 27x unit
Work done by A + C in (x - 41) days
= (10 + 12)(x + 8) unit
According to the question,
$\frac{27x}{(22)(x+8)} = \frac{9}{11}$
⇒ 3x = (2x + 16) ⇒ x = 16
Now, 3.5 × x = 3.5 × 16 = 56 days
Hence, work done in 56 days by C
$= \frac{56 \times 12}{960} = \frac{7}{10}$th part

Sol.18.(a) Using the formula :- $\frac{MDH}{W}$

$\frac{(N+18) \times 20 \times 7.5 \times 100}{48}$

$= \frac{(N+12) \times 30 \times 6.5 \times 100}{52}$

$\frac{(N+18) \times 150}{12} = \frac{(N+12) \times 195}{13}$

$\frac{(N+18)}{(N+12)} = \frac{12 \times 195}{13 \times 150} = \frac{12 \times 15}{150} = \frac{12}{10}$

10N + 180 = 12N + 144
2 N = 36 ⇒ N = 18

Sol.19.(a) According to question,

Efficiency of Suresh = $\frac{40}{5}$ = 8 unit

Efficiency of Anil = $\frac{32}{6} = \frac{16}{3}$ unit

Required time = $\frac{110}{8 + \frac{16}{3}}$ = 8.25

= 8 hours 15 minutes

Sol.20.(c) Raja and Rocky complete the work in 5 days.
They work together for 2 days , and Rocky leaves the work .
Raja complete the remaining work in 4 days , it means
3 days of Rocky's work completed by Raja in 1 day .
Their efficiency ratio:- Rocky : Raja = 1 : 3
Total work = (1 + 3) × 5 = 20 units
Number of days required by Rocky alone to complete the total work alone
$= \frac{20}{1}$ = 20 days

Sol.21.(d)
Let , Total work = LCM(32 , 8) = 32 units
Work gets completed in 8 days , working alternatively.
It means 4 days work of Ajay and 4 days work of Bharat.
Now , efficiency of Ajay = $\frac{32}{32}$ = 1 unit
Work done by Ajay in 4 days = 4 units
Remaining work = 32 – 4 = 28 units
then, Efficiency of bharat = $\frac{28}{4}$ = 7 units
So, Bharat can do 7 times of the same work in = $\frac{32 \times 7}{7}$ = 32 days

Sol.22.(d) Let the share of a woman and a girl be 'a' and 'b'.
According to question,
(5a + 9b) × 9 = 18720 --------(1)
(9a + 16b) × 14 = 52080 --------(2)
From the above equations, we get ;
a = 200 and b = 120
Required amount
= {(12 × 200) + (7 × 120)} × 13 = 42,120 Rs.

Sol.23.(c)
Let efficiency of Reena = 10 unit
Work done by Reena in 12 days = 120 unit
Total work = 120 × $\frac{100}{10}$ = 1200 unit
Remaining work = 1200 – 120 = 1080 unit
According to question,
Efficiency of Priya = 10 × $\frac{140}{100}$ = 14 unit
Required time = $\frac{1080}{10+14}$ = 45 days

Sol.24.(c) According to the question,
Time taken by T to complete the work = 8 days
And time taken by S to complete the work = 2 days
Then, the efficiency of S and T = 8 unit and 2 unit
As we know Total work = total time × total efficiency
Then, total work = 60 × 10 = 600 unit
Therefore, total time taken by S to complete the work = $\frac{600}{8}$ = 75 days

Sol.25.(d) we know,
$\frac{M_1 \times D_1}{W_1} = \frac{M_2 \times D_2}{W_2}$
Let x more workers be required to complete the work.
$\frac{90 \times 200}{0.5} = \frac{(x+90) \times 400}{2.5}$
$\Rightarrow 400x + 36000 = 90000$
$\Rightarrow 400x = 54000 \Rightarrow x = 135$
So, 135 more workers are required.

Sol.26.(a)
$\frac{65}{4}(1M + 4W) = \frac{13}{2}(3M + 4W)$
$\Rightarrow 130M + 520W = 156M + 208W$
$\Rightarrow 312W = 26M$
$\Rightarrow 1M = 12W \Rightarrow \frac{M}{W} = \frac{12}{1}$
Total work done by $(1M + 4W)$ in $\frac{65}{4}$
days = (1 × 12 + 4 × 1) × $\frac{65}{4}$
= 16 × $\frac{65}{4}$ = 260 units
Time taken by 13 women
$= \frac{260}{13}$ = 20 days

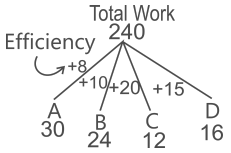
Sol.27.(a) Time taken by A alone to complete the whole work
= 12 × $\frac{5}{2}$ = 30 days
Efficiency ∝ $\frac{1}{Time\ taken}$

		A	:	B
Efficiency	→	4	:	5
Time	→	5	:	4

5 units corresponds to 30 days.
Then, 4 unit corresponds to
$= \frac{30}{5}$ × 4 = 24 days
Since, time taken by C is 12 days less than that of B. so, C = 24 - 12 = 12 days
Again ,

		C	:	D
Efficiency	→	4	:	3
Time	→	3	:	4

Here, 3 unit corresponds to 12 days
4 unit corresponds to $\frac{12}{3}$ × 4 = 16 days
So, the time taken by D to complete the whole work = 16 days



Time taken by A, B, C and D to complete the whole work = $\frac{240}{8+10+20+15}$
$= \frac{240}{53}$ days

Sol.28.(d) Efficiency of a man and a boy is 4 and 3 unit respectively
Total work = 24 × (4 + 3) = 168 unit
Time taken by a boy to complete the whole work = $\frac{168}{3}$ = 56 days

Sol.29.(d) Total work = 14 × 18 = 252
Work completed in 5 days = 14 × 5 = 70
Work is done on the last day = 14
Remaining work = 252 - 84 = 168
Number of workers = 8
Number of days to complete remaining work = $\frac{168}{8}$ = 21
Total number of days
= 21 + 1 + 5 = 27 days

Sol.30.(b) Let the total work = 20 and efficiency of Each man = 1
work done by an employee in Day 1
= 1 unit, remaining work = 19
work done by 2 employee in Day 2

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

= 2 unit, remaining work = 17
work done by 3 employee in Day 3
= 3 unit, remaining work = 14
work done by 4 employee in Day 4
= 4 unit, remaining work = 10
work done by 5 employee in Day 5
= 5 unit, remaining work = 5
work done by 5 employee in Day 6
= 5 unit, remaining work = 0
So, Total work to be completed in 6 days.

Sol.31.(c)
Total work = 8×20 = 160 units
Work done by 8 workers in 5 days
= 8×5 = 40 units
Remaining work = 120 units
Let x more workers be employed to complete remaining work in the next 8 days.
120 = $(8 + x) \times 8 \Rightarrow x = 7$

Sol.32.(c) We know that, in such cases formula to be followed is
A does a work in (x + a) days
B does the same work in (x + b) days
A + B will do the same work in = $\sqrt{ab}$
Now, on putting the values in formula
= $\sqrt{8 \times 18}$ = 12 days
Thus 1 unit of work will be done by
(A + B) in $\frac{1}{12}$ day
$\frac{5}{6}$ unit of work will be done in 10 days

Sol.33.(a) Total work = 25 × 60 = 1500
According to the question
1500 = 25x + 15(80 - x)
1500 = 25x + 1200 - 15x, ⇒ x = 30

Sol.34.(a)

	A	:	B + C
Efficiency →	1	:	1
	(A + B)	:	C
Time →	36	:	60
Efficiency →	5	:	3
Work →	180 : 180		

Balancing the ratio for total efficiency
A : B + C → 4 : 4
A + B : C → 5 : 3
Efficiency of B = 8 - 4 - 3 = 1 unit
Work done by A and C in 10 days
= 10 × (4 + 3) = 70 unit
Work left = 180 - 70 = 110 unit
Time taken by B to finish this work
= $\frac{110}{1}$ = 110 days

Sol.35.(d) Let the efficiency of a man = m and efficiency of the woman = w and A be the desired number of women.
{4(m) + 5(w)} × 15 = {9(m) +6(w)} × 10
⇒ 60m + 75w = 90m + 60w ⇒ $\frac{m}{w} = \frac{1}{2}$
Total work = {4(1) + 5(2)} × 15 or {9(1) + 6(2)} × 10 = 210 unit
According to question
210 = 7 × {4(1) + A(2)}
⇒ 30 = 4 + 2A ⇒ A = 13

Sol.36.(a)

	X	:	Y
Efficiency →	5	:	4

Total work = 10 × (5 + 4) = 90 unit
Work done by Y = 5 × 4 = 20 unit
Work left = 90 - 20 = 70 unit
Time taken by X to finish this work
= $\frac{70}{5}$ = 14 days

Sol.37.(d) Let the number of Person = 100 and H be the desired number of hours.⇒ Remaining persons = 60
According to the question
100 × 34 × 9 = 60 × 51 × H
⇒ H = 10 hours

Sol.38.(a)

	A + B	:	A + B + C
Work →	13	:	15
	C + B	:	A + B + C
Work →	11	:	20

Balancing the ratio for total work
A + B : B + C : A + B + C
52 : 33 : 60
Work done by A = 60 - 33 = 27 unit
Work done by C = 60 - 52 = 8 unit
Amount will be distributed according to the amount of work done by each person.
According to the question
(27 - 8) unit = 7600
1 unit = 400
Total wages of A, B and C = 60 unit
= 60 × 400 = 24000

Sol.39.(b)
Man = 2 × Woman ⇒ $\frac{Man}{Woman} = \frac{2}{1}$
Total Work = 2 × {3(2) + 2(1)} = 16 unit
No. of days required for a woman = $\frac{16}{1}$
= 16 days

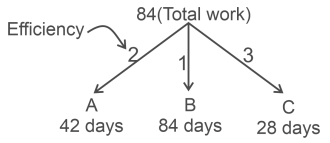
Sol.40.(c) According to the question

	Helper	:	Labourer
Wages →	2	:	1
	Craftsman	:	Labourer
Wages →	3	:	1

	Helper	:	Craftsman	:	Labourer
Wages →	2	:	3	:	1

Total amount received
= 3(3) + 5(2) + 6(1) = 25 unit Now,
25 unit = 10000 ⇒ 1 unit = 400
Amount received by 3 craftsman (9 unit)
= 9 × 400 = 3600

Sol.41.(c)



Work done by A in first 3 days
= 3 × 2 = 6 units
Work done by A and B in next 2 days
= 2(2 + 1) = 6 units
Work remaining = 84 - 6 - 6 = 72 units
Total time taken by all three to finish this work = $\frac{72}{2+1+3}$ = 12 days
A worked = 12 + 2 + 3 = 17 days

Sol.42.(d)
Per day wages of A = 180×7= 1260
Per day wages of B = 160×5 = 800
Required Ratio = 1260 : 800
= 63 : 40

Sol.43.(a) According to the question

	Man	:	Woman
Efficiency →	1	:	3
	Man	:	boy
Efficiency →	2	:	1

Balancing the ratio for man

	Man	:	Woman	:	boy
Efficiency →	2	:	6	:	1

Total work = 6{3(2) + 4(6) + 6(1)}
= 216 unit
Let the required number of woman = w
216 = 4 × w × 6 ⇒ w = 9

Sol.44.(d) 40% = $\frac{2}{5}$ ⇒ A : B = 7 : 5
20% = $\frac{1}{5}$ ⇒ B : C = 5 : 4
⇒ A : B : C = 7 : 5 : 4
Total work = 5 (7 + 5 + 4) = 80 unit
Time taken by A to complete the 70% of work = $\frac{80 \times 70}{7 \times 100}$ = 8 days

Sol.45.(c) Let the efficiency of A = 1 unit
Total work = 48×1= 48 unit
From $11\frac{1}{3}$ days, A worked for $5\frac{1}{3}$ days and B worked for 6 days .....(B started the work)
Work done by A in $5\frac{1}{3}$days
= $\frac{16}{3} \times 1 = \frac{16}{3}$ unit
Work done by B = 48 - $\frac{16}{3} = \frac{128}{3}$ unit
Efficiency of B = $\frac{128}{3 \times 6} = \frac{64}{9}$ unit
Time taken by B to finish 4 times of total work = $\frac{4 \times 48}{\frac{64}{9}}$ = 27 days

Alternate method :- In $11\frac{1}{3}$ days, A worked for $5\frac{1}{3}$ days and B worked for 6 days .....(B started the work)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

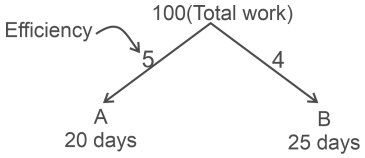
B × 6 + A × $5\frac{1}{3}$ = 48A ⇒ 6B = 48A - $\frac{16}{3}$A

18B = 128A = $\frac{B}{A} = \frac{64}{9}$

Total work = 9 × 48 = 432 units

Time taken by B to finish 4 times the same work = $\frac{4 \times 432}{64}$ = 27 days

Sol.46.(d)



Work done by A + B in 10 days

= 10(5 + 4) = 90 unit

Work done by C = 100 - 90 = 10 unit

Share of C = 700 × $\frac{10}{100}$ = ₹ 70

Sol.47.(c) Let M be the required number of men

According to the question

$\frac{36 \times 8 \times 12}{3} = \frac{M \times 16 \times 6}{5}$

Therefore, M = 60 men

Sol.48.(a) Ratnesh and Vineet worked on alternate days

Total cycle = $\frac{54}{2}$ = 27

Remaining $\frac{3}{4}$ days Ratnesh do the work

So, if they together do the work then,

27V + (27 + $\frac{3}{4}$)R = 48R

27V = 48R − $\frac{111R}{4}$

27V = $\frac{192R - 111R}{4}$

27V = $\frac{81R}{4}$ ⇒ V = $\frac{3R}{4}$

V : R = 3 : 4 ⇒ efficiency of (vineet : Ratnesh) = 3 : 4

Total work = 48R = 48 × 4 = 192 unit

Hence, time taken by Vineet to do the whole work alone = $\frac{192}{3}$ = 64 days.

Sol.49.(a) According to the question,

$\frac{40 \times 4}{50} = \frac{24 \times 8}{x}$ ⇒x = $\frac{24 \times 8 \times 50}{40 \times 4}$ = 60

Required no. of bags (x) = 60

Sol.50.(c) According to the question,

$\frac{9 \times 30}{8100} = \frac{7 \times D}{8400}$

Required days (D)

= $\frac{9 \times 30 \times 8400}{8100 \times 7}$ = 40 days

Sol.51.(a) According to the question,

200 × 30 = (200 + 50) × D

D = $\frac{200 \times 30}{250}$ = 24 days

Sol.52.(d) Formula :- $M_1 D_1 H_1 = M_2 D_2 H_2$

24 × 10 × 7 = 21 × d_2 × 9

d_2 = $\frac{24 \times 10 \times 7}{21 \times 9} = \frac{80}{9}$ = $8\frac{8}{9}$ days

Sol.53.(d) 16 women × 20 = 20 men × 32

$\frac{women}{men} = \frac{20 \times 32}{16 \times 20} = \frac{2}{1}$

Time taken by 8 women and 16 men

= $\frac{total\ work}{efficiency} = \frac{16 \times 2 \times 20}{8 \times 2 + 16 \times 1}$

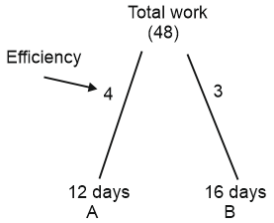
= $\frac{640}{32}$ = 20

Sol.54.(c) According to the question,

$\frac{17}{27}$ units = 34 days

1 units = $\frac{34 \times 27}{17}$ = 54 days

Sol.55.(c)

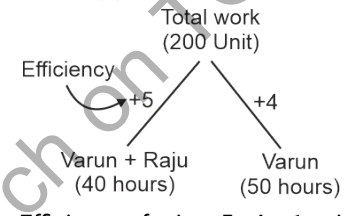


working together, work done in 6 days

= 7 × 6 = 42 unit

Remaining work = $\frac{48 - 42}{48} = \frac{1}{8}$

Sol.56.(a)

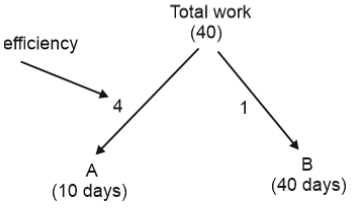


Efficiency of raju = 5 - 4 = 1 unit

Time taken by Raju alone

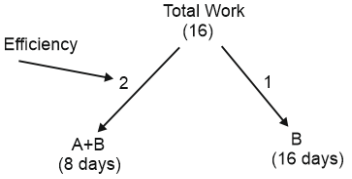
= $\frac{200}{1}$ = 200 hours

Sol.57.(c)



Required time = $\frac{40}{4 + 1}$ = 8 days

Sol.58.(a)



Efficiency of A = 2 - 1 = 1 unit

Hence, required days = $\frac{16}{1}$ = 16 days

Sol.59.(a) Required time = $\frac{9 \times 15}{9 + 15}$

= $\frac{135}{24} = \frac{45}{8}$ = $5\frac{5}{8}$ days

Sol.60.(b) Let required rupee = Rs. x

According to the question,

$\frac{15 \times 12}{18000} = \frac{18 \times 9}{x}$ ⇒ x = ₹16,200

Sol.61.(b)

Formula used :- $M_1 D_1 H_1 = M_2 D_2 H_2$

⇒ 12 × 24 × 9 = 8 × x × 12

⇒ x = $\frac{12 \times 24 \times 9}{8 \times 12}$ = 27

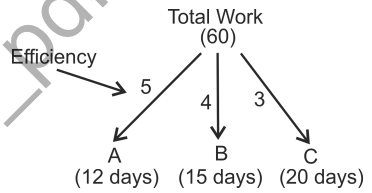
Hence, required days = 27

Sol.62.(c) Let required masons be x

According to the question,

$\frac{47}{35} = \frac{x}{105}$ ⇒ x = $\frac{47 \times 105}{35}$ = 141

Sol.63.(c)



Efficiency of A, B and C

= 5 + 4 + 3 = 12 units

Required time = $\frac{60}{12}$ = 5 days

Sol.64.(a) 25% = $\frac{1}{4}$

Ratio - Tim : Joey

Efficiency - 5 : 4

Time - 4 : 5

(∵ Time and efficiency is inversely proportional to each other)

(Time taken by Joey) 5 units = 15 days

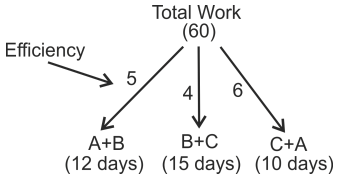
(time taken by Tim) 4 units

= $\frac{15}{5}$ × 4 = 12 days

Sol.65.(a) By using MDH formula : -

$\frac{18 \times 5 \times 10}{1} = \frac{5 \times 5 \times m}{2}$ ⇒ m = 72

Sol.66.(c)



Efficiency of A + B + C

= $\frac{5 + 4 + 6}{2}$ = 7.5 unit

Efficiency of A = 7.5 - 4 = 3.5 unit

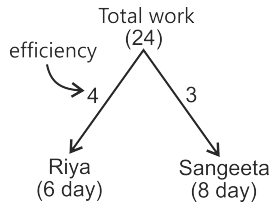
Hence, required days

= $\frac{60}{3.5} = \frac{120}{7}$ = $17\frac{1}{7}$ days

Sol.67.(d)

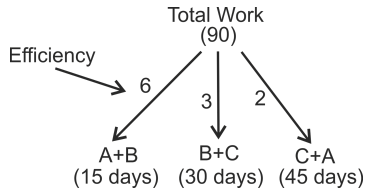
Search on TG: @apna_pdf

Search on Telegram @apna_pdf



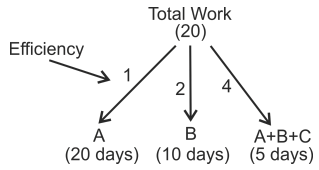
Let time taken to complete the work be x days
According to the question,
4x + 3(x - 3) = 24
7x = 33 ⇒ $x = \frac{33}{7} = 4\frac{5}{7}$ days

Sol.68.(a)



Efficiency of A, B and C
$= \frac{6+3+2}{2}$ = 5.5 units
Required time = $\frac{90}{5.5} = 16\frac{4}{11}$ days

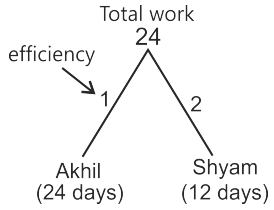
Sol.69.(a)



Efficiency of C = 4 - (2 + 1) = 1 unit
Time taken by C = $\frac{20}{1}$ = 20 days

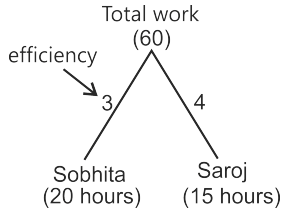
Sol.70.(b) Total work = 12 × 8 = 96 unit
Work done by 8 workers in 2 days
= 2 × 8 = 16 unit
Remaining work = 96 - 16 = 80 unit
Now, let required additional worker be x
According to question,
(8 + x) × 2 = 80 ⇒ 2x = 64 ⇒ x = 32

Sol.71.(b)



Total Efficiency of Akhil and Shyam
= 1 + 2 = 3 units
Required time = $\frac{24}{3}$ = 8 days

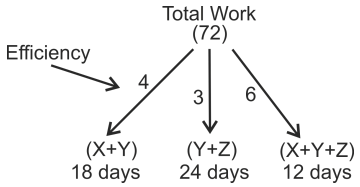
Sol.72.(c)



Total Efficiency of Sobhita and Saroj
= 3 + 4 = 7 units
Required time = $\frac{60}{7}$ hours or $8\frac{4}{7}$ hours

Sol.73.(c)
Total work = LCM (12 , 8) = 24 unit
Efficiency of man = $\frac{24}{12}$ = 2 unit
Efficiency of women = $\frac{24}{8}$ = 3 unit
So, time taken to 6 men and 4 women to complete the whole work
$= \frac{24}{6\times2+4\times3} = \frac{24}{24}$ = 1 day

Sol.74.(a)

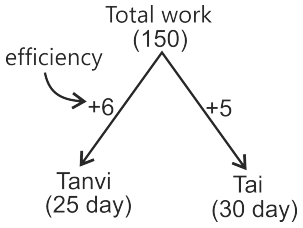


Efficiency of X = 6 - 3 = 3 units
Efficiency of Z = 6 - 4 = 2 units
Efficiency of (X + Z) = 5 units
So, Work done by (X + Z)
$= \frac{72}{5} = 14\frac{2}{5}$ days

Sol.75.(c)
Total work = LCM(10, 4) = 20 unit
Efficiency of Rohan = $\frac{20}{10}$ = 2 unit
Efficiency of (Mohan + Rohan)
$= \frac{20}{4}$ = 5 unit
Then, efficiency of Mohan = 5 - 2 = 3 unit
Time taken by Mohan to do whole work alone = $\frac{20}{3}$ hours

Sol.76.(b) According to the question,
R × 10 × 6 = S × 8 × 5
$\frac{R}{S} = \frac{40}{60} = \frac{2}{3}$
Total work = 2 × 10 × 6 = 120 units
Required days = $\frac{120}{(2+3)\times6}$ = 4 days

Sol.77.(d)



Work done by both in 5 days
= 5 × (6 + 5) = 55 unit
Required fraction = $\frac{150-55}{150} = \frac{19}{30}$ unit

Sol.78.(c) Total work = LCM (12, 16) = 48
Efficiency of Rohan = $\frac{48}{12}$ = 4
Efficiency of Hari = $\frac{48}{16}$ = 3
Work done by Rohan + Hari in 3 days
= 3 × (4 + 3) = 21
Remaining work = 48 - 21 = 27
Time taken by Hari to complete the remaining work = $\frac{27}{3}$ = 9 days
Hence, total time taken to complete the whole work = 3 + 9 = 12 days

Sol.79.(a) $M_1D_1H_1 = M_2D_2H_2$
30 × 18 × 5 = 20 × D_2 × 7
$D_2 = \frac{30\times18\times5}{20\times7} = \frac{135}{7} = 19\frac{2}{7}$ Days

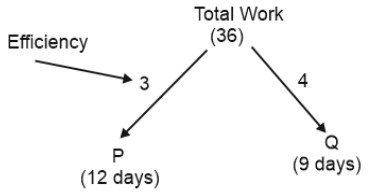
Sol.80.(b) According to the question.
6 engineers × 5 = 5 skilled workers × 7
$\frac{engineers}{skilled\ workers} = \frac{7}{6}$
Total works = 6 × 7 × 5 units
Required time = $\frac{6\times7\times5}{(7\times7)+(4\times6)}$
$= 2\frac{64}{73}$ days

Sol.81.(d)
Ratio → P : Q
Time → 1 : 2
Efficiency → 2 : 1

Total work = 36 × 3 = 108 unit
Time taken by Q alone to finish work
$= \frac{108}{1}$ = 108 days

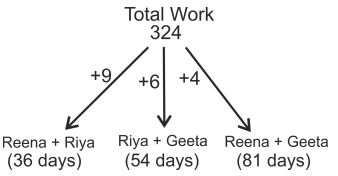
Sol.82.(c)
Formula used: $\frac{M_1D_1H_1}{W_1} = \frac{M_2D_2H_2}{W_2}$
55 × 16 = x × 10 ⇒ x = 88
More men required = 88 - 55 = 33

Sol.83.(c)



According to the question,
Share of P
$= \frac{63000}{3+4}$ × 3 = 9000 × 3 = ₹27000

Sol.84.(d)



Efficiency of (Reena + Riya + Geeta)
$= \frac{9+6+4}{2} = \frac{19}{2}$ unit
Then, efficiency of Reena
$= \frac{19}{2} - 6 = \frac{7}{2}$ unit

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Time taken by Reena to complete the whole work = $\frac{324}{\frac{7}{2}}$ = 324 × $\frac{2}{7}$

= $\frac{648}{7}$ = $92\frac{4}{7}$ days

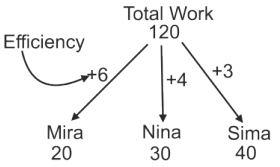
Sol.85.(c) As we know, Efficiency ∝ $\frac{1}{Time}$

	Amit		Nirmal
Efficiency	5	:	4
Time	4	:	5

Now, 5 unit ---------- 45 days

Then, 4 unit ---------- $\frac{45}{5}$ × 4 = 36 days

Sol.86.(c)



Work done by Mira and Sima

= (6 + 3) × 4 = 36 unit

Remaining work = 120 - 36 = 84 unit

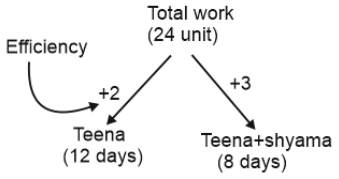
Now, work done by Nina and Sima

= $\frac{84}{4+3}$ = 12 days

So, the time taken to complete the whole work = 12 + 4 = 16 days

Sol.87.(d) Time taken by teena to complete the work = 12 days

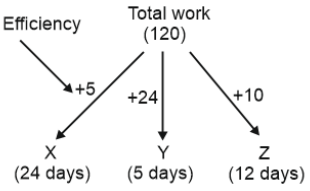
Time taken by teena and shyama to complete the work = 8 days



Efficiency of shyama = 3 - 2 = 1 unit

Time taken by shyama alone= $\frac{24}{1}$= 24 days

Sol.88.(b)



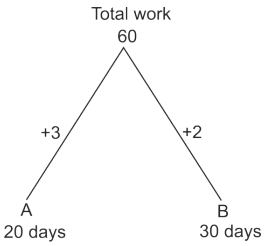
Total efficiency = 5 + 24 + 10 = 39 unit

Total work = 120 unit

Time taken together

= $\frac{120}{39}$ = $\frac{40}{13}$ = $3\frac{1}{13}$ days

Sol.89.(c)



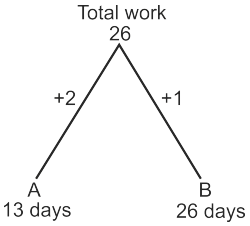
Work done by (A + B) in 2 days

= (3 + 2) × 2 =10 unit

Remaining work = 60 - 10 = 50 unit

Required fraction of work left = $\frac{50}{60}$ = $\frac{5}{6}$

Sol.90.(a)



Work done in 1 cycle(2 days)

= 2 + 1 = 3 unit

Work done in 8 cycle(16 days)

= 3 × 8 = 24 unit

Remaining work = 26 - 24 = 2 unit which is completed by A in $\frac{2}{2}$ = 1 day

So, the total time taken to complete the whole work = 16 + 1 = 17 days

Sol.91.(c)

Formula used : - $\frac{M_1D_1H_1}{W_1}$ = $\frac{M_2D_2H_2}{W_2}$

According to the question,

$\frac{24 \times 25}{90}$ = $\frac{27 \times x}{162}$

x = $\frac{24 \times 25 \times 162}{27 \times 90}$ = 40 days

Required more days = 40 - 25 = 15 days

Sol.92.(b)

Formula used : - $\frac{M_1D_1H_1}{W_1}$ = $\frac{M_2D_2H_2}{W_2}$

According to the question,

$18 \times 96 = 18 \times 26 + (28 \times x)$

$18 \times 96 - 18 \times 26 = (28 \times x)$

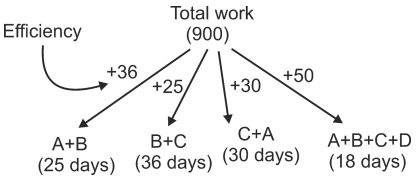
$18(96 - 26) = (28 \times x)$

$18 \times 70 = (28 \times x)$

$x = \frac{18 \times 70}{28}$ = 45 days

Time taken to complete the whole work = 45 + 26 = 71 days

Sol.93.(c)



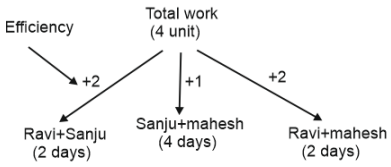
Efficiency of A + B + C = $\frac{91}{2}$ = 45.5 unit

Efficiency of A + B + C + D = 50

Efficiency of D = 50 - 45.5 = 4.5 unit

Time taken by D alone = $\frac{900}{4.5}$ = 200 days

Sol.94.(b)



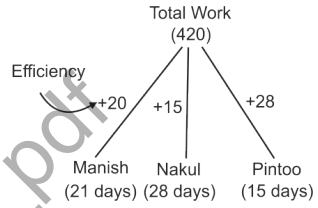
Efficiency of Ravi + Sanju + Mahesh

= $\frac{2+1+2}{2}$ = 2.5 unit

Efficiency of Ravi = 2.5 - 1 = 1.5 unit

Time taken by Ravi = $\frac{4}{1.5}$ = $\frac{8}{3}$ days

Sol.95.(d)



5 days work of Manish and Pintu

= 5 × (20 + 28) = 240 unit

Remaining work = 420 - 240 = 180 unit

Time taken by all three to complete remaining work = $\frac{180}{20+15+28}$

= $\frac{180}{63}$ = $2\frac{6}{7}$ days

Hence, number of days Nakul worked for

= $2\frac{6}{7}$ days

Sol.96.(b) Ratio → Tarun : Tripti

Effi. → 2 : 1

Total work = total efficiency × 16

= 3 × 16 = 48 unit

Time taken by tripti alone = $\frac{48}{1}$= 48 days

Sol.97.(b)

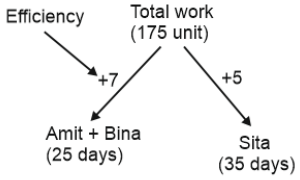
Ratio → Amita : Bina + Sita

Time → 1 : 1

Effi. → 1 : 1

Total Effi. = 2 units … (i)

Now,



Effi. of Amita + Bina + Sita = 12 unit … (ii)

From (i) and (ii)

Effi. of Bina and Sita = 6 unit

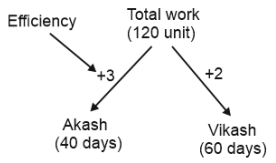
Effi. of Bina = 6 - 5 = 1 unit

Time taken by Bina = $\frac{175}{1}$ = 175 days

Sol.98.(a)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf



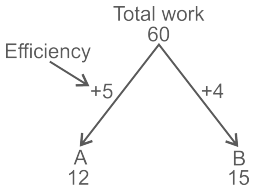
Work done in 2 days = 5 unit
Total work = 120 unit
Number of 2 day cycle = $\frac{120}{5}$ = 24
Each cycle consists 2 days , hence total days = 2 × 24 = 48 days

Sol.99.(a)
Ratio → Sapna : Rakesh
Efficiency → 2 : 1
Time taken by both to complete the work = 48 days
Hence, total work = 48 × 3 = 144 unit
Time taken by sapna alone = $\frac{144}{2}$
= 72 days

Sol.100.(c) $\frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$
300 × 30 = 300 × 20 + 250 × x
9000 = 6000 + 250 × x
250 × x = 3000 ⇒ $x = \frac{3000}{250}$ = 12 days

Sol.101.(a) $\frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$
$\frac{12 \times 10}{540} = \frac{M_2 \times 8}{720}$
$M_2 = \frac{12 \times 10 \times 720}{540 \times 8}$ = 20 days
No. of more people = 20 - 12 = 8 men

Sol.102.(d)



Work done in 2 days = 5 + 4 = 9 unit
60% of work = 60% of 60 = 36 unit
Work done in 1 cycle(2 days) = 9 unit
Work done in 4 cycle(8 days) = 9 × 4
= 36 unit
So, the time taken to complete 60% of the total work in 8 days.

Sol.103.(d) Given, 15 men and 10 machines do the same work at the same time.
Let the efficiency of men = a
And efficiency of machines = b
Hence,
15 a = 10 b ⇒ a = 2, b = 3
Total work = 15 × 2 × 66
= 10 × 3 × 66 = 1980
Time taken by 5 men and 4 machines to complete the work = $\frac{1980}{(5 \times 2) + (4 \times 3)}$
= $\frac{1980}{10 + 12} = \frac{1980}{22}$ = 90

Sol.104.(b)
Total work = 140 × 35 = 4900 unit
140 men worked for 10 days
= 140 × 10 = 1400 unit
Remaining work = 4900 - 1400
= 3500 unit
Given, 35 more men joined
⇒ Total men = 140 + 35 = 175 men
So, time taken to complete remaining work = $\frac{3500}{175}$ = 20 days

Sol.105.(c) Total work done = 108 × 36
Time taken by 48 workers
= $\frac{108 \times 36}{48}$ = 81 days

Sol.106.(c)
Let the required time taken be 't'
1hr 20min = 60 + 20 = 80 minutes
According to the question,
6 × 80 = 5 × t ⇒ 480 = 5t
t = $\frac{480}{5}$ = 96 minutes

Sol.107.(b) Let the no of men in the beginning be x and efficiency of each men be 1 unit
Total work = 4 × x = 4x
Now, work done in 1st, 2nd, 3rd, 4th day are x, (x - 10), (x - 20),(x - 30) .....(given series in AP)
Then, Work done in 7th day = a + 6d
= x + 6(-10) = x - 60
ATQ,
x + (x -10) + (x -20) + (x - 30) +.....(x - 60)
= 4x
7x - 210 = 4x ⇒ 3x = 210 ⇒ x = 70

Sol.108.(c) Given: 8 men = 16 women
= 32 boys = 32 k (say)
⇒ men's efficiency = 4k
Women's efficiency = 2k
Boys's efficiency = k
⇒ Total work done = 32k × 8 = 256 k
Time taken by 4 men, 4 women and 4 boys = $\frac{256\,k}{16\,k + 8\,k + 4\,k}$
⇒ Time taken = $\frac{256\,k}{28\,k}$ = $9\frac{1}{7}$ days

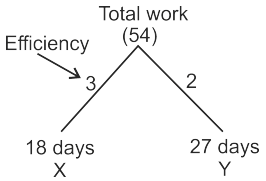
Sol.109.(b) 3 men × 10 = 4 women × 12
= 10 qualified workers × 6
⇒ 5 M = 8 W = 10 Q
Efficiency (M : W : Q)
= 8 : 5 : 4
now, total work = 3 × 8 × 10 = 240 units
Time taken by 4 men, 4 women and 4 qualified workers(T) = $\frac{240}{4\times 8 + 4\times 5 + 4\times 4}$
⇒ T = $\frac{240}{32 + 20 + 16} = \frac{240}{68} = \frac{60}{17}$ days

Sol.110.(a) $\frac{25 \times 8}{5} = \frac{10 \times 16}{containers}$
⇒ 40 = $\frac{160}{containers}$ ⇒ containers = 4

Sol.111.(d) 2 men = 4 women = 8 qualified workers = 8k ⇒ men = 4 k
Women = 2 k
Qualified workers = k
Given : 10 qualified workers can finish a work in 8 days
⇒ total work = 10 × 8 × k = 80 k
⇒ work done in three days
= 4k + 2k + k = 7k
⇒ work done in 33 days = 77k
Time taken for 80 k work done
= 33 + $\frac{3}{4}$ = $\frac{135}{4}$ days

Sol.112.(c)
8 M × 10 D × 6 H = 20 Q × 6 D × 8 H
M = 2 Q ⇒ $\frac{M}{Q} = \frac{2}{1}$
⇒ Efficiency of men = 2 unit
And efficiency of qualified workers
= 1 unit
Total work = (8 × 2) × 10 × 6 = 960 unit
Hence,
Required time
= $\frac{960}{(2 \times 2 + 4 \times 1)\ 10} = \frac{960}{80}$ = 12 days

Sol.113.(d)



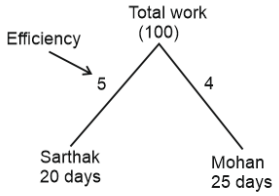
As both are working on alternate days
Work done in 2 days = 5 unit
⇒ work done in 20 days = 50 unit
For 54 unit of work done = 21 + $\frac{1}{2}$
As they take whole number of days
Total time taken = 22 days

Sol.114.(c) Let total work = 25 units
⇒ A's efficiency = 1
A did work for 5 days
⇒ 25 - 5 = 20 units
Now work done in 8 days
⇒ efficiency of A + B = $\frac{20}{8} = \frac{5}{2}$ unit
For 25 units of work,
Time taken = $\frac{25}{\frac{5}{2}}$ = 10 days

Sol.115.(b)

Search on TG: @apna_pdf

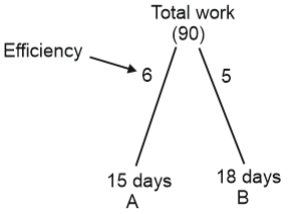
Search on Telegram @apna_pdf



Since they work alternatively,
Work done for 2 days = 5 + 4 = 9 units
⇒ Work done for 22 days = 99 units
Now remaining 1 unit of work will be done by Sarthak in $\frac{1}{5}$ days.

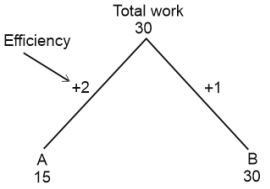
Hence total time taken = 22 $\frac{1}{5}$ days.

Sol.116.(a)



Work done in 2 days = 6 + 5 = 11 unit
⇒ Work done in 16 days = 88 unit
Now remaining two unit work will be done by A in = $\frac{2}{6}$ = $\frac{1}{3}$ days
Hence,
Total time taken = 16$\frac{1}{3}$ days

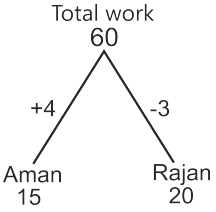
Sol.117.(b)



Work done by (A + B) in 3 days
= (2 + 1) × 3 = 9 unit
Remaining work = 30 - 9 = 21 unit
Time taken by B to complete the remaining work = $\frac{21}{1}$ = 21 days

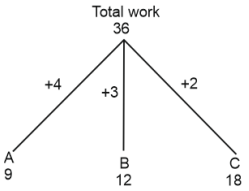
Sol.118.(d)
Let the required no of hours be x
According to the question,
8 × 10 × 18 = 5 × x × 24
1440 = 120x ⇒ x = 12

Sol.119.(d)



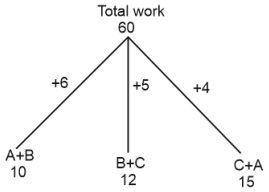
Efficiency of Aman and Rajan
= 4 - 3 = 1 unit
Work done in 1 cycle (2 days) = 1 unit
Work done in 56 cycle (112 days)
= 1 × 56 = 56 unit
Remaining work = 60 - 56 = 4 unit which is completed by Aman in $\frac{4}{4}$ = 1 day
So, the time taken to complete the whole work = 112 + 1 = 113 days

Sol.120.(a)



Work done by A in 3 days
= 4 × 3 = 12 unit
Work done by B in 3 days = 3 × 3 = 9 unit
Remaining work = 36 - (12 + 9) = 15 unit
Now, the time taken by C to complete the remaining work = $\frac{15}{2}$ = 7$\frac{1}{2}$ days

Sol.121.(d)

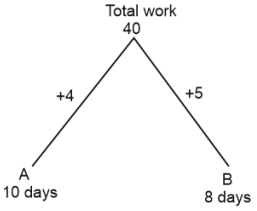


Efficiency of(A + B + C)
= $\frac{6+5+4}{2}$ = $\frac{15}{2}$ = 7.5 unit
Time taken by (A + B + C) to complete the whole work = $\frac{60}{7.5}$ = 8 days

Sol.122.(b)
Let the required no of students be x
According to the question,
$\frac{12 \times 15}{4800} = \frac{x \times 10}{7200} \Rightarrow \frac{3}{80} = \frac{x}{720}$
x = $\frac{3 \times 720}{80}$ = 27

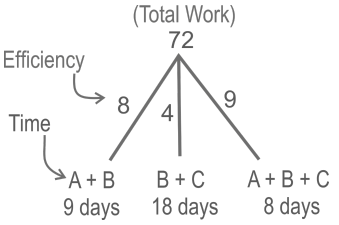
Sol.123.(c)
Let the required no of people be x
ATQ,
$\frac{30 \times 10 \times 12}{5} = \frac{x \times 16 \times 8}{8} \Rightarrow 720 = 16x$
x = $\frac{720}{16}$ = 45

Sol.124.(c)



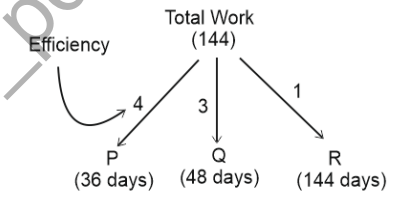
Pattern of doing work when they work alternately; A, B, A, B, A ……. and so on
Now, Work done in 1 cycle (2 days)
= 4 + 5 = 9 unit
Work done in 4 cycle (8 days)
= 9 × 4 = 36 unit
Remaining work = 40 - 36 = 4 unit which is completed by A in $\frac{4}{4}$ = 1 days
So, the time taken to complete the whole work = 8 + 1 = 9 days

Sol.125.(c)



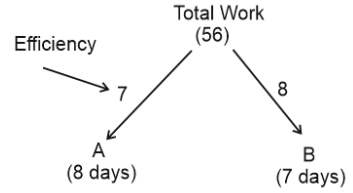
Efficiency of A +2B + C = 8 + 4=12
Efficiency of A + B + C = 9
∴ Efficiency of B = 12 - 9 = 3
Efficiency of A+C = 9 - 3 = 6
Time taken to complete the work by A+C
= $\frac{72}{6}$ = 12 days

Sol.126.(c)



P's 12 days work = 12 × 4 = 48 units
Q's 8 days work = 8 × 3 = 24 units
New Total work = 144 + 48 + 24
= 216 units
Total efficiency = 4 + 3 + 1 = 8
Now, time taken to complete the work
= $\frac{216}{8}$ × 1 = 27 days

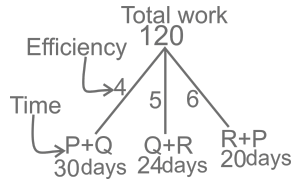
Sol.127.(d)



Efficiency of A and B = 7 + 8 = 15 units
Work done by A and B in 2 days = 15 units
Work done by A and B in 6 days = 45 units
Remaining work = 56 - 45 = 11 units
7th day A done 7 units
Now remaining work = 11 - 7 = 4 units
Time taken by B to done remaining work
= $\frac{4}{8}$ = $\frac{1}{2}$ days

So total time = 7 + $\frac{1}{2}$ = 7$\frac{1}{2}$ days

Sol.128.(d)



Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Total efficiency of P, Q and R

$= \frac{4+5+6}{2}$ = 7.5 units

Work done by P, Q and R in 10 days

= 7.5 × 10 = 75 units

Remaining work = 120 - 75 = 45 units

Efficiency of P = 7.5 - (Q + R) = 2.5 units

Required time = $\frac{45}{2.5}$ = 18 days

Sol.129.(d)

Efficiency of 4 men = Efficiency of 6 boys

$\Rightarrow \frac{M}{B} = \frac{3}{2}$

Total work = 20 × 3 × 4 = 240 unit

Now, Time taken to complete the work by 6 men and 11 boys

$= \frac{240}{6\times3+11\times2} = 6\ days$

Sol.130.(b)

Let efficiency of A = x and B = y

According to question,

$5(x+y)+5y+5x = 25x$

$\Rightarrow 10x+10y = 25x \Rightarrow \frac{x}{y} = \frac{2}{3}$

Then, the share of A

$= \frac{2}{5} \times 36000 = Rs.\ 14,400$

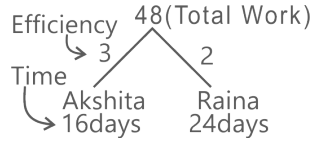
Sol.131.(a) According to the question,

Let the 15 employee left the work after x days

$75 \times 60 = (60 \times 65) + 15x$

$x = \frac{60(10)}{15}$ = 40 days

Sol.132.(a)



2 day work of Akshita and Raina = 5 units

18 days work of Akshita and Raina

= 45 units

Remaining work = 48 - 45 = 3 units

Remaining work done by Akshita in

$= \frac{3}{3}$ = 1 day

So the total time = 18 + 1 = 19 days

Sol.133.(b)

Formula used : - $\frac{M_1D_1H_1}{W_1} = \frac{M_2D_2H_2}{W_2}$

According to the question,

$\frac{36\times48}{25} = \frac{45\times x}{60} \Rightarrow 36 \times 48 \times 12$

$= 45 \times 5 \times x$

Required days (x) $= \frac{64\times36}{25}$ = 92.16

Sol.134.(a) Efficiency of 2 men

= Efficiency of 4 women

$\frac{M}{W} = \frac{4}{2}$

Total work = 34 × 2 × 4 = 272 units

Time taken to complete the work by 6 men and 5 women

$= \frac{272}{6\times4+5\times2} = 8\ days$

Sol.135.(b) Ratio of efficiency of A and B

$= \frac{1}{24} : \frac{1}{30}$ = 5 : 4

A does 5 units in 10 hours then A will do in 6 hours $= \frac{5}{10} \times 6$ = 3 unit

A will do in 4 hours $= \frac{5}{10} \times 4$ = 2 unit

B does 4 units in 10 hours then B will do in 6 hours $= \frac{4}{10} \times 6$ = 2.4 unit

B will do in 6 hours $= \frac{4}{10} \times 4$ = 1.6 unit

Total work = 24 × 5 = 120 unit

Work done by A and B in first day

= 3 + 1.6 = 4.6 unit

Work done by A and B in second day

= 2.4 + 2 = 4.4 unit

Work done by A and B in two days

= 4.6 + 4.4 = 9 unit

Work done by A and B in 26 days

= 13 × 9 = 117 unit

Remaining work = 120 – 117 = 3 unit

Remaining work will be completed by A in 27th days

Hence work will completed in 27th days

Sol.136.(c) According to the question,

→ Robert : Tom : George

Time → 6 : 3 : 2

Efficiency of Robert, Tom and george

$= (\frac{1}{6} : \frac{1}{3} : \frac{1}{2}) \times 12 = 2 : 4 : 6$

Total work = 23(2 + 4 + 6) = 23 × 12 units

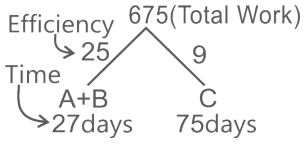
Time taken by Tom $= \frac{23\times12}{4}$ = 69 hours

Sol.137.(d) According to the question,

Ratio → A : B + C

Time → 24 : 10

Efficiency → 10 : 24



(25 + 9) = (10 + 24)

Efficiency of B = 25 - 10 = 15

Required time $= \frac{675}{15}$ = 45 days

Sol.138.(d) Time taken to complete $\frac{2}{3}rd$ of work = 12 days

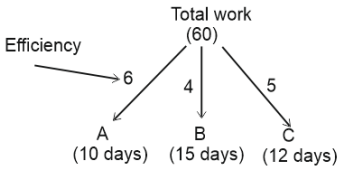
Time taken to complete Total work

$= 12 \times \frac{3}{2}$ = 18 days

Time taken to complete $\frac{1}{6}th$ of work

$= 18 \times \frac{1}{6}$ = 3 days

Sol.139.(d)



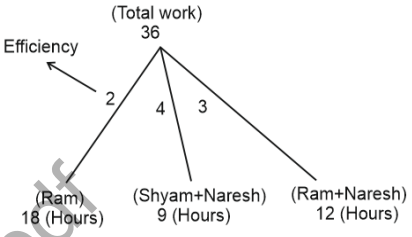
Efficiency of A and B = 6 + 4 = 10 units

Work done by A and B in 5 days

= 10 × 5 = 50 units

Required time $= \frac{60-50}{5}$ = 2 days

Sol.140.(c)



Efficiency of Naresh = 3 – 2 = 1 unit

Efficiency of Shyam = 4 – 1 = 3 units

Time taken by Shyam $= \frac{36}{3}$ = 12 hr

Sol.141.(a) Let A leaves after x days

$\frac{x}{9} + \frac{x+15}{18}$ = 1 ⇒ 3x + 15 = 18 ⇒ x = 1

Sol.142.(c) 20M × 40 = 40W × 60

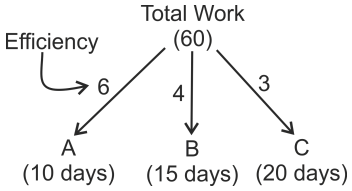
M : W = 3 : 1

Total work = 20 × 3 × 40 = 2400 units

Time taken by (10M + 20W)

$= \frac{2400}{(10\times3+20)}$ = 48 days

Sol.143.(d)



Work done by (A + B + C) in 3 days

= 13 units

Work done by (A + B + C) in 12 days

= 52 units

Remaining work = (60 – 52) = 8 units

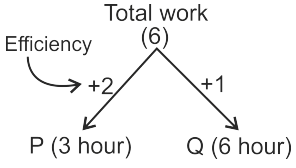
At 13th days A will do 6 units

Remaining work = (8 – 6) = 2 units

2 units work done by B in $= \frac{2}{4} = \frac{1}{2}$ days

Total time $= (13 + \frac{1}{2}) = 13\frac{1}{2}$ days

Sol.144.(d)



Total efficiency of P and Q

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

= 2 + 1 = 3 units

Required time = $\frac{6}{3}$ = 2 hours or 120 min.

So the value of x be 120 min

Sol.145.(c) According to the question,

M × 12 = 10 × W

$\frac{M}{W} = \frac{5}{6}$

Total work = 12 × 5 = 60 units

1st day work = 2 × 5 = 10 units

2nd day work = 3 × 6 = 18 units

So work done in 2 days

= 10 + 18 = 28 units

Work done in 4 days = 28 × 2 = 56 units

Remaining work = 60 - 56 = 4 units

Remaining work done by men

= $\frac{4}{5 \times 2} = \frac{2}{5}$ days

Total time = 4 + $\frac{2}{5} = \frac{22}{5}$ days

Sol.146.(a) Ratio of efficiency of Akash and Arvind = 3 : 1

Ratio of time = 1 : 3

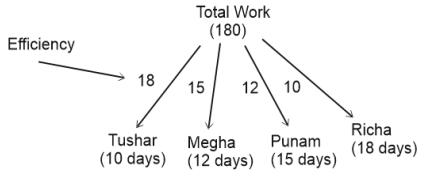
(3 – 1) units = 30 days

1 unit = 15 days , 3 units = 45 days

Required time

= $\frac{15 \times 45}{15 + 45} = \frac{45}{4} = 11\frac{1}{4}$ days

Sol.147.(b)



1 cycles = 4 days

Work done in 1 cycle

= 15 + 12 + 10 + 18 = 55 units

Work done in 3 cycle = 55 × 3 = 165 units

Remaining work = 180–165 = 15 units

Now remaining 15 units done by megha

= $\frac{15}{15}$ = 1 days

Total time = (3 × 4) + 1 = 13 days

Sol.148.(a) Let efficiency of a man be M and a boy be B

According to the question,

(M + B) × 12 = (M + B) × 10 + 3M

$\frac{M}{B} = \frac{2}{1}$

Total work = (M + B) × 12 = 36 units

Required time = $\frac{36}{1}$ = 36 days

Sol.149.(d)

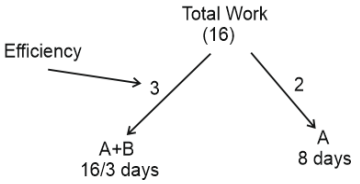
X types pages in 1 min = $\frac{8}{3}$ pages

Y types pages in 1 min = $\frac{3}{5}$ pages

So, they type pages in 15 min.

= 15 × $(\frac{8}{3} + \frac{3}{5})$ = 15 × $\frac{49}{15}$ = 49 pages

Sol.150.(c)



Efficiency of B = 3 - 2 = 1 unit

They both work alternatively,

So, 2 days work of A and B = 3 unit

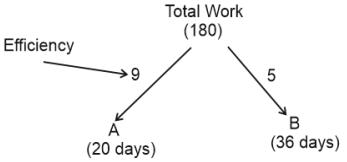
10 days work of A and B = 15 unit

Remaining work = 1 unit

11th day B done the work = 1 unit

Hence, whole work completed in 11 days

Sol.151.(b)



Time taken to A and B to complete the whole work together

= $\frac{180}{9 + 5} = 12\frac{6}{7}$ days

Sol.152.(a)

Ratio of time of A and B = 10 : 15 = 2 : 3

Ratio of efficiency of A and B = 3 : 2

Total work = LCM of 10 and 15 = 30 units

Work done by A + B in 2 days

= 5 × 2 = 10 units

Remaining work = 30 – 10 = 20 units

Time taken by B to complete the remaining work = $\frac{20}{2}$ = 10 days

Sol.153.(a) Let efficiency of Mohan be M and Sohan be S

According to the question,

6M + 21S = 24M

$\frac{M}{S} = \frac{7}{6}$

Total work = 24M = 24 × 7 = 168 unit

So , required time = $\frac{168}{6 + 7} = 12\frac{12}{13}$ days

Sol.154.(c)

Remaining days = (94 – 10) = 84 days

Remaining men = (160 – 20) = 140

According to the question,

160 × 84 = 140 × D_2

Then, required days (D_2)

= $\frac{160 \times 84}{140}$ = 96 days

Sol.155.(b) Ratio - A : B

Efficiency - 2 : 1

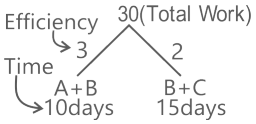
Total work = (2 + 1) × 20 = 60 units

Required time = $\frac{60}{2}$ = 30 days

Sol.156.(c) $\frac{m_1 \times d_1 \times h_1}{w_1} = \frac{m_2 \times d_2 \times h_2}{w_2}$

$\frac{100 \times 25 \times 8}{2000} = \frac{m_2 \times 32 \times 5}{2800} \Rightarrow m_2 = 175$

Sol.157.(d)



Efficiency of (A : C) = 2 : 1

efficiency of B = (2 – 1) = 1 unit

Required time = $\frac{30}{1}$ = 30 days

Sol.158.(a)

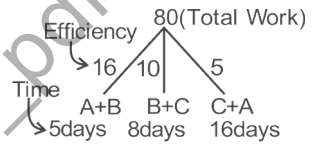
Let the number of men originally was x

According to the question,

x × 60 = (x + 8) × 50

6x = 5x + 40 ⇒ x = 40

Sol.159.(d)



Efficiency of A + B + C

= $\frac{16 + 10 + 5}{2}$ = 15.5 units

Required time = $\frac{80}{15.5} = 5\frac{5}{31}$ days

Sol.160.(a)

A's 6 days work done by B in 9 days.

6 × A = 9 × B ⇒ $\frac{A}{B} = \frac{3}{2}$

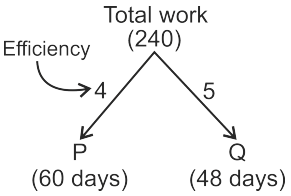
Total work = 10 × 3 = 30 units

Required time = $\frac{30}{3 + 2}$ = 6 days

Sol.161.(a) P can complete the whole work = 5 × 12 = 60 days

Q can complete the whole work

= 6 × 8 = 48 days

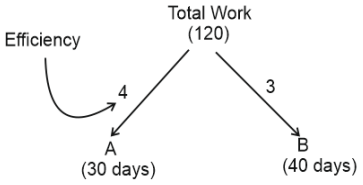


Total efficiency of P and Q

= 4 + 5 = 9 units

Required time = $\frac{240}{9} = 26\frac{2}{3}$ days

Sol.162.(a)



Let A left after the x days

According to the question,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$4x + (x + 25) \times 3 = 120 \Rightarrow 7x = 45$

$x = \frac{45}{7} = 6\frac{3}{7}$ days

Sol.163.(b)

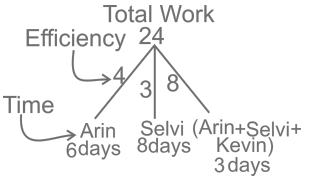
Let the total work completed in x days

According to the question,

$30 \times 10 = 30 \times 6 + 40 \times (x - 6)$

$120 = 40 \times (x - 6) \rightarrow x = 9$ days

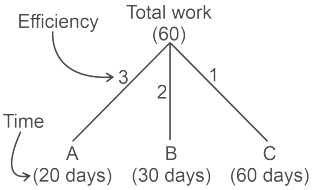
Sol.164.(a)



Efficiency of Kevin = 8 − (4 + 3) = 1 unit

Share of Kevin = 7200 × $\frac{1}{8}$ = ₹900

Sol.165.(d)



According to question,

Work will be done in series :

AB, AC, AB, AC....

Work done in 1 cycle (2 days)

= (3 + 2) + (3 + 1) = 9 unit

Work done in 6 cycle(12 days)

= 9 × 6 = 54 unit

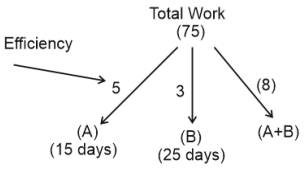
Work done in 13 day = 54 + 5 = 59 unit

Remaining work = 60 − 59 = 1 unit

Time required to complete remaining work by AC = $\frac{1}{4}$

Total required time = 13 + $\frac{1}{4}$ = $\frac{53}{4}$ days.

Sol.166.(c)



Work done by (A+B) in 5 days = 8 × 5

= 40 units

Efficiency of (A + C)

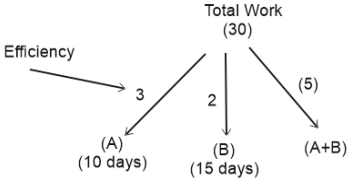
= $\frac{(75 - 40)\ units}{4\ days}$ = $\frac{35}{4}$ units/day

Now,

Efficiency of C = $\frac{35}{4} - 5 = \frac{15}{4}$ units/day

Required time = $\frac{75 \times 4}{15}$ = 20 days

Sol.167.(d)



Work done by B in last 5 days

= 2 × 5 = 10 units

Remaining work = 30 − 10 = 20 units

Work done by (A + B) together

= $\frac{20}{(3+2)}$ = 4 days

Total time = 5 + 4 = 9 days

Sol.168.(b)

Let, the efficiency of deepak = 1 unit

Then efficiency of Babita = 1.25 units

Total work = 40 × (1 + 1.25) = 90 units

Required time = $\frac{90}{1}$ = 90 days

Sol.169.(b) 69 × 20 = $(69 + x) \times 12$

$(69 + x) = 115$

x = 46 more workers needed.

Sol.170.(d)

(4M + 8W) × 10 = (5M + 24W) × 4

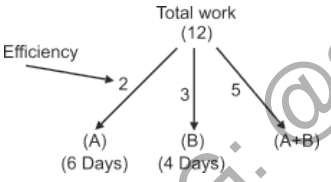
20M = 16W ⇒ $\frac{M}{W} = \frac{4}{5}$

Total work = (4M + 8W) × 10

= (4 × 4 + 8 × 5) ×10 = 560 units

Required time = $\frac{560}{4+5} = 62\frac{2}{9}$ days

Sol.171.(a)

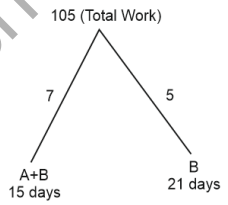


Work done by A in 2 days = 2 × 2 = 4 units

Remaining work = 12 - 4 = 8 units

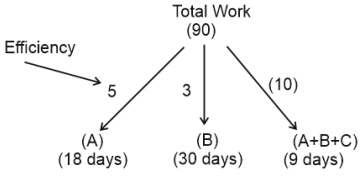
Required days = 2 + $\frac{12-4}{5}$ = $3\frac{3}{5}$ days

Sol.172.(b)



Required time by A = $\frac{105}{2} = 52\frac{1}{2}$ days

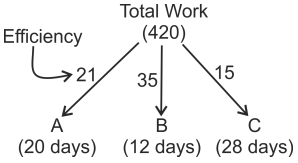
Sol.173.(b)



Efficiency of C = $10 - (5 + 3)$ = 2 units

Required time = $\frac{90}{2}$ = 45 days

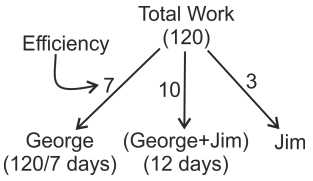
Sol.174.(a)



Required time = $\frac{420}{21+35+15}$

= 6 days (approx.)

Sol.175.(b) Time taken by George to done whole work = $6 \times \frac{20}{7} = \frac{120}{7}$ days



Required time = $\frac{120}{3}$ = 40 days

Sol.176.(c)

Let the required no. of days = x

$30 \times 5 \times 18 = 21 \times 8 \times x$

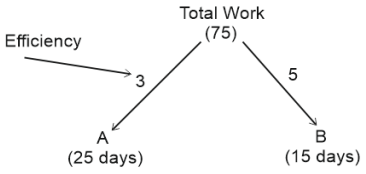
$x = \frac{10 \times 5 \times 9}{7 \times 4} = 16\frac{1}{14}$ days

Sol.177.(a) Let x mechanics be required

According to the question,

$\frac{18 \times 10}{90} = \frac{12 \times x}{150} \Rightarrow x = \frac{2 \times 150}{12} = 25$

Sol.178.(c)



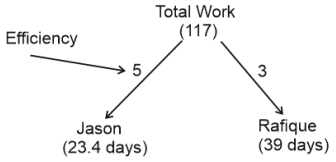
Total work done by B in 10 days

= 10 × 5 = 50 units

Remaining work = 75 − 50 = 25 units

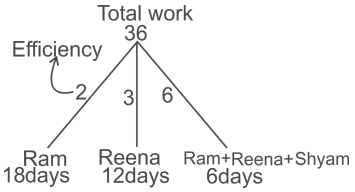
Hence, time taken by A to complete remaining work = $\frac{25}{3} = 8\frac{1}{3}$ days

Sol.179.(b)



Time taken to Work done by both together = $\frac{117}{8}$ = 14.625 days

Sol.180.(b)



Efficiency of Shyam = 6 − (2 + 3) = 1 units

Required time = $\frac{36}{1}$ = 36 days

Sol.181.(a) Number of pages Raju types in one hour = $\frac{32}{4}$ = 8 pages

Number of pages Akber types in one

Search on TG: @apna_pdf

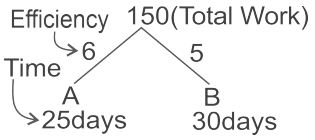
Search on Telegram @apna_pdf

hour = $\frac{48}{6}$ = 8 pages

so, together they type in one hour = 16 pages

Hence, required time to complete the assignment = $\frac{256}{16}$ = 16 hours

Sol.182.(a)



As they work alternatively , starting with A :-

Work done by A and B in 5 days

= 6 + 5 + 6 + 5 + 6 = 28 units

Now , remaining work = 150 - 28 = 122

Required time by B to finish the remaining work =

$\frac{122}{5}$ = $24\frac{2}{5}$ days

Sol.183.(c)

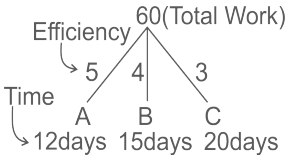
Ratio	→	P	:	Q
Efficiency	→	3	:	1
Time	→	1	:	3

Difference in time (2 unit) = 40 days

Total work = $\frac{40}{2}$ × 3 = 60 units

Required time = $\frac{60}{3+1}$ = 15 days

Sol.184.(b)



Four days work of A, B and C together

= (5 + 4 + 3) × 4 = 48 units

Remaining part of work

= $\frac{60-48}{60}$ = $\frac{1}{5}$ th part

Sol.185.(b)

(15 M + 25 W) × 9.6 = 16 W × 27

(15 M+ 25 W) × 3.2 = 16 W × 9

48 M + 80 W = 144 W

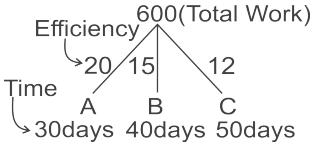
$\frac{M}{W}$ = $\frac{64}{48}$ = $\frac{4}{3}$

Total work (16W × 27) = 16 × 3 × 27

Required time

= $\frac{16 \times 3 \times 27}{16 \times 4}$ = 20.25 days

Sol.186.(a)



According to question,

Work done in 1 cycle (3 days)

= (20 + 15 + 12) = 47 units

Work done in 12 cycle (36 days)

= 47 × 12 = 564 units

Remaining work = 600 – 564 = 36 units

Remaining work after 37th and 38th day

= 36 – (20 + 15) = 1 unit

Time required to complete remaining work = $\frac{1}{12}$ days

Therefore, Required time

= 36 + 2 + $\frac{1}{12}$ = $38\frac{1}{12}$ days

Sol.187.(d) According to the question,

$m_1 \times w_1 \times h_1 = m_2 \times w_2 \times h_2$

(15 men + 21 women) × 56

= (12 men + 24 women) × 64

(15 men + 21 women) × 7

= (12 men + 24 women) × 8

105 men + 147 women

= 96 men + 192 women

9 men = 45 women

$\frac{men}{women}$ = $\frac{5}{1}$

Total work = (15 × 5 + 21 × 1) × 56

= 96 × 56

Required time = $\frac{96 \times 56}{(18 \times 5) + (24 \times 1)}$

= $\frac{96 \times 56}{114}$ = $47\frac{3}{19}$ days

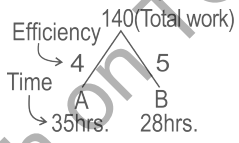
Sol.188.(d) According to the question,

Time taken by A to done whole work

= 7 × 5 = 35 days

Time taken by B to done whole work

= 7 × 4 = 28 days



Total efficiency of A and B

= 4 + 5 = 9 units

Work done by A and B in 7 days

= 9 × 7 = 63 units

Required % = $\frac{63}{140}$ × 100 = 45%

Sol.189.(a)

Let the efficiency of a man be 1 unit.

Then, total work = 30 × 1 × 12 = 360 units

Work done in 6 days

= 1 × 30 × 6 = 180 units

Remaining work = 360 – 180 = 180 unit

According to question,

Required time = $\frac{180}{(30+24)}$ = $3\frac{1}{3}$ days

Sol.190.(d)

Let efficiency of each A and B be 1 unit

Then, total work = 30 × 1 = 30 unit

According to the question,

Work done in one cycle (6 days)

= A(4 + 1) + B(5) = 10 units

Work done in three cycle (18 days)

= 10 × 3 = 30 units

So, work will be completed on 18 August 2022 .

Sol.191.(b) Mohit can complete $\frac{2}{3}rd$ of work in 24 days.

Mohit complete the total work in

= $24 \times \frac{3}{2}$ = 36 days.

Mohit can complete $\frac{1}{9}th$ of work in

= $36 \times \frac{1}{9}$ = 4 days

Sol.192.(a) Equating the total work :-

10 Women × 6 days = 6 Men × 5 days

$\frac{Men}{Women}$ = $\frac{60}{30}$ = $\frac{2}{1}$

Total work = 6 Men × 5 days

= 6 × 2 × 5 = 60 units

Efficiency of 6 men and 10 women

= 6 × 2 + 10 × 1 = 22 units

Required no. of days = $\frac{60}{22}$ = $2\frac{8}{11}$ days

Sol.193.(a) According to question,

Time taken by (N + 15) person to complete the work

= $\frac{8 \times 100 \times 9}{36}$ = 200 hours

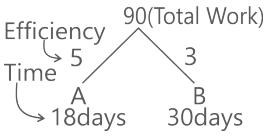
Time taken by (N + 9) person to complete the work

= $\frac{20 \times 100 \times 7}{64}$ = 218.75 hours

(N + 15) × 200 = (N + 9) × 218.75

18.75N = 1031.25 ⇒ N = 55

Sol.194.(b)



Work done by B in $16\frac{2}{3}$ days

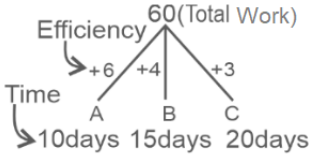
= $\frac{50}{3}$ × 3 = 50 units

Remaining work = 90 – 50 = 40 units

A and B work together for

= $\frac{40}{5+3}$ = 5 days.

Sol.195.(b)

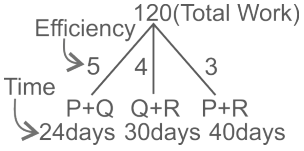


According to question,

Ratio of efficiency of A, B and C = 6 : 4 : 3

Share of C = 2600 × $\frac{3}{6+4+3}$ = Rs. 600

Sol.196.(d)



Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Efficiency of P + Q + R = $\frac{12}{2}$ = 6 Unit

Efficiency of P = 6 − 4 = 2 unit
Efficiency of Q = 6 − 3 = 3 unit
Efficiency of R = 6 − 5 = 1 unit
Now, According to the question,
Efficiency of X = 4P = 8 unit
Efficiency of Y = 0.5 Q = 1.5 unit
Efficiency of Z = 2.5R = 2.5 unit
Then, time taken by X,Y and Z together to complete the work

= $\frac{120}{8+1.5+2.5}$ = 10 days

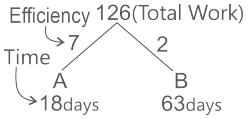
Sol.197.(c) Ratio of their wages :-
X : Y : Z = 4 × 5 : 7 × 5 : 10 × 3
= 20 : 35 : 30
Wages received by X

= $\frac{20}{85} \times 3400$ = ₹ 800

Sol.198.(d) Efficiency of A : B = 3.5 : 1
According to the question,

$(3.5-1)x = 45 \Rightarrow x = \frac{45}{2.5} = 18$

So, time taken by A to complete the work = 18 days
And, time taken by B to complete the work = 3.5 × 18 = 63 days



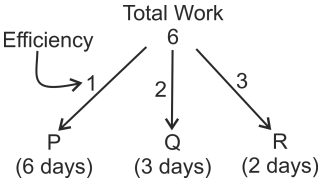
Time taken by A and B to complete whole work = $\frac{126}{9}$ = 14 days

Sol.199.(a) 40% = $\frac{+2}{5}$

Efficiency of A : B = 7 : 5
Total work = 31 × 7 = 217 units
Hence , required time

= $\frac{217}{5+7} = \frac{217}{12}$days

Sol.200.(b)



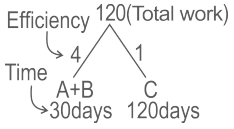
Total work = 2 × (1 + 2 + 3) = 12 units

Required time = $\frac{12}{2}$ = 6 days

Sol.201.(c)

Efficiency ∝ $\frac{1}{time} \Rightarrow \frac{A}{B+C} = \frac{2}{3}$

Efficiency of A + B + C = 5 units
Now ,



Here , Efficiency of A + B + C = 5 units
On comparing efficiencies , we get
Efficiency of C = 1, and Efficiency of B = 2

Required time = $\frac{120}{2}$ = 60 days

Sol.202.(b) According to the question,

$\frac{(4W+7M)\times 7}{(10W+17M)\times 9} = \frac{11480}{36360}$

$\frac{(4W+7M)}{(10W+17M)} = \frac{41}{101}$

101 × $(4W + 7M)$ = 41 × $(10W + 17M)$

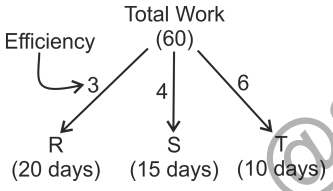
$\frac{W}{M} = \frac{5}{3}$

Now, $(4W + 7M) \times 7$
= (4 × 5 + 7 × 3) × 7 = 287 units
287 unit = ₹ 11480 ⇒ 1 unit = ₹40
So, 11 women and 9 men together earn in 13 days
= (11 W + 9M) × 13 = (11 × 5 + 9 × 3) × 13
= 82 × 13 = 1066 units
1066 units = 1066 × 40 = ₹ 42,640

Sol.203.(a) $M_1 \times D_1 = M_2 \times D_2$

$6 \times 16 = (10 + x) \times 8 \Rightarrow 8x = 96 - 80$
x = 2 more labour needed.

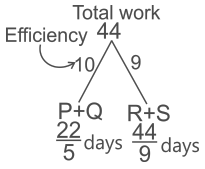
Sol.204.(c)



According to question,
Series of work = (R + T),(R + S),(R + T).....
Work done in 1 cycle (2 days)
= (3 + 6) + (3 + 4) = 16 units
Work done in 3 cycle (6 days)
= 16 × 3 = 48 units
Remaining work = 60 − 48 = 12 units
7th day work done by (R + T) = 9 units
Remaining work = 12 − 9 = 3 units

Required time = 6 + 1 + $\frac{3}{7}$ = $\frac{52}{7}$ days

Sol.205.(d)



Time taken to complete whole work done by P + Q + R + S together

= $\frac{44}{10+9}$ = $2\frac{6}{19}$ days

Sol.206.(a)
Let the no. of students be 'x' , then
According to the question ,
$x \times 10 = x + (x - 2) + (x - 4) + \ldots\ldots(x - 28)$
$10x = 15x - 210$

= $x = \frac{210}{5}$ = 42 students

Sol.207.(a) Equating the total work :-
(20W + 15M) × 6 = (1W) × 150

90M = 30W ⇒ $\frac{M}{W} = \frac{1}{3}$

Total work = (1W) × 150 = 3 × 150
= 450 units
Required number of days when a man can complete the work alone

= $\frac{450}{1}$ = 450 days

Sol.208.(a) Efficiency ratio :-
Men : Women : Boys
3 : 2
3 : 2
---
9 : 6 : 4
Total work = 60 × efficiency of boy
= 60 × 4 = 240 unit
Time taken by a man and a woman to complete the whole work

= $\frac{240}{9+6}$ = 16 days

Sol.209.(c)
Let total number of men initially be x
According to the question,
$11x = x + (x - 16) + (x - 32) + (x - 48)$ ---------- and so on,
$11x = 15x - (16 + 32 + 48 + \text{----- 14 terms})$

$11x = 15x - \frac{14}{2}[2\times 16 + (14 - 1)\times 16]$

{formula used :- $S_n = \frac{n}{2}[2a + (n-1)d]$}

$11x = 15x - 1680$
$15x - 11x = 1680 \Rightarrow x = 420$

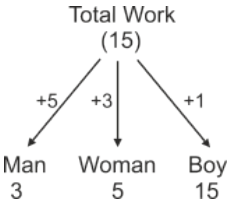
Sol.210.(a) According to question,

15M × 10 = 15W × 12 ⇒ $\frac{M}{W} = \frac{6}{5}$

Total work (15M × 10)
= 15 × 6 × 10 = 900 units
Required time

= $\frac{900}{(15\times 6)+(15\times 5)}$ = $5\frac{5}{11}$ days

Sol.211.(a)

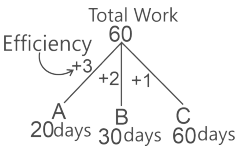


Let the no of boys be x ,
According to the question ,

$(5 + 3 + x) \times \frac{1}{5} = 15$

$8 + x = 75 \Rightarrow x = 67$

Sol.212.(b)



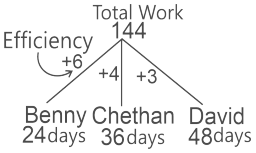
Pattern of doing work when A is assisted by B&C on every third day
= (A, A, A + B + C, A, A, A + B + C, ...)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

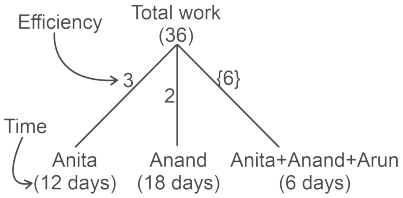
Work done by them in 1 cycle(3 days)
= 3 + 3 + 6 = 12 unit
Work done by them in 5 cycle(15 days)
= 12 × 5 = 60 unit
So,
the required time taken by A = 15 days

Sol.213.(a)



Extra work done by Benny for 4 days
= 6 × 4 = 24 unit
Extra work done by Chethan for 10 days
= 4 × 10 = 40 unit
Now, Total work = 144 + 24 + 40 = 208 unit
Time taken by them to complete the whole work = $\frac{208}{6+4+3}$ = $\frac{208}{13}$ = 16 days

Sol.214.(a)



Wages will be divided in the ratio of their efficiency.

Anita : Anand : Arun

Efficiency → 3 : 2 : 1

Share of Anita and Anand (5 units)

= $\frac{48000}{(3+2+1)}$ × 5 = 40000 Rs.

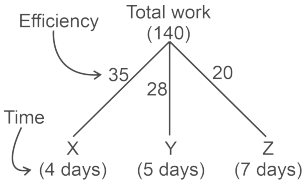
Sol.215.(a) According to the question ,

$(Maya + Suresh) \times \frac{3}{10}$ of work = 4 days

Time taken by maya and suresh to complete the total work

= $\frac{4 \times 10}{3}$ = $\frac{40}{3}$ days.

Sol.216.(b)



According to question,
Number of days to finish the work when the work together = $\frac{140}{35+28+20}$

= $\frac{140}{83}$ days

Work done by X in $\frac{140}{83}$ days

= $\frac{140}{83}$ × 35 unit

Share of X = $\frac{140 \times 35 \times 415}{83 \times 140}$ = Rs. 175

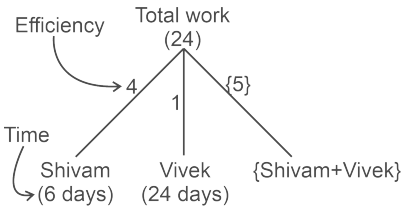
Sol.217.(c) Let the required number of men be x , then

⇒ $\frac{16 \times 18 \times 6}{24}$ = $\frac{x \times 9 \times 12}{42}$

⇒ x = $\frac{2 \times 2 \times 42}{3 \times 1 \times 2}$ = 28 men

Extra required men = 28 − 16 = 12 men

Sol.218.(d)

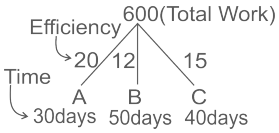


Work done by vivek in last three days
= 1 × 3 = 3 units
Remaining work done by them together
= 24 − 3 = 21 units

Required time = $\frac{21}{5}$ = $4\frac{1}{5}$ days

Total no. of days = 3 + $4\frac{1}{5}$ = $7\frac{1}{5}$ days.

Sol.219.(b)

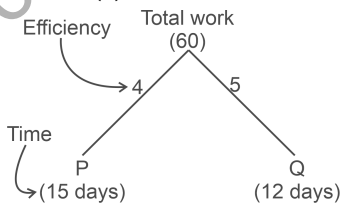


Work done in first two days
= (20 + 12) + (20 + 15) = 67 units
Work done in 16 days = 67 × 8 = 536 units
Work done on 17 days = 536 + (20 + 12)
= 568 units
Time require to complete left work

= $\frac{600-568}{(20+15)}$ = $\frac{32}{35}$ days.

Total days = $17\frac{32}{35}$ days

Sol.220.(d)



Total efficiency = 4 + 5 = 9 units
Work done in first 3 days = 9 × 3
= 27 units
Remaining work = 60 − 27 = 33 units

Required time = $\frac{33}{5}$ = 6.6 days

Sol.221.(b)

Formula used :- $\frac{M_1D_1H_1}{W_1}$ = $\frac{M_2D_2H_2}{W_2}$

Suresh × 1 × 10 = Shalu × 5 × 2

Efficiency of $\frac{Suresh}{Shalu}$ = $\frac{1}{1}$

Total work = 1 × 1 × 10 = 10 unit
Let , they work together to complete the work in x hours.
According to the question,

10 = $\frac{(1+1) \times 10 \times x}{1}$ ⇒ x = 0.5 hours.

Sol.222.(c)
Total work = 90 × (3 + 5) = 720 units

Required time = $\frac{720}{5}$ = 144 days

Sol.223.(a) According to the question, Efficiency and Time are inversely proportional to each other.

A : B : C = $\frac{1}{4}$: $\frac{1}{3}$: $\frac{1}{6}$

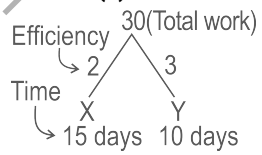
Ratio of efficiency of A : B : C = 3 : 4 : 2

Sol.224.(d) Given, the food was provided for 1200 men for 80 days.
After 5 days, remaining food is sufficient for 1200 men for 75 days.
Remaining men after 5 days
= 1200 − 400 = 800
According to question,

$\frac{1200}{800}$ = $\frac{x}{75}$ ⇒ x = $\frac{1200 \times 75}{800}$

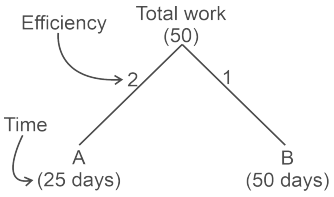
= 112.5 days

Sol.225.(a)



Total Efficiency of X and Y = 2 + 3
= 5 units
Work done by X and Y in 3 days
= 3 × 5 = 15 units
Remaining work = 30 − 15 = 15 units
Work done by Z in 1 day = 15 units
50% work done by X and Y and remaining 50% work done by Z so the amount paid to Z will be ⇒ $\frac{4000}{2}$ = ₹ 2000

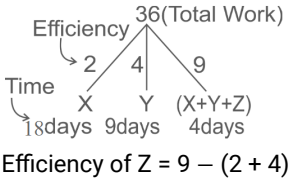
Sol.226.(d)



9 days work of A and B = 9 × (2 + 1)
= 27 Unit

Required % = $\frac{27}{50}$ × 100 = 54%

Sol.227.(a)



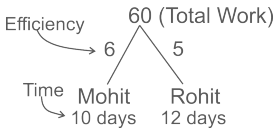
Efficiency of Z = 9 − (2 + 4) = 3 unit

Required time = $\frac{36}{3}$ = 12 days

Sol.228.(b)

Search on TG: @apna_pdf

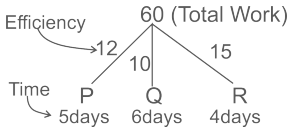
Search on Telegram @apna_pdf



Difference between their efficiency
= 6 – 5 = 1 unit

Required amount = 2200 × $\frac{1}{6+5}$ = ₹ 200

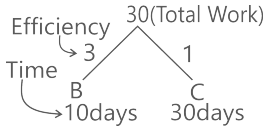
Sol.229.(a)



If Q don't leave the work then works done by him = 1 × 10 = 10 units
Now total work = 60 + 10 = 70 units

Required time = $\frac{70}{12+10+15}$ = $\frac{70}{37}$ days

Sol.230.(d)



According to question,
Work done by C in 10 day = 10 units
Remaining work = 30 – 10 = 20 units

Required time = $\frac{20}{3+1}$ = 5 days

Sol.231.(d)
Efficiency of Shreyas and Ruchi = 1 : 2.5
Shreyas can complete the work

= $\frac{16 \times 5}{4}$ = 20 days

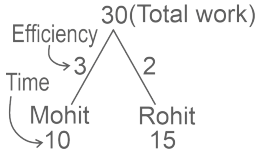
Total work = 20 × 1 = 20 units
Ruchi alone can complete the work

= $\frac{20}{2.5}$ = 8 days

Sol.232.(a) Efficiency of A : B = 2 : 1
According to the question,
(2 – 1) unit = 20 days
Total work = 2 × 20 = 40 unit
So, they together complete the work

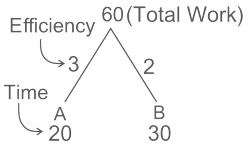
= $\frac{40}{2+1}$ = $\frac{40}{3}$ days

Sol.233.(d)



Mohit and Rohit undertook a work for
= 4400 Rs.
Mohit received the amount if he work alone = $\frac{3}{5} \times 4400$ = 2640 Rs.
Rohit received the amount if he work alone = $\frac{2}{5} \times 4400$ = 1760 Rs.
So, difference between the amount they received = (2640 - 1760) = 880 Rs.

Sol.234.(b)

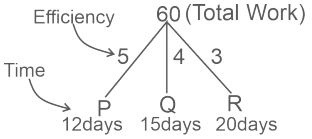


Ratio of efficiency of A and B is → 3 : 2
Working together A and B can complete the same work in → $\frac{60}{5}$ = 12 days
So, both statement is correct

Sol.235.(d) Let B's efficiency be 1 unit then A's efficiency be 3 units.
Total work done by A and B together in 32 days → 32 × 4 = 128 units
B alone can do the work

→ $\frac{128}{1}$ = 128 days

Sol.236.(c)

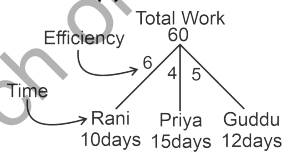


If P do not leave the work then he did the work in 8 days = 8 × 5 = 40
If Q do not leave the work then he did the work in 3 days = 3 × 4 = 12
Total work done by P and Q
= 40 + 12 = 52
So total work done by P, Q, R

= $\frac{60+52}{5+4+3}$ ⇒ $\frac{112}{12}$ = $\frac{28}{3}$ days

So, p will do total works in $\frac{28}{3}$ days

Sol.237.(a)



Share of priya in the money

→ 9000 × $\frac{4}{(6+4+5)}$ = 2400 Rs.

Sol.238.(d) let the initial persons be x

then , $\frac{x \times 90}{1} = \frac{(x-10) \times 100}{1}$

⇒ x = 100

Sol.239.(c) Fraction value of 20% = $\frac{1}{5}$

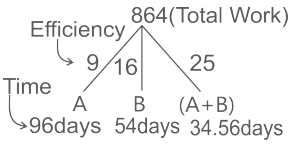
Efficiency of A → before : after
5 : 4

Total work = 20 × 5 → 100 units
Now,

A will do the all work = $\frac{100}{4}$ = 25 days

Sol.240.(b) A can complete the whole work in = $\frac{36 \times 8}{3}$ = 96 days

B can complete the whole work in
= 27 × 2 = 54 days



Here A is less efficient than B.
A and B working together can complete $\frac{11}{15}$ part of the work in 25.3 days.
So, the only conclusion I follow.

Sol.241.(b) Let no of days taken by men to build the wall be 1
Total Work done = 10 h × 6 × 1 = 60
60 = $x \times 12 \times 1$ = 5 h.
Working 5 hours a day, 12 men can complete the wall in the same day .

Sol.242.(a)
Total work = Time × Efficiency

		A	:	B	:	C
Time	→	20	:	5	:	4
Efficiency	→	1	:	4	:	5

Total work = (1 + 4 + 5) × 4 days
= 40 unit
Time taken by B alone to finish the work

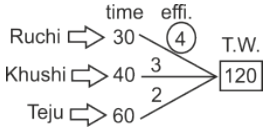
= $\frac{40}{4}$ = 10 days

Sol.243.(d)

		A	:	B	:	C
Time	→	6	:	3	:	2
efficiency	→	3	:	6	:	9

total work = (3 + 6 + 9) × 8days = 144 units
Time taken by A alone to complete the work = $\frac{144}{3}$ = 48 days
Time taken by B alone to complete the work = $\frac{144}{6}$ = 24 days
Time taken by C alone to complete the work = $\frac{144}{9}$ = 16 days

Sol.244.(b)



Ruchi's efficiency is 4 units. On every third day she is assisted by Khushi and Teju .
Work done in 3 days = 4 + 4 + (4 + 3 + 2)
= 17 units
Work done in 21 days = 17 × 7 = 119 units
Remaining work =(120 - 119) = 1 units
On 22nd days ruchi work alone , time require to complete 1 unit of work by ruchi = $\frac{1}{4}$ days.

Total days = $(21 + \frac{1}{4})$ days. = $\frac{85}{4}$days

Sol.245.(b) Let the efficiency of one man is 'm' then,
Total work = (60 m × 20 days) + (80 m ×

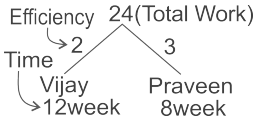
Search on TG: @apna_pdf

Search on Telegram @apna_pdf

60 days) = 6000 m unit
If extra men did not employed , then time in which work finish
$= \frac{6000\,m}{60\,m}$ = 100 days
Extra days = 100 - 80 = 20 days

Sol.246.(b) Let 'm' men initially decide to do a job.
'm' men complete the job in 6 days.
Then , total work = 6m
According to the question ,
Equating the total work ,
6m = m + (m - 18) + (m - 18 × 2) + (m - 18 × 3)+ .....+ (m - 18 × 7)
6m = 8m - 18(1 + 2 + ... + 7)
6m = 8m - 18 × 28 ⇒ m = 252

Sol.247.(c)

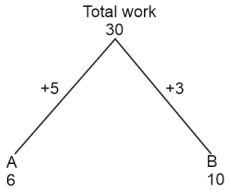


They work alternately, so in 2 week they do → 5 units of work
And in 8 week. → 20 units of work
Next week Praveen will do 3 units of work and vijay will do remaining 1 unit work in $\frac{1}{2}week$
Time taken by them to complete the work = $9\frac{1}{2}weeks$ or 9.5 weeks.

Sol.248.(c)
Total work = 20 × 220 = 4400 unit
Work done by 20 men at the end of 90 days = 90 × 20 = 1800 unit
Remaining work = 4400 - 1800 = 2600 unit
Time taken by 40 men to complete the remaining work = $\frac{2600}{40}$ = 65 days

Sol.249.(b) Let the efficiency of Abha and Anuj be 'a' and 'b' respectively
ATQ,
$(a + b) \times \frac{40}{9} = (2a + \frac{b}{3}) \times \frac{60}{17}$
$\frac{(a+b)\times 3}{6a+b} = \frac{60}{17} \times \frac{9}{40} = \frac{27}{34}$
$\frac{a+b}{6a+b} = \frac{9}{34}$ ⇒ 34a + 34b = 54a + 9b
25b = 20a ⇒ $\frac{a}{b} = \frac{25}{20} = \frac{5}{4}$
Then, total work = $(5 + 4) \times \frac{40}{9}$ = 40 unit
Time taken by Abha to complete the whole work = $\frac{40}{5}$ = 8 days

Sol.250.(b)



Work done by A and B alone to complete 1 cycle (2hrs) = 5 + 3 = 8 unit
Then, work done in 3 cycle (6 hrs)
= 8 × 3 = 24 unit
Remaining work = 30 - 24 = 6 unit i.e. 5 unit work is completed by A in 1 hr and 1 unit work by B in $\frac{1}{3}$ hrs
So, required time taken by them to complete the whole work = $6 + 1 + \frac{1}{3}$
= $7\frac{1}{3}$ hrs

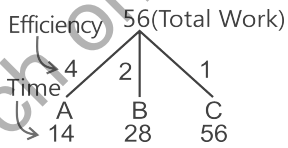
Sol.251.(d) Time $\propto \frac{1}{efficiency}$

	X : Y + Z	and	Z : Y + X
Efficiency →	1 : 3		1 : 4

Balancing the ratio, we have
Efficiency of X , Y and Z = 5 : 11 : 4
Total work = (5 +11 + 4) × 10 = 20 × 10
= 200 unit
Time taken by (X + Z) to complete the whole work = $\frac{200}{5+4} = \frac{200}{9} = 22\frac{2}{9}$ days

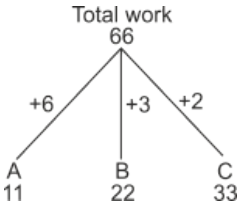
Sol.252.(b) Let the total number of men workers be x.
$x \times 20 = (x - 5) \times 40$
$\Rightarrow 20x = 40x - 200$
$\Rightarrow 40x - 20x = 200$
$\Rightarrow 20x = 200 \Rightarrow x = 10$
So, the number of men who agreed to do the work = 10

Sol.253.(d) Let the time taken to complete the whole work be n days.



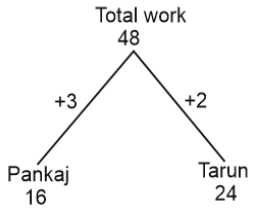
So, 4(n - 3) + 2(n - 2) + 1(n) = 56
4n - 12 + 2n - 4 + n = 56
7n - 16 = 56 ⇒ 7n = 72 ⇒ n = $\frac{72}{7}$ days

Sol.254.(a)



Work done by (A, B + B, C + C, A) in 1 cycle(3 days) = 9 + 5 + 8 = 22 unit
Work done (AB + BC + CA) in 2nd cycle(3 days) i.e. = 22 unit
Work done (AB + BC + CA) in 3rd cycle(3 days) = 22 unit
So, the time taken by workers to complete the whole work i.e. 66 unit
= 3 + 3 + 3 = 9 days

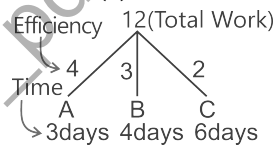
Sol.255.(b)



They can do 5 units of work in 2 hours.
So, they can do 45 units of work in 18 hours.
Next hour, Pankaj will do the remaining 3 units of work.
Total time taken by both to complete the work = 19 hours.

Sol.256.(d) Time taken by Anjali to complete $\frac{7}{11}$ of the work is 14 days
Time taken by Anjali to complete $\frac{4}{11}$ of the work = $14 \times \frac{11}{7} \times \frac{4}{11}$ = 8 days

Sol.257.(b)



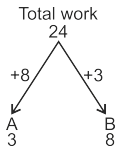
Total Price spent on this piece of work
= Rs. 432
They got their share according to their efficiency.
so 9 units → Rs. 432
4 units → $432 \times \frac{4}{9}$ = Rs.192
So, A's share = Rs.192

Sol.258.(b) 3 adults consume milk in a day = 2 litres
So 5 adult consume milk in 30 day
$= \frac{2}{3} \times 5 \times 30$ = 100 litres
5 children consume milk in a day
= 2 × 2 = 4 litres
So 8 children consume milk in 30 day
$= \frac{4}{5} \times 8 \times 30$ = 192 litres
3 adults consume sugar in a day = 0.5 kg
So 5 adult consume sugar in 30 day
$= \frac{0.5}{3} \times 5 \times 30$ = 25 kg
5 children consume sugar in a day
$= \frac{0.5}{2}$ = 0.25 kg
So 8 children consume sugar in 30 day
$= \frac{0.25}{5} \times 8 \times 30$ = 12 kg
total expenditure on milk
= (100 + 192) × 50 = Rs.14600
total expenditure on Sugar
= (25 + 12) × 80 = Rs. 2960
Total expenditure on both commodities
= 14600+ 2960 = Rs.17560

Sol.259.(c)

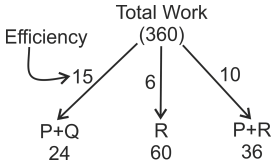
Search on TG: @apna_pdf

Search on Telegram @apna_pdf



Time taken by (A + B) to complete the whole work = $\frac{24}{8+3}$ = $\frac{24}{11}$ hrs

Sol.260.(d) According to the question,



Efficiency, R = 6 unit

⇒ P + R = 10 So, P = 10 - 6 = 4 unit

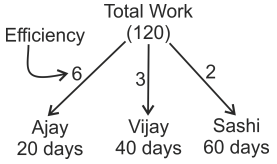
Therefore,

⇒ P + Q = 15 so, Q = 15 - 4 = 11 unit

Q will complete the work

= $\frac{total\ work}{efficiency\ of\ Q}$ = $\frac{360}{11}$ = $32\frac{8}{11}$ days

Sol.261.(b)



Now according to the question,

Ajay work all days and vijay and sashi assists him on every 4th days

So work done in 4 days

= 6 + 6 + 6 + (6 + 3 + 2) = 29 units

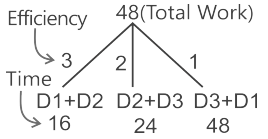
Work done in 16 days

= 29 × 4 = 116 units

Now on 17th day remaining work = 4 unit done by ajay with efficiency of 6 units per day

Total days = 16 + $\frac{2}{3}$ = $\frac{50}{3}$ days

Sol.262.(b)



Combined efficiency of D1 , D2 and D3

= $\frac{D1 + D2 + D2 + D3 + D3 + D1}{2}$

= $\frac{3+2+1}{2}$ = 3

Now $\frac{5}{6}th$ part of the work

= $\frac{48}{3} \times \frac{5}{6}$ = $\frac{40}{3}$ days

Sol.263.(b)

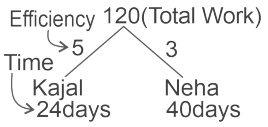
	Z1	:	Z2	:	Z3
Days →	8	:	10	:	15
Wages →	3x	:	4x	:	4x
Total wages→	24x	:	40x	:	60x

Total wages = 124x = Rs. 4960 ⇒ x = 40

Combined wages of Z2 and Z3

= 40x + 60x = 100x = 100 × 40 = Rs. 4000

Sol.264.(b)



Work done in 12 days = 5 × 12 = 60 unit

Remaining work = 120 - 60 = 60 unit

Time = $\frac{60}{5+3}$ = 7.5 days

Total days = 12 + 7.5

= 19.5 days or $\frac{39}{2}$ days

Sol.265.(c)

	A	:	B
Time →	1	:	3
Efficiency →	3	:	1

(3 - 1) = 2 unit = 40 days

1 unit = 20 days

So, time taken by Anamika to complete a work = 20 days

Time taken by Bani to complete a work

= 20 × 3 = 60 days

Total work = 60 × 1 = 60 unit

Time taken by them to complete whole work = $\frac{60}{3+1}$ = $\frac{60}{4}$ = 15 days

Sol.266.(d) According to the question ,

⇒ $\frac{A \times 1}{\frac{1}{2}}$ = $\frac{B \times 6}{1}$ ⇒ A = B × 6 × $\frac{1}{2}$

⇒ A = 3B ⇒ $\frac{A}{B}$ = $\frac{3}{1}$

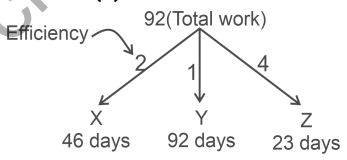
Total work = (3 + 1) × 16 = 4 × 16 = 64 unit

Time taken by B alone to complete the whole work = $\frac{64}{1}$ = 64 days

Sol.267.(b) 40 × 18 = 40 × 9 + 45 × d

⇒ 720 = 360 + 45 × d ⇒ d = 8

Sol.268.(c)



Work done by X in 2 days

= 2 × 2 = 4 units

Work done by X and Y in next 6 days

= (2 + 1) × 6 = 18 units

Remaining work = 92 – (4 + 18)

= 92 – 22 = 70 units

Let the number of days Z work = n

So, (2 + 1 + 4) × n = 70

7n = 70 ⇒ n = 10 days

Number of days for which X worked

= 2 + 6 + 10 = 18 days

Sol.269.(c) Time taken by A to complete whole work = 15 × 4 = 60 days

Let efficiency of A = 1,

so total work = 60 × 1 = 60 units

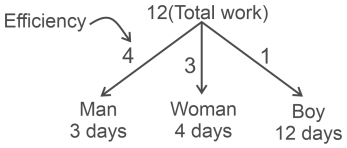
Work done by A in 15 days

= 15 × 1 = 15 units

Efficiency of B = $\frac{60-15}{30}$ = $\frac{45}{30}$ = 1.5

Required time = $\frac{\frac{1}{2} \times 60}{1 + 1.5}$ = $\frac{30}{2.5}$ = 12 days

Sol.270.(a)

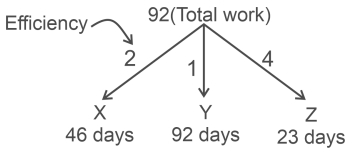


Let the required number of boys = n

So, [4(1) + 3(1) + n(1)] = 12

4 + 3 + n = 12 ⇒ n = 12 – 7 = 5 boys

Sol.271.(b)



Let total work completed in n days

Now according to the question ,X work for n days

Y for (n – 7) days and Z for (n – 8) days

n × 2 + (n – 7) × 1 + (n – 8) × 4 = 92 units

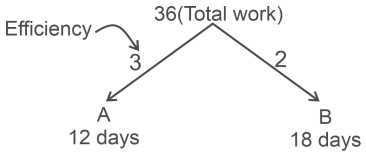
⇒ 2n + n – 7 + 4n – 32 = 92

⇒ 7n = 131 ⇒ n = $\frac{131}{7}$ days

No of days for which Y worked = n – 7

= $\frac{131}{7}$ – 7 ⇒ $\frac{82}{7}$ = $11\frac{5}{7}$ days

Sol.272.(b)



Work completed by A and B in 4 days

= 5 × 4 = 20 units

Remaining Work = 36 - 20 = 16 units

Remaining work completed by A and C in 4 days

Let efficiency of C is 'x' unit.

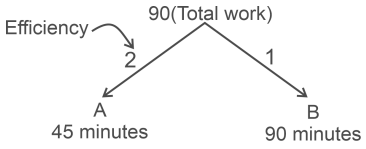
(A + C) × 4 days = 16

⇒ (3 + x) × 4 = 16 ⇒ x = 1 unit

50% of work = $\frac{36}{2}$ = 18 unit

Time taken by C to complete 50% of the work = $\frac{18}{x}$ = $\frac{18}{1}$ = 18 days

Sol.273.(a)



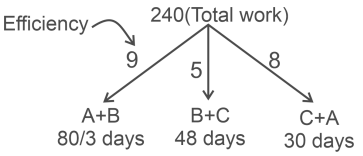
Time taken to flatten tire by puncture 1 and 2 = $\frac{total\ work}{total\ efficiency}$

= $\frac{90}{(1+2)}$ = $\frac{90}{3}$ = 30 $minutes$

Sol.274.(b)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf



2(A + B + C) = 9 + 5 + 8
(A + B + C) = 11
efficiency(A) = 11 - 5 = 6 units

60% of work = 240 × $\frac{3}{5}$ = 144 units

Required time by A = $\frac{144}{6}$ = 24 days

Sol.275.(c)
(4M + 5W) × 15 = (9M + 6W) × 10
60M + 75W = 90M + 60W
15W = 30M
Let W = 2 units, M = 1 unit
Total work = (4 × 1 + 5 × 2) × 15 = 210 units. Let there be y women,
(y × 2 + 4 × 1) × 7 = 210
2y + 4 = 30 ⇒ Y = 13 days.

Sol.276.(d) Let the efficiency of P = 1, so total work = 1 × 18 = 18 units
Work completed by P in 5 days
= 1 × 5 = 5 units
Combined efficiency of (P + Q)

= $\frac{Remaining\ work}{Time\ taken}$ = $\frac{13}{\frac{13}{5}}$ = 5 units

So, efficiency of Q = 5 – 1 = 4 units

Time taken by Q to finish $66\frac{2}{3}$% of work

= $\frac{\frac{2}{3} \times 18}{4}$ = 3 days

Sol.277.(c)

	P	:	Q	:	R	:	S
Efficiency→	1	:	2	:	3	:	4

Work done by P in a week = 1 × 2
= 2 units
Work done by Q in a week = 2 × 2
= 4 units
Work done by R in a week = 3 × 2
= 6 units
Work done by S in a week = 4 × 1
= 4 units
Total work done by all four persons in a week = 2 + 4 + 6 + 4 = 16 units
Task began on Monday and completed on 15th day, which means 2 weeks + 1 day.
So, in 2 weeks + 1 day, total work completed = 16 × 2 + 1 × 1 = 32 + 1
= 33 units
Time required by R to complete the whole work alone = $\frac{33}{3}$ = 11 days

Sol.278.(a) If (A + B) together can do a work in d days and A can do work in (d + x) days and B can do work in (d + y) days then the number of days required by (A + B) to complete the whole work
= d = $\sqrt{x \times y}$
Similarly, in the present question, time required to finish work together

= $\sqrt{14 \times \frac{7}{2}}$ = 7 hours

Sol.279.(b) As A completes the work in 8 days, Fraction of work done by A in 4 days = $\frac{4}{8}$ = $\frac{1}{2}$
Money received by A

= $\frac{1}{2}$ × 7200 = Rs 3600

As B completes the work in 12 days, Fraction of work done by B in 4 days

= $\frac{4}{12}$ = $\frac{1}{3}$.

Money received by B = $\frac{1}{3}$ × 7200
= Rs. 2400
Remaining money is obtained by C
= (7200 - 3600 - 2400) = Rs. 1200.

Sol.280.(a) Let per day inflow of water in each tank = x lit/day
So , water inflow in 20 days in tank = 20x
And water inflow in 50 days in second tank = 50x , Now
Water inflow = water outflow
And efficiency of 1st tank = 24 kl + 20x
= 7 man × 20 days ....(1)
Efficiency of 2nd tank = 36kl + 50 x
= 5 man × 50 days ....(2)
From equ. (1) ÷ (2), we get
$\frac{24kl + 20x}{36kl + 50x}$ = $\frac{7 \times 20}{5 \times 50}$(put 24kl = 24000 lit , 36kl = 36000 lit) After solving this
We find x = 480 lit

Sol.281.(d) Let the efficiency of Man = M & Efficiency of Women = W
6 man → 64 days
24 women → 32 days
12 women → 64 days
So, 6 M = 12 W ⇒ $\frac{M}{W}$ = $\frac{2}{1}$
Total work = 6 × 2 × 64 = 768
Work completed by 16 men and 24 women = (16 × 2 + 24 × 1) × 12
= 56 × 12 = 672
Remaining work = 768 - 672 = 96
Efficiency of 8 men and 16 women = 32

Time to complete remaining work = $\frac{96}{32}$

= 3 days ⇒ Total time = 12 + 3 = 15 days

Sol.282.(d)
Total work = efficiency × time taken

⇒ Total work = (5 + 11) × $27\frac{1}{2}$

= 16 × $\frac{55}{2}$ = 440 units

Work done by (A + B) in 20 days
= (5 + 11) × 20 = 320 units
Remaining work = 440 - 320 = 120 units.
C took 18 days to complete 120 units of work

Work done by C per day = $\frac{120}{18}$

75% of total work = 440 × $\frac{75}{100}$ = 330

Required days = $\frac{330 \times 18}{120}$ = $\frac{99}{2}$

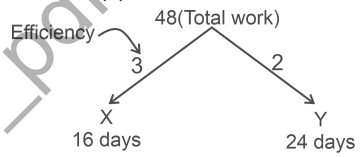
= $49\frac{1}{2}$days

Sol.283.(a) Y = $\frac{125}{100}$ X so, X : Y = 4 : 5

Z = $\frac{128}{100}$ Y so, Y : Z = 25 : 32

On balancing above ratios, we get the Efficiency of X : Y : Z = 20 : 25 : 32
Total work = 20a × 40 = 800a
Number of hours to complete the work together = $\frac{800a}{77a}$ = $\frac{800}{77}$ hours

Sol.284.(c)



Work completed in 4 days working together = (3 + 2) × 4 = 5 × 4 = 20 units
Z completes the remaining work in 10.5 days, so efficiency of Z

= $\frac{48 - 20}{10.5}$ = $\frac{8}{3}$

Y and Z can complete $\frac{7}{8}$th of work in

= $\frac{\frac{7}{8} \times 48}{2 + \frac{8}{3}}$ = $\frac{42}{\frac{14}{3}}$ = 9 days

Sol.285.(c)
Let the number of days taken by X be "a"
No. of days taken by Y = (a + 5)

Now given, $\frac{a \times (a+5)}{a + a + 5} = 6.$

$\Rightarrow a^2 + 5a = 12a + 30$

$\Rightarrow a^2 - 7a - 30 = 0$
$\Rightarrow (a + 3)(a - 10) = 0$
Clearly a = 10 as negative value of a is not possible here.
No of days taken by Y = a + 5 = 10 + 5 = 15.

Sol.286.(d) In $11\frac{1}{3}$ days, A worked for $5\frac{1}{3}$ days and B worked for 6 days

A × $5\frac{1}{3}$ + B × 6 = A × 24,

$\frac{16}{3}A$ + 6B = 24A, ⇒ 6B = $\frac{56}{3}A$,

$\frac{B}{A}$ = $\frac{56}{3 \times 6}$ = $\frac{28}{9}$
Total work = 9 × 24 = 216

Time taken by B alone to do $\frac{7}{9}th$ part of

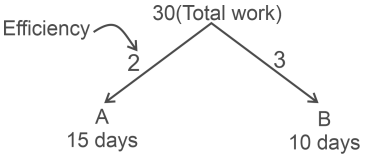
Search on Telegram @apna_pdf

Search on Telegram @apna_pdf

the original work = 216× $\frac{7}{9}$ × $\frac{1}{28}$ = 6 days

Sol.287.(a) Let the total work = 120
Efficiency of A and B = 4 : 5
One day work of A = $\frac{120}{15}$ = 8 units
One day work of B = 10 units
Work done in 4 days by A and B together
= (8 + 10) × 4= 72
Work left = 120-72 = 48
One day work of C = $\frac{48}{8}$ = 6
Total efficiency of A, B and C
= 10 + 8 + 6 = 24
Time taken to complete the work
= $\frac{120}{24}$ = 5 days

Sol.288.(a)



Their 4 day work = (2 + 3) × 4 = 20 unit
Work left = 30 - 20 unit = 10 unit
A worked for 3 more days so he completed 6 unit more work
Work left = 4 unit to be completed by C in 3 days
Efficiency of C = $\frac{4}{3}$
40% of the work = 12 unit
Time taken by C = $\frac{12}{\frac{4}{3}}$ = 9 days

Sol.289.(a) Work done by Sameer in 5 days = $\frac{5}{10}$ = $\frac{1}{2}$
Work done by Puneet in 5 days = $\frac{5}{15}$ = $\frac{1}{3}$
Work left = $\frac{1}{6}$
Ashok completed the $\frac{1}{6}$ of the work
His payment = $\frac{1}{6}$ × 4500 = 750

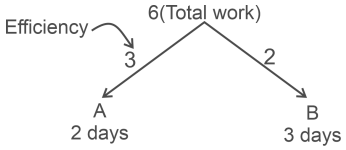
Sol.290.(c)

	A	:	B
Efficiency →	4	:	5
Time →	5	:	4

total work = 60 × 4 = 240
Work done by A and B in 15 days
= 15 × (4 + 5) = 135
Efficiency of C = $\frac{240-135}{14}$ = 7.5
B and C time taken to complete $\frac{5}{8}$th part of work = $\frac{240}{7.5+5}$ × $\frac{5}{8}$ = 12 days

Sol.291.(a) Efficiency of Men = M
Efficiency of Women = W
5M × 20 = 10W × 15 ⇒ $\frac{M}{W}$ = $\frac{3}{2}$
Total work = 5 × 3 × 20 = 300
Work completed in 5 days
= (2M + 6W) × 5 = 90
Remaining work = 300 - 90 = 210
Work in one day = 3M + 3W = 15
Number of days = $\frac{210}{15}$ = 14

Sol.292.(a) B can do five times of the work in 15 days
B can complete the work in 3 days



work done by A and B = 5 units
Remaining work = 6 - 5 = 1 unit
Number of hours in addition to a days
= $\frac{1}{5}$ × 10 = 2 hours

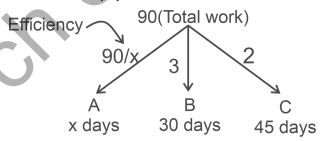
Sol.293.(b) 25% = $\frac{1}{4}$
A : B = 4 : 5
B : C = 2 : 1

A	:	B	:	C
4	:	5		
		2	:	1
8	:	10	:	5

Total work = 8 × 11.5 = 92
Time taken by A, B and C = $\frac{92}{8+10+5}$
= 4 days

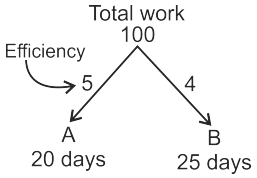
Sol.294.(a)
Let the number of people initially = n
ATQ, 54n = (n - 15) × 72
3n = 4n - 60 ⇒ n = 60

Sol.295.(a)



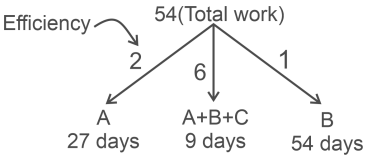
Work done by B and C together in 6 days
= 6 × (3 + 2) = 30 units
Efficiency of A = $\frac{90-30}{12}$ = 5 units/day
A alone will finish the whole work in
= 90 ÷ 5 = 18 days

Sol.296.(a)



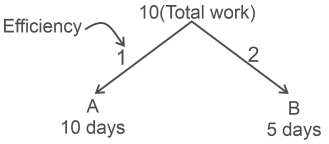
Work done by (A + B) in 10 days
= (5 + 4) × 10 = 90 unit
Remaining work = 100 - 90 = 10 unit
Efficiency of C = $\frac{10}{10}$ = 1 unit
Time taken by A + B + C = $\frac{100}{5+4+1}$
= 10 days

Sol.297.(a)



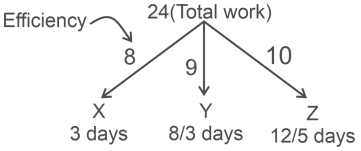
Efficiency of C = 6 - 3 = 3
To complete the $\frac{8}{9}$ of work
= 54 × $\frac{8}{9}$ × $\frac{1}{3}$= 16 days

Sol.298.(c)



Total work done by A = 5 × 1 = 5 units
Total work done by B = 2 × 2 = 4 units
Work done by C in 3 days = 1 units
Therefore 10 units of work will be done by C in 30 days
60% of work will be done by C in
$\frac{60}{100}$ × 30 = 18 days

Sol.299.(d) X can do in 3 days
Y can do in $\frac{8}{3}$ days
Z can do in $\frac{12}{5}$ days



Combined efficiency = 27
Time taken = $\frac{24}{27}$
Time taken (in hours) = $\frac{24}{27}$ × 6
= $\frac{16}{3}$= 5 hours 20 minutes

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Pipe and Cistern

Pipes and Cisterns are just an application of Time and Work. Concept wise, it is one and the same. In the above proportionality, Efficiency is replaced by Rate of filling. The equation in this case becomes

$$\text{Rate of filling} \propto \frac{1}{time\ taken}$$

The concept of the percentage of work done can be used to solve most of the related questions.

A few basic points one needs to know to use the percentage concept are: When it is said that someone has done a work, it means he has done 100 % of the work. Hence, if A finishes work in 4 days, it means- in 4 days he will do 100% of the work. Hence, in one day he finishes 25% (100/4) of the work. Similarly, in 3 days he finishes 75 % of the work.

The complete work can also be considered as 1 unit. Then if A takes 4 days to finish a work, it means he can finish 1/4th of the work in 1 day.

Illustrations:

Here are some basic questions to illustrate time and work shortcut tricks.

Efficiency and Time taken are inversely proportional implies that If A is twice as good as B then A will take half the Time that B will take.

If the efficiencies are in the ratio m : n then Time taken will be in the ratio, n : m. i.e. If A is thrice as good as B then A will take (1/3)rd of the Time.

This can be proved with the help of the following proportionality

$$\text{Efficiency} \propto \frac{1}{time\ taken}$$

MDH formula

MDH formula is used to compare the works of the same nature done at two different times using different manpower. The MDH formula can be represented as

$$\frac{M_1D_1H_1E_1}{W_1} = \frac{M_2D_2H_2E_2}{W_2}$$

Where, M = denotes the number of men/women, D = denotes the number of days, H = denotes the number of hours in a day, E = denotes the efficiency of 1 man, and W = denotes part of work done

Variety Questions

Q.1. A cistern can be filled by two pipes in 8 minutes and 10 minutes, separately. Both the pipes are opened together for a certain time, but due to an obstruction, only 5/8 of the full quantity of water flowed through the former pipe and 3/5 through the latter pipe. However, the obstruction was suddenly removed, and the cistern was filled in 3 minutes from that moment. How long did it take before the full flow began?
SSC CGL 26/09/2024 (3rd Shift)
(a) $3\frac{1}{16}$minutes (b) $2\frac{6}{17}$minutes
(c) $9\frac{6}{7}$minutes (d) $2\frac{30}{37}$minutes

Q.2. Three pipes, P, Q and R, together take four hours to fill a tank. All the three pipes were opened at the same time. After three hours, P was closed, and Q and R filled the remaining tank in two hours. How many hours will P alone take to fill the tank?
SSC CGL 23/09/2024 (2nd Shift)
(a) 8 (b) 10 (c) 12 (d) 9

Q.3. Pipe Q can fill the tank in 60 hours while pipe R may fill in 45 hours. Q and R pipes are opened together for 6 hours after which pipe W is also opened to empty the tank. All three pipes are opened simultaneously for 24 hours to reach the half level mark. How much time (in hours) will pipe W alone take to empty the entire tank?
SSC CGL 18/09/2024 (3rd Shift)
(a) 48 (b) 42 (c) 36 (d) 30

Q.4. A cistern can be filled by two pipes in 8 minutes and 10 minutes, separately. Both the pipes are opened together for a certain time, but due to an obstruction, only 5/8 of the full quantity of water flowed through the former pipe and 3/5 through the latter pipe. However, the obstruction was suddenly removed, and the cistern was filled in 3 minutes from that moment. How long did it take before the full flow began?
SSC CGL 17/09/2024 (2nd Shift)
(a) $3\frac{1}{16}$minutes (b) $2\frac{6}{17}$minutes
(c) $9\frac{6}{7}$minutes (d) $2\frac{30}{37}$minutes

Q.5. The tank is filled by three pipes with different uniform flow rates. While the first two pipes are operating simultaneously, they fill the tank in the same duration that the third pipe takes to fill it alone. The second pipe can fill the tank 5 hours quicker than the first pipe, yet 4 hours slower than the third pipe. What is the time (in hours) needed for the first pipe to fill the tank?
SSC CGL 11/09/2024 (3rd Shift)
(a) 18 (b) 12 (c) 9 (d) 15

Q.6. Two pipes can fill a cistern in 12 hours and 16 hours, respectively. The pipes are opened simultaneously and it is found that due to leakage at the bottom, it takes 90 minutes more to fill the cistern. How much time will the leakage take to empty the completely filled tank ?
SSC CPO 04/10/2023 (3rd Shift)
(a) $39\frac{13}{49}$h (b) $36\frac{29}{49}$h
(c) $37\frac{15}{49}$h (d) $38\frac{10}{49}$h

Q.7. An inlet pipe can fill an empty tank in 3.6 hours, while an outlet pipe can drain a completely-filled tank in 6.3 hours. If both the pipes are opened simultaneously when the tank is empty, in how many hours will the tank get completely filled ?
SSC CPO 04/10/2023 (1st Shift)
(a) 8.7 (b) 8.1 (c) 9.0 (d) 8.4

Q.8. 5 pipes are required to fill a tank in 1 hour and 40 minutes. How long (in minutes) will it take to fill the same tank if 4 pipes of the same type are used?
SSC MTS 11/09/2023 (2nd Shift)
(a) 115 (b) 150 (c) 125 (d) 140

Q.9. Two pipes S1 and S2 alone can fill an empty tank in 15 hours and 20 hours respectively. Pipe S3 alone can empty that completely filled tank in 40 hours. Firstly both pipes S1 and S2 are opened and after 2 hour pipe S3 is also opened. In how much time(in hrs) tank will be completely filled after S3 is opened?
SSC CGL 21/07/2023 (2nd shift)
(a) $\frac{90}{17}$ (b) $\frac{89}{12}$ (c) $\frac{90}{13}$ (d) $\frac{92}{11}$

Q.10. An inlet pipe can fill an empty tank in 140 hours while an outlet pipe drains a completely-filled tank in 63 hours. If 8 inlet pipes and y outlet pipes are opened simultaneously, when the tank is empty, then the tank gets completely filled in 105 hours. Find the value of y.
SSC CGL 14/07/2023 (3rd shift)
(a) 1 (b) 4 (c) 2 (d) 3

Q.11. There are three taps of diameter 2 cm, 3 cm and 4 cm, respectively. The ratio of the water flowing through them is equal to the ratio of the square of their diameters. The biggest tap can fill an empty tank alone in 81 min. If all the taps are opened simultaneously, then how long will the tank take (in min) to be filled?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL Tier II (02/03/2023)
(a) $34\frac{20}{29}$ (b) $64\frac{20}{29}$ (c) $54\frac{20}{29}$ (d) $44\frac{20}{29}$

Q.12. Pipe A can fill an empty tank in 30 hours and B can fill it in 10 hours. Due to a leakage in the tank, it takes pipes A and B together 1.5 hours more to fill it completely that it would have otherwise taken. What is the time taken by the leakage alone to empty the same tank completely, starting when the tank is completely full ?
SSC MTS 22/07/2022 (Evening)
(a) 42 hr (b) 40 hr (c) 36 hrs (d) 45 hr

Q.13. A tank is to be filled completely with water for which 8 pipes of the same kind are used. The tank gets filled in 1 hour and 40 minutes. If 10 pipes of the same kind, as mentioned above are used, in how much time (in hours and minutes) will the tank be completely filled?
SSC MTS 22/10/2021(Morning)
(a) 1 hour 30 minutes
(b) 1 hour 20 minutes
(c) 1 hour 45 minutes
(d) 2 hours 5 minutes

Q.14. There are two water taps in a tank which can fill the empty tank in 12 hours and 18 hours respectively. It is seen that there is a leakage point at the bottom of the tank which can empty the completely filled tank in 36 hours. If both the water taps are opened at the same time to fill the empty tank and the leakage point was repaired after 1 hour, then in how much time the empty tank will be completely filled?
SSC CGL 17/08/2021(Afternoon)
(a) 7 hours 12 min (b) 8 hours 24 min
(c) 7 hours (d) 7 hours 24 min

Q.15. Two pipes A and B can fill a cistern in $12\frac{1}{2}$ hours and 25 hours, respectively. The pipes are opened simultaneously and it is found that due to a leakage at the bottom, It took 1 hour and 40 minutes more to fill the cistern. When the cistern is full, in how much time (in hrs) will the leak empty the cistern?
SSC CPO 25/11/2020(Evening)
(a) 42 (b) 48 (c) 45 (d) 50

Q.16. Pipe A and B fill a tank in 43.2 minutes and 108 minutes, respectively, Pipe C can empty it at 3 litres per minute. When all the three pipes are opened together, they will fill the tank in 54 minutes. The capacity (in litres) of the tank is :
SSC CGL Tier II (15/11/2020)
(a) 160 (b) 180 (c) 216 (d) 200

Q.17. Pipe A can fill a tank of capacity 350 litres in $3\frac{1}{2}$ minutes. Pipe B can fill a tank of capacity 780 litres in $8\frac{2}{3}$ minutes. What time (in min) will it take to fill a tank of capacity 1615 litres when both pipes are opened together?
SSC CPO 13/12/2019(Evening)
(a) $7\frac{1}{2}$ (b) $8\frac{1}{2}$ (c) 9 (d) 8

Q.18. Pipes A and B can empty a full tank in 18 hours and 24 hours, respectively. Pipe C alone can fill the tank in 36 hours. If the tank is $\frac{5}{6}$ full and all the three pipes are opened together, then in how many hours will the tank be emptied?
SSC CPO 13/12/2019(Morning)
(a) 10.5 (b) 12.5 (c) 10 (d) 12

Q.19. A tank is filled in 4 hours by three pipes A,B and C. The pipe is twice as fast as B and pipe B is thrice as fast as A. How much time (in hrs) will pipe A alone take to fill the tank ?
SSC CPO 12/12/2019 (Evening)
(a) 25 (b) 40 (c) 30 (d) 32

Q.20. Pipes A and B are emptying pipes and can empty a tank in 6 hours and 16 hours respectively. C is a filling pipe. All the three pipes were opened together. They took 80 minutes to empty $\frac{5}{18}$th of the tank. Pipe C alone can fill the tank in:
SSC CPO 12/12/2019 (Morning)
(a) 36 hours (b) 42 hours
(c) 48 hours (d) 40 hours

Q.21. Pipes A and B together can fill an empty tank in $6\frac{2}{3}$ minutes. If A takes 3 minutes more than B to fill the tank, then the time (in minutes) in which A alone would fill one-third part of the tank is ?
SSC CPO 11/12/2019 (Evening)
(a) 6 (b) 5 (c) 5.5 (d) 4.5

Q.22. Pipes A and B are filling pipes while C is an emptying pipe. A and B can fill a tank in 72 and 90 minutes respectively. When all the three pipes are opened together, the tank gets filled in 2 hours. A and B are opened together for 12 minutes, then closed and C is opened. The tank will be empty (in min) after :
SSC CGL TIER II (13/09/2019)
(a) 15 (b) 18 (c) 12 (d) 16

Q.23. Pipes A and B can fill a tank in 16 hours and 24 hours, respectively, and pipe C alone can empty the full tank in x hours. All the pipes were opened together at 10.30 a.m., but C was closed at 2:30 p.m. If the tank was full at 8:30 p.m. on the same day, then what is the value of x ?
SSC CGL TIER II (12/09/2019)
(a) 64 (b) 48 (c) 45 (d) 96

Q.24. Pipes A, B and C can fill a tank in 30h, 40 h and 60 h respectively. Pipes A, B and C are opened at 7 a.m., 8 a.m., and 10 a.m., respectively on the same day. When will the tank be full? (in p.m.)
SSC CGL TIER II (11/09/2019)
(a) 10.00 (b) 10.20 (c) 9.20 (d) 9.40

Q.25. A pipe can fill a tank in 18 hours. In how much time (in hours) will another pipe operating at one - third the efficiency of the first pipe fill a tank whose capacity is 50% of that of the first tank?
SSC MTS 19/08/2019 (Morning)
(a) 36 (b) 21 (c) 45 (d) 27

Q.26. An inlet pipe A originating from a river can fill a reservoir in 30 days. And an outlet pipe B, which is capable of emptying the completely filled reservoir in 50 days, drains out the water from the reservoir to an irrigation canal. The pipes are opened on alternate days starting with A. On which day from the beginning will the reservoir get completely filled for the first time ?
SSC MTS 05/08/2019 (Morning)
(a)75th (b)147th (c)150th (d) 74th

Q.27. Two pipes A and B fill tank in 20 min and 30 min. respectively. If A is kept open for only $\frac{1}{5}$th of the total time and A and B are kept open for remaining time; then how much time is taken by both pipes to fill the tank.
SSC CPO 15/03/2019 (Evening)
(a) $16\frac{5}{23}$ (b) $13\frac{1}{23}$ (c) $13\frac{5}{23}$ (d) $16\frac{1}{23}$

Q.28. One - fourth of a tank can be filled in 3 hours by pipe A and one-third of the same tank can be filled in 2 hours by pipe B. How long will it take for the tank to be filled if both pipes are kept open ?
SSC CPO 14/03/2019 (Morning)
(a) 5 h (b) 2 h (c) 4 h (d) $2\frac{1}{2}$ h

Practice Questions

SSC CGL 2024 Tier - 1

Q.29. Fill pipe P is 21 times faster than fill pipe Q . If Q can fill a cistern in 110 minutes, find the time it takes to fill the cistern when both fill pipes are opened together.
SSC CGL 09/09/2024 (1st Shift)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) 5 minutes (b) 4 minutes
(c) 3 minutes (d) 6 minutes

Q.30. Pipes M, N and S can fill a tank in 25, 50 and 100 minutes, respectively. Initially, pipes N and S are kept open for 10 minutes, and then pipe N is shut while pipe M is opened. Pipe S is closed 15 minutes before the tank overflows. How much time (in minutes) will it take to fill the tank if the three pipes work in this pattern?
SSC CGL 09/09/2024 (2nd Shift)
(a) 30 (b) 33 (c) 42 (d) 27

Q.31. Three pipes P, Q and R can fill a cistern in 40 minutes, 80 minutes and 120 minutes, respectively. Initially, all the pipes are opened. After how much time (in minutes) should the pipes Q and R be turned off so that the cistern will be completely filled in just half an hour?
SSC CGL 10/09/2024 (1st Shift)
(a) 14 (b) 10 (c) 16 (d) 12

Q.32. Pipes P and Q can completely fill a water tank in 10 hours and 15 hours, respectively. A pipe R can empty a tank filled completely with water in 12 hours. Initially, the tank is empty and only pipes P and Q are opened at 6 a.m. and pipe R is also opened at 9 a.m. By what time will the tank be completely filled?
SSC CGL 10/09/2024 (3rd Shift)
(a) 1 p.m. (b) 2 p.m. (c) 11 a.m. (d) 3 p.m.

Q.33. There are two pipes to fill a tank. Together, they can fill the tank in 15 minutes. If one pipe can fill the tank in one and a half times as fast as the other, the faster pipe alone can fill the tank in:
SSC CGL 11/09/2024 (1st Shift)
(a) 10 minutes (b) 25 minutes
(c) 20 minutes (d) $32\frac{1}{2}$ minutes

Q.34. Two pipes, A and B, can fill a tank in 10 minutes and 20 minutes, respectively. The pipe C can empty the tank in 30 minutes. All the three pipes are opened at a time in the beginning. However, pipe C is closed 2 minutes before the tank is filled. In what time, will the tank be full (in minutes)?
SSC CGL 12/09/2024 (1st Shift)
(a) 12 (b) 10 (c) 8 (d) 6

Q.35. Two pipes A and B can fill a tank in 48 minutes and 66 minutes, respectively. If both the pipes are opened simultaneously, then after how many minutes should pipe B be closed so that the tank gets filled in 32 minutes?
SSC CGL 12/09/2024 (2nd Shift)
(a) 18 (b) 16 (c) 22 (d) 20

Q.36. There are two pipes used to fill a tank and when operated together, they can fill the tank in 20 minutes. If one pipe can fill the tank two and a half times as quickly as the other, then the faster pipe alone can fill the tank in:
SSC CGL 13/09/2024 (1st Shift)
(a) 30 min (b) 32 min
(c) 34 min (d) 28 min

Q.37. A pipe can fill an empty tank in 5 minutes and another pipe can empty it in 6 minutes. If both pipes are opened simultaneously, how much time (in minutes) will it take to fill the empty tank?
SSC CGL 13/09/2024 (2nd Shift)
(a) 33 min (b) 30 min
(c) 35 min (d) 25 min

Q.38. Pipes A and B can fill a tank in 15 hours and 25 hours, respectively, whereas pipe C can empty the full tank in 40 hours. All three pipes are opened together, but pipe A is closed after 5 hours. After how many hours will the remaining part of the tank be filled?
SSC CGL 17/09/2024 (1st Shift)
(a) $41\frac{4}{9}$ (b) $43\frac{4}{9}$ (c) $44\frac{4}{9}$ (d) $39\frac{4}{9}$

Q.39. Two pipes can fill a tank in 12 hours and 18 hours, respectively, while a third pipe can empty it in 8 hours. How long (in hours) will it take to fill the empty tank if all three pipes are opened simultaneously?
SSC CGL 17/09/2024 (3rd Shift)
(a) 48 (b) 24 (c) 36 (d) 72

Q.40. Pipe X can fill a tank in 9 hours and Pipe Y can fill it in 21 hours. If they are opened on alternate hours and Pipe X is opened first, in how many hours shall the tank be full?
SSC CGL 19/09/2024 (1st Shift)
(a) $10\frac{3}{7}$ (b) $12\frac{3}{7}$ (c) $9\frac{3}{7}$ (d) $11\frac{3}{7}$

Q.41. At a school building, there is an overhead tank. To fill this tank 50 buckets of water are required. Assume that the capacity of the bucket is reduced to two-fifth of the present. How many buckets of water are required to fill the same tank?
SSC CGL 19/09/2024 (2nd Shift)
(a) 62.5 (b) 20 (c) 125 (d) 60

Q.42. Two inlet pipes, P1 and P2, can fill a cistern in 20 hours and 30 hours, respectively. They were opened at the same time, but pipe P1 had to be closed 5 hours before the cistern was full. How many hours in total did it take for the two pipes to fill the cistern?
SSC CGL 19/09/2024 (3rd Shift)
(a) 15 hours (b) 9 hours
(c) 12 hours (d) 10 hours

Q.43. A tank can be filled by pipe A in 4 hours and pipe B in 6 hours. At 8 : 00 a.m., pipe A was opened. At what time will the tank be filled if pipe B is opened at 9 : 00 a.m.?
SSC CGL 23/09/2024 (1st Shift)
(a) 10 : 16 a.m. (b) 10 : 22 a.m.
(c) 10 : 48 a.m. (d) 10 : 18 a.m.

Q.44. One pipe can fill a tank 6 times faster than another pipe. If both the pipes together can fill the tank in 40 minutes, then in how many minutes will the slower pipe alone be able to fill the tank?
SSC CGL 24/09/2024 (1st Shift)
(a) 275 (b) 285 (c) 290 (d) 280

Q.45. Pipe A takes $\frac{4}{5}$ of the time required by pipe B to fill an empty tank individually. When an outlet pipe C is also opened simultaneously with pipes A and B, it takes $\frac{4}{5}$ more time to fill the empty tank than it takes when only pipe A and pipe B are opened together. If it takes 40 hours to fill the tank when all the three pipes are opened simultaneously, in what time (in hours) will pipe C empty the full tank, operating alone?
SSC CGL 24/09/2024 (2nd Shift)
(a) 50 (b) 45 (c) 65 (d) 75

Q.46. Pipe A can fill a cistern in 4 hours and Pipe B can fill the same cistern in 5 hours. Pipe C can empty a full cistern in 3 hours. If all three pipes are opened together, then the time (in minutes) taken to fill the tank is: (round to the nearest minute)
SSC CGL 24/09/2024 (3rd Shift)
(a) 625 (b) 445 (c) 800 (d) 514

Q.47. Two pipes X and Y can fill a tank in 14 hours and 21 hours, respectively. Both pipes are opened simultaneously to fill the tank. In how many hours will the empty tank be filled?
SSC CGL 25/09/2024 (2nd Shift)
(a) $8\frac{2}{5}$ hours (b) $6\frac{2}{5}$ hours
(c) $7\frac{2}{5}$ hours (d) $5\frac{2}{5}$ hours

Q.48. One pipe can fill a tank four times as fast as another pipe. If together the two pipes can fill the tank in 48 minutes, the slower pipe alone will be able to fill the tank in:
SSC CGL 26/09/2024 (1st Shift)
(a) 192 minutes (b) 288 minutes
(c) 240 minutes (d) 144 minutes

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC Selection Post (Phase - XII)

Q.49 Pipes A and B can fill a tank in 18 hours and 27 hours, respectively, whereas pipe C can empty the full tank in 54 hours. All three pipes are opened together, but pipe C is closed after 12 hours. In how much time (in minutes) will the one-third of the remaining part of the tank be filled by A and B together?
Higher Secondary 21/06/2024 (Shift - 2)
(a) 24 (b) 36 (c) 30 (d) 15

SSC CHSL 2023 Tier - 2

Q.50. Two pipes can fill a cistern separately in 36 minutes and 45 minutes, respectively. A waste pipe can drain off 40 litres per minute. If all the three pipes are opened, the cistern fills in one hour. The capacity (in litres of the cistern) is:
SSC CHSL Tier II 10/01/2024
(a) 600 (b) 1200 (c) 300 (d) 400

SSC CGL 2023 Tier - 1

Q.51. Inlet Pipes A and B can together fill an empty tank in 1.5 hours. Outlet Pipe C, when opened alone, can empty the completely filled tank, in 4.5 hours. When only Pipes A and C are opened together, the empty tank is filled in 6 hours. Find the time taken by Pipe B, when opened alone, to fill the empty tank.
SSC CGL 19/07/2023 (2nd shift)
(a) 3 hours 30 minutes
(b) 3 hours 36 minutes
(c) 3 hours 32 minutes
(d) 3 hours 40 minutes

Q.52. An inlet pipe can fill an empty tank in 120 hours while an outlet pipe drains a completely-filled tank in 54 hours. If 8 inlet pipes and 3 outlet pipes are opened simultaneously, when the tank is empty, then in how many hours will the tank get completely filled ?
SSC CGL 20/07/2023 (1st shift)
(a) 81 (b) 96 (c) 72 (d) 90

Q.53. An inlet pipe can fill an empty tank in $4\frac{1}{2}$ hours while an outlet pipe drains a completely filled tank in $7\frac{1}{5}$ hours. The tank is initially empty, and the two pipes are alternately opened for an hour each, till the tank is completely filled, starting with the inlet pipe. In how many hours will the tank be completely filled?
SSC CGL 21/07/2023 (2nd shift)
(a) 24 (b) $20\frac{1}{4}$ (c) $20\frac{3}{4}$ (d) $22\frac{3}{8}$

SSC MTS 2022 Tier - 1

Q.54. Two taps P and Q can fill a tank alone in 10 hours and 12 hours respectively. If the two taps are opened at 9 a.m., then at what time should the tap P be closed to completely fill the tank at exactly 3 p.m. ?
SSC MTS 16/06/2023 (Morning)
(a) 2 p.m (b) 1 p.m (c) 3 p.m (d) 12 p.m

Q.55. Two pipes can fill a tank alone in 20 hours and 24 hours respectively and an outlet pipe alone can empty 20 gallons of water per hour. All the three pipes working together can fill the same empty tank in 40 hours. What is the capacity of the tank ?
SSC MTS 16/06/2023 (Afternoon)
(a) 450 gallons (b) 300 gallons
(c) 600 gallons (d) 480 gallons

SSC CHSL 2022 Tier - 1

Q.56. 15 taps can fill a tank in 36 minutes. How many taps will be required to fill the tank in one hour?
SSC CHSL 15/03/2023 (2nd Shift)
(a) 12 (b) 9 (c) 8 (d) 6

SSC CGL 2022 Tier - 2

Q.57. There are two inlets A and B connected to a tank. A and B can fill the tank in 32 h and 28 h, respectively. If both the pipes are opened alternately for 1 h, starting with A, then in how much time (in hours, to nearest integer) will the tank be filled ?
SSC CGL Tier II (03/03/2023)
(a) 22 (b) 30 (c) 36 (d) 24

SSC CGL 2022 Tier - 1

Q.58. There are 3 taps A, B, and C in a tank. These can fill the tank in 10 hours, 20 hours and 25 hours, respectively. At first, all three taps are opened simultaneously. After 2 hours, tap C is closed and A and B keep running. After 4 hours from the beginning, tap B is also closed. The remaining tank is filled by tap A alone. Find the percentage of work done by tap A itself.
SSC CGL 05/12/2022 (4th Shift)
(a) 32% (b) 75% (c) 52% (d) 72%

SSC Selection Post (Phase - X)

Q.59. Two pipes X and Y can fill a tank in 12 minutes and 18 minutes, respectively. If both the pipes are opened simultaneously, how long will it take to fill the tank (in mins) ?
Higher Secondary 03/08/2022 (Shift - 4)
(a) 15 (b) $\frac{5}{36}$ (c) 14 (d) $7\frac{1}{5}$

SSC MTS 2021 Tier - 1

Q.60. Pipe A can fill an empty cistern in 6 hours and pipe B can fill the same empty cistern in 8 hours. Both the pipes are opened simultaneously but after two hours, pipe A is closed. How many hours will B take to fill the remaining part of the cistern ?
SSC MTS 21/07/2022 (Afternoon)
(a) 2 (b) $3\frac{1}{3}$ (c) $3\frac{2}{3}$ (d) 4

SSC CHSL 2021 Tier - 1

Q.61. A container is normally filled in 5 hours. However, it takes 6 hours when there is a leak at the bottom. If the container is full, at what time would the leak empty it, if no water is allowed into the container during that period?
SSC CHSL 30/05/2022 (Morning)
(a) 5 h (b) 6 h (c) 15 h (d) 30 h

Q.62. Manoj and his wife Swathi fill a tank with water fetched from a well. Manoj fetches 5 liters of water in 4 minutes whereas Swathi fetches 4 liters of water in 5 minutes. Find the time taken by them together to fetch 205 liters of water.
SSC CHSL 03/06/2022 (Morning)
(a) 2 hours (b) 80 minutes
(c) 100 minutes (d) 1 hour 30 minutes

SSC CGL 2020 Tier - 2

Q.63. In 6 minutes, $\frac{4}{13}$ of a bucket is filled. How much time will it take to fill the remaining bucket?
SSC CGL Tier II (29/01/2022)
(a) 14 minutes 30 seconds
(b) 11 minutes 30 seconds
(c) 13 minutes 30 seconds
(d) 12 minutes 30 seconds

Q.64. A tap can fill a tank in $5\frac{1}{2}$ hours. Because of a leak, it took $8\frac{1}{4}$ hours to fill the tank. In how much time (in hours) will the leak alone empty 30% of the tank
SSC CGL Tier II (29/01/2022)
(a) $\frac{9}{2}$ (b) $\frac{99}{20}$ (c) $\frac{5}{2}$ (d) $\frac{17}{2}$

Q.65. Two pipes A and B can fill a cistern in $12\frac{1}{2}$ hours and 25 hours, respectively.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

The pipes were opened simultaneously, and it was found that, due to leakage in the bottom, it took 1 hour 40 minutes more to fill the cistern. If the cistern is full, in how much time (in hours) will the leak alone empty 70% of the cistern?
SSC CGL Tier II (29/01/2022)
(a) 50 (b) 40 (c) 35 (d) 30

Q.66. Pipes A, B and C can fill a tank in 20, 30 and 60 hours, respectively. Pipes A, B and C are opened at 7 a.m., 8 a.m., and 9 a.m., respectively, on the same day. When will the tank be full?
SSC CGL Tier II (03/02/2022)
(a) 4:40 p.m. (b) 5:40 p.m.
(c) 6:20 p.m. (d) 7:20 p.m.

SSC MTS 2020 Tier - 1

Q.67. Pipes A and B can fill a tank in 18 minutes and 30 minutes, respectively. Pipe C, attached to the tank , can drain off 125 litres of water per minute. If all the pipes are opened together, the tank is filled in 45 minutes. The capacity of the tank in litres, is:
SSC MTS 14/10/2021 (Evening)
(a) 1500 (b) 1375 (c) 1875 (d) 2000

SSC CGL 2020 Tier - 1

Q.68. Two pipes A and B can fill an empty tank in 10 hours and 16 hours respectively. They are opened alternatively for 1 hour each, opening Pipe B first. In how many hours, will the empty tank be filled ?
SSC CGL 20/08/2021 (Afternoon)
(a) $12\frac{2}{5}$ (b) $14\frac{2}{5}$ (c) $10\frac{2}{5}$ (d) $16\frac{2}{5}$

SSC CHSL 2020 Tier - 1

Q.69. Pipes A and B can empty a full tank in 36 and 45 minutes, respectively, whereas pipe C alone can fill the tank in 15 minutes. B and C are opened together for 15 minutes, and then both are turned off and A is opened. Pipe A will empty the tank in how many hours (in minutes).
SSC CHSL 19/04/2021 (Afternoon)
(a) 30 (b) 18 (c) 20 (d) 24

SSC CPO 2020 Tier - 1

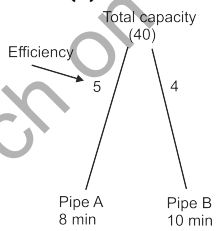
Q.70. Pipe A, B and C can fill an empty tank in $\frac{30}{7}$ hours, if all the three pipes are opened simultaneously A and B are filling pipe and C is an emptying pipe. Pipe A can fill the tank in 15 hours and pipe C can empty it in 12 hours. In how many hours can pipe B alone fill the empty tank ?
SSC CPO 24/11/2020 (Morning)
(a) 6 (b) 3 (c) 5 (d) 4

Answer Key :-

1.(b)	2.(a)	3.(c)	4.(b)
5.(d)	6.(d)	7.(d)	8.(c)
9.(d)	10.(d)	11.(d)	12.(d)
13.(b)	14.(d)	15.(d)	16.(c)
17.(b)	18.(d)	19.(b)	20.(c)
21.(b)	22.(b)	23.(d)	24.(c)
25.(d)	26.(b)	27.(b)	28.(c)
29.(a)	30.(d)	31.(d)	32.(d)
33.(b)	34.(c)	35.(c)	36.(c)
37.(b)	38.(d)	39.(d)	40.(b)
41.(c)	42.(a)	43.(c)	44.(d)
45.(a)	46.(d)	47.(a)	48.(c)
49.(a)	50.(b)	51.(b)	52.(d)
53.(c)	54.(a)	55.(b)	56.(b)
57.(b)	58.(d)	59.(d)	60.(b)
61.(d)	62.(c)	63.(c)	64.(b)
65.(c)	66.(b)	67.(c)	68.(a)
69.(d)	70.(d)		

Solutions :-

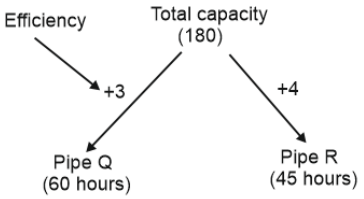
Sol.1.(b)



Water filled by Pipe A in 3 min.
= (5 + 4) × 3 = 27 unit
Remaining water to be filled
= 40 - 27 = 13 unit
Due to blockage-
Efficiency of Pipe A = $(5 \times \frac{5}{8}) = \frac{25}{8}$ unit
Efficiency of Pipe B = $(4 \times \frac{3}{5}) = \frac{12}{5}$ unit
Time taken by to fill remaining water when there was blockage = $\frac{13}{(\frac{25}{8}+\frac{12}{5})}$
$= \frac{13 \times 40}{125+96} = \frac{520}{221} = \frac{40}{17} = 2\frac{6}{17}$ minutes

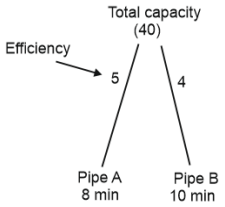
Sol.2.(a) Part filled in 3 hours = $\frac{3}{4}$
Remaining part = $1 - \frac{3}{4} = \frac{1}{4}$
(Q + R)'s 1 hours work = $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$
P's 1 hours work = $\frac{1}{4} - \frac{1}{8} = \frac{2-1}{8} = \frac{1}{8}$
So, P alone can fill the tank = 8 hours

Sol.3.(c)



Efficiency of Q and R in 1 hour
= 3 + 4 = 7 unit
Water filled by Q and R in 6 hours
= 7 × 6 = 42 units
Now
Q and R along with pipe W opened then tank will be half filled in 24 hours i.e. 90 unit
Water filled by Q and R in 24 hour + previous 6 hours = 7 × 24 + 42 unit
= 168 + 42 = 210 unit
But it was only 90 unit filled
Hence water emptied by W in 24 hours
= 210 - 90 = 120 unit
Efficiency of W in 1 hour = $\frac{120}{24}$ = 5 unit
Hence,
Time taken by W to empty entire tank
= $\frac{180}{5}$ = 36 hours

Sol.4.(b)



Water filled by Pipe A in 3 min.
= (5 + 4) × 3 = 27 unit
Remaining water to be filled
= 40 - 27 = 13 unit
Due to blockage-
Efficiency of Pipe A = $(5 \times \frac{5}{8}) = \frac{25}{8}$ unit
Efficiency of Pipe B = $(4 \times \frac{3}{5}) = \frac{12}{5}$ unit
Time taken by to fill remaining water when there was blockage = $\frac{13}{(\frac{25}{8}+\frac{12}{5})}$
$= \frac{13 \times 40}{125+96} = \frac{520}{221} = \frac{40}{17} = 2\frac{6}{17}$ minutes

Sol.5.(d) Given that, eff (C) = eff(A + B)
Time taken by first pipe be x
Time taken by second pipe = x - 5
Time taken by third pipe
= (x - 5) - 4 = x - 9
According to question
$\frac{1}{x-9} = \frac{1}{x} + \frac{1}{x-5} \Rightarrow \frac{1}{x-9} = \frac{2x-5}{x(x-5)}$
x(x - 5) = (2x - 5)(x - 9)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

x^2 - 5x = $2x^2$ - 18x - 5x + 45

x^2 - 5x = $2x^2$ - 23x + 45

x^2 - 18x + 45 = 0 ⇒ x^2 - 15x - 3x + 45 = 0

x(x - 15) - 3(x - 15) = 0

(x - 3)(x - 15) = 0 ⇒ x = 3 or 15

Then, time taken by pipe A to fill the tank in 15 hrs

Short trick :

Given that, eff (C) = eff(A + B)

Time taken by first pipe be x → t + 9

Time taken by second pipe

= x - 5 → t + 4

Time taken by third pipe

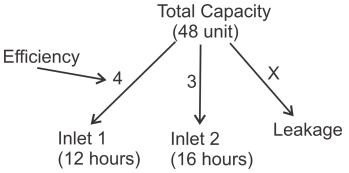
= (x - 5) - 4 = x - 9 → t

⇒ t = $\sqrt{9 \times 4}$ = $\sqrt{36}$ = 6 hrs

So, the time taken to fill the tank

= (t + 9) hrs = 6 + 9 = 15 hrs

Sol.6.(d)



According to the question,

⇒ $\frac{48}{(7-x)} - \frac{48}{7} = \frac{3}{2}$

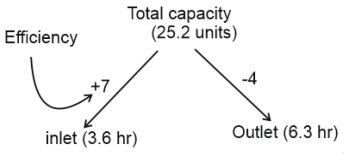
⇒ $32x = 7(7 - x)$ ⇒ $39x = 49$

Efficiency of Leakage (x) = $\frac{49}{39}$ unit

Hence, required time = $\frac{48}{\frac{49}{39}} = \frac{48 \times 39}{49}$

= 38 $\frac{10}{49}$ days

Sol.7.(d)



Time taken to fill the tank = $\frac{25.2}{7-4}$

$= 8.4\ hours$

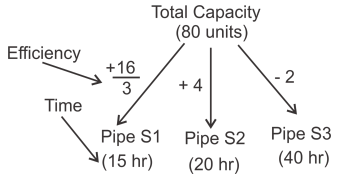
Sol.8.(c) $m_1 \times d_1 \times h_1 = m_2 \times d_2 \times h_2$

1 hour 40 min. = 100 min.

100 × 5 = 4 × time

Time = 125 min.

Sol.9.(d)



Part of the tank emptied by pipe s_1 and s_2 in two hours = 2 × ($\frac{16}{3}$ + 4) = $\frac{56}{3}$ units

Remaining filled part of the tank

= 80 - $\frac{56}{3}$ = $\frac{184}{3}$

Efficiency of all pipes together

= $(s_1 + s_2 - s_3)$ = $\frac{16}{3}$ + 4 - 2 = $\frac{22}{3}$

time taken to fill the remaining tank by all 3 pipes = $\frac{184 \times 3}{3 \times 22}$ = $\frac{92}{11}$ hours

Sol.10.(d) According to the question ,

105 = $\frac{1260}{8 \times 9 - (y \times 20)}$ ⇒ $72 - 20y = 12$

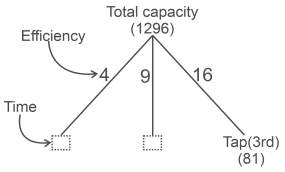
y = 3 outlet pipe connected.

Sol.11.(d) According to question ,

Efficiency of three taps α square of the diameter of the pipe

Ratio of efficiency = $(2)^2 : (3)^2 : (4)^2$

= 4 : 9 : 16

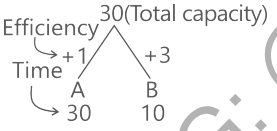


Total time taken by all three tap together

= $\frac{total\ capacity}{total\ efficiency}$ = $\frac{1296}{(4+9+16)}$

= $\frac{1296}{29}$ = 44$\frac{20}{29}$ minute

Sol.12.(d)



Time taken by A and B together to fill the tank = $\frac{30}{3+1}$ = 7.5 hours

Time taken by A and B together to fill the tank along with leakage pipe

= (7.5 + 1.5) = 9 hours

Now, Efficiency of leakage pipe

= A + B - C = $\frac{30}{9}$ ⇒ 4 - C = $\frac{10}{3}$ ⇒ C = $\frac{2}{3}$

So, Time taken by leakage pipe to empty the tank = $\frac{30}{\frac{2}{3}}$ = 45 hours

Sol.13.(b)

Let the efficiency of each pipe be 1 unit.

Efficiency of 8 pipes = 8 units.

Efficiency of 10 pipes = 10 units.

1 hour 40 minutes = 100 minutes.

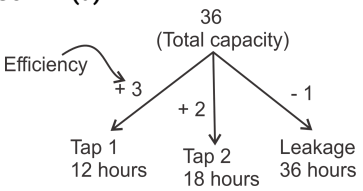
We know that,

$E_1 \times T_1 = E_2 \times T_2$ ⇒ 8 × 100 = 10 × T_2

T_2 = 8 × 10 = 80 minutes.

= 1 hour 20 minutes.

Sol.14.(d)



Water filled by Tap 1, 2 and leakage in 1 hour = (3 + 2 − 1) = 4 unit

Remaining water to filled = 36 − 4 = 32 unit

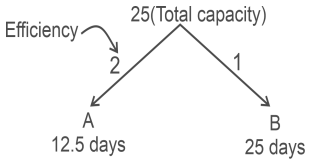
Time taken to fill remaining tank = $\frac{32}{5}$

= 6 hours 24 min

total Time taken to fill tank

= 6 hr. 24 min + 1 hr. = 7 hr. 24 min

Sol.15.(d)



Time taken to fill the tank Without leakage = $\frac{25}{3}$ = 8 hr 20 min

With leakage = 8 hr 20 min + 1 hr 40 min

= 10 hr.

Efficiency with leakage = $\frac{25}{10}$ = 2.5 unit

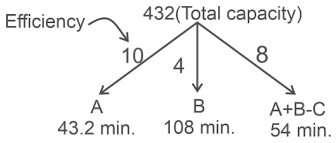
Efficiency of leakage =

efficiency of (A + B) - Efficiency with leakage = 3 - 2.5 = 0.5 unit

Time required to empty the tank

= $\frac{25}{0.5}$ = 50 hr

Sol.16.(c)



Efficiency of C = 10 + 4 - 8 = 6 units

Time taken by C to empty the tank

= $\frac{432}{6}$ = 72 min

Capacity of the tank = 72 × 3 = 216 $liter$

Sol.17.(b) A → 350 liter in 3$\frac{1}{2}$minute

In one minute = $\frac{350 \times 2}{7}$ = 100 liter

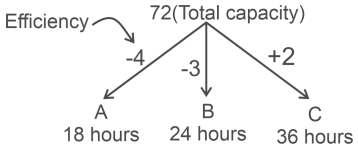
B → 780 liter in 8$\frac{2}{3}$ minute

In one minute = $\frac{780 \times 3}{26}$ = 90 liter

(A + B) in one minute = 100 + 9 = 190 L

Required Time = $\frac{1615}{190}$ = $\frac{17}{2}$ = 8$\frac{1}{2}$ min

Sol.18.(d)



The quantity emptied by all three pipes in 1 hour = 5 units

$\frac{5}{6}$ part of tank = 60 unit

Time taken to empty 60 units of water

= $\frac{60}{5}$ = 12 hours

Sol.19.(b) Ratio → A : B : C

Efficiency → 1 : 2

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Efficiency → 1 : 3 .

Efficiency → 1 : 3 : 6

Total work = 4 × (1 + 3 + 6) = 40 units

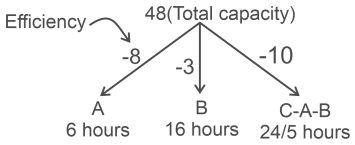
Time taken by A to fill the tank = $\frac{40}{1}$

= 40 hours

Sol.20.(c) In 80 mins $\frac{5}{18}$th tank is emptied.

A,B and C can empty the tank in

= $\frac{18}{5} \times \frac{80}{60} = \frac{24}{5}$hr



Efficiency of C = 1 unit

Time taken by C to fill the tank = $\frac{48}{1}$

= 48 hrs

Sol.21.(b) Let time taken by B = x minutes

ATQ, $\frac{1}{x+3} + \frac{1}{x} = \frac{3}{20}$

On solving, we get

$40x + 60 = 3x^2 + 9x$

$3x^2 - 31x - 60 = 0$

$x = \frac{36}{3}$ or $\frac{-5}{3} \Rightarrow x = 12$

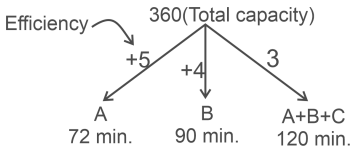
So, pipe B takes 12 mins to fill the tank

Pipe A takes 15 mins to fill the tank.

$\frac{1}{3}$rd of the tank filled by A alone

= 5 mins.

Sol.22.(b)



Efficiency of pipe C = 3 – 5 - 4 = - 6 unit

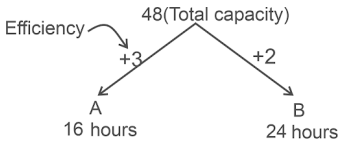
Note : Negative sign indicates that it is an outlet pipe.

Quantity filled by pipe A and B in 12 minutes = 12 × (5 + 4) = 108 unit

Time taken by pipe C to drain it = $\frac{108}{6}$

= 18 min.

Sol.23.(d)



Quantity filled by pipe A and B (from 10:30 a.m. to 8:30 pm) = 10 × (3 + 2)

= 50 unit

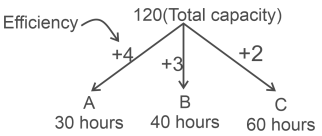
Quantity drained by pipe C (from 10:30 a.m. to 2:30 pm) = 50 – 48 = 2 unit

Efficiency of pipe(C) = $\frac{2}{4} = \frac{1}{2}$ unit

Time taken by pipe C to drain the tank

= $\frac{48}{\frac{1}{2}}$ = 96 hours

Sol.24.(c)



Quantity filled by pipe A till 10:00 AM

= 4 × 3 = 12 unit

Quantity filled by pipe B till 10:00 AM

= 3 × 2 = 6 unit

Remaining quantity = 120 – 12 – 6

= 102 unit

Time taken to fill this quantity

= $\frac{102}{4+3+2} = 11\frac{1}{3}$ hours

= Tank will be filled at 10:00 AM + $11\frac{1}{3}$hr

= 9:20 PM

Sol.25.(d)

Let the efficiency of the pipe = 3 unit

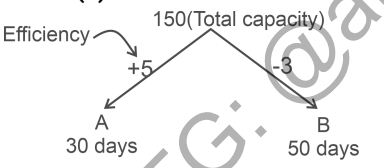
⇒ Total capacity of tank = 18 × 3 = 54 unit

Quantity to be filled = $\frac{1}{2}$ × 54 = 27 unit

Efficiency of new pipe = $\frac{1}{3}$ × 3 = 1 unit

Required time = $\frac{27}{1}$ = 27 hours

Sol.26.(b)



Quantity filled in one cycle (2 days)

= 5 – 3 = 2 unit

146 unit will be filled in $\frac{146}{2}$ = 73 cycles of 146 days

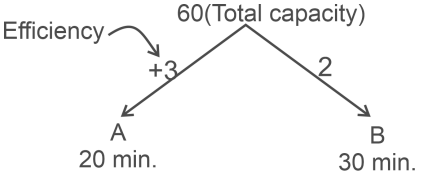
Remaining quantity after 146 days

= 150 – 146 = 4 unit

Time taken to fill this quantity = $\frac{4}{5}$ day

⇒ The reservoir will be completely filled on the 147th day.

Sol.27. (b)



Let total time taken be $5x$.

According to question,

$3x + (5 \times 4x) = 60$

$\Rightarrow 23x = 60 \Rightarrow x \Rightarrow \frac{60}{23}$

Therefore,

Total time = $5x = 5 \times \frac{60}{23} = \frac{300}{23} = 13\frac{1}{23}$

Sol.28.(c)

Time taken by A to fil $\frac{1}{4}$ th of tank = 3 hr

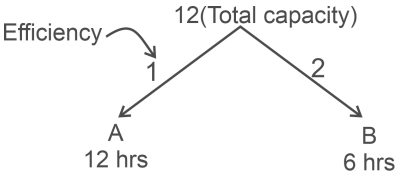
Time taken by A to fill complete tank

= 3 × 4 = 12 hr

Time taken by B to fill $\frac{1}{3}$ rd of tank = 2 hr

Time taken by B to fill complete tank

= 2 × 3 = 6 hr



Let total capacity of tank = 12 unit

Desired time = $\frac{12}{1+2}$ = 4 hours

Sol.29.(a)

Ratio of pipe	→	P	:	Q
Time	→	1	:	21
Efficiency	→	21	:	1

Now,

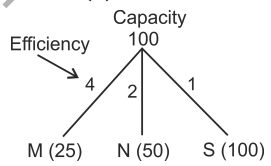
Total time to fill the cistern = 110 × 1

= 110 units

Time taken by both pipe to fill the cistern

= $\frac{110}{22}$ = 5 minutes

Sol.30.(d)



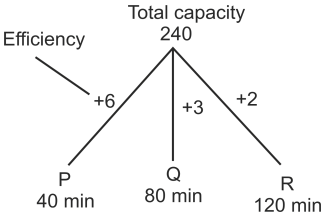
(N + S) × 10 + (M + S) × T + M × 15 = 100

3 × 10 + 5 × T + 4 × 15 = 100

T = 2

And total time = 10 + 15 + 2 = 27

Sol.31.(d)



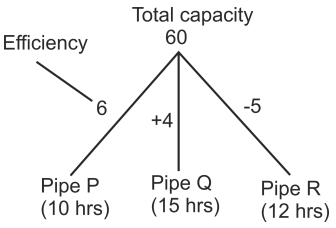
Let pipes Q and R be turned off for t minutes

According to question

(6 + 3 + 2) × t + 6 × (30 - t) = 240

11t + 180 - 6t = 240 ⇒ 5t = 60 ⇒ t = 12

Sol.32.(d)



P and Q worked for three hours

= 10 × 3 = 30 units

Remaining work = 60 - 30 = 30 units

Time taken by all pipes for remaining work = $\frac{30}{6+4-5}$ = 6 hrs

⇒ the tank will be completely filled at

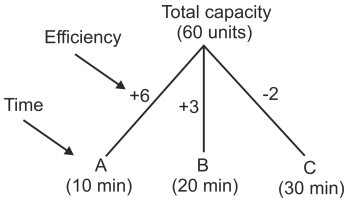
Search on TG: @apna_pdf

Search on Telegram @apna_pdf

9 am + 6 hrs = 3 pm

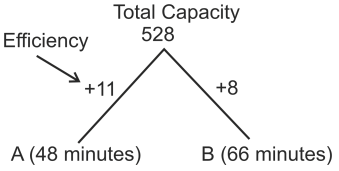
Sol.33.(b) Efficiency of pipes = 1 : 1.5
Time taken to fill the tank by both the pipes = 15 min.
Total capacity of tank
= 15 × (1 + 1.5) = 15 × 2.5 unit
Hence, time taken to fill the tank by faster pipe alone = $\frac{15 \times 2.5}{1.5}$ = 25 min.

Sol.34.(c)



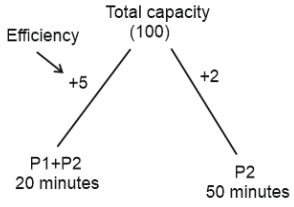
Work done by pipe C for last 2 minutes
= -2 × 2 = -4 units
Work done by all pipes
= $\frac{60-4}{6+3-2}$ = $\frac{56}{7}$ = 8 units

Sol.35.(c)



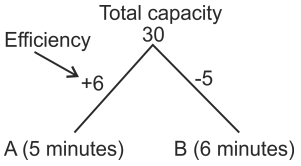
If A worked for 32 minutes
= 32 × 11 = 352
Remaining work = 528 - 352 = 176
Remaining work by B
= $\frac{176}{8}$ = 22 minutes
After 22 minutes,
pipe B should be closed.

Sol.36.(c) **time taken by** (P1 + P2) pipe to fill the tank = 20 minutes
time taken by P2 pipe to fill the tank
= 20 × $\frac{5}{2}$ = 50 minutes



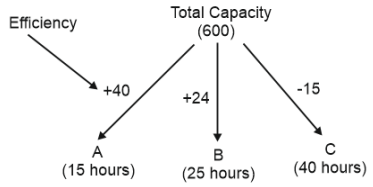
time taken by Faster pipe to fill the tank
= $\frac{100}{3}$ = 33.33 or 34 minutes

Sol.37.(b)



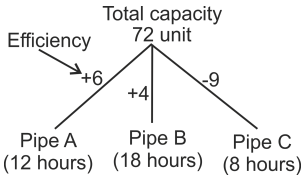
Net efficiency of A and B = 6 - 5 = 1 unit
Time taken together to fill tank
= $\frac{30}{1}$ = 30 min.

Sol.38.(d)



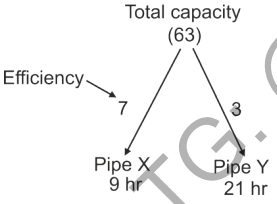
All three pipes capacity of after 5 hours
= 5 (40 + 24 - 15) = 245 units
Remaining capacity
= 600 - 245 = 355 units
According to the question,
Remaining tank can be filled
= $\frac{355}{24-15}$ = $\frac{355}{9}$ = $39\frac{4}{9}$ hours

Sol.39.(d)



Efficiency of A, B and C = 6 + 4 - 9 = 1 unit
Time taken to fill the empty tank
= $\frac{72}{1}$ = 72 hours

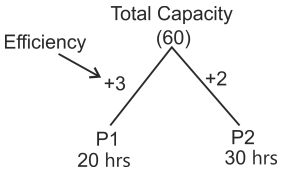
Sol.40.(b)



If Pipes are opened on alternate hr , than
In 2hr , tank fill in = (7 + 3) = 10 unit
⇒ 12 hr = 60 unit
Remaining 3 unit fill by pipe X in $\frac{3}{7}$ hr
∴ Total time taken to full the tank
= 12 hr + $\frac{3}{7}$ hr = $12\frac{3}{7}$ hr

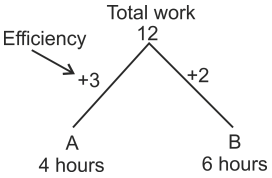
Sol.41.(c)
Let the initial capacity of bucket = 5
After reducing two-fifth of the initial , the capacity of bucket = 2
Total capacity of the tank = 5 × 50 = 250
After reduction , required no of bucket to fill the same tank = $\frac{250}{2}$ = 125

Sol.42.(a)



Total efficiency of pipe (P1 + P2) = 3 + 2
= 5 units
Water filled by pipe P2 in 5 hours = 2 × 5
= 10 units
amount of water to be filled by both pipe
= 60 - 10 = 50 unit
Time taken to fill 50 unit water by both pipe = $\frac{50}{5}$ = 10 hours
Hence, total time taken
= 5 hrs + 10 hrs = 15 hrs

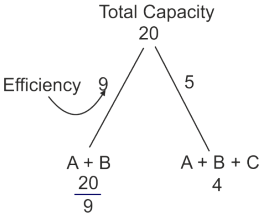
Sol.43.(c)



According to the question,
3 × 1 + (3 + 2) × T = 12
(5) × T = 9units
Remaining work = 9 units
Time taken by A and B(remaining work)
= $\frac{9}{5}$ hours = $1\frac{4}{5}$ × 60 = 1 hour 48 minutes
Hence, time to fill the tank
= 9 : 00 a.m. + 1 hours + 48 minutes
= 10 : 48 a.m.

Sol.44.(d)
Ratio → $pipe_1 : pipe_2$
Efficiency → 1 : 6
Capacity of tank = 40 × 7 = 280 min
Time taken by slower pipe to fill the tank
= $\frac{280}{1}$ = 280 min

Sol.45.(a) Let pipe A fill an empty tank in 4hr , and pipe B fill an empty tank in 5hr
Let Total capacity of tank (LCM 4 ,5)
= 20
Efficiency of Pipe A and Pipe B = 5 unit and 4 unit
Time taken by both pipe to fill the tank
= $\frac{20}{9}$hr
Again , Given C is an outlet pipe , and when A , B and C open together , it will take $\frac{4}{5}$ more time to fill the tank than it takes when only pipe A and pipe B are opened together
∴ Time taken by Pipe A , B and C together to fill the tank = $\frac{20}{9}$ + $\frac{20}{9}$ × $\frac{4}{5}$ = 4hr

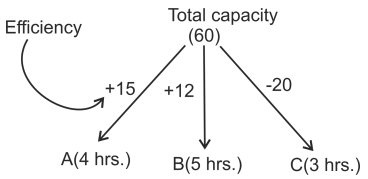


Here efficiency of c = (A + B) - (A + B + C)
= 9 - 5 = 4
Now, Total capacity of tank
= 5 × 40 = 200
Time required by pipe C to empty the full tank = $\frac{200}{4}$ = 50 hr

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.46.(d)

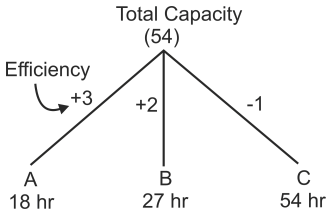


Efficiency of all pipe together
= 15 + 12 - 20 = 7 unit
Time taken to fill tank together
$= \frac{60}{7} \times 60$ minutes
= 514 .28 ≈ 514 minute

Sol.47.(a) Time taken to fill tank
$= \frac{14 \times 21}{14 + 21} = \frac{14 \times 21}{35} = \frac{42}{5} = 8\frac{2}{5}$ hours

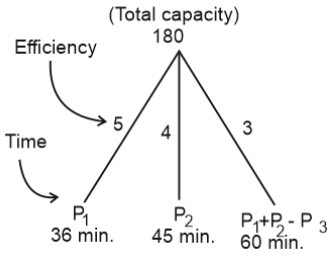
Sol.48.(c)
Ratio → $pipe_1 : pipe_2$
Efficiency → 4 : 1
Total volume = 5 × 48 = 240 unit
Time taken by $pipe_2$
$= \frac{240}{1}$ = 240 minutes

Sol.49.(a)



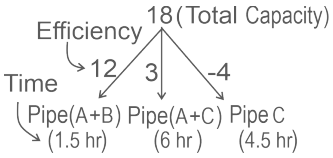
Work done in 12 hours
= (3 + 2 - 1) × 12 = 48 units
Remaining work = 54 - 48 = 6 units
$\frac{1}{3}$rd of 6 units = 2 units
Time taken by A and B to fill 2 units
$= \frac{2}{3+2} = \frac{2}{5}$ hours
$= \frac{2}{5} \times 60$ = 24 minutes

Sol.50.(b)



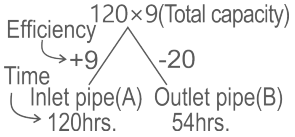
Efficiency of P_3 i.e. waste pipe
= (5 + 4) - 3 = 6 unit
So time taken to fill the cistern by waste pipe $= \frac{180}{6}$ = 30 min.
∴ capacity of cistern = 30×40
= 1200 liters.

Sol.51.(b)



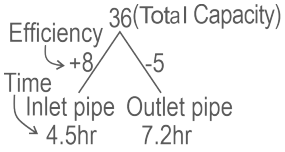
Efficiency of A = 3 − (− 4) = 7 units
Efficiency of B = 12 − 7 = 5 units
So, time taken by B to fill the tank alone
$= \frac{18}{5}$ = 3 hours 36 min.

Sol.52.(d)



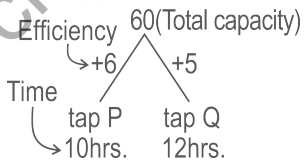
Efficiency of 8 inlet and 3 outlet pipes
= (9 × 8) + (-20 × 3) = 12 units
Required time $= \frac{120 \times 9}{12}$ = 90 hours.

Sol.53.(c)



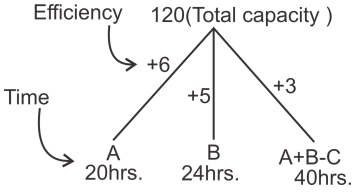
Since pipes are open alternatively starting with Inlet pipe
Tank filled in 2 hours = 8 + (- 5) = 3 unit
Tank filled in 20 hours = 30 unit
Time taken to fill Remaining water by inlet pipe $= \frac{36-30}{8} = \frac{6}{8} = \frac{3}{4}$ hours
Total time taken = $(20 + \frac{3}{4})$ hours
$= 20\frac{3}{4}$ hours

Sol.54.(a) Let, pipe P opened for x hour



According to the question,
5 × (6 hours) + 6 × x hours
= 60 units ⇒ x = 5 hours
So, P is closed after 5 hours
= (9 am + 5 hours) = 2 pm

Sol.55.(b) Let, filling pipes A and B
And outlet pipe = C

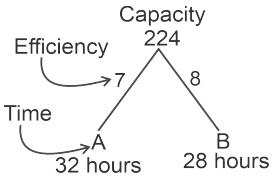


Efficiency of outlet pipe = 11 - 3 = 8 units
Capacity of tank $= \frac{120}{8} \times 20$ = 300 gallons

Sol.56.(b) $\frac{m_1 \times d_1 \times h_1}{w_1} = \frac{m_2 \times d_2 \times h_2}{w_2}$

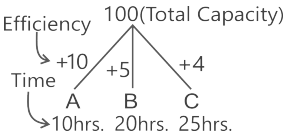
Let the number of taps = x
15 × 36 = 60 × x ⇒ x→ 9

Sol.57.(b)



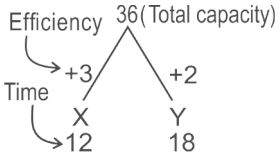
A and B pipes are opened alternately for 1 h
Work done in 2 hour = 7 + 8 = 15 units
Similarly, work done in 29 hour
= (15 × 14) + 7 = 217 units
In the 30th hour , work will be completed.

Sol.58.(d)



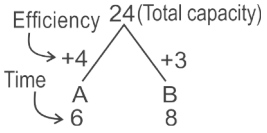
Total efficiency = 19 units
Tank filled by tap C in 2 hrs = 8 units
Tank filled by tap B in 4 hrs = 20 units
Remaining tank filled by tap A
= 100 - (20 + 8) = 72 units
Now, percentage of work done by tap A
$= \frac{72}{100} \times 100$ = 72 %

Sol.59.(d)



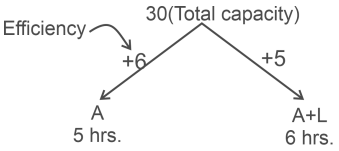
Time taken by (X + Y) to fill the whole tank $= \frac{36}{3+2} = \frac{36}{5} = 7\frac{1}{5}$ min

Sol.60.(b)



(A + B)'s 2 hours work = 2 × 7=14
Remaining work=24 - 14 = 10
Time taken to complete the remaining work by B $= \frac{10}{3} = 3\frac{1}{3} hours$

Sol.61.(d)



Efficiency of leak = 6 - 5 = 1 unit
Time taken to empty the container when there is leak $= \frac{30}{1}$ = 30 hours

Sol.62.(c) L.C.M. (4 ,5) min. = 20 min.
Tank fill by Manoj in 20 min. = 25 l
Tank fill by Swathi in 20 min. = 16 l
Together they fill the tank in 20 min.= 41 l
Required time together to fill 205 l =

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\frac{20}{41} \times 205 = 100$ minute

Sol.63.(c)

Time taken to fill $\frac{4}{13}$ parts = 6 minutes

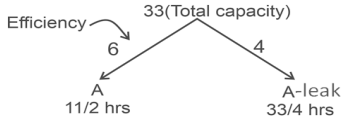
Remaining part = $\frac{9}{13}$

Time taken to fill remaining part

$= 6 \times \frac{13}{4} \times \frac{9}{13} = \frac{27}{2}$ minutes

⇒ 13 minutes 30 seconds

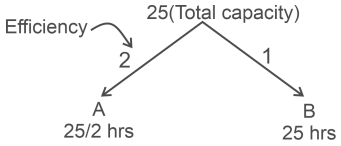
Sol.64.(b)



Efficiency of leak = 6 – 4 = 2 unit

Time taken by leak to empty 30% of the tank = $\frac{33}{2} \times \frac{30}{100} = \frac{99}{20}$ hours.

Sol.65.(c)



Time taken by A and B together to fill cistern = $\frac{25}{1+2}$ = 8 hours & 20 minutes

Time taken with leakage C

= 8 h 20 m + 1 h 40 m = 10 h

Tank filled by A and B together in 10 h

= 30 unit

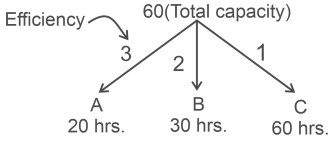
Efficiency of pipe C in 10 hour

= 30 - 25 = 5 unit

Efficiency of pipe C in 1 hour = $\frac{5}{10}$ unit

Time taken by pipe C (leakage) to empty 70% of cistern = $\frac{\frac{7}{10} \times 25}{\frac{5}{10}}$ = 35 hours

Sol.66.(b)



Tank filled by A alone till 9 am

= 2 × 3 = 6 units

Tank filled by B alone till 9 am

= 1 × 2 = 2 units

Total tank filled 9 am

= 6 + 2 = 8 units

Remaining tank to be filled

= 60 – 8 = 52 units

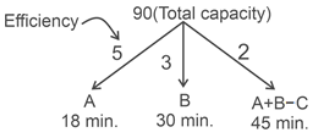
Time taken by A, B and C together

$= \frac{52}{3+2+1} = 8\frac{2}{3}$ hrs = 8 hrs 40 minutes

So, the tank will be full at

= 9 am + 8 hrs 40 minutes = 5:40 p.m.

Sol.67.(c)



Efficiency of C = 5 + 3 - 2 = 6 unit

So, C can empty entire tank in = $\frac{90}{6}$

= 15 minutes

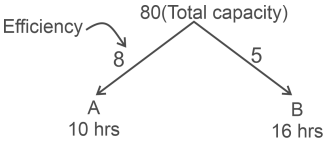
Water drain by C in 1 minute = 125 litres

Water drain by C in 15 minute = 125 × 15

= 1875 litres

Capacity of tank = 1875 litres

Sol.68.(a)



Amount of water filled by A and B in 2 hours = 13 unit

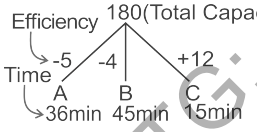
Amount of water filled A and B in 12 hours = 13 × 6 = 78 unit

Amount of water left = 80 – 78 = 2 unit

Time taken by pipe B to fill 2 unit = $\frac{2}{5}$

Total time = $12\frac{2}{5}$hr.

Sol.69.(d)



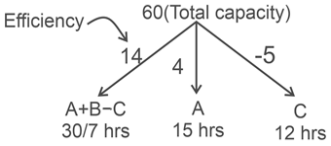
Tank filled in 15 min by B and C together

= 15 × (– 4 + 12) = 120 units

Time taken by A to empty 120 units

$= \frac{120}{5}$ = 24 min

Sol.70.(d)



Efficiency of B = 14 – 4 + 5 = 15

Time taken by B = $\frac{60}{15}$ = 4

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Time, Speed and Distance

KEY - POINTS

1). Time

$$\text{Time} = \frac{Distance}{Speed}$$

We just need to remember this formula. If two values are given the third can be found easily.

Ex. A man travels from Delhi to Chandigarh at a speed of 50 km/h covering a distance of 300 km. Find the time taken?

Here, we are given, Distance(D) = 300 km and Speed(S) = 50 km/h.

$\therefore Time(T) = \frac{D}{S} = \frac{300}{50} = 6\ hours$

- If the distance is constant then speed ratio is inversely proportional to Time ratio. Similarly, if time is constant then Speed ratio is equal to Distance ratio.

Ex 1 : For the same distance, speed in outward journey and return journey is 50 km/h and 60 km/h. Find the ratio of the time taken.

Soln : Here, the distance is constant. So, time taken will be inversely proportional to speed.

So, the required ratio

$= \frac{1}{50} : \frac{1}{60} = \frac{6}{300} : \frac{5}{300} = 6 : 5$

Ex 2 : In the same time, find the ratio of the distance travelled by A and B at a speed of 6 km/h and 8 km/h respectively.

Soln : Here, the time taken is constant. So, the distance covered will be directly proportional to the speed.

Hence, the required ratio = 6 : 8 = 3 : 4

2). Average speed

a.) When different distance is travelled each time then,

$$Average\ Speed = \frac{Total\ Distance}{Total\ Time}$$

b.) When same distance is travelled each time then

For two terms a and b :

$Average\ Speed = \frac{2ab}{a+b}$,

where a and b are speed

For three terms a, b and c :

$Average\ Speed = \frac{3abc}{ab+bc+ac}$,

where a, b and c are speed

Ex. A person travels from point A to point B at a speed of 30 km/h and comes back at a speed of 20 km/h. What is his average speed?

Here, distance travelled is same,

So, average speed = $\frac{2 \times 30 \times 20}{30+20} = \frac{1200}{50}$

= 24 km/h

•Total distance traveled when a man covers a certain distance with x km/hr and comes back with y km/hr. He takes 't' hr to complete the whole journey is :

Distance(D) = $(\frac{xy}{x+y})$ t km

Example : A man travel a certain distance by train at the rate of 25 km/hr and walk back at the rate of 3 km/hr. The whole journey took 5 hr 36 min. What distance did he travel by train ?

D = $(\frac{25 \times 3}{25+3}) \times \frac{28}{5}$ = 15 km

•Total distance travelled when a man covers a certain distance with x km/hr and he comes back with a speed of y km/hr . if he takes 't' hrs more to come back than go is :

Distance (D) = $(\frac{xy}{x-y})$ t km

Example : A man covers a certain distance by 10 km/hr and becomes 20 min late but if he travels the same distance with 12 km/hr then he becomes 5 min late. Find the distance ?

D = $\frac{10 \times 12}{12-10} \times (20 - 5) = \frac{120}{2} \times \frac{15}{60}$

= 15 km

3). Relative Speed

(i). Same Direction -: When two things are moving in the same direction, the relative speed is given by the difference between their respective speeds.

Ex. A and B are going to a same point Z at speeds of 80 km/h and 60 km/h respectively.

Relative speed of A with respect to B will be = 80 – 60 = 20 km/h.

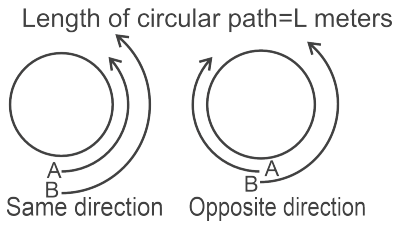
(ii) Opposite direction :- When two things are moving in opposite directions, the relative speed is given by the addition of their respective speeds.

Ex. A is moving towards point Z at 60 km/h and B is going away from point Z at 80 km/h.

Relative speed of A with respect to B

= 60 + 80 = 140 km/h.

4). Circular track:-



(where x m/s, y m/s are speeds of A and B respectively. L = length of the track in meters.)

- Meet first time each other at any point on the track in opposite direction = $\frac{L}{x+y}$ sec.
- Meet first time each other at any point on the track in same direction = $\frac{L}{x-y}$ sec.
- Meet each other exactly at the starting point in same or opposite direction = LCM of $\left(\frac{L}{x}, \frac{L}{y}\right)$ sec.

(i) When three persons A, B and C are running around a circular track of length L meters with speed x, y and z m/s in the same direction, then

- Meet each other at any point on the track = LCM of $\left(\frac{L}{(x-y)}, \frac{L}{(y-z)}\right)$ sec.

5). Unit Conversion:

1 km/h = 1 × $\frac{1000\ m}{3600\ s} = \frac{5}{18}$ m/s

So, to convert km/hr to m/sec just multiply by $\frac{5}{18}$ and to convert m/sec to km/hr multiply by $\frac{18}{5}$.

Ex. 90 km/h = 90 × $\frac{5}{18}\frac{m}{s} = 25$ m/s

Also, 25 m/s = $25 \times \frac{18}{5}\frac{km}{hr}$

= 90 km/h

- When using the unit of speed in km/h, keep in mind that the unit of time should also be in hours. When the unit of speed is used in m/s, the unit of time should also be in seconds. That is, the units of speed and time are the same.

6). Trains

Case 1: Train crossing a person or, pole. In such case the length of the person or pole is taken to be negligible. To cross the person the train has to cover distance equal to its length.

Ex. A train, of length 100 m, travelling at

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

90 km/hr will take how much time to cross a man?

Here, Speed = 90 km/hr

$= 90 \times \frac{5}{18} \frac{m}{s} = 25$ m/s

Distance = Length of train = 100 m

Time = $\frac{Distance}{speed} = \frac{100}{25} = 4\ seconds$

Case 2: Train crossing a platform.

In such a case the distance covered by train to cross the platform will be equal to sum of length of train and platform.

Ex. A train, of length 100 m, travelling at 90 km/hr will take how much time to cross a platform of length 150 m?

Here,Speed = 90 km/hr

$= 90 \times \frac{5}{18} \frac{m}{s}$ = 25 m/s

Distance = Length of train + Length of platform = 100 + 150 = 250 m

Time = $\frac{Distance}{Speed} = \frac{250}{25}$ = 10 sec.

Case 3: Train crossing another train moving in same direction. In such case the distance covered by train to cross the other train will be equal to sum of lengths of the two trains. To calculate time we need to consider relative speed of one train with respect to the other.

$Relative\ Speed = \frac{Relative\ Distance}{Relative\ Time}$

Ex. A train, of length 100 m, travelling at 90 km/hr will take how much time to cross another train, of length 50 m, moving in same direction at speed of 36 km/hr?

Here, Relative speed of first train with respect to second train =

(90 – 36) km/h $= 54 \times \frac{5}{18} \frac{m}{s}$ = 15 m/s

Distance = Length of first train + Length of second train = 100 + 50 = 150 m

Time = $\frac{Distance}{Speed} = \frac{150}{15}$ = 10 seconds

Case 4: Train crossing another train moving in the opposite direction. In such case the distance covered by train to cross the other train will be equal to the sum of lengths of the two trains. To calculate time we need to consider relative speed of one train with respect to the other.

Ex. A train, of length 100 m, travelling at 90 km/hr will take how much time to cross another train, of length 50 m, moving in the opposite direction at a speed of 36 km/hr?

Here, Relative speed of first train with respect to second train = (90 + 36) $\frac{km}{hr}$

$= 126 \times \frac{5}{18} \frac{m}{s} = 35 \frac{m}{s}$

Distance = Length of first train + Length of second train = 100 + 50 = 150 m

Time = $\frac{Distance}{Speed} = \frac{150}{35} = \frac{30}{7}$ seconds

Case 5: Train crossing a man sitting in another train moving in the same direction.

In such a case, the distance covered by the train to cross the man will be equal to the length of the train. To calculate the time we need to consider the relative speed of the train with respect to the man. The length of the second train will not be considered.

Ex. A train, of length 100 m, travelling at 90 km/hr will take how much time to cross a man sitting in another train, of length 50 m, moving in the same direction at a speed of 36 km/hr?

Speed of the man = 36 km/hr

Here, the Relative speed of the first train with respect to the man = (90 – 36) km/h

$= 54 \times \frac{5}{18} \frac{m}{s}$ = 15 m/s

Distance = Length of first train = 100 m

Time = $\frac{Distance}{Speed} = \frac{100}{15} = \frac{20}{3}$ sec

Case 6: Train crossing a man sitting in another train moving in opposite direction

In such a case the distance covered by the train to cross the man will be equal to the length of the train. To calculate time we need to consider the relative speed of the train with respect to the man. Length of the second train will not be considered.

Ex. A train, of length 100 m, travelling at 90 km/hr will take how much time to cross a man sitting in another train, of length 50 m, moving in the opposite direction at speed of 54 km/hr?

Speed of the man = 54 km/hr

Here, Relative speed of first train with respect to the man = (90 + 54)$\frac{km}{hr}$

$= 144 \times \frac{5}{18} \frac{m}{s}$ = 40 m/s

Distance = Length of first train = 100 m

Time = $\frac{Distance}{Speed} = \frac{100}{40} = \frac{5}{2}$ sec.

Case 7 : If two trains starts at same time from point A and B towards each other and after crossing each other they take a and b seconds in reaching B and A respectively, then : $\frac{A's\ speed}{B's\ speed}$

$= \frac{\sqrt{Time\ taken\ by\ B\ after\ meeting\ A}}{\sqrt{Time\ taken\ by\ A\ after\ meeting\ B}}$

Other important points :

1. LCM of time taken by train A and train B shows after how much time they will meet each other at the starting point.

2. Without stoppage a person travel a distance at an average speed of x km/h and with stoppage it travels the same distance at y km/h and $x > y$, then number of minutes per hour does he stop

$= \frac{Faster\ speed - Slower\ speed}{Faster\ speed} \times 60$

$= \frac{x - y}{x} \times 60$

Variety Questions

Q.1. A policeman noticed a thief at some distance. The policeman started running to catch the thief and the thief also started running at the same time. The speed of both the policeman and the thief was 12 km per hour and 10 km per hour, respectively. It took 30 minutes for the policeman to catch the thief. Find the initial distance (in metres) between them.

SSC CGL 25/09/2024 (2nd Shift)

(a) 500 (b) 600 (c) 1000 (d) 100

Q.2. The distance (d) a moving body travels, varies directly with the time (t) when it moves. A train travels 72 km in 2 hours. Find the equation that relates d and t.

SSC CPO 28/06/2024 (2nd Shift)

(a) d = t + 36 (b) d = t - 36

(c) d = 36t (d) d = $\frac{t}{36}$

Q.3. A thief steals an item and escapes, running at 13.5 km/h. A policeman arrives at the spot of the crime after 8 minutes and immediately starts chasing the thief. 28 minutes after the policeman started to chase the thief, there is still a gap of 540 m between the two. At what distance from the spot of the crime would the policeman catch up with the thief, and what is the speed (in km/h) at which the policeman ran ?

Graduate Level 26/06/2024 (Shift - 3)

(a) 11.2 km, 16.4 (b) 10.8 km, 16.2

(c) 12.96 km, 16.2 (d) 10.4 km, 16

Q.4. A police station, a bank and a safe house for the thief are in a straight line with a bank in between. The distance between the police station and the safe house is four times the distance between

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

the bank and the safe house. After looting the bank at 9:15 A.M, the thief runs away. A policeman gets the information instantly and chases him at the speed of 16 km/h. The policeman catches the thief at the gate of the safe house in fifteen minutes. What is the distance between the bank and the police station ?
Higher Secondary 25/06/2024 (Shift - 2)
(a) 2 km (b) 1 km (c) 4 km (d) 3 km

Q.5. While travelling from A to B, Raghav travels a quarter of the distance at 10 km/h, the next quarter of the distance at 15 km/h, the third quarter of the distance at 20 km/h, and the final quarter of the distance at 30 km/h. While travelling on exactly the same route, Manish travels for a quarter of the total time taken for his journey at 10 km/h, the next quarter of the total time taken for his journey at 15 km/h, the third quarter of the total time taken for his journey at 20 km/h, and the final quarter of the total time taken for his journey at 30 km/h. If the overall average speed of Raghav during his journey is given as y km/h, and that of Manish is given as z km/h, find the value of (z – y).
Graduate Level 21/06/2024 (Shift - 3)
(a) 1.5 (b) 2.75 (c) 2.5 (d) 0

Q.6. A man runs for 40 km. The time taken by him in the first 10 km is twice the time taken by him in the second 10 km. The time taken in the third 10 km is half of the time taken in the fourth 10 km, and the time taken in the fourth 10 km is equal to the time taken in the first 10 km. If his speed in the first 10 km is 40 km/h, then what is the average speed for 40 km?
SSC CPO 03/10/2023 (1st Shift)
(a) $\frac{160}{3}$ km/h (b) $\frac{70}{3}$ km/h
(c) 50 km/h (d) 40 km/h

Q.7. If a person walks at 18 km/hr instead of 12 km/hr, he would have walked 24 km more. What is the actual distance travelled by him?
SSC MTS 14/09/2023 (2nd Shift)
(a) 52 km (b) 60 km (c) 55 km (d) 48 km

Q.8. The distance between two towns is covered in 9 hours at a speed of 60 kmph. By how much should the speed (in km/h) be increased so that 1 hour of the travelling time is saved?
SSC MTS 14/09/2023 (1st Shift)
(a) 7.5 (b) 10 (c) 15 (d) 12.5

Q.9. If the ratio among the time taken by three cars to travel a certain distance is 2 : 3 : 5, then the ratio of speeds of these cars will be:
SSC MTS 11/09/2023 (1st Shift)
(a) 10 : 6 : 15 (b) 15 : 9 : 8
(c) 10 : 15 : 8 (d) 15 : 10 : 6

Q.10. Anil completed a certain journey by a car. If he covered 35% of the distance at 70 km/h. 40% of the distance at 80 km/h and the remaining distance at 50 km/h, his average speed (in km/h) for the entire journey is:
SSC CHSL 09/08/2023 (1st Shift)
(a) $66\frac{3}{3}$ km/h (b) $66\frac{2}{3}$ km/h
(c) $66\frac{1}{3}$ km/h (d) $66\frac{4}{3}$ km/h

Q.11. Two men do the same journey by travelling at the speed of 18 km/h and 24 km/h, respectively. If one man takes 20 minutes more than the other man, then the distance (in km) of the total journey is:
SSC CHSL 04/08/2023 (1st Shift)
(a) 24 (b) 20 (c) 18 (d) 21

Q.12. A train starts from a station P for another station Q at 6 p.m. at an average speed of 75 km per hour. Another train starts from station Q for station P at 8 p.m. at an average speed of 105 km per hour. If the distance between these two stations is 690 km, then at what time will the two trains meet ?
SSC CHSL 03/08/2023 (1st Shift)
(a) 10 : 30 p.m. (b) 10 p.m.
(c) 11 p.m. (d) 11 : 30 p.m.

Q.13. A boy covers a certain distance between his house and school on a cycle. Riding on an average speed of 15 km/h, he is late by 10 min. However, with an average speed of 20 km/h, he reaches the school 5 min earlier. Find the distance between his house and school.
SSC CHSL 02/08/2023 (4th Shift)
(a) 25 km (b) 20 km (c) 15 km (d) 30 km

Q.14. The force (in pound-force) needed to keep a car from skidding on a curve varies directly with the weight of the car (in pounds) and the square of its speed (in miles per hour [mph]) and inversely with the radius (in feet) of the curve. Suppose 6125 pound- force is required to keep a 2750 pound car, travelling at a speed of 35 mph, from skidding on a curve of radius 550 feet. How much pound-force is then required to keep a 3600 pound car, travelling at a speed of 50 mph, from skidding on a curve of radius 750 feet?
SSC CGL 26/07/2023 (4th shift)
(a)11960 (b)12150 (c)12240 (d)12000

Q.15. A thief steals an item and escapes, running at a speed of 15 km/h. A policeman arrives at the spot of the crime after 4 minutes and immediately starts chasing the thief. 16 minutes after the policeman started to chase the thief; there is still a gap of 200 m between the two. At what distance from the spot of the crime will the policeman catch up the thief and what is the speed (in km/h) of the policeman ?
SSC CGL 25/07/2023 (4th shift)
(a) 5.5 km; 16.5 (b) 6 km; 18
(c) 6.5 km; 19.5 (d) 5 km; 15

Q.16. Anil and Tirath drove between two points A and B 192 km apart. Anil started the journey from point A at 8 : 20 a.m.; drove at a speed of 64 km/h; reached point B and immediately returned to A at the same speed. Tirath started the journey from point A at 9 : 50 a.m.; drove at a speed of 96 km/h; reached point B and immediately returned to A at the same speed. At what time did Anil and Tirath first meet each other?
SSC CGL 21/07/2023 (4th shift)
(a) 11 : 38 a.m. (b) 11 : 28 a.m.
(c) 11 : 43 a.m. (d) 11 : 33 a.m.

Q.17. Anuj and Anup have to travel from a place A to a place B in their respective cars, Anuj is driving at 70 km/h, and takes 3 halts of 10 minutes each, while Anup is driving at 80 km/h, and takes 4 halts of 15 minutes each. The time taken by Anup to reach Place B, if Anuj takes 8.5 hours, is :
SSC CGL 21/07/2023 (1st shift)
(a) 8 hours (b) 7 hours
(c) 4 hours (d) 6 hours

Q.18. Anand covers a certain distance in the first lag of 5 hours at the speed of 50 km/h. In the second lag, he increased the speed by 20% due to which he covered 20% extra distance than that of the first lag. He covered the third lag at the average speed of the first two lags and covered 10% extra distance than that of the second lag distance.How much total time (in hours) did he take to complete all three lags?
SSC CGL 21/07/2023 (1st shift)
(a) 16 (b) 15 (c) 18 (d) 14

Q.19. A car starts running at an initial speed of 60km/h, with its speed increasing every hour by 10 km/h. How many hours will it take to cover a distance of 1210 km?
Higher Secondary 30/06/2023(Shift- 2)
(a) 12 (b) 8 (c) 10 (d) 11

Q.20. The distance between two places is 1200 km. To cover this distance, a

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

person X takes 5 hours lesser than another person Y, whose average speed is 40 km/h lesser than that of X. The time taken by Y to complete the travel is:
Higher Secondary 27/06/2023 (Shift - 3)
(a) 16 hours (b) 14 hours
(c) 18 hours (d) 15 hours

Q.21. A car left 4 hours later than the scheduled time but in order to reach its destination 480 km away in time, it had to increase its usual speed by 10 km/hr. What is the usual speed of the car ?
SSC MTS 16/05/2023 (Morning)
(a) 40 km/hr (b) 60 km/hr
(c) 30 km/hr (d) 50 km/hr

Q.22. Excluding stoppages, the speed of a bus is 60 kmph and including stoppages, it is 54 kmph. For how many minutes does the bus stop per hour?
SSC CHSL 20/03/2023 (3rd Shift)
(a) 4 mins (b) 6 mins
(c) 7 mins (d) 5 mins

Q.23. The speed of a train including stoppages is 75 kmph and excluding stoppages, the speed of the train is 90 kmph. For how many minutes does the train stop per hour?
SSC CHSL 13/03/2023 (3rd Shift)
(a) 10 minutes (b) 15 minutes
(c) 20 minutes (d) 11 minutes

Q.24. The radius of a wheel is 14 cm. How much distance will be travelled by the wheel in 10 revolutions?
SSC CHSL 09/03/2023 (1st Shift)
(a) 910 cm (b) 880 cm
(c) 800 cm (d) 820 cm

Q.25. Two cities A and B are 135 km apart on a straight track. One car starts from A at 8 a.m. and travels towards B at 25 km/h. Another car starts from B at 9 a.m. and travels towards A at a speed of 30 km/h. At what time will they meet?
SSC CGL 09/12/2022 (1st Shift)
(a) 11 a.m. (b) 10 a.m.
(c) 10.45 a.m. (d) 11.30 a.m.

Q.26. A bus starts from a bus station after every 30 minutes in the same direction. The speed of each bus is the same. Z is riding a bike in the opposite direction at a speed of 25 km/h . Z meets each bus in 20 minutes. What is the speed of each bus ?
SSC MTS 19/07/2022 (Evening)
(a) 50 km/h (b) 75 km/h
(c) 30 km/h (d) 60 km/h

Q.27. A person goes from P to Q at a speed of 20 km/h.Then he goes from Q to R at a speed of q km/h. Finally the person goes from R to S at a speed of r km/h. The distances from P to Q, Q to R and R to S are equal. If the average speed from P to R is $\frac{280}{11}$ km/h and the average speed from Q to S is $\frac{112}{3}$ km/h, then what is the value of r ?
SSC MTS 14/07/2022 (Morning)
(a) 40 (b) 37.5 (c) 42.5 (d) 45

Q.28. If a boy goes from his home to his school at a speed of 40 km/h, he reaches 10 minutes early. If he goes at a speed of 35 km/h, he reaches 5 minutes late. What will be the time taken for the journey at a speed of 35 km/h?
SSC MTS 07/07/2022 (Evening)
(a) 125 minutes (b) 135 minutes
(c) 115 minutes (d) 120 minutes

Q.29. Three cities, A, B, and C are located such that they form the vertices of an equilateral triangle if joined by straight lines. Rashid travels from A to B at the speed of 40 km/h, from B to C at the speed of 60 km/h and from C to A at the speed of 72 km/h. Find the average speed of Rashid for the entire journey.
SSC CHSL 08/06/2022 (Evening)
(a) 54 (b) $56\frac{2}{3}$ (c) 55 (d) $57\frac{1}{3}$

Q.30. A man had to travel 49 km, which he divided into six stretches which were exact multiples of either 4 km or 5 km. The first four stretches were 4 km, 5 km, 8 km, and 10 km. Multiples of 4 km and 5 km were travelled at the rates of 40 and 60 km/h, respectively, and between two consecutive stretches, he rested for six minutes. What was his average speed (in km/h) for the whole journey?
SSC MTS 18/10/2021 (Evening)
(a) $31\frac{7}{11}$ (b) $32\frac{4}{13}$ (c) $33\frac{3}{8}$ (d) $34\frac{4}{15}$

Q.31. A man walking at a speed of 3km/h crosses a square field diagonally in 5 minutes. What is the area of the field (in m^2) ?
SSC CGL 24/08/2021 (Afternoon)
(a) 3125 (b) 31250 (c) 3.125 (d) 312.5

Q.32. A takes 2 hours more than B to cover a distance of 40 km. If A doubles his speed, he takes $1\frac{1}{2}$hour more than B to cover 80 km. To cover a distance of 120 km, how much time (in hours) will B take travelling at his same speed?
SSC CGL 20/08/2021 (Morning)
(a) $1\frac{1}{3}$ (b) $1\frac{2}{3}$ (c) $1\frac{1}{4}$ (d) $1\frac{1}{2}$

Q.33. A train leaves station A at 8 am and reaches station B at 12 noon. A car leaves station B at 8:30 am and reaches station A at the same time when the train reaches station B. At what time do they meet?
SSC CGL 16/08/2021 (Afternoon)
(a) 9 : 38 am (b) 10 : 22 am
(c) 10 : 08 am (d) 9 : 52 am

Q.34. X and Y start at the same time to ride from place A to place B, which is 80km away from A. X travels 4 km/hour slower than Y.Y reaches place B and at once turns back meeting X, 16 km from place B. Y's speed(in km/h) is:
SSC CHSL 04/08/2021 (Evening)
(a) 9 (b) 15 (c) 8 (d) 12

Q.35. Vaibhav and Vignesh each travel a distance of 78 km such that the speed of Vaibhav is faster than that of Vignesh. The sum of their speeds is 91 kmph and the total time taken by both is 3 hours and 30 minutes. The speed (Km/h) of Vaibhav is:
SSC CHSL 15/04/2021 (Evening)
(a) 48 (b) 45 (c) 52 (d) 54

Q.36. Train A takes $1\frac{4}{5}$ hours more than the time taken by train B to cover a distance of 360 km. If the speed of train A doubles, it will take 36 min less than the time taken by train B to travel the same distance. What is the speed of train B ? (in kmph)
SSC CHSL 13/04/2021 (Afternoon)
(a) 96 (b) 100 (c) 90 (d) 120

Q.37. Two trains start at the same time from two stations and proceed towards each other at speeds of 90 km/h and 70 km /h , respectively. When they meet, it is found that one train has travelled 140 km more than the other. What is the distance between the two stations? (in km)
SSC CHSL 12/04/2021 (Afternoon)
(a) 980 (b) 1100 (c) 1200 (d) 1120

Q.38. A person travels a distance of 300km and then returns to the starting point. The time taken by him for the outward journey is 5 hours more than the time taken for the return journey. If he returns at a speed of 10km/h more than the speed of going, what is the average speed (in km/h) for the entire journey ?
SSC CPO 23/11/2020 (Evening)
(a) 24 (b) 15 (c) 20 (d) 30

Q.39. A delivery boy started from his office at 10 a.m. to deliver an article. He rode his scooter at a speed of 32 km/h. He delivered the article and waited for 15 minutes to get the payment. After the payment was made, he reached his office at 11 : 25 a.m., travelling at a speed of 24

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

km/h. Find the total distance travelled by the boy.
SSC CGL Tier II (18/11/2020)
(a) 32 km (b) 30 km (c) 35 km (d) 40 km

Q.40. The distance between two railway stations is 1176 km. To cover this distance, an express train 5 hours less than a passenger train while the average speed of the passenger train is 70 km/h less than that of the express train. The time taken by the passenger train to complete the travel is:
SSC CHSL 13/10/2020 (Morning)
(a) 18 (b) 17 (c) 23 (d) 12

Q.41. Two cars start from the same place at the same time at right angles to each other. Their speeds are 54 km/h and 72 km/h, respectively. After 20 seconds, the distance between them will be :
SSC CHSL 17/03/2020 (Evening)
(a) 480 m (b) 540 m (c) 720 m (d) 500 m

Q.42. X and Y are two stations which are 280 km apart. A train starts at a certain time from X and travels towards Y at 60 km/h. After 2 hours, another train starts from Y and travels towards X at 20 km/h. After how many hours does the train leaving from X meets the train which left from Y ?
SSC CGL 09/03/2020 (Morning)
(a) 3 (b) 6 (c) 4 (d) 2

Q.43. A person travels a distance of 240 km, partly by train and the rest by bus. He takes $3\frac{1}{2}$ hours if he travels 150 km by train and the rest by bus. If he travels 140 km by bus and the rest by train, he takes $3\frac{2}{3}$ hours. What is the speed of the train (in km/h) ?
SSC CPO 09/12/2019 (Evening)
(a) 72 (b) 75 (c) 80 (d) 70

Q.44. Renu was sitting inside train A, which was travelling at 50 km/h. Another train, B, whose length was three times the length of A crossed her in the opposite direction in 15 seconds. If the speed of train B was 58 km/h, then the length of train A (in m) is :
SSC CGL Tier II (12/09/2019)
(a) 210 (b) 180 (c) 160 (d) 150

Q.45. A train runs 50% faster than a car. Both start running from the same point and meet after covering a distance of 360 km. In the middle of this journey, the train stops for two hours due to some faults in the engine. What is the speed of the train ? (in km/h)
SSC MTS 16/08/2019 (Evening)
(a) 80 (b) 60 (c) 72 (d) 90

Q.46. A train goes from P to Q with a speed μ km/h, then from Q to R (QR = 2PQ) with a speed 3μkm/h, and returns from R to P with a speed $\frac{\mu}{2}$km/h. What is the average speed (in km/h) of the train for the entire journey starting from P and back to P?
SSC CHSL 11/07/2019 (Afternoon)
(a) $\frac{18\mu}{23}$ (b) $\frac{4\mu}{3}$ (c) $\frac{16\mu}{23}$ (d) $\frac{3\mu}{2}$

Q.47. The platform of a station 400 m long starts exactly where the last span of a bridge 1.2 km long ends. How long(in min.) will a train 200 m long and travelling at the speed of 72 km/h take to cover the distance between the starting point of the span of the bridge and the far end of the platform?
SSC CHSL 11/07/2019 (Morning)
(a) 1.6 (b) 1.5 (c) 1.8 (d) 1.2

Q.48. A 360 m long running at a uniform speed, crosses a platform in 55 seconds and a man standing on the platform in 24 seconds. What is the length (in metres) of the platform?
SSC CHSL 03/07/2019 (Morning)
(a) 480 (b) 445 (c) 410 (d) 465

Q.49. Amit travelled from A to B at an average speed of 80 km/h. He travelled the first 75% of the distance in two-third of the time and the rest at a constant speed of x km/h. The value of x is:
SSC CHSL 02/07/2019 (Afternoon)
(a) 56 (b) 60 (c) 64 (d) 54

Q.50. A man travels a certain distance at 12km/h and returns to the starting point at 9km/h. The total time taken by him for the entire journey is $2\frac{1}{3}$ hours. The total distance (In km) covered by him is:
SSC CHSL 01/07/2019 (Evening)
(a) 25 (b) 12 (c) 24 (d) 28

Q.51. The speed of train A is 25 km/h more than the speed of train B. A takes 4 hours less time to travel a distance of 300 km than what train B takes to travel 250 km. What is the speed (In km/h) of A?
SSC CGL 10/06/2019 (Morning)
(a) 60 (b) 50 (c) 65 (d) 55

Q.52. A and B are travelling towards each other from the points P and Q respectively. After crossing each other A and B take $6\frac{1}{8}$ hours and 8 hours, respectively, to reach their destinations Q and P, respectively. If the speed of B is 16.8 km/h then the speed (in km/h) of A is:
SSC CGL 06/06/2019 (Morning)
(a) 20.8 (b) 19.8 (c) 19.2 (d) 20.4

Q.53. A takes 30 minutes more than B to cover a distance of 15 km at a certain speed. But if A doubles his speed, he takes one hour less than B to cover the same distance. What is the speed (in km/h) of B?
SSC CGL 04/06/2019 (Afternoon)
(a) 6 (b) 5 (c) $6\frac{1}{2}$ (d) $5\frac{1}{2}$

Q.54. The speed of a car increases by 2 km/h after every one hour. If the distance travelled in the first one hour was 35 km, what was the total distance travelled in 12 hours?
SSC CPO 16/03/2019 (Evening)
(a) 560 (b) 650 (c) 558 (d) 552

Practice Questions

SSC MTS 2024 Tier - 1

Q.55. A thief saw a policeman, and he started running at a speed of 18 m/s. After 12 seconds, the policeman starts running behind the thief at a certain speed. If the policeman covered 864 meters distance to reach the thief, then the speed (in m/s) of the policeman is:
SSC MTS 30/09/2024 (Morning)
(a) 28 (b) 15 (c) 30 (d) 24

Q.56. Two trains, 148 m and 152 m long, are running towards each other on parallel lines at 62 km/h and 46km/h, respectively. In what time will they be clear of each other from the moment they meet ?
SSC MTS 30/09/2024 (Morning)
(a) 5 sec (b) 20 sec (c) 10 sec (d) 15 sec

Q.57. A policeman follows a thief, who is 150 metres ahead of him., and they run at the speed of 6 km/h and 5 km/h, respectively. What distance does the policeman cover to catch up with the thief ?
SSC MTS 30/09/2024 (Afternoon)
(a) 880 metres (b) 870 metres
(c) 890 metres (d) 900 metres

Q.58. A Policeman chases a thief. The speed of the policeman and thief are 10 kmph and 8 kmph, respectively. If the policeman started 15 minutes late, find the time taken by the policeman to catch the thief.
SSC MTS 30/09/2024 (Afternoon)
(a) 15 minutes (b) 45 minutes
(c) 30 minutes (d) 60 minutes

Q.59. Two trains running towards each

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

other on parallel tracks, at speeds of 45 km/hr and 51 km/hr, take 21 seconds to cross each other. If the length of one train is 290 m, then the length (in m) of the other train is :
SSC MTS 01/10/2024 (Morning)
(a) 250 (b) 290 (c) 230 (d) 270

Q.60. A train travelling at a speed of 60 km/h leaves station A at 7 : 00 a.m. and another train travelling at a speed of 84 km/h starts from station A at 9 : 30 a.m. in the same direction on a parallel track. At what distance (in km) from station A and after how many hours of travel of the second train will they be together ? Express your answer in the same order.
SSC MTS 01/10/2024 (Afternoon)
(a) 693, 8.25 (b) 525, 6.25
(c) 375, 6.25 (d) 495, 8.25

Q.61. A person has to cover a distance of 8 km in 1 hour. If he covers one-fourth of the distance in one-third of the total time, then what should his speed (in km/h) be to cover the remaining distance in the remaining time so that the person reaches the destination exactly on time ?
SSC MTS 07/10/2024 (Evening)
(a) 6 (b) 8 (c) 9 (d) 7

Q.62. A thief saw a policeman and he started running at a speed of 12 m/s. After a certain time, the policeman starts running behind the thief at a speed of 18 m/s. If the policeman covered a 540 m distance to catch the thief, the time (in seconds) after which the policeman started running is:
SSC MTS 08/10/2024 (Morning)
(a) 10 (b) 12 (c) 15 (d) 18

Q.63. A fast train takes 1 hour less than a slow train for a journey of 96 km. If the speed of the slow train is 8 km/h less than that of the fast train, then find the speeds of the fast train and slow train respectively.
SSC MTS 08/10/2024 (Evening)
(a) 26 km/h, 34 km/h
(b) 32 km/h, 24 km/h
(c) 34 km/h, 28 km/h
(d) 12 km/h, 14 km/h

Q.64. Radha walks to her office 5 km away from home. In the morning, she covers the distance in 1 hour whereas, while returning home in the evening, she takes 15 more minutes to cover the same distance. Find her average speed (in km/h) during the two-way journey.
SSC MTS 09/10/2024 (Afternoon)
(a) $4\frac{2}{3}$ (b) $4\frac{4}{9}$ (c) $3\frac{1}{8}$ (d) $3\frac{3}{5}$

Q.65. A train is moving in from north to south direction. It overtakes Raj and Madhur who are walking in the same direction at the rate of 2 km/h and 4 km/h in 9 sec and 10 sec, respectively. If the train is x metres long, find the value of x.
SSC MTS 09/10/2024 (Evening)
(a) 70 (b) 50 (c) 30 (d) 90

Q.66. A man on a tour of 400 km, travels the first 120 km at 80 km/h and the next 150 km at 75 km/h. If he must spend less than 5 hours in the tour, what is the minimum speed at which he has to travel for the remaining distance ?
SSC MTS 16/10/2024 (Morning)
(a) 90.21 km/h (b) 84.72 km/h
(c) 86.66 km/h (d) 88.56 km/h

Q.67. A person walks along a rectangular field, whose dimensions are 6 km long and 3 km wide. For the first 1 hour, he walks at a speed of 2 km/hr. After 1 hour, he increases his speed to 4 km/hr. Next 1 hour, his speed is decreased to 2 km/hr. For the next 1 hour, he increases his speed to 4 km/hr. Find his average speed (in km/hr).
SSC MTS 18/10/2024 (Evening)
(a) 5 (b) 4 (c) 3 (d) 2

Q.68. Distance between A and B is 1200 km. If they start moving towards each other at same time, they will meet in 24 hrs. If A starts 10 hrs after B, then they will meet after another 20 hrs. What are their respective speeds ?
SSC MTS 21/10/2024 (Afternoon)
(a) 30 km/h, 20 km/h
(b) 25 km/h, 35 km/h
(c) 35 km/h, 25 km/h
(d) 40 km/h, 25km/h

Q.69. The speeds of three trains are in the ratio 5 : 3 : 7. What is the ratio of the time taken by them to travel the same distance ?
SSC MTS 11/11/2024 (Afternoon)
(a) $\frac{1}{4} : \frac{1}{2} : \frac{1}{7}$ (b) $\frac{1}{8} : \frac{1}{5} : \frac{1}{9}$
(c) $\frac{1}{5} : \frac{1}{3} : \frac{1}{7}$ (d) $\frac{1}{6} : \frac{1}{5} : \frac{1}{3}$

Q.70. A start from X at 9:00 A.M. and reaches Y at 1:00 P.M., on the same day, B also starts from Y at 9:00 A.M. and reaches X at 3:00 P.M. on the same day, following the same route as A. At what time do the two meet ?
SSC MTS 12/11/2024 (Afternoon)
(a) 11:30 A.M. (b) 11:12 A.M.
(c) 11:24 A.M. (d) 10:00 A.M.

Q.71. Two trains start at the same time from two stations and proceed towards each other at speeds of 120 km/hr and 80 km/hr, respectively. When they meet, it is found that one train has travelled 60 km more than the other. What is the distance (in km) between the two stations ?
SSC MTS 12/11/2024 (Evening)
(a) 387 (b) 300 (c) 268 (d) 452

Q.72. A thief Rohan is spotted by a policeman Ramesh from a distance of 250 m. When they see each other, they start running. How much distance is covered by Rohan, who is running at the speed of 20 km/h, before being caught by Ramesh, who is running at the speed of 25 km/h ?
SSC MTS 13/11/2024 (Afternoon)
(a) 2 km (b) 3 km (c) 1 km (d) 4 km

Q.73. A man covers 30 km by car at a speed of 60 km/h and another 20 km by cycle. His whole journey is completed in 3 hours. What is the speed (in km/h) of the cycle ?
SSC MTS 13/11/2024 (Evening)
(a) 10 (b) 12 (c) 8 (d) 6

Q.74. A person can complete a journey in 21 hours. He covers the first one-third of the journey at the speed of 40 km/h and the remaining distance at the speed of 60 km/h. What is the total distance of his journey ?
SSC MTS 13/11/2024 (Evening)
(a) 720 km (b) 1080 km
(c) 360 km (d) 1140 km

Q.75. The scale of a map is given as 1:250. Two cities are 6.5 km apart on the map. The actual distance between them is
SSC MTS 14/11/2024 (Afternoon)
(a) 1250 km (b) 1625 km
(c) 1200 km (d) 1000 km

Q.76. A train increases its regular speed by 12.5% and reaches its destination 20 minutes earlier. What is the actual time taken by the train on the journey ?
SSC MTS 14/11/2024 (Evening)
(a) 110 min (b) 120 min
(c) 150 min (d) 180 min

SSC CGL 2024 Tier - 1

Q.77. A bus travels $\frac{1}{3}$ of the distance initially at a speed of 40 km/h, the next $\frac{1}{3}$ of the distance 50 km/h, and the final of the distance at 60 km/h. Find the average speed of the bus for the entire journey. (Rounded off to two decimal places)
SSC CGL 10/09/2024 (1st Shift)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) 48.65 km/h (b) 51.43 km/h
(c) 54.13 km/h (d) 46.85 km/h

Q.78. Places A and B are 20 km apart on the highway. A car starts from A and another from B at the same time. If the cars travel in the same direction at different speeds, they meet in one hour. If they travelled towards each other, they met in 12 minutes. What are the speeds (in km/h) of two cars ?
SSC CGL 10/09/2024 (2nd Shift)
(a) 60,40 (b) 52,48 (c) 51,49 (d) 55,45

Q.79. Akshara and Siddharth travel from point P to Q, a distance of 72 km at a rate of 8 km/h and 10 km/h, respectively. Siddharth reaches Q first and returns immediately and meets Akshara at R. Find the distance from P to R.
SSC CGL 17/09/2024 (1st Shift)
(a) 65 km (b) 63 km (c) 64 km (d) 66 km

Q.80. Two trains of lengths 150 m and 250 m run on parallel lines. When they run in the same direction, they take 20 seconds to cross each other and, when they run in the opposite direction, they take 5 seconds to cross each other. What is the speed of the two trains ?
SSC CGL 19/09/2024 (1st Shift)
(a) 150 km/h and 105 km/h
(b) 150 km/h and 250 km/h
(c) 180 km/h and 108 km/h
(d) 160 km/h and 106 km/h

Q.81. A thief is spotted by a policeman from a distance of 195 metres. When the policeman starts the chase, the thief also starts running. If the speed of the thief is 22 km/h and that of the policeman is 27 km/h, then how far would the thief have run (in m) before he is overtaken ?
SSC CGL 19/09/2024 (3rd Shift)
(a) 825 (b) 951 (c) 858 (d) 958

Q.82. A thief is spotted by a policeman from a distance of 100 m. The thief starts running and the policeman chases him. If the speed of thief and policeman are 21 km/h and 23 km/h, respectively, then how far will the thief have to run before he is over taken ?
SSC CGL 24/09/2024 (1st Shift)
(a) 1020 m (b) 1050 m
(c) 1090 m (d) 1080 m

Q.83. Two goods trains 132 m and 108 m in length are running towards each other on parallel tracks. The first train is running at a speed of 32 km/h and the second at a speed of 40 km/h. How much time will they take to cross each other after meeting ?
SSC CGL 24/09/2024 (2nd Shift)
(a) 12 s (b) 10 s (c) 13 s (d) 15 s

Q.84. A policeman is chasing a thief at a speed of 82 km/h. The thief is 1300 m away and is running at a speed of 64 km/h. In how much time will the policeman catch the thief if both are riding on bikes ?
SSC CGL 24/09/2024 (3rd Shift)
(a) 350 sec (b) 260 sec
(c) 250 sec (d) 300 sec

Q.85. Suppose A starts walking at a speed of 8 km/h. After 8 hours B started travelling on a bicycle at a speed of 24 km/h. The distance from the starting B can catch A is:
SSC CGL 25/09/2024 (1st Shift)
(a) 64 km (b) 96 km (c) 72 km (d) 88 km

Q.86. A thief takes off on his bike at a certain speed, after seeing a police car at a distance of 250 m. The police car starts chasing the thief and catches him. If the thief runs 1.5 km before being caught and the speed of the police car is 70 km/h, then what is the speed of thief's bike (in km/h) ?
SSC CGL 26/09/2024 (2nd Shift)
(a) 65 (b) 60 (c) 55 (d) 50

SSC CHSL 2024 Tier - 1

Q.87. A motorcycle covered the first 60 km of its journey at an average speed of 40 km/h. The speed of the motorcycle for covering the rest of the journey, i.e. 90 km, was 45 km/h. During the whole journey, the overall average speed of the motorcycle was:
SSC CHSL 01/07/2024 (1st Shift)
(a) $42\frac{1}{2}$km/h (b) $42\frac{1}{7}$km/h
(c) 42 km/h (d) $42\frac{6}{7}$km/h

Q.88. A man walking at the speed of 5 km/h covers a certain distance in 3 hours 45 minutes. If he covers the same distance by a cycle in 2 hours 10 minutes, then the speed of the cycle in km/h is:
SSC CHSL 01/07/2024 (1st Shift)
(a) $7\frac{16}{26}$ (b) $8\frac{17}{26}$ (c) $5\frac{11}{26}$ (d) $9\frac{11}{26}$

Q.89. A person drives 110 miles at 55 miles per hour, he drives the next 120 miles at 60 miles per hour, and then he drives the next 60 miles in an hour. What is his average speed for the entire journey in miles per hour ?
SSC CHSL 01/07/2024 (2nd Shift)
(a) 55 (b) 60 (c) 63 (d) 58

Q.90. Ram travelled an equal distance with the speed of 40 km/hr, 45 km/hr and 60 km/hr. What is the average speed of Ram during the whole journey? Correct to two decimal places.
SSC CHSL 01/07/2024 (2nd Shift)
(a) 94.66 km/hr (b) 46.96 km/hr
(c) 64.96 km/hr (d) 66.94 km/hr

Q.91. Moving at $\frac{6}{7}$ of its usual speed, a bus is 20 minutes late. What is its usual time to cover the journey?
SSC CHSL 02/07/2024 (2nd Shift)
(a) 3 hours (b) 4 hours
(c) 1.5 hours (d) 2 hours

Q.92. Mithila covers 50 km by bus in 90 minutes. After deboarding the bus, she takes rest for 15 minutes and covers another 30 km by a taxi in 35 minutes. Find the average speed (in km/h) for the whole journey.
SSC CHSL 02/07/2024 (3rd Shift)
(a) $34\frac{2}{7}$ (b) $32\frac{2}{7}$ (c) $31\frac{2}{7}$ (d) $33\frac{2}{7}$

Q.93. A policeman received information that a thief is at a distance of 1.5 km from him. The thief starts moving by car and the policeman chases him by car. The thief and the policeman are moving at the speeds of 90 km/h and 120 km/h respectively. At what distance (in km) will the police catch the thief ?
SSC CHSL 02/07/2024 (3rd Shift)
(a) 45.0 km (b) 4.5 km (c) 6 km (d) 5 km

Q.94. Two trains of lengths 310 m and 330 m, respectively, are 160 m apart. They start moving towards each other on parallel tracks, at speeds 130 km/h and 158 km/h, respectively. In how much time (in seconds) will the trains cross each other?
SSC CHSL 02/07/2024 (4th Shift)
(a) 10 (b) 18 (c) 8 (d) 12

Q.95. Two stations T1 and T2 300 km apart. A car starts from station T1 at 8 am and moves towards station T2 at a speed of 45 km/hr. and at 10 am another car starts from station T2 towards T1 at a speed of 60 km/hr. Then the cars will meet at :
SSC CHSL 03/07/2024 (1st Shift)
(a) 12 : 00 p.m. (b) 11 : 00 a.m.
(c) 1 : 00 p.m. (d) 10 : 00 a.m

Q.96. A bus driver must complete a 240 km trip in 4 hours. If he averages 70 km an hour for the first 3 hours of his trip, how fast must he travel (in km/h) in the last/final hour?
SSC CHSL 03/07/2024 (1st Shift)
(a) 50 (b) 60 (c) 30 (d) 35

Q.97. Ram and Shyam start Walking from the same place in the opposite

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

direction. If Shyam walks at a speed of 5 $\frac{1}{4}$ km/hr and Ram at a speed of 3 km/hr, then after how much time will they be 44 km apart?
SSC CHSL 03/07/2024 (4th Shift)
(a) 6 hours 20 minutes
(b) 4 hours 20 minutes
(c) 3 hours 20 minutes
(d) 5 hours 20 minutes

Q.98. Shankar covers a certain distance by a car driving at 40 km/h and he returns to the starting point riding on a scooter with a speed of 20 km/h. Find the average speed of the whole journey.
SSC CHSL 04/07/2024 (1st Shift)
(a) $22\frac{2}{3}$ km/h (b) $29\frac{2}{3}$ km/h
(c) $24\frac{2}{3}$ km/h (d) $26\frac{2}{3}$ km/h

Q.99. A car covers a certain distance in 85 minutes, if it runs at a speed of 36 km/hr. The speed at which the car must run to reduce the time of journey to 51 minutes will be:
SSC CHSL 04/07/2024 (3rd Shift)
(a) 50 km/hr (b) 60 km/hr
(c) 70 km/hr (d) 80 km/hr

Q.100. A girl walking at a speed of 9 km/h crosses a bridge in 45 minutes. Find the length of the bridge in meters.
SSC CHSL 05/07/2024 (1st Shift)
(a) 7532 (b) 6750 (c) 6349 (d) 6398

Q.101. To reach at a destination, D takes 45 minutes if he drives at a speed of 60 km/h. Due to some urgency, he is to reach the destination in 30 minutes. What should be his speed in km/h?
SSC CHSL 05/07/2024 (2nd Shift)
(a) 90 (b) 75 (c) 60 (d) 80

Q.102. A motorcyclist rides his motorcycle at a speed of 90 km/hr in the first one hour and the next two hours at a speed of 120 km/hr. Find the average speed of the rider.
SSC CHSL 05/07/2024 (3rd Shift)
(a) 115 km/hr (b) 120 km/hr
(c) 105 km/hr (d) 110 km/hr

Q.103. A train 550 metres long is running at a speed of 78 km/h. How many seconds will it take to cross a 350 metres long train running in the opposite direction at a speed of 30 km/h?
SSC CHSL 05/07/2024 (3rd Shift)
(a) 50 seconds (b) 20 seconds
(c) 40 seconds (d) 30 seconds

Q.104. A person divides his total route of journey into three equal parts and decides to travel the three parts at the speeds of 80 km/h, 60 km/h and 30 km/h, respectively. What is the average speed during the journey?
SSC CHSL 05/07/2024 (4th Shift)
(a) 49 km/h (b) 40 km/h
(c) 45 km/h (d) 48 km/h

Q.105. A person travels from one place to another at 60 km/hr and returns at 75 km/hr. If the total time taken is 6 hours, then find the total distance travelled.
SSC CHSL 05/07/2024 (4th Shift)
(a) 250 km (b) 240 km
(c) 400 km (d) 300 km

Q.106. A part of the journey is covered in 22.5 minutes at a speed of 68 km/h and the remaining part in 12 minutes at a speed of 72 km/h. The total distance of the journey is (to the nearest integer):
SSC CHSL 09/07/2024 (2nd Shift)
(a) 35 km (b) 42 km (c) 38 km (d) 40 km

Q.107. If Tanya walks at the speed of 6 km/h, she misses a train by 2 minutes. However, if she walks at the speed of 8 km/h, she reaches the station 3 minutes before the arrival of the train. The distance covered by Tanya to reach the station is:
SSC CHSL 09/07/2024 (3rd Shift)
(a) 2.5 km (b) 2.75 km (c) 3 km (d) 2 km

Q.108. The speed of a thief is $\frac{4}{5}$ times the speed of a policeman. The thief covers a distance of 6 km before he was caught by the policeman in 30 minutes. Initially, what was the distance between the policeman and the thief in km ?
SSC CHSL 09/07/2024 (4th Shift)
(a) 1.5 (b) 1.2 (c) 1.0 (d) 0.8

Q.109. A person reaches his destination 30 minutes late, if his speed is 3 km/h, and reaches 30 minutes before time if his speed is 4 km/h. Find the distance of his destination from his starting point.
SSC CHSL 10/07/2024 (1st Shift)
(a) 11 km (b) 14 km
(c) 12 km (d) 13 km

Q.110. A policeman was asked to chase a thief. Before the policeman started the chase, he realised that the thief was 200 metres ahead of him and was running at a speed of 16 km/h. The policeman started the chase at a speed of 20 km/h. How far will the thief run before he is overtaken by the policeman ?
SSC CHSL 10/07/2024 (2nd Shift)
(a) 600 m (b) 700 m (c) 800 m (d) 1000 m

Q.111. With a uniform speed, a car covers a distance in 16 hours. Had the speed been increased by 20 km/h, the same distance would have been covered in 12 hours. The total distance covered by the car is:
SSC CHSL 10/07/2024 (3rd Shift)
(a) 1080 km (b) 480 km
(c) 720 km (d) 960 km

Q.112. By what percentage should a racer increase the speed to reduce the time by 25% to cover a fixed distance?
SSC CHSL 11/07/2024 (1st Shift)
(a) 41 % (b) $33\frac{1}{3}$% (c) 31% (d) $37\frac{1}{3}$%

Q.113. A and B are two stations 420 km apart. A train starts from A at 11 am and travels towards B at the speed of 70 kmph. Another train starts from B at 12 noon and travels towards A at the speed of 30 kmph. At what time do they meet?
SSC CHSL 11/07/2024 (2nd Shift)
(a) 3.30 pm (b) 1.30 pm (c) 2 pm (d) 3 pm

Q.114. Tom travelled 285 km in 6 hours. In his total travelling, he travelled the first part by busat 40 km/hr and the remaining part by train at 55 km/hr. How much distance has he travelled by train?
SSC CHSL 11/07/2024 (4th Shift)
(a) 155 km (b) 120 km
(c) 135 km (d) 165 km

SSC CPO 2024 Tier - 1

Q.115. A car covers 20 km in the first quarter of an hour, 25 km in the second quarter of that hour and 15 km in the third quarter. The average speed of the car (in km/h) over the entire journey is:
SSC CPO 27/06/2024 (1st Shift)
(a) 70 (b) 75 (c) 80 (d) 65

Q.116. Two cars run to a place at the speeds of 45 km/h and 55 km/h, respectively. If the second car takes 40 minutes less than the first for the journey, then what is the length of the journey (in km)?
SSC CPO 27/06/2024 (2nd Shift)
(a) 145 (b) 165 (c) 180 (d) 99

Q.117. A 255-m long train is running at a speed of 72 km/h. It crosses a platform of length 745 m in:
SSC CPO 27/06/2024 (2nd Shift)
(a) 53 seconds (b) 40 seconds
(c) 50 seconds (d) 51 seconds

Q.118. A bus covers the first 50 km of its journey in 40 minutes and covers the remaining 75 km in 40 minutes. What is the average speed (in km/h) of the bus?
SSC CPO 27/06/2024 (2nd Shift)
(a) $95\frac{1}{4}$ (b) $93\frac{3}{4}$ (c) $101\frac{1}{4}$ (d) $105\frac{3}{4}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.119. R reaches office from home in 30 minutes and comes back in 20 minutes. The distance to his office from home is 12.5 km. What is his average speed (in km/h) from home to office and then back home?
SSC CPO 27/06/2024 (3rd Shift)
(a) 20 (b) 25 (c) 60 (d) 30

Q.120. A man travels some distance at a speed of 12 km/h and returns at a speed of 8 km/h. If the total time taken by him is 3 hours and 45 minutes, then the total distance (in km) travelled is:
SSC CPO 27/06/2024 (3rd Shift)
(a) 32 (b) 42 (c) 36 (d) 24

Q.121. S drives his car and covers 37 km and 500 m in 90 minutes. What is his average speed (in km/h) ?
SSC CPO 28/06/2024 (1st Shift)
(a) 25 (b) 22.5 (c) 40 (d) 20

Q.122. A person covers 11 km with a speed of 7 km/h, 25 km with a speed of 10 km/h and 30 km with a speed of 20 km/h. What is the average speed of the person?
SSC CPO 28/06/2024 (2nd Shift)
(a) $11\frac{7}{13}$ km/h (b) $11\frac{11}{13}$ km/h
(c) $11\frac{10}{13}$ km/h (d) $11\frac{9}{13}$ km/h

Q.123. A man travels 1200 km by train at 80 km/h, 1600 km by ship at 40 km/h, 1000 km by plane at 400 km/h, and 200 km by car at 50 km/h. What is the average speed for the entire distance? (rounded off to 2 decimal places)
SSC CPO 28/06/2024 (2nd Shift)
(a) 75.40 km/h (b) 68.14 km/h
(c) 72.40 km/h (d) 65.04 km/h

Q.124. Two towns P and Q are 275 km apart. A motorcycle rider starts from P towards Q at 10:00 a.m. at the speed of 25 km/h. Another rider starts from Q towards P at 12 noon on the same day at the speed of 20 km/h. At what time will they cross each other?
SSC CPO 28/06/2024 (2nd Shift)
(a) 3:00 p.m. (b) 5:00 p.m.
(c) 1:15 p.m. (d) 4:30 p.m.

Q.125. A train covers a distance of 850 metres in 45 seconds. Travelling at the same speed, how many kilometres will the train cover in an hour?
SSC CPO 28/06/2024 (2nd Shift)
(a) 67.5 (b) 69 (c) 68 (d) 67.2

Q.126. Ashish covers 72 km at a speed of 45 km/h by bike, 28 km at a speed of 4 km/h by bicycle, and another 160 km at a speed of 20 km/h by car. Find his average speed (in km/h) for the whole journey. (Rounded off to two decimal places)
SSC CPO 28/06/2024 (3rd Shift)
(a) 15.66 (b) 25.25 (c) 28.33 (d) 27.65

Q.127. Two trains are moving in the same direction at 60 km/h and 42 km/h. The faster train crosses a man in the slower train in 36 seconds. Find the length of the faster train.
SSC CPO 28/06/2024 (3rd Shift)
(a) 185 m (b) 180 m (c) 195 m (d) 175 m

Q.128. In a 100-km journey, the average speed of S is 40 km/h. He covers the first 60 km in 40 minutes and the next 20 km in 50 minutes. What is his speed in the last 20 km (in km/h) ?
SSC CPO 29/06/2024 (1st Shift)
(a) 20 (b) 40 (c) 25 (d) 30

Q.129. A 320 m long train completely crosses a 240 m long train, coming from the opposite direction, in y seconds. If the first train is travelling at the speed of 44 km/h and the second train is travelling at 56.8 km/h, then what is the value of y ?
SSC CPO 29/06/2024 (1st Shift)
(a) 21 (b) 18 (c) 20 (d) 22

Q.130. The distance between two stations A and B is 800 km. A train covers the journey from A to B at a speed of 90 km/h and returns to A with a uniform speed of 65 km/h. Find the average speed of the train during the whole journey (in km/h)?
SSC CPO 29/06/2024 (2nd Shift)
(a) 82.36 (b) 80.50 (c) 70.45 (d) 75.48

Q.131. A 234 m long train passes a person running at 9 km/h in the opposite direction, in 6 seconds. In how much time (in seconds) will it pass another person who is moving at 23.4 km/h, in the same direction?
SSC CPO 29/06/2024 (2nd Shift)
(a) 8 (b) 7.8 (c) 7.2 (d) 8.4

Q.132. Two trains, P and Q, are running on parallel tracks in opposite directions with lengths of 110 m and 140 m, respectively. Train P is running at a speed of 70 km/h and took 5 seconds to cross train Q . The speed of train Q is:
SSC CPO 29/06/2024 (3rd Shift)
(a) 120 km/h (b) 110 km/h
(c) 90 km/h (d) 100 km/h

Q.133. A student goes to his school by cycle. The distance from his house to school is 5 km and he covers this distance in 1 hour. While going he stops twice for 5 minutes each. Find his average speed (in km/h).
SSC CPO 29/06/2024 (3rd Shift)
(a) 5.5 (b) 6.5 (c) 6 (d) 4.5

Q.134. If a car runs at a speed of 60 km/h and takes 180 minutes to cover a certain distance, then what time will it take to cover the same distance at a speed of 40 km/h ?
SSC CPO 29/06/2024 (3rd Shift)
(a) 3 hr (b) 4 hr 30 min
(c) 3 hr 45 min (d) 3 hr 15 min

SSC Selection Post (Phase - XII)

Q.135. A car covers the distance from Delhi to Gurugram at 60 km/h and returns at a uniform speed of 40 km/h. The average speed of the car during the whole journey is:
Matriculation Level 20/06/2024 (Shift - 1)
(a) 40 km/h (b) 60 km/h
(c) 50 km/h (d) 48 km/h

Q.136. A man walks 3 km and 200 metres in 25 minutes. What is his speed (in km/h) ?
Matriculation Level 20/06/2024 (Shift - 1)
(a) 7.86 (b) 7.68 (c) 8.76 (d) 6.87

Q.137. A teacher travelled a distance of 22 km in 7 hours. He travelled partly on foot at the speed of 2 km/h and partly on bicycle at the rate of 4 km/h. The distance travelled on foot is:
Matriculation Level 20/06/2024 (Shift - 4)
(a) 10 km (b) 3 km (c) 6 km (d) 8 km

Q.138. If Tanmay covers three equal distances at the speeds of 2 km/h, 3 km/h and 4 km/h, respectively, then find his average speed (in km/h) during the whole journey. (Rounded off to 2 decimal places)
Matriculation Level 20/06/2024 (Shift - 4)
(a) 3.25 (b) 5.75 (c) 4.35 (d) 2.77

Q.139. A train passes a 500 m long platform in 12 seconds and a man standing on the platform in four seconds. Find the speed of the train.
Matriculation Level 20/06/2024 (Shift - 4)
(a) 252.5 km/h (b) 125 km/h
(c) 225 km/h (d) 152.5 km/h

Q.140. A thief is noticed by a policeman from a distance of 500 m. The thief starts running and the policeman chases him. The thief and the policeman run at the speed of 12 km/h and 13 km/h, respectively. What is the distance between them after 12 minutes?
Matriculation Level 20/06/2024 (Shift - 4)
(a) 150 m (b) 100 m
(c) 300 m (d) 200 m

Q.141. A drives for 2 hours, 2.5 hours, 3 hours, 2 hours and 2.5 hours in five days

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

of a week, respectively. His speeds on these days are 45 km/h, 50 km/h, 60 km/h, 70 km/h and 80 km/h, respectively. What is his average speed for the week ?
Matriculation Level 21/06/2024 (Shift - 1)
(a) 68.02 km/h (b) 60.8 km/h
(c) 61.25 km/h (d) 64.08 km/h

Q.142. Two trains, A and B started travelling towards each other at the same time, from places P to Q and Q to P, respectively. After crossing each other, A and B took 9 hours and 16 hours to reach Q and P, respectively. If the speed of A was 56 km/h, then what was the speed (in km/h) of B ?
Matriculation Level 21/06/2024 (Shift - 1)
(a) 40 (b) 46 (c) 42 (d) 38

Q.143. A train starts from station P with 'n' number of passengers. At station Q, 20% of the passengers get down and 50 passengers get in. At station R, 40% of the passengers get down and 10 passengers get in. If a total of 520 passengers are left on the train, find the value of 'n'.
Matriculation Level 21/06/2024 (Shift - 4)
(a) 855 (b) 1000 (c) 750 (d) 975

Q.144. A truck driver drove for 4 hours at 40 km/h. He drove for another 3 hours at 50 km/h after taking rest for 1 h. What was the driver's average speed, in km/h, during the whole journey ?
Matriculation Level 21/06/2024 (Shift - 4)
(a) 40 (b) 38.75 (c) 39.25 (d) 36.50

Q.145. Ram goes to his office from his house at a speed of 8 km/h and returns at a speed of 2 km/h. If he takes four hours in going and coming back, find the distance between the house and the office.
Matriculation Level 21/06/2024 (Shift - 4)
(a) 6.4 km (b) 5.3 km
(c) 7.4 km (d) 6.3 km

Q.146. A car covers a distance of 45.6 km in 2.4 litres of petrol. How much distance will it cover in 1 litre of petrol ?
Matriculation Level 24/06/2024 (Shift - 1)
(a) 19 km (b) 20 km
(c) 19.4 km (d) 109.44 km

Q.147. Ram, standing on a railway platform, noticed that a train took 36 seconds to completely pass through the platform, which was 108 m long, and it took 12 seconds in passing him. Find the speed of the train.
Matriculation Level 24/06/2024 (Shift - 4)
(a) 25.2 km/h (b) 18.2 km/h
(c) 16.2 km/h (d) 20.2 km/h

Q.148. A goods train 350 m long passes through a tunnel of 1250m in 80 seconds. What is the speed of the train ?
Matriculation Level 25/06/2024 (Shift - 1)
(a) 64 km/h (b) 78 km/h
(c) 56 km/h (d) 72 km/h

Q.149. Two trains start at the same time from stations P and Q and travel towards each other at the speeds of 75 km/h and 100 km/h, respectively. When they meet, it is found that one train has travelled 50 km more than the other. The distance (in km) between two stations is:
Matriculation Level 25/06/2024 (Shift - 1)
(a) 300 (b) 350 (c) 375 (d) 325

Q.150. Two trains of equal length take 10 s and 20 s, respectively, to cross a pole. If these trains are moving in the same direction, then how long will they take to cross each other ?
Matriculation Level 25/06/2024 (Shift - 1)
(a) 10 sec (b) 15 sec
(c) 40 sec (d) 30 sec

Q.151. Reshma covers 45 km at a speed of 15 km/h by bicycle, 80 km at a speed of 40 km/h by car, and another 6 km at a speed of 2 km/h on foot. Find her average speed for the whole journey (correct to 2 decimal places).
Matriculation Level 26/06/2024 (Shift - 1)
(a) 18.36 km/h (b) 43.50 km/h
(c) 16.38 km/h (d) 15.25 km/h

Q.152. A policeman chases a thief on a straight road. The policeman catches the thief in 15 minutes if he drives with a speed of 60 km/h and catches the thief in 0.5 hours if he drives with a speed 45 km/h. What should be his driving speed (in km/h) to catch the thief in just 10 minutes?
Matriculation Level 26/06/2024 (Shift - 1)
(a) 70 (b) 75 (c) 65 (d) 90

Q.153. A bus covers 1200 km in 30 hours. What is its average speed in m/s ?
Higher Secondary 20/06/2024 (Shift - 2)
(a) $12\frac{1}{9}$ (b) $12\frac{1}{3}$ (c) $11\frac{1}{9}$ (d) $13\frac{1}{9}$

Q.154. A bus covers the first 70 km of its journey in 40 minutes and the remaining 60 km in 30 minutes. The average speed of the bus, in km/h, is:
Higher Secondary 20/06/2024 (Shift - 2)
(a) $106\frac{5}{7}$ (b) $109\frac{3}{7}$ (c) $111\frac{3}{7}$ (d) $91\frac{2}{7}$

Q.155. Veena and Karmesh were at different places in Delhi. They fixed a meeting point to meet to settle some issue. Veena started her journey at 8:00 a.m. from place A and reached place B at 4:00 p.m. and Karmesh started moving from place B 2 hours later than the time Veena started and could reach place A at 5:00 p.m. the same day, via the same route. At what time will Karmesh and Veena meet each other ?
Higher Secondary 21/06/2024 (Shift - 2)
(a) 1 : 24 p.m. (b) 12 : 48 p.m.
(c) 1 : 00 p.m. (d) 1 : 46 p.m.

Q.156. Rashi travelled a distance of 400 km at an average speed of 50 km/h. She covers the first half distance in the first lag in 2 hours, while she covers another lag at half the speed of that of the first lag in 1 hour. What is the speed (in km/h) of the remaining distance ?
Higher Secondary 21/06/2024 (Shift - 2)
(a) 45 (b) 50 (c) 60 (d) 30

Q.157. P drives a car for 5 hours and after every hour he doubles the speed. In the fifth hour, his speed is 128 km/h. What is his average speed of the journey in km/h ?
Higher Secondary 21/06/2024 (Shift - 2)
(a) 52.6 (b) 55.6 (c) 49.6 (d) 62.6

Q.158. A train leaves Hyderabad at 4:00 A.M. and reaches Vijayawada at 8:00 A.M. the same day. Another train leaves Vijayawada at 6:00 A.M. and reaches Hyderabad at 9:30 A.M the same day. At what time do the two trains cross each other ?
Higher Secondary 25/06/2024 (Shift - 4)
(a) 6:45 A.M. (b) 7:56 A.M.
(c) 7:45 A.M. (d) 6:56 A.M.

Q.159. A truck travels 75 km in the first hour and 33 km in the second hour. Find the average speed of the truck (in km/h).
Graduate Level 20/06/2024 (Shift - 3)
(a) 42 (b) 108 (c) 54 (d) 60

Q.160. A person travels two-fifth of a distance at a speed of 40 km/h and the remaining at a speed of 60 km/h. What is his average speed (in km/h) in the entire journey ?
Graduate Level 26/06/2024 (Shift - 4)
(a) 40 (b) 48 (c) 60 (d) 50

SSC CHSL 2023 Tier - 2

Q.161. A person covers $\frac{1}{4}$ of his journey at the speed of 25 km/h, $\frac{1}{2}$ of the journey at 40km/h and the remaining at the speed of 50 km/h. Find his average speed per hour for the whole journey (in km/h).
SSC CHSL Tier II (02/11/2023)
(a) $34\frac{6}{11}$ (b) $36\frac{4}{11}$ (c) $36\frac{6}{11}$ (d) $34\frac{4}{11}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 2023 Tier - 2

Q.162. Vipin travels one-third of the distance of a journey at a speed of 30 km/h and the remaining distance at a speed of 40 km/h. If he took a total of 12 hours to complete the journey, what was the total distance (in km) of the journey?
SSC CGL Tier II (26/10/2023)
(a) 432 (b) 450 (c) 445 (d) 412

SSC CPO 2023 Tier - 1

Q.163. A tourist van travels the distance of 35 km from Dehradun to Mussoorie at an average speed of 36 km/h and returns at 60 km/h. What is the approximate average speed (in km/h) of the tourist van for the entire journey?
SSC CPO 03/10/2023 (1st Shift)
(a) 45 (b) 48 (c) 50 (d) 42

Q.164. An inspector is 288 metres behind a thief. The inspector runs 42 metres and the thief runs 30 metres in a minute. In how much time will the inspector catch the thief ?
SSC CPO 04/10/2023 (1st Shift)
(a) 20 minutes (b) 24 minutes
(c) 19 minutes (d) 21 minutes

Q.165. A car, during its entire journey of 5 hours, travels the first 45 minutes at a certain speed, the next 75 minutes at a speed of 85 km/h, and the last 3 hours at a speed of 70 km/h. During its entire journey, the average speed of the car is found to be 73 km/h. What is the speed (in km/h) of the car during the first 45 minutes ?
SSC CPO 04/10/2023 (2nd Shift)
(a) 62 (b) 65 (c) 72 (d) 68

Q.166. Traveling a distance of 1000 km, a train slowed down due to repairs of the tracks. Its average speed for the trip reduced by 75 km/h and the time of travel increased by 3 hours. The original duration of the travel is:
SSC CPO 04/10/2023 (2nd Shift)
(a) 5 hours (b) 6 hours
(c) 6.5 hours (d) 5.5 hours

Q.167. The time taken to travel the same distance by three cars is in the ratio of 12 : 15 : 10. What is the ratio of the speeds of the three cars ?
SSC CPO 04/10/2023 (2nd Shift)
(a) 4 : 5 : 6 (b) 5 : 4 : 6
(c) 5 : 6: 4 (d) 4 : 6 : 5

Q.168. Jimmy has to cover a distance of 88 km in 16 hours. If she covers half of the journey in $\frac{3}{4}$ time, then what should be her speed to cover the remaining distance in the time left?
SSC CPO 04/10/2023 (3rd Shift)
(a) 12 km/h (b) 10 km/h
(c) 13 km/h (d) 11 km/h

Q.169. A vehicle is going at one-fourth of its usual speed and it takes an extra 45 minutes to reach its destination. Its usual time to cover the same distance is:
SSC CPO 04/10/2023 (3rd Shift)
(a) 20 minutes (b) 15 minutes
(c) 10 minutes (d) 30 minutes

Q.170. At 7 : 30 P.M. the owner of a Cycle noticed that a thief is taking away his cycle from his home and is cycling in a particular direction at an estimated speed of 10 km per hour. He informed the police about the theft and the policeman started from the same point, half an hour later than the time of the theft but with a speed of 12 km per hour. At what time will Policeman catch the thief ?
SSC CPO 05/10/2023 (1st Shift)
(a) 10 : 00 PM. (b) 10 : 30 P.M.
(c) 10 : 45 P.M. (d) 9 : 30 P.M.

Q.171. Julle and Soma start from the same point and walk in opposite directions. Julie walks 4 km/h faster than Soma. After 4 hours they are 40 km apart. How fast did each walk?
SSC CPO 05/10/2023 (2nd Shift)
(a) Julle-7 km/h: Soma -3 km/h
(b) Julie-8 km/h; Soma-4 km/h
(c) Julle-9 km/h; Soma-5 km/h
(d) Julie 10 km/h; Soma-6 km/h

Q.172. A fast local of Mumbai takes 45 minutes less than a slow local for a journey of 150 km. If the speed of the fast local is 10 km/h more than that of the slow local, find the speed (in km/h) of the slow local train.
SSC CPO 05/10/2023 (3rd Shift)
(a) 30 (b) 40 (c) 45 (d) 35

SSC MTS 2023 Tier - 1

Q.173. A truck driver drove 60 km/h for three hours. Then he stopped for one hour and did not go anywhere. Then, he drove four more hours at 60 km/h. What was the driver's average speed (in km/h) ?
SSC MTS 01/09/2023 (1st Shift)
(a) 52.5 (b) 62.4 (c) 50.5 (d) 42.8

Q.174. Two trains of length 110 m and 85 m are moving in the same direction at 12 m/s and 7 m/s, respectively. Find the time (in seconds) taken by the faster train to cross the slower train.
SSC MTS 01/09/2023 (1st Shift)
(a) 39 (b) 35 (c) 19 (d) 29

Q.175. Two persons take steps of 77 cm and 88 cm, respectively. If they start in step, then what is the minimum distance (in cm) they should cover so that both of them can cover the distance in complete steps?
SSC MTS 01/09/2023 (1st Shift)
(a) 968 (b) 828 (c) 616 (d) 560

Q.176. P and Q start from point A to point B, at the same time at speeds of 32 km/h and 40 km/h, respectively. If in covering the journey P takes 15 minutes longer than Q, the total distance AB of the journey is:
SSC MTS 04/09/2023 (1st Shift)
(a) 36 km (b) 32 km (c) 40 km (d) 44 km

Q.177. Yug covers a certain distance with a speed of 56 km/h in $\frac{3}{2}$ hours. If he wants to cover the same distance in 7 hours, what would be his speed (in km/h) ?
SSC MTS 04/09/2023 (2nd Shift)
(a) 16 (b) 20 (c) 14 (d) 12

Q.178. Two trains started from a station, at the same time in the same direction, at speeds of 90 km/h and 80 km/h. What will be the distance between the two trains after 5 hours?
SSC MTS 04/09/2023 (2nd Shift)
(a) 55 km (b) 50 km (c) 45 km (d) 40 km

Q.179. Two trains 120 metres and 150 metres long, respectively, are running in the same direction with speeds of 70 km/h and 52 km/h, respectively. In how much time will the first train cross the second? (in seconds)
SSC MTS 04/09/2023 (3rd Shift)
(a) 52 (b) 60 (c) 48 (d) 54

Q.180. A man takes 8 hours 30 minutes to go to a place by bicycle and return from there by scooter. If he travels both ways by bicycle, it takes 10 hours. How much time will it take for him to travel both ways by scooter (in hours)?
SSC MTS 05/09/2023 (2nd Shift)
(a) $4\frac{1}{2}$ (b) 7 (c) $3\frac{1}{2}$ (d) 4

Q.181. A policeman sees a thief from a distance of 185 m. The thief starts running away and the policeman chases him. The thief and the policeman run at speeds of 8m/s and 9m/s respectively. What is the distance between them after 2 minutes?
SSC MTS 05/09/2023 (2nd Shift)
(a) 65 m (b) 92 m (c) 120 m (d) 130 m

Q.182. A train covers a certain distance

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

with a speed of 72 km/h in the first two hours of its journey and 120 km in the next 1.5 hours. What is its average speed (in km/h, rounded off to the nearest integer) for the entire journey?
SSC MTS 05/09/2023 (3rd Shift)
(a) 75 (b) 78 (c) 73 (d) 79

Q.183. Two trains of equal length are running on parallel lines in the same direction at 36 km/h and 54 km/h. The faster train passes the slower train in 48 seconds. The length of each train (in m) is:
SSC MTS 06/09/2023 (1st Shift)
(a) 80 (b) 160 (c) 240 (d) 120

Q.184. Trains A and B start at the same time. Train A travels at the speed of 50 km/h from station P to station Q and train B travels at the speed of 70 km/h from station Q to station P. They cross each other after 1 hour 20 minutes. What is the distance (in km) between station P and station Q ?
SSC MTS 06/09/2023 (2nd Shift)
(a) 180 (b) 150 (c) 140 (d) 160

Q.185. A thief is noticed by a policeman from a distance of 98 m. The thief starts running and the policeman chases him. The thief and policeman run at the speed of 90 km/h and 118.8 km/h, respectively. What is the time taken to catch the thief by a policeman ?
SSC MTS 06/09/2023 (3rd Shift)
(a) $14\frac{1}{4}$ sec (b) $10\frac{1}{2}$ sec
(c) $13\frac{1}{4}$ sec (d) $12\frac{1}{4}$ sec

Q.186. Two-fifth of a journey is covered at a speed of 45 km/h, and the remaining distance is covered at the rate of 63 km/h. The average speed for the whole journey (in km/h, rounded off to the nearest integer) is:
SSC MTS 11/09/2023 (3rd Shift)
(a) 60 (b) 58 (c) 54 (d) 55

Q.187. Two trains A and B, 210 m and 150 m, respectively, in length, are running in the same direction on parallel lines. If the speed of A and B be 110 km/h and 128 km/h, respectively, then what will be the time (in seconds) taken by train B to cross train A ?
SSC MTS 11/09/2023 (3rd Shift)
(a) 72 (b) 74 (c) 71 (d) 70

Q.188. Two places A and B are 60 km apart from each other on a highway. A car starts from A and another car from B at the same time. If they move in the same direction, they meet each other in 6 hours. If they move in the opposite direction towards each other, they meet in 1 hour 30 minutes. Find the speeds of the cars (in km/h).
SSC MTS 12/09/2023 (2nd Shift)
(a) 15, 18 (b) 15, 20 (c) 25, 15 (d) 25, 20

Q.189. Lucknow Shatabdi Express leaves Varanasi at 3 : 30 p.m. and reaches Lucknow at 8 : 30 p.m. on the same day. The average speed of the train is 140 km/h. What is the distance (in km) from Varanasi to Lucknow ?
SSC MTS 12/09/2023 (3rd Shift)
(a) 725 (b) 675 (c) 750 (d) 700

Q.190. Two trains are travelling in the same direction on parallel tracks. Train A is travelling at 30 km/h and Train B is travelling at 60 km/h. If Train A is 400 m long and it takes Train B two minutes to pass Train A, what is the length of Train B?
SSC MTS 13/09/2023 (1st Shift)
(a) 700 m (b) 500 m (c) 400 m (d) 600 m

Q.191. A policeman sees a thief and starts chasing him. The distance between the thief and the policeman is 200 m and the speed of the thief is 8 km/h. If the policeman was able to catch the thief in 20 minutes, then the speed of the policeman is _____ km/h.
SSC MTS 13/09/2023 (2nd Shift)
(a) 8.4 (b) 9.2 (c) 8.6 (d) 8.2

Q.192. Amit drove for 6 hours at a speed of 60 miles per hour and for 6 hours at 40 miles per hour. What was his average speed (in miles per hour) for the whole journey?
SSC MTS 14/09/2023 (1st Shift)
(a) 48 (b) 44 (c) 46 (d) 50

Q.193. A man decided to cover 7.5 km in 72 minutes. He decided to cover two thirds of the distance at 5 km/h and the remaining at some different speed. Find the speed after two third distance has been covered
SSC MTS 14/09/2023 (1st Shift)
(a) 14.3 km/h (b) 15.5 km/h
(c) 12.5 km/h (d) 10 km/h

Q.194. Smita is faster than Pihu. Smita and Pihu each walk 48 km. The sum of their speeds is 14 km/hr, and the sum of times taken by them is 28 hours. What is Smita's speed ?
SSC MTS 14/09/2023 (3rd Shift)
(a) 12.5 km/hr (b) 12 km/hr
(c) 8 km/hr (d) 10 km/hr

Q.195. A man goes from his house to a vegetable market at the speed of 15 km/h and walked back at the speed of 10 km/h. If the whole journey took 2 hours 30 minutes, find the distance from his house to the vegetable market (in km).
SSC MTS 14/09/2023 (3rd Shift)
(a) 15 (b) 20 (c) 12 (d) 18

SSC CHSL 2023 Tier - 1

Q.196. Rajinder drives his car at an average speed of 40 km per hour to cover half of his total distance and thereafter he increases his speed to 60 km per hour. He covers his journey in 7 hours. What is the average speed of Rajinder in this journey ?
SSC CHSL 03/08/2023 (2nd Shift)
(a) 52 km per hour (b) 48 km per hour
(c) 50 km per hour (d) 54 km per hour

Q.197. A person walked from his house to a supermarket at the rate of 10 kmph and walked back at the rate of 5 kmph. For the whole journey, he took 1 hour 30 minutes. Find the distance from his house to the supermarket (in km).
SSC CHSL 04/08/2023 (3rd Shift)
(a) 10 (b) 5 (c) 6 (d) 8

Q.198. If Aashima travels a certain distance with a speed of 80 km/h in 5 hours. Then how many hours (rounded off to 1 decimal point) approximately will she take to cover the same distance with a speed of 150 km/h?
SSC CHSL 04/08/2023 (3rd Shift)
(a) 2.7 hours (b) 8.3 hours
(c) 3 hours (d) 3.5 hours

Q.199. Aman decided to cover a distance of 12 km in 78 minutes. He decided to cover the initial two-thirds of the distance at 10 km/h/ and the remaining at some different speed. Find the speed for the last one-third of the distance.
SSC CHSL 07/08/2023 (1st Shift)
(a) 7.8 km/h (b) 8 km/h
(c) 8.4 km/h (d) 9 km/h

Q.200. A bus travels for three hours at 60 km/h, four hours at 50 km/h and the next five hours at 50 km/h. Find its average speed.
SSC CHSL 08/08/2023 (2nd Shift)
(a) 52.5 km/h (b) 52 km/h
(c) 46 km/h (d) 50 km/h

Q.201. The speed of a car is 63 km/h. What is the distance traveled by it in 10 seconds ?
SSC CHSL 08/08/2023 (2nd Shift)
(a) 175 m (b) 1.75 km
(c) 185 m (d) 17.5 m

Q.202. A train traveling at 80 km/h crosses another train traveling in the same direction at 26 km/h in 30

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

seconds. What is the combined length of both the trains ?
SSC CHSL 08/08/2023 (4th Shift)
(a) 400 m (b) 450 m (c) 550 m (d) 350 m

Q.203. Two cities P and Q are 181 km apart on a straight road. One man starts from P at 8 : 30 A.M. and travels toward Q at 30 km/h. If another man starts from Q at 8 : 54 A.M. and travels towards P at a speed of 35 km/h, then at what time will they meet?
SSC CHSL 11/08/2023 (1st Shift)
(a) 11 : 30 A.M. (b) 10 : 00 A.M.
(c) 10 : 30 A.M. (d) 11 : 00 A.M.

Q.204. Two trains that are 125 metres and 99 metres in length, respectively, are running in opposite directions at the speeds of 40 km/h and 32 km/h, respectively. In how much time will they be completely clear of each other from the moment they meet?
SSC CHSL 17/08/2023 (1st Shift)
(a) 10.2 sec (b) 11.2 sec
(c) 9.2 sec (d) 12.2 sec

Q.205. By driving the car at an average speed of 40 km per hour, I reach my destination in 7 hours. With what speed I can reach the same destination in 5 hours?
SSC CHSL 17/08/2023 (2nd Shift)
(a) 50 km per hour (b) 56 km per hour
(c) 55 km per hour (d) 65 km per hour

Q.206. Two trains 320 m and 205 m in length are running towards each other on parallel lines. One train runs at the rate of 70 kmph and the other train runs at the rate of 56 kmph. Find the time they will take to cross each other (in seconds).
SSC CHSL 17/08/2023 (4th Shift)
(a) 10 (b) 20 (c) 12 (d) 15

SSC CGL 2023 Tier - 1

Q.207. A thief steals a van at 3:00 a.m. and drives it at a speed of 57 km/h. The thief is discovered at 4:00 am. and the owner starts the chase with another van at a speed of 76 km/h. At what time will he catch the thief ?
SSC CGL 14/07/2023 (2nd shift)
(a) 7 : 30 a.m (b) 7 : 00 p.m
(c) 7 : 00 a.m (d) 6 : 00 a.m

Q.208. Jehangir had to cover a distance of 90 km in an hour. During the first 25 minutes he travelled at a speed of 15.2 metres per second. How many metres did Jehangir cover per second during the remaining period to reach his destination just on time?
SSC CGL 14/07/2023 (3rd shift)
(a) 30.8 (b) 32.5 (c) 32 (d) 31.2

Q.209. A constable Ram is 225 m behind a thief Somesh, Ram runs 50 m and Somesh runs 30 m in a minute. At what time will the constable Ram catch the thief Somesh?
SSC CGL 17/07/2023 (3rd shift)
(a) 10 minutes 16 seconds
(b) 15 minutes 11 seconds
(c) 16 minutes 10 seconds
(d) 11 minutes 15 seconds

Q.210. A man is walking at a speed of 14 km/h. After every km, he takes a rest for 7 minutes. How much time will he take to cover a distance of 7 km?
SSC CGL 17/07/2023 (3rd shift)
(a) $1\frac{1}{5}$ hours (b) $2\frac{1}{3}$ hours
(c) $1\frac{1}{3}$ hours (d) $\frac{1}{5}$ hours

Q.211. Sudhin cycled at 8.5 km/h for 4 hours, then took an auto and travelled at 20 km/h for 1.5 hours, and then walked at 4 km/h for y hours. If Sudhin's overall average speed for the entire journey was 10 km/h, what is the value of y?
SSC CGL 18/07/2023 (4th shift)
(a) 2 (b) 1.25 (c) 1.5 (d) 1.75

Q.212. On day one, with speed v, R covers a distance x, in t time. On the next day, he covers a distance 2.5x in 0.75t time. What is his speed the next day?
SSC CGL 19/07/2023 (1st shift)
(a) 3.5v (b) $\frac{10}{3}$v (c) 4.5v (d) $\frac{5}{3}$v

Q.213. A thief committed a crime and escaped from the spot at a speed of 12 m/h. A Security guard started chasing him 20 minutes after the thief started running and caught him in the next 20 minutes. What is the speed (in meter/hour) of the Security guard?
SSC CGL 19/07/2023 (2nd shift)
(a) 24 (b) 30 (c) 32 (d) 36

Q.214. Ram rides at the rate of 36 km/h but stops for five minutes to take a drink at the end of every 10 km. Find the time that Ram will take to cover a distance of 84 km.
SSC CGL 20/07/2023 (4th shift)
(a) 180 minutes (b) 60 minutes
(c) 220 minutes (d) 120 minutes

Q.215. The distance between two towns is covered in 7 hours and 30 minutes at the speed of 72 km/h. The time saved if the speed is increased by 25% is:
SSC CGL 21/07/2023 (2nd shift)
(a) 1 hour 36 minutes
(b) 1 hour 50 minutes
(c) 1 hour 30 minutes
(d) 1 hour 20 minutes

Q.216. S_1 and S_2 are two stations which are 195 km apart. A train starts from S_1 at 4 : 00 pm and moves towards S_2 at the speed of 65 km/h. Another train starts from S_2 at 5 : 00 pm and moves towards S_1 at the speed of 35 km/h. At what time will the two trains meet?
SSC CGL 21/07/2023 (3rd shift)
(a) 6 : 06 p.m (b) 6 : 30 p.m
(c) 6 : 15 p.m. (d) 6 : 18 p.m

Q.217. Two men walk from a place at speeds of 9 km/h and 12 km/h, respectively. The first man takes 20 minutes more than the second one to cover the journey. Find the distance of the journey.
SSC CGL 24/07/2023 (2nd shift)
(a) 10 km (b) 13 km (c) 15 km (d) 12 km

Q.218. An airplane travels five times as fast as a bus. If the bus covers 60 km in 80 minutes, then what distance (in km) will the airplane cover in 25 minutes?
SSC CGL 24/07/2023 (3rd shift)
(a) 95.35 (b) 93.75 (c) 65.35 (d) 18.75

Q.219. Ramesh, on his way to his hometown, travelled the first 250 km at a speed of 75km/h and the next 250 km at a speed of 85 km/h. Find the average speed for the whole journey(correct to 2 decimal places).
SSC CGL 25/07/2023 (2nd shift)
(a) 80.55km/h (b) 79.69km/h
(c) 79.20km/h (d) 80.69km/h

Q.220. A thief steals an item and escapes, running at 20 km/h. A policeman arrives at the spot of the crime after 6 minutes and immediately starts chasing the thief. 24 minutes after the policeman started to chase the thief, there is still a gap of 400 m between the two. At what distance from the spot of crime would the policeman catch up with the thief, and what is the speed at which the policeman ran ?
SSC CGL 26/07/2023 (1st shift)
(a) 15 km; 25 km/h (b) 14.4 km; 24 km/h
(c) 10 km; 25 km/h (d) 12 km ; 24 km/h

Q.221. Two motorists start together to travel to a certain destination, one at the speed of 4 km/h and the other at the speed of 6 km/h. Find the distance travelled by them (in km) if the motorist travelling at 4 km/h arrives half an hour after the other motorist.
SSC CGL 27/07/2023 (1st shift)
(a) 8 (b) 5 (c) 6 (d) 4

Q.222. A certain distance is covered by a

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

person at a certain speed. If another person covers 25% of the distance in triple the time, the ratio of the speed of the first person to that of the second person is:
SSC CGL 27/07/2023 (2nd shift)
(a) 1 : 6 (b) 1 : 12 (c) 6 : 1 (d) 12 : 1

SSC Selection Post (Phase - XI)

Q.223. A train takes 7 seconds to pass man standing on a platform and another train whose length is double that of the first train, and moving in the opposite direction, takes 10 seconds to pass him. The time taken (in seconds, to the nearest integer) by the trains to pass each other will be:
Graduate Level 30/06/2023 (Shift - 1)
(a) 8 (b) 9 (c) 10 (d) 12

Q.224. A goods train, travelling at constant speed, crossed two persons walking in the same direction (as that of the train) in 11.6 seconds and 11.8 seconds, respectively. The first person was walking at 5.85 km/h, while the second was walking at 6.3 km/h. What was the speed of the train (in km/h)?
Higher Secondary 27/06/2023 (Shift - 3)
(a) 32.5 (b) 32.6 (c) 32.4 (d) 32.2

Q.225. A bus is running at a speed of 60 km/h to cover a distance in 50 min. To reduce the time of the journey to 20 min, at what speed (in km/h) should the bus run ?
Matriculation Level 27/06/2023 (Shift - 2)
(a) 120 (b) 90 (c) 140 (d) 150

SSC MTS 2022 Tier - 1

Q.226. A bus covers a distance of 45 km in 45 minutes. If its speed is decreased by 20 km/hr, then what will be the time taken by it to cover the same distance ?
SSC MTS 02/05/2023 (Morning)
(a) 62.5 minutes (b) 67.5 minutes
(c) 78.5 minutes (d) 72.5 minutes

Q.227. A man takes 6 hours to go to a place and come back by walking both the ways. He could have saved 2 hours by riding both the ways. The distance covered in the whole journey is 20 miles. What is the average speed for the whole journey if he goes by walking and comes back by riding ?
SSC MTS 02/05/2023 (Morning)
(a) 8 miles/hr (b) 5 miles/hr
(c) 6 miles/hr (d) 4 miles/hr

Q.228. If Aman travels with 12.5 percent less speed of his usual speed, then he will reach 9 minutes late. What is the usual time taken by him ?
SSC MTS 04/05/2023 (Afternoon)
(a) 63 minutes (b) 70 minutes
(c) 56 minutes (d) 49 minutes

Q.229. A person walks 10 km at a speed of 2.5 km per hour, then runs 10 km at a speed of 5 km per hour and then goes 30 km by bus at the speed of 30 km per hour. What is the average speed of the man ? (in kmph)
SSC MTS 08/05/2023 (Morning)
(a) 9 (b) 8.25 (c) 7.14 (d) 7

Q.230. A truck covers a distance of 540 km at a certain speed in 9 hours. How much time (in hours) would a car take at an average speed which is 16 km/hr more than that of the speed of the truck to cover a distance which is 68 km more than that travelled by the truck ?
SSC MTS 08/05/2023 (Evening)
(a) 10 (b) 8 (c) 6 (d) 12

Q.231. A man covers half part of a certain distance at 25 km/hr. He covers 40 percent of remaining distance at the speed of 8 km/hr and covers rest of the distance at the speed of 18 km/hr. What is his average speed (km/hr) for the entire journey ?
SSC MTS 08/05/2023 (Evening)
(a) $\frac{650}{37}$ (b) $\frac{540}{37}$ (c) $\frac{600}{37}$ (d) $\frac{480}{37}$

Q.232. A person goes from J to K at a speed of 55 km/hr. He comes back from K to J at a certain speed. If his average speed is $\frac{660}{17}$ km/hr, then what was his speed while moving from K towards J ?
SSC MTS 09/05/2023 (Afternoon)
(a) 24 km/hr (b) 38 km/hr
(c) 30 km/hr (d) 42 km/hr

Q.233. Monika took a non-stop flight to visit her grandparents. The 650 km trip took 1 hour and 30 minutes. Because of the bad weather, the return trip took 2 hours and 30 minutes. What was her average speed for the round trip ?
SSC MTS 09/05/2023 (Evening)
(a) 1300 kmph (b) 550 kmph
(c) 325 kmph (d) 690 kmph

Q.234. Two stations A and B are 230 km apart on a straight line. One train starts from A at 4 a.m. and travels towards B at 40 km/hr. Another train starts from B at 5 a.m. and travels towards A at a speed of 55 km/hr. At what time will they meet?
SSC MTS 10/05/2023 (Evening)
(a) 10 a.m. (b) 7 a.m. (c) 6 a.m. (d) 8 a.m.

Q.235. Ram walks at the speed of 12 km/hr and reaches his school 12 minutes late. If he walks at 16 km/hr, then he reaches 8 minutes before the scheduled time. What is the distance of his school from his home?
SSC MTS 11/05/2023 (Morning)
(a) 16 km (b) 30 km (c) 20 km (d) 24 km

Q.236. A man covers half part of a certain distance at 60 km/hr. He covers 40 percent of the remaining distance at the speed of 12 km/hr and covers the rest of the distance at the speed of 18 km/hr. What is his average speed for the entire journey ? (in km/hr)
SSC MTS 11/05/2023 (Afternoon)
(a) 24 (b) $\frac{58}{3}$ (c) 36 (d) 40

Q.237. Dinesh makes four trips of equal distances. His speed on first trip was 140 km/hr and in each subsequent trip his speed was half of the previous trip. What is the average speed of Dinesh in these four trips ?
SSC MTS 12/05/2023 (Afternoon)
(a) 40 km/hr (b) 44 km/hr
(c) ($\frac{112}{3}$) km/hr (d) ($\frac{124}{3}$) km/hr

Q.238. Krish takes as much time in running 24 meters as a bus takes in covering 72 meters. What will be the distance covered by Krish during the time the bus covers 4.8 km ?
SSC MTS 15/05/2023 (Morning)
(a) 2.4 km (b) 3.6 km
(c) 2.1 km (d) 1.6 km

Q.239. A man drives his car at a speed of 50 km/hr for 2 hours and then decides to slow down to 40 km/hr till the end of the journey. If his average speed for the journey was 44 km/hr, then for how much time he drives his car at speed 40 km/hr?
SSC MTS 16/05/2023 (Afternoon)
(a) 2 hours (b) 1 hour
(c) 3 hours (d) 4 hours

Q.240. A man starts from a place A and reaches the place B in 50 hours. He travels $\frac{1}{4}$ distance at the speed of 5 km/hr and the remaining distance at the speed of 15 km/hr. What is the distance between A and B ?
SSC MTS 17/05/2023 (Morning)
(a) 525 km (b) 500 km
(c) 375 km (d) 425 km

Q.241. Kartik takes 4 hours to travel from place X to place Y at the speed of 80 km/hr. He takes 1 hour to travel from place Y to place Z with 80% increased speed. What is the average speed from Place X to Z for the complete Journey?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC MTS 17/05/2023 (Morning)
(a) 82.6 km/hr (b) 90.8 km/hr
(c) 92.8 km/hr (d) 88.6 km/hr

Q.242. Two stations L and M are 720 km apart from each other. A train leaves from L to M and simultaneously another train leaves from M to L. Both trains meet after 24 hours. If the speed of the first train is 10 km/hr more than the second train, then what is the speed of the slower train ?
SSC MTS 19/05/2023 (Morning)
(a) 20 km/hr (b) 16 km/hr
(c) 14 km/hr (d) 10 km/hr

Q.243. A train starts at 3 : 00 pm from Mumbai and moves towards Ahmedabad at the speed of 20 km/hr. Another train starts from Ahmedabad at 8 pm and moves towards Mumbai at the speed of 60 km/hr. If the distance between Mumbai and Ahmedabad is 600 km, then at what time both the trains will meet ?
SSC MTS 13/06/2023 (Afternoon)
(a) 1 : 30 am (b) 12 : 30 am
(c) 2 : 00 am (d) 2 : 15 am

Q.244. A walks at a speed of 10 km/hr and 20 hours after his start, B starts on his cycle after him at the speed of 15 km/hr. How far from the starting point will B catch A? (in km)
SSC MTS 14/06/2023 (Morning)
(a) 600 (b) 800 (c) 1000 (d) 700

Q.245. Two trains are moving in the same direction at the speed of 44 km/hr and 70 km/hr. The time taken by faster train to cross a man sitting in the slower train is 72 seconds. What will be the length of the faster train?
SSC MTS 15/06/2023 (Afternoon)
(a) 520 metres (b) 620 metres
(c) 450 metres (d) 500 metres

Q.246. A man takes 20 hours to go to a place and come back by walking both ways. He could have saved 4 hours by riding both ways. The distance covered in the whole journey is 36 miles. Find the average speed for the whole journey if he goes by walking and comes back by riding.
SSC MTS 16/06/2023 (Evening)
(a) 2 miles/hr (b) 1 miles/hr
(c) 4 miles/hr (d) 3 miles/hr

Q.247. A train starts moving from a place A at 10 : 00 a.m. and arrives at another place B at 5 : 30 p.m. on the same day. If the speed of the train is 80 km/hr, then what will be the distance(in km) covered by the train?
SSC MTS 19/06/2023 (Evening)
(a) 600 (b) 550 (c) 650 (d) 450

Q.248. Suraj starts his journey from point Q at 2 p.m. He drives the car at the speed of 40 km/hr for first three hours and complete the remaining journey at the speed of 30 km/hr. If Rahul starts moving towards Suraj 6 p.m. from point Q at the speed of 80 km/hr, then at what time he will catch Suraj?
SSC MTS 20/06/2023 (Morning)
(a) 9 : 00 pm (b) 9 : 15 pm
(c) 9 : 36 pm (d) 10 : 06 pm

SSC CHSL 2022 Tier - 1

Q.249. A car travels a distance of 60 km at uniform speed. If the speed of car is increased by 8 km/hr, then it takes 2 hours less to cover the same distance. What is the original speed of the car?
SSC CHSL 09/03/2023 (1st Shift)
(a) 12 km/hr (b) 16 km/hr
(c) 10 km/hr (d) 15 km/hr

Q.250. A car left 60 minutes early than the scheduled time but in order to reach its destination 280 km away in time, it has to slow its usual speed by 14 km/hr. What is the usual speed of the car?
SSC CHSL 09/03/2023 (3rd Shift)
(a) 77 km/h (b) 70 km/h
(c) 66 km/h (d) 63 km/h

Q.251. A wheel makes 500 revolutions in covering a distance of 44 km. Find the radius of the wheel.
SSC CHSL 10/03/2023 (2nd Shift)
(a) 14 m (b) 21 m (c) 28 m (d) 7 m

Q.252. Ram needs to reach the examination center in 6 hours, the journey itself is 250 km. If Ram has covered $(\frac{3}{5})$th of the distance in 3.5 hours then what is the speed required to reach the destination 30 minutes early than the required time?
SSC CHSL 10/03/2023 (2nd Shift)
(a) 50 km/h (b) 90 km/h
(c) 40 km/h (d) 60 km/h

Q.253. Vivek starts moving at the speed of 70 km/hr at 8:00 am. Neeraj starts moving in the same direction after 4 hours of Vivek at the speed of 120 km/hr. Which of the following statement(s) is/are correct?
I. Neeraj and Vivek meet each other at 5:36 pm.
II. Total distance covered by both Neeraj and Vivek till 4 pm is 1080 km.
SSC CHSL 10/03/2023 (3rd Shift)
(a) Neither I nor II (b) Only II
(c) Both I and II (d) Only I

Q.254. Two places B1 and B2 are 500 km apart from each other. Sonit and Robin start moving from B1 towards B2 at the same time. After reaching B2, they return back to B1. Speed of Sonit is 80 km/hr more than the Robin. If they meet after 6 hours, then which of the following statement(s) is/are correct?
I. Distance covered by Sonit is 600 km.
II. Speed of Robin is 120/3 km/hr.
SSC CHSL 10/03/2023 (4th Shift)
(a) Only I (b) Both I and II
(c) Neither I nor II (d) Only II

Q.255. If Manoj cycles at 12 kmph instead of 10 kmph, he would have cycled 15 km more. What is the actual distance cycled by him?
SSC CHSL 13/03/2023 (4th Shift)
(a) 105 km (b) 150 km
(c) 75 km (d) 120 km

Q.256. Speed of a train is 30 percent more than the speed of a car. Both start from point P at the same time and reach point Q at the same time. P and Q are 130 km apart from each other. On the way train stops for 30 minutes at a station. What is the speed of the train?
SSC CHSL 14/03/2023 (1st Shift)
(a) 78 km/hr (b) 72 km/hr
(c) 60 km/hr (d) 70 km/hr

Q.257. A car moves at the speed of 108 km/hr after repairing and moves at the speed of 72 km/hr before repairing. It covers a distance of x km in 3 hours after repairing. How much time will it take to cover a distance of 5x km before repairing ?
SSC CHSL 14/03/2023 (2nd Shift)
(a) 24 hours
(b) 22 hours 30 minutes
(c) 25 hours 20 minutes
(d) 20 hours 40 minutes

Q.258. Ram covers a distance in 8 hours and Mohan covers the same distance in 4 hours. If speed of Mohan is 10 km/hr more than Ram, then which of the following statements is/are correct?
I. Speed of Mohan is 20 km/hr
II. Sum of their speed is 30 km/hr.
SSC CHSL 15/03/2023 (2nd Shift)
(a) Neither I nor II (b) Both I and II
(c) Only II (d) Only I

Q.259. A bus starts from a bus stand after every 50 minutes in the same direction. Mohit is walking in opposite direction with a speed of 50 km/hr. If Mohit meets each bus in 10 minutes, then what is the speed of bus?
SSC CHSL 15/03/2023 (4th Shift)
(a) 14.5 km/hr (b) 15 km/hr
(c) 12.5 km/hr (d) 10.5 km/hr

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.260. The distance between P and Q is 720 km. A train leaves P at 6 am and runs at a speed of 20 m/s. The train stops on the way for 1 hour 30 minutes. At what time train will reach at Q?
SSC CHSL 17/03/2023 (2nd Shift)
(a) 5 : 00 pm (b) 4 : 45 pm
(c) 5 : 15 pm (d) 5 : 30 pm

Q.261. Diameter of wheel of a cycle is 7 cm . A cyclist takes 75 minutes to reach a destination at the speed of 36.3 km/hr. How many revolutions will the wheel make during the journey?
SSC CHSL 17/03/2023 (3rd Shift)
(a) 196280 (b) 206250
(c) 216580 (d) 212520

Q.262. Two people A and B are at a distance of 220 km from each other at 10:30 AM. After 30 minutes. A starts moving towards B at a speed of 40 km/hr while at 12 PM, B starts moving away from A at a speed of 30 km/hr. At what time will they meet on the next day ?
SSC CHSL 17/03/2023 (4th Shift)
(a) 7 : 00 AM (b) 4 : 00 AM
(c) 5 : 30 AM (d) 6 : 00 AM

Q.263. A train of length 300 m crosses a tree in 20 seconds and crosses another train of the same length travelling in opposite direction in 25 seconds. What is the speed of the second train ?
SSC CHSL 20/03/2023 (2nd Shift)
(a) 10 m/s (b) 12 m/s
(c) 15 m/s (d) 9 m/s

Q.264. A train starts from a place S at 10:00 am and arrives at another place T at 2:30 p.m. on the same day. If the speed of the train is 40 m/s, then what will be the distance covered by the train?
SSC CHSL 21/03/2023 (4th Shift)
(a) 706 km (b) 648 km
(c) 726 km (d) 616 km

SSC CGL 2022 Tier - 1

Q.265. A circular clock has the hour hand of length 6 inch. Find the length of the distance it covers by it's tip from 9 p.m. to 3 a.m.
SSC CGL 02/12/2022 (1st Shift)
(a) 4π inch (b) 2π inch
(c) 6π inch (d) 8π inch

Q.266. The distance covered by a train in (5y - 1) hours is ($125y^3$ - 1) km. The speed of the train is:
SSC CGL 02/12/2022 (2nd Shift)
(a) ($5y^3$ - 1) Km/h (b) ($25y^2$ - 5y +1) Km/h
(c) (5y + 1) Km/h (d) ($25y^2$ + 5y +1) Km/h

Q.267. How far will the tip of a 2 cm - long minute hand of a clock move in 45 minutes ?
SSC CGL 02/12/2022 (3rd Shift)
(a) π cm (b) 3π cm (c) 4π cm (d) 2π cm

Q.268. A car starts from point A towards point B, travelling at the speed of 20 km/h. $1\frac{1}{2}$ hours later, another car starts from point A and travelling at the speed of 30 km/h and reaches $2\frac{1}{2}$ hours before the first car. Find the distance between A and B.
SSC CGL 03/12/2022 (1st Shift)
(a) 300 km (b) 240 km
(c) 260 km (d) 280 km

Q.269. A thief steals a bike at 12:30 p.m. and drives it at 48 km/h. But the theft was discovered after half an hour. The bike owner starts to chase him on another bike at 58 km/h. The thief will be caught at _____.
SSC CGL 03/12/2022 (2nd Shift)
(a) 3 : 40 p.m. (b) 3 : 54 p.m.
(c) 3 : 10 p.m. (d) 3 : 24 p.m.

Q.270. A policeman sees a chain snatcher at a distance of 500m. He starts chasing a chain snatcher running with a speed of 5 m/s, while the policeman is chasing him with a speed of 15 m/s. What is the distance covered by the chain snatcher when he is caught by the policeman?
SSC CGL 03/12/2022 (3rd Shift)
(a) 200m (b) 180m (c) 150 m (d) 250m

Q.271. R jogs at twice the speed of walking and runs at twice the speed of jogging. From his home to office, he covers half of the distance by walking and the rest by jogging. From his office to home, he covers half the distance jogging and the rest by running. What is his average speed (in km/h) in a complete round from his home to office and back home if the distance between his office and home is 10 km and he walks at the speed of 5 km/h?
SSC CGL 05/12/2022 (1st Shift)
(a) $\frac{90}{8}$ (b) $\frac{60}{8}$ (c) $\frac{60}{9}$ (d) $\frac{80}{9}$

Q.272. Which of the following is NOT a correct statement?
SSC CGL 05/12/2022 (3rd Shift)
(a) The speed of 20 m/s is less than the speed of 85 km/h.
(b) Time may be calculated by dividing the distance by the speed.
(c) Covering the same distance in less time implies a higher speed.
(d) The speed of 99 km/h is less than the speed of 24 m/s.

Q.273. Two tourist buses start from the same point and move along two roads at right angles at speeds of 48 km/h and 36 km/h, respectively. The distance between the buses after 15 seconds is _____.
SSC CGL 05/12/2022 (4th Shift)
(a) 175m (b) 350m (c) 250m (d) 150m

Q.274. From point H, at 6:30 pm, a train starts moving towards point K at the speed of 90 km/hr. Another train starts moving from point K at 7:30 p.m. towards point H at the speed of 72 km/hr. Both the train meet at 11:30 p.m. at point J. What is the ratio of the distance HJ and KJ?
SSC CGL 06/12/2022 (4th Shift)
(a) 25 : 16 (b) 5 : 16 (c) 36 : 25 (d) 31 : 19

Q.275. A is chasing B in the same interval of time. A jumps 8 times, while B jumps 6 times. But the distance covered by A in 7 jumps is the same as that of B in 5 jumps. The ratio between the speeds of A and B is _____.
SSC CGL 08/12/2022 (1st Shift)
(a) 32 : 24 (b) 30 : 56
(c) 20 : 21 (d) 28 : 36

Q.276. Menu and Daya travel from point A to B, a distance of 105 km, at speeds of 10 km/h and 25 km/h, respectively. Daya reaches point B first and returns immediately and meets Menu at point C. Find the distance from point A to point C.
SSC CGL 09/12/2022 (2nd Shift)
(a) 35 km (b) 60 km (c) 45 km (d) 62 km

Q.277. A thief running at speed of 'x' km/h is chased by a policeman running at a speed of 10 km/h. If the thief is ahead by 100 metres, the policeman catches the thief after 3 minutes. At what speed is the thief running ('x' being the unknown speed)?
SSC CGL 09/12/2022 (3rd Shift)
(a) 4 km/h (b) 8 km/h
(c) 10 km/h (d) 6 km/h

Q.278. Some students went on a field trip. At a speed of 6 km/h, they travelled by bikes for 2 hours; then at a speed of 2 km/h, they walked for another hour; then they took rest for an hour and had lunch for half an hour; then at a speed of 1 m/s, they walked for an hour to visit a garden; and finally at a speed 4 km/h, they returned home in 3 hours. Their average speed, in km/h, (rounded off to two places of decimal) is:
SSC CGL 12/12/2022 (3rd Shift)
(a) 3.48 (b) 129.23 (c) 0.28 (d) 251.62

Q.279. Ram starts from point A at 8 a.m. and reaches point B at 2 p.m. on the same day. On the same day, Raju starts

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

from point B at 8 a.m. and reaches point A at 6 p.m. on the same day. Both points A and B are separated by only a straight line track. At what time they both meet?
SSC CGL 12/12/2022 (3rd Shift)
(a) 11 : 45 a.m. (b) 9 : 42 a.m
(c) 10 : 42 a m. (d) 12 : 42 p.m.

Q.280. Train A running at 81 km/h takes 72 sec to overtake train B, when both the trains are running in the same direction, but it takes 36 sec to cross each other if the trains are running in the opposite direction. If the length of train B is 600 metres, then find the length of train A. (in metres)
SSC CGL 13/12/2022 (3rd Shift)
(a) 600 (b) 480 (c) 590 (d) 900

Q.281. Two stations R and S are 400 km apart from each other. A train leaves from R to S and simultaneously another train leaves from S to R. Both trains meet after 10 hours. If the speed of the first train is 4 km/hr more than the second train, then what is the speed of the slower train?
SSC CGL 13/12/2022 (4th Shift)
(a) 18 km/hr (b) 26 km/hr
(c) 16 km/hr (d) 22 km/hr

SSC CPO 2022 Tier - 1

Q.282. On a straight road, a bus is 30 km ahead of a car travelling in the same direction. After 3 hours, the car is 60 km ahead of the bus. If the speed of the bus is 42 km/h, then find the speed (km/h) of the car.
SSC CPO 09/11/2022 (Morning)
(a) 67 (b) 72 (c) 65 (d) 59

Q.283. Two trains, running between Bangalore and Chennai, start at the same time from their respective locations and proceed towards each other at the speed of 80 km/h and 95 km/h. When they meet, it is found that one train has travelled 180km more than the other.The distance between Bangalore and Chennai is _____(km).
SSC CPO 10/11/2022 (Morning)
(a) 1200 (b) 2100 (c) 345 (d) 400

Q.284. Two stations are 120 km apart on a straight line. A train starts from station A at 8 a.m. and moves towards station B at 20 km/h, and another train starts from station B at 9 a.m. and travels towards station A at a speed of 30 km/h. At what time will they meet?
SSC CPO 10/11/2022 (Morning)
(a) 10 : 30 a.m. (b) 10 : 00 a.m.
(c) 11 : 00 a.m. (d) 11 : 30 a.m.

Q.285. In a journey of three unequal laps, a car covers a distance of 200 km in 4 h in the first lap, while another 162 km at the speed of 15 m/s in the second lap. It covered the remaining distance of the final lap in 4 h such that the average speed of the car for the entire journey was 50km/h. What was the speed (km/h) of the car in the third lap of the journey?
SSC CPO 10/11/2022 (Afternoon)
(a) 47 (b) 52 (c) 42 (d) 45

Q.286. A bus travels at 100km/h for the first $\frac{1}{2}$ hour. Later it travels at 80km/h. Find the time (hours) taken by the bus to travel 290 km.
SSC CPO 10/11/2022 (Evening)
(a) 4 (b) 3.5 (c) 3 (d) 2.5

Q.287. A train crosses two persons travelling at 4 km/h and 6 km/h in the same direction in 12 sec and 14 sec, respectively. The speed of the train is _____(km/h).
SSC CPO 11/11/2022 (Evening)
(a) 18 (b) 26 (c) 20 (d) 24

SSC CGL 2021 Tier - 2

Q.288. Two trains whose lengths are 450 metres and 300 metres are moving towards each other at the speed of 162 km/hr and 108 km/hr respectively. If distance between trains is 300 metres, then in how much time, these trains will cross each other?
SSC CGL Tier II (08/08/2022)
(a) 14 seconds (b) 35 seconds
(c) 28 seconds (d) 21 seconds

SSC Selection Post (Phase - X)

Q.289. A thief was noticed by a policeman from a distance of 80 metres. The speed of the thief is 21km/h and the policeman is 20 km/h . What is the distance between them after 18 seconds?
Graduate Level 01/08/2022 (Shift - 4)
(a) 70 metres (b) 85 metres
(c) 95 metres (d) 90 metres

Q.290. A journey of 180 km takes 6 hours more when the speed of a bike is reduced by 8 km/h. What is the original speed of the bike ?
Graduate Level 03/08/2022 (Shift - 3)
(a) 25 km/h (b) 15 km/h
(c) 30 km/h (d) 20 km/h

Q.291. A man's average driving speed for 9 hours is 72 km/h. During the first 3 hours of his journey, he drove at 54 km/h, and for the next 2 hours and 15 minutes, he drove at a speed of 68 km/h. He maintained a speed of 90 km/h for another 3 hours. What was his speed (in km/h) for the last 45 minutes?
Higher Secondary 04/08/2022 (Shift - 3)
(a) 75 (b) 84 (c) 93 (d) 72

Q.292. Four cities P, Q, R and S are on the corner of the square and the side of a square is 75 km. A businessman travels from P to Q at 5 km/h, Q to R at 3 km/h, R to S at 5 km/h and S to P at 3 km/h. Find his average speed of the whole journey.
Higher Secondary 05/08/2022 (Shift - 2)
(a) $3\frac{3}{4}$ km/h (b) $4\frac{1}{2}$ km/h
(c) $4\frac{3}{4}$ km/h (d) $3\frac{1}{2}$ km/h

SSC MTS 2021 Tier - 1

Q.293. A thief escapes from a police station at 8 : 00 a.m. on a cycle at a speed to 50 km/h. A policeman starts chasing the thief on a motorbike at 9 : 30 a.m. at the speed of 65 km/h. At what distance from the police station will the policeman catch up with the thief ?
SSC MTS 05/07/2022 (Evening)
(a) 335 km (b) 310 km
(c) 325 km (d) 300 km

Q.294. A and B leave from point M at the same time towards point N. B reaches N and starts towards M instantly. He meets A at point O (between M and N). The distance between M and N is 245 km. if the speeds of A and B are 26 km/h and 65 km/h respectively, then what is the distance between O and N ?
SSC MTS 05/07/2022 (Evening)
(a) 115 km (b) 105 km
(c) 95 km (d) 140 km

Q.295. The ratio of the speed of a bus to that of a train is 15 : 27. Also, a car covers a distance of 720 km in 9 hours. The speed of the bus is three-fourths of the speed of the car. How much distance will the train cover in 7 hours?
SSC MTS 07/07/2022 (Afternoon)
(a) 760 km (b) 756 km
(c) 784 km (d) 770 km

Q.296. Points A and B are 200 km apart. A person starts from A at 10 a.m. at a speed of 10 km/h and goes towards B. Another person starts from B at 11 a.m. at a speed of 20 km/h and goes towards A. At what time will they meet?
SSC MTS 08/07/2022 (Afternoon)
(a) 5 : 10 p.m. (b) 4 : 40 p.m.
(c) 5 : 40 p.m. (d) 5 : 20 p.m.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.297. P starts place A at 6 a.m. and reaches B after 8 hours. Q starts from B at 8 a.m. and reaches A after 9 hours. When they meet, what is the ratio of the distance travelled by Q to the distance travelled by P
SSC MTS 08/07/2022 (Evening)
(a) 3 : 8 (b) 6 : 7 (c) 6 : 11 (d) 8 : 3

Q.298. The speed of Ashu is 15 km/h more than the speed of Vishu. They start moving in the same direction at the same time, but initially Vishu is ahead of Ashu by a certain distance. If Ashu crosses Vishu 6 hours after they start moving, what is the initial distance between them?
SSC MTS 11/07/2022 (Morning)
(a) 45 km (b) 60 km (c) 90 km (d) 80 km

Q.299. A train crosses a stationary pole completely in 18 seconds and a bridge completely in 44 seconds. If the length of the bridge is 650 meters, then what is the length of the train?
SSC MTS 11/07/2022 (Evening)
(a) 540 m (b) 360 m (c) 450 m (d) 270 m

Q.300. Abbhishek climbs up a hill at a speed of 3 mi/h and comes down at a speed of 5 mi/h. If the total time taken for the two - way journey is 10 hours, then what is the distance between the hilltop and the foothill?
SSC MTS 14/07/2022 (Afternoon)
(a) 20.75 mi (b) 18.75 mi
(c) 11.25 mi (d) 37.5 mi

Q.301. A train P travelling at a speed of 15 m/s is able to cross a platform of 200m length completely in 30 seconds. Approximately how long will it take train P to cross a man who is coming towards the train on his bike at speed of 27 km/h?
[Note: Ignore the length of the bike]
SSC MTS 14/07/2022 (Evening)
(a) 15 sec (b) 11.1 sec
(c) 16.7 sec (d) 18.3 sec

Q.302. A bus can travel 20% faster than a scooter. Both start from point P at the same time, and reach point Q, 60 km away from point P, at the same time. On the way, however, the bus lost about 10 mins while stopping at bus stations, while the scooter did not stop anywhere. What is the speed of the bus?
SSC MTS 15/07/2022 (Morning)
(a) 68 km/h (b) 80 km/h
(c) 60 km/h (d) 72 km/h

Q.303. What is the total time taken by a train L to cross a stationary train T of length twice that of L, if the train L crosses a platform of length thrice that of train T in 28 seconds?
SSC MTS 18/07/2022 (Evening)
(a) 18 sec (b) 21 sec
(c) 25 sec (d) 12 sec

Q.304. A train can cover a certain distance in 3 hrs. If the track management is improved, an increase in the speed of the train by 10 km/h is possible, which can reduce the above journey times by 30 minutes. Find the initial speed of the train.
SSC MTS 19/07/2022 (Evening)
(a) 60 km/h (b) 80 km/h
(c) 50 km/h (d) 65 km/h

Q.305. A car starts at a speed of 30 km/h and increases its speed by 5 km/h after every hour. Another car has a constant speed of 40 km/h. In how much time will both the cars cover an equal distance?
SSC MTS 20/07/2022 (Evening)
(a) 6 hours (b) 3 hours
(c) 5 hours (d) 4 hours

Q.306. An inkjet printer can print 8 lines/second and can print a document in 6 minutes. How much time would an LED printer take to print the same document if it can print 7 lines/second more than the inkjet printer?
SSC MTS 21/07/2022 (Morning)
(a) 2 min 54 sec (b) 2 min 50 sec
(c) 3 min 12 sec (d) 3 min 4 sec

Q.307. The speed of a superfast train, T_1 is 20% more than the speed of another superfast train T_2 . Both the trains start from point N at the same time and reach point M at the same time. N and M are 500 km apart. T_1 stops for 10 minutes on the way to M, but T_2 covers the distance without any stops en route. What is the speed of T_1?
SSC MTS 22/07/2022 (Morning)
(a) 600 km/h (b) 500 km/h
(c) 650 km/h (d) 550 km/h

SSC CHSL 2021 Tier - 1

Q.308. With an average speed of 42 km/h, a train reaches its destination in time. If it moves with an average speed of 14 km/h, it is late by 35 minutes. The length of the journey is:
SSC CHSL 27/05/2022 (Evening)
(a) 12.25 (b) 12.15 (c) 10.25 (d) 11.25

Q.309. A train covers the distance between two stations X and Y in 6 hours. If the speed of the train is reduced by 13 km/h, then it travels the same distance in 9 hours. Find the distance between the two stations ?
SSC CHSL 30/05/2022 (Morning)
(a) 220 (b) 234 (c) 185 (d) 215

Q.310. Sunila drove her car at an average speed of 45 km/h for the first 75 km of a trip, and then at an average speed of 70 km/h for the remaining 45 km of the trip. If she made no stops during the trip, what was Sunila's average speed (in km/h) for the entire trip?
SSC CHSL 31/05/2022 (Morning)
(a) 52 (b) $51\frac{3}{7}$ (c) 51 (d) $51\frac{93}{97}$

Q.311. The ratio of the distances Ravina and Suhel had to travel from their respective houses to their workplaces was 4 : 7. If Suhel had to travel 63 km, how much did Ravina have to travel?
SSC CHSL 03/06/2022 (Morning)
(a) 40 km (b) 32 km (c) 39 km (d) 36 km

Q.312. A train takes 3 hours to travel from place A to B at the speed of 60 km/h. The same train takes 2 hours to travel from B to C at 50% increased speed. What is the average speed of the train from place A to C ?
SSC CHSL 06/06/2022 (Afternoon)
(a) 60 (b) 90 (c) 80 (d) 72

Q.313. Rani covers a distance of 475 m in a minute. How much distance would Rani have covered in an hour if she travelled at 1.2 times of her current speed ?
SSC CHSL 07/06/2022 (Morning)
(a) 34.4 (b) 34.3 (c) 34.2 (d) 34.1

Q.314. In a trip, Ram covers a distance of 200 km in 10 hours. First he started his journey by bike at a speed of 15 km/h, after that his bike got damaged and the rest of the journey he completed by his friend's car at a speed of 25 km/h. Ratio of distances covered by bike and car _____ is.
SSC CHSL 09/06/2022 (Morning)
(a) 3 : 5 (b) 2 : 3 (c) 1 : 1 (d) 5 : 3

Q.315. The average speed of a car is $1\frac{3}{5}$ times the average speed of a bus. A tractor covers 1150 km in 23 hours . How much distance will the car cover in 4 hours if the speed of the bus is twice the speed of the tractor ?
SSC CHSL 09/06/2022 (Evening)
(a) 540 (b) 740 (c) 440 (d) 640

Q.316. For the first part of her journey,Sunita travelled at a speed of 450 m/min and,for the rest of the journey, at a speed 1.4 times of her initial speed. If Sunita travelled a total distance of 33.3 km in 1 hour, what was the distance that

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sunita travelled at a lower speed?
SSC CHSL 10/06/2022 (Morning)
(a) 11.50 (b) 11.15 (c) 11.25 (d) 11.20

Q.317. 'A' and 'B' are two stations 494 km apart. A train starts from station 'A' at 3 p.m. and travels towards station 'B' at 83 km/h. Another train starts from station 'B' at 4 p.m. and travels towards station 'A' at 54 km/h. At what time do they meet ?
SSC CHSL 10/06/2022 (Afternoon)
(a) 7 p.m. (b) 7 a.m. (c) 8 p.m. (d) 9 a.m.

SSC CGL 2021 Tier - 1

Q.318. A takes 3 hours more than B to walk "d" km. If A doubles his speed, then he can make it in 1 hour less than B. How much time (in hours) does A require to walk "d" km?
SSC CGL 19/4/2022 (Morning)
(a) 5 (b) 9 (c) 8 (d) 4

Q.319. Ram travelled from a place Z to P at an average speed of 130 km/h . He travelled the first 75% of the distance in two-third of the time and the rest at an average speed of x km/h. The value of $\frac{x}{2}$ is:
SSC CGL 20/4/2022 (Morning)
(a) 51 (b) 48.75 (c) 97.5 (d) 19.25

SSC CGL 2020 Tier - 2

Q.320. The ratio of the distance between two places A and B to the distance between places B and C is 3 : 5. A man travels from A to B at a speed of x km/h and from B to C at a speed of 50 km/h. If his average speed for the entire journey is 40 km/h, then what is the value of (x - 10) : (x + 1) ?
SSC CGL Tier II (29/01/2022)
(a) 31 : 20 (b) 11 : 10
(c) 10 : 11 (d) 20 : 31

Q.321. A covered a distance of 240 km at a certain speed. Had his speed been 8 km/h less, then the time taken would have been one hour more for covering the same distance. How much time (in hours) will he take to cover a distance of 480 km at his original speed?
SSC CGL Tier II (29/01/2022)
(a) 8 (b) 10 (c) 11 (d) 9

Q.322. The driver of a car, which is traveling at a speed of 75 km/h, locates a bus 80 m ahead of him, travelling in the same direction. After 15 seconds, he finds that the bus is 40 m behind the car. What is the speed of the bus (in km/h)?
SSC CGL Tier II (03/02/2022)
(a) 44.2 (b) 42.5 (c) 47.5 (d) 46.2

Q.323. An athlete runs 8 times around a circular field of radius 7 m in 3 minutes 40 seconds. His speed (in km/h) is:
SSC CGL Tier II (03/02/2022)
(a) $\frac{72}{25}$ (b) $\frac{118}{25}$ (c) $\frac{144}{25}$ (d) $\frac{108}{25}$

Q.324. The distance between two places A and B is 140 km. Two cars x and y start simultaneously from A and B, respectively. If they move in the same direction, they meet after 7 hours. If they move towards each other, they meet after one hour. What is the speed (in km/h) of car y if its speed is more than that of car x?
SSC CGL Tier II (03/02/2022)
(a) 60 (b) 100 (c) 80 (d) 90

SSC MTS 2020 Tier - 1

Q.325. The speed of wind during a storm is 10^5 mm per sec. How long (in seconds) will it take a dust particle suspended in air to travel 1 Km ?
SSC MTS 05/10/2021 (Morning)
(a) 1 (b) 0.1 (c) 10 (d) 0.01

Q.326. How much time (in seconds) does the earth take to rotate through an angle of 135 degrees about its axis ?
SSC MTS 5/10/2021 (Morning)
(a) 21600 (b) 28800 (c) 32400 (d) 33600

Q.327. The speed of A is 20 km/h more than the speed of B. The time that A takes to travel a distance of 300km is 2 hours less than the time that B takes to travel a distance of 240km. What is the speed(in km/h) of A ?
SSC MTS 06/10/ 2021 (Morning)
(a) 30 (b) 40 (c) 45 (d) 50

Q.328. A car covers a distance of 450 km at a certain uniform speed (in km/h). The number of hours it takes for the journey is $\frac{1}{8}$ of the number representing the speed. The time taken (in hours) by the car to cover the distance is:
SSC MTS 06/10/2021 (Afternoon)
(a) 9 (b) 6 (c) $6\frac{1}{4}$ (d) $7\frac{1}{2}$

Q.329. A car travels a distance of x km at a speed of $5\frac{5}{9}$ m/sec and returns at 5 m/sec to the starting point. If the total time taken by the car is $7\frac{3}{5}$ hours, then the value of (x + 3) is :
SSC MTS 07/10/2021 (Evening)
(a) 78 (b) 80 (c) 75 (d) 72

Q.330. A bus moves from station A towards station B, which is at a distance of 189 km. An hour later a car, the ratio of whose speed with the bus is 3 : 2, starts from station A and moves towards station B. Find the speed of the bus (in km/h), if the car arrives at station B half an hour earlier than the bus.
SSC MTS 11/10/2021 (Morning)
(a) 41 (b) 37.8 (c) 42 (d) 63

Q.331. A man travelled a distance of 47 km in 6 hours. He travelled partly on foot at the rate of $6\frac{1}{2}$ km/h and partly on bicycle at the rate of $8\frac{1}{2}$km/h. The distance travelled on foot is:
SSC MTS 11/10/2021 (Afternoon)
(a) 13 km (b) 15 km (c) 12 km (d) 16 km

Q.332. A lady walks to her office every day from home and maintains a fixed time for the same. On one day she decreases her speed by 25%. By what fraction of her usual time will she be late on that day?
SSC MTS 12/10/2021 (Afternoon)
(a) $\frac{2}{3}$ (b) $\frac{1}{4}$ (c) $\frac{1}{3}$ (d) $\frac{1}{6}$

Q.333. Sita and Geeta start at the same time to ride from place A to place B, which is 90 km away from A. Sita travels 3 km per hour slower than Geeta. Geeta reaches place B and at once turns back meeting Sita 15 km from place B. Sita's speed (in km/h) is:
SSC MTS 13/10/2021 (Morning)
(a) 9 (b) 6 (c) 10.5 (d) 7.5

Q.334. Two girls move in opposite directions, one from A to B and the other from B to A. The girl from A reaches the destination in 12 minutes. The girl from B stops on the way for 10 minutes and reaches her destination in 25 minutes. If A's speed is 5 km/h, then what is the speed of B (in km/h)?
SSC MTS 13/10/2021 (Afternoon)
(a) 3 (b) $1\frac{5}{7}$ (c) 4 (d) 2.4

Q.335. While covering a distance of 51 km, a man noticed that after walking for one hour and 40 minutes, the distance covered by him was $\frac{5}{12}$ of the remaining distance. What was his speed (in km/h)?
SSC MTS 18/10/2021 (Morning)
(a) 7 (b) 10 (c) 8 (d) 9

Q.336. An earthworm of length 18 cm is crawling along a certain path with a speed of 4 cm/s. An insect overtakes the earthworm in 6 s. How fast (in cm/s) is the insect walking? Assume that they

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

both are walking along parallel paths.
SSC MTS 20/10/2021 (Evening)
(a) 7.0 (b) 6.5 (c) 5.5 (d) 6.0

Q.337. An airplane took off from the starting point 45 minutes later than the scheduled time. The destination was 2100 km away from the starting point. To reach on time, the pilot had to increase the speed by 40% of its usual speed. What was the increased speed (in km/h)?
SSC MTS 22/10/2021 (Morning)
(a) 1870 (b) 2520 (c) 2940 (d) 1120

Q.338. A person traveled a distance of 150 km and then returned to the starting point. The time taken for the outward journey was $2\frac{1}{2}$ hours more than that for the return journey. His speed for the return journey was 10 km/h more than that for the outward journey. His speed for the return journey, in km/h, was:
SSC MTS 26/10/2021 (Afternoon)
(a) 30 (b) 35 (c) 25 (d) 20

Q.339. A truck driver has to cover a total distance of 260 km in 4 hours. He drives at a speed of 56 km/h for the first 75 minutes, and the next 90 km at a speed of 60 km/h. At what speed (in km/h) must he drive the remaining distance in order to complete the journey in 4 hours?
SSC MTS 02/11/2021 (Morning)
(a) 65 (b) 58 (c) 80 (d) 75

Q.340. Two cyclists start simultaneously from two points A and B, their destinations being B and A, respectively. After crossing each other, they precisely take 2 hours 33 minutes 36 seconds and 1 hour 26 minutes 24 seconds respectively to reach their destinations. What is the ratio of the speed of the first to that of the second cyclist?
SSC MTS 02/11/2021 (Evening)
(a) 2 : 3 (b) 3 : 2 (c) 4 : 3 (d) 3 : 4

Q.341. The speed of light is very nearly equal to 3×10^{17} nanometre per second. How much time (in seconds), approximately, does it take light to travel from the moon to the earth, the average distance between them being 384000 km? (1 nanometre = 10^{-9} metre)
SSC MTS 02/11/2021 (Evening)
(a) 38.4 (b) 12.8 (c) 3.84 (d) 1.28

Q.342. Two clocks were synchronized at 11 a.m. on a Sunday. Thereafter, every day they were, respectively, found to gain and lose one minute per day. What time, expressed in hours and minutes, will the second clock show when the first clock shows 10 p.m. on the next Friday ?
SSC MTS 12/10/2021 (Afternoon)
(a) 9 hours $48\frac{3}{11}$ minutes p.m.
(b) 9 hours $48\frac{7}{11}$ minutes p.m.
(c) 9 hours $49\frac{1}{12}$ minutes p.m.
(d) 9 hours $49\frac{9}{11}$ minutes p.m.

SSC CGL 2020 Tier - 1

Q.343. A takes 8 hours more than the time taken by B to cover a distance of 160 km. If A doubles his speed, he takes 3 hours more than B to cover the same distance. Speed of B (in km/h) is ?
SSC CGL 17/08/2021 (Morning)
(a) 72 (b) 80 (c) 70 (d) 75

Q.344. Akhil takes 30 minutes extra to cover a distance of 150 km if he drives 10 km/h slower than his usual speed. How much time will he take to drive 90 km if he drives 15 km per hour slower than his usual speed?
SSC CGL 18/08/2021 (Morning)
(a) 2 h 15 m (b) 2 h
(c) 2 h 45 m (d) 2 h 30 m

SSC CHSL 2020 Tier - 1

Q.345. A person moved from place A for place B at 2 p.m at a speed of 4.5 km/h, stayed at place B for 1.5 hours and returned to place A at a speed of 6 km/h. He came back to place A at 7 p.m. What is the distance (in km) between places A and B.
SSC CHSL 13/4/2021 (Evening)
(a) $8\frac{1}{3}$ (b) $8\frac{2}{5}$ (c) 9 (d) $9\frac{6}{11}$

Q.346. Two cars X and Y start running towards each other from two places 216 km apart. The ratio of the speeds of X and Y is 5 : 7 and the speed of X is 60 km/h. After how many minutes will X and Y meet each other ?
SSC CHSL 19/04/2021 (Morning)
(a) 75 (b) 72 (c) 90 (d) 80

Q.347. A train travels at a speed of 66 km/h and halts at five junctions for a certain time. It covers a distance of 1485 km in one day. For how long (in minutes) does the train stop at each junction, if it halts for the same period of time at all the junctions?
SSC CHSL 05/08/2021 (Afternoon)
(a) 15 (b) 18 (c) 12 (d) 20

Q.348. During his morning walk, Atul walks for 45 minutes at a speed of 8km/h and takes 15 rounds of a park. Shekhar takes 10 rounds of the same park in 40 minutes. What is the speed of Shekhar in km/h?
SSC CHSL 05/08/2021 (Evening)
(a) 7.2 (b) 6 (c) 6.75 (d) 7.5

Q.349. Ajit Singh left from place P at 9 : 30 am for place Q, and David Raj left place Q at 1 : 30 for place P. The distance between them is 416 km. If Ajit Singh's speed is 44 km/h and David Raj's speed is 52 km/h, then at what time will they meet each other?
SSC CHSL 11/08/2021 (Afternoon)
(a) 4.30 pm (b) 5 pm (c) 6 pm (d) 4 pm

SSC CGL 2019 Tier - 2

Q.350. A and B start moving towards each other from X and Y, respectively, at the same time on the same day. The speed of A is 20% more than the speed of B. After meeting on the way, A and B take p hours and $7\frac{1}{5}$ hours, respectively to reach Y and X respectively. What is the value of p ?
SSC CGL Tier II (15/11/2020)
(a) 5 (b) 5.5 (c) 6 (d) 4.5

Q.351. Amita travels from her house at $3\frac{1}{2}$ km/h and reaches her school 6 minutes late. The next day she travels at $4\frac{1}{2}$ km/h and reaches school 10 min early. What is the distance (in km) between her house and the school ?
SSC CGL Tier II (16/11/2020)
(a) 5.4 (b) 5.6 (c) 4.8 (d) 4.2

SSC CHSL 2019 Tier - 1

Q.352. The distance between the places H and O is D units. The average speed that gets a person from H to O in a stipulated time is S units. He takes 20 minutes more time than usual if he travels at 60 km/h, and reaches 44 minutes early if he travels 75 km/h. The sum of the numerical values of D and S is:
SSC CHSL 13/10/2020 (Afternoon)
(a) 358 (b) 384 (c) 376 (d) 344

Q.353. Two trains start at the same time from stations A and B, 1800 km apart, and proceed towards each other at an average speed of 44 km/h and 46 km/h, respectively. Where will the trains meet?
SSC CHSL 16/10/2020 (Afternoon)
(a) 920 km from station A
(b) 900 km from station B

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(c) 880 km from station A
(d) 880 km from station B

Q.354. How much time (in minutes) will a dog take to run around a square field of side 75 m if it runs at the rate of 6 km/hr?
SSC CHSL 19/10/2020 (Evening)
(a) 2.5 (b) 3.6 (c) 3 (d) 1.8

Q.355. A train takes 45 minutes to cover a certain distance at a speed of 80 km/h. If the speed is increased by 125%, then how long will it take (in minutes) the train to cover $\frac{8}{5}$ of the same distance?
SSC CHSL 26/10/2020 (Morning)
(a) 25 (b) 30 (c) 32 (d) 28

Q.356. Ravi starts for his school from his house on his cycle at 8 : 20 a.m. If he runs his cycle at a speed of 10 km/h, he reaches his school 8 minutes late, and if he drives the cycle at a speed of 16 km/h, he reaches his school 10 minutes early. The school starts at:
SSC CHSL 18/03/2020 (Morning)
(a) 8 : 50 a.m . (b) 8 : 40 a.m.
(c) 9 : 00 a.m. (d) 9 : 40 a.m.

SSC CGL 2019 Tier - 1

Q.357. Places A and B are 144 km apart. Two cars start simultaneously, one from A and the other from B. If they move in the same direction, they meet after 12 hours, but if they move towards each other they meet after $\frac{9}{8}$ hours. The speed(in km/h) of the car moving at a faster speed, is :
SSC CGL 04/04/2020 (Evening)
(a) 70 (b) 72 (c) 60 (d) 64

Q.358. A student takes 1.25 hours to travel from home to school at a speed of 4 km/h. By what percentage should he increase his speed to reduce the time by 25% to cover the same distance from school to home?
SSC CGL 06/03/2020 (Morning)
(a) 45% (b) 50% (c) 25% (d) $33\frac{1}{3}$%

Q.359. Two cyclists X and Y start at the same time from place A to go towards place B at a speed of 6 km/h and 8 km/h, respectively. Despite stopping for 15 minutes during the journey, Y reaches 10 minutes earlier than X. The distance between the places A and B (in km) is:
SSC CGL 06/03/2020 (Afternoon)
(a) 10 (b) 16.5 (c) 8 (d) 6

Q.360. Two cars A and B leave Delhi at 8:30 a.m. and 9 a.m. for Shimla, respectively. They travel at the speeds of 40km/h and 50 km/h respectively. How many kilometers away from Delhi will the two cars be together ?
SSC CGL 07/03/2020 (Morning)
(a) 200 (b) 45 (c) 100 (d) 5

Answer Key :-

1.(c)	2.(c)	3.(b)	4.(d)
5.(b)	6.(a)	7.(d)	8.(a)
9.(d)	10.(b)	11.(a)	12.(c)
13.(c)	14.(d)	15.(b)	16.(a)
17.(a)	18.(a)	19.(d)	20.(d)
21.(c)	22.(b)	23.(a)	24.(b)
25.(a)	26.(a)	27.(a)	28.(d)
29.(a)	30.(b)	31.(b)	32.(d)
33.(c)	34.(d)	35.(c)	36.(d)
37.(d)	38.(a)	39.(a)	40.(d)
41.(d)	42.(c)	43.(b)	44.(d)
45.(d)	46.(a)	47.(b)	48.(d)
49.(b)	50.(c)	51.(b)	52.(c)
53.(a)	54.(d)	55.(d)	56.(c)
57.(d)	58.(d)	59.(d)	60.(b)
61.(c)	62.(c)	63.(b)	64.(b)
65.(b)	66.(c)	67.(c)	68.(a)
69.(c)	70.(c)	71.(b)	72.(c)
73.(c)	74.(b)	75.(b)	76.(d)
77.(a)	78.(a)	79.(c)	80.(c)
81.(c)	82.(b)	83.(a)	84.(b)
85.(b)	86.(b)	87.(d)	88.(b)
89.(d)	90.(b)	91.(d)	92.(a)
93.(c)	94.(a)	95.(a)	96.(c)
97.(d)	98.(d)	99.(b)	100.(b)
101.(a)	102.(d)	103.(d)	104.(d)
105.(c)	106.(d)	107.(d)	108.(a)
109.(c)	110.(c)	111.(d)	112.(b)
113.(a)	114.(d)	115.(c)	116.(b)
117.(c)	118.(b)	119.(d)	120.(c)
121.(a)	122.(b)	123.(d)	124.(b)
125.(c)	126.(a)	127.(b)	128.(a)
129.(c)	130.(d)	131.(b)	132.(b)
133.(c)	134.(b)	135.(d)	136.(b)
137.(c)	138.(d)	139.(c)	140.(c)
141.(c)	142.(c)	143.(b)	144.(b)
145.(a)	146.(a)	147.(c)	148.(d)
149.(b)	150.(c)	151.(c)	152.(b)
153.(c)	154.(c)	155.(b)	156.(d)
157.(c)	158.(d)	159.(c)	160.(d)
161.(b)	162.(a)	163.(a)	164.(b)
165.(b)	166.(a)	167.(b)	168.(d)
169.(b)	170.(b)	171.(a)	172.(b)
173.(a)	174.(a)	175.(c)	176.(c)
177.(d)	178.(b)	179.(d)	180.(b)
181.(a)	182.(a)	183.(d)	184.(d)
185.(d)	186.(c)	187.(a)	188.(c)
189.(d)	190.(d)	191.(c)	192.(d)
193.(c)	194.(b)	195.(a)	196.(b)
197.(b)	198.(a)	199.(b)	200.(a)
201.(a)	202.(b)	203.(a)	204.(b)
205.(b)	206.(d)	207.(c)	208.(c)
209.(d)	210.(a)	211.(c)	212.(b)
213.(a)	214.(a)	215.(c)	216.(d)
217.(d)	218.(b)	219.(b)	220.(d)
221.(c)	222.(d)	223.(b)	224.(c)
225.(d)	226.(b)	227.(d)	228.(a)
229.(c)	230.(b)	231.(c)	232.(c)
233.(c)	234.(b)	235.(a)	236.(a)
237.(c)	238.(d)	239.(c)	240.(b)
241.(c)	242.(d)	243.(d)	244.(a)
245.(a)	246.(a)	247.(a)	248.(a)
249.(a)	250.(b)	251.(a)	252.(a)
253.(d)	254.(c)	255.(c)	256.(a)
257.(b)	258.(b)	259.(c)	260.(d)
261.(b)	262.(d)	263.(d)	264.(b)
265.(c)	266.(d)	267.(b)	268.(b)
269.(d)	270.(d)	271.(d)	272.(d)
273.(c)	274.(a)	275.(c)	276.(b)
277.(b)	278.(a)	279.(a)	280.(b)
281.(a)	282.(b)	283.(b)	284.(c)
285.(a)	286.(b)	287.(a)	288.(a)
289.(b)	290.(d)	291.(b)	292.(a)
293.(c)	294.(b)	295.(b)	296.(d)
297.(c)	298.(c)	299.(c)	300.(b)
301.(b)	302.(d)	303.(d)	304.(c)
305.(c)	306.(c)	307.(a)	308.(a)
309.(b)	310.(d)	311.(d)	312.(d)
313.(c)	314.(a)	315.(d)	316.(c)
317.(a)	318.(c)	319.(b)	320.(d)
321.(b)	322.(d)	323.(c)	324.(c)
325.(c)	326.(c)	327.(d)	328.(d)
329.(c)	330.(c)	331.(a)	332.(c)
333.(d)	334.(c)	335.(d)	336.(a)
337.(d)	338.(a)	339.(c)	340.(d)
341.(d)	342.(c)	343.(b)	344.(b)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

345.(c)	346.(c)	347.(b)	348.(b)
349.(d)	350.(a)	351.(d)	352.(b)
353.(c)	354.(c)	355.(c)	356.(c)
357.(a)	358.(d)	359.(a)	360.(c)

Solutions :-

Sol.1.(c)
Relative speed = 12 - 10 = 2 km/h
Time = 30 min. = 0.5 hours
Initial distance = Relative speed × time
= 2 × 0.5 = 1 km or 1000 m .

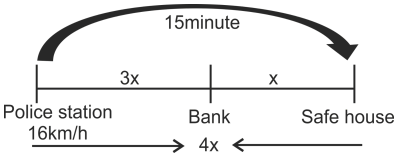
Sol.2.(c) Distance(d) ∝ time(t) ... (given)
Speed of train = $\frac{72}{2}$ = 36 km/h
Hence,
Distance (d) = $36t$

Sol.3.(b)
Let the speed of policeman be x km/hr
Relative speed of policeman
= (x - 13.5) km/hr
Distance between Policeman and thief in 8 min = (13.5 × $\frac{5}{18}$) × (8 × 60) = 1800 m
Distance covered by policeman in 28 min to catch the thief = 1800 - 540 = 1260 m
ATQ,
(x - 13.5) × $\frac{5}{18}$ × (28 × 60) = 1260
x - 13.5 = 2.7
x = 2.7 + 13.5 = 16.2 km/hr

	Policeman	:	Thief
Speed →	16.2	:	13.5
	6	:	5
Distance →	6	:	5

Now, (6 - 5) = 1 unit ---------- 1800 m
Then, 6 unit ---------- 1800 × 6 = 10800 m
= $\frac{10800}{1000}$ = 10.8 km
Therefore, At 10.8 km distance from the spot of the crime, the policeman catch up with the thief

Sol.4.(d)



Time taken by police to catch the thief
= 15 minute = $\frac{1}{4}$ hour
Distance covered by police = 4x , speed of police = 16 km/h
So, $\frac{1}{4} = \frac{4x}{16}$ ⇒ x = 1km
Required distance (3x) = 3 km

Sol.5.(b) Let the distance between A and B be 240 km

60 km	60 km	60 km	60 km
10 km/hr	15 km/hr	20 km/hr	30 km/hr

Average speed of Raghav(y)
$= \frac{240}{\frac{60}{10}+\frac{60}{15}+\frac{60}{20}+\frac{60}{30}}$
$= \frac{240}{6+4+3+2} = \frac{240}{15}$ = 16 km/hr
Let time taken by Manish to cover the journey be 16 hrs

4 hrs	4 hrs	4 hrs	4 hrs
10 km/hr	15 km/hr	20 km/hr	30 km/hr

Distance travelled by Manish
= (10 + 15 + 20 + 30) × 4 = 300 km
Average speed of Manish(z) = $\frac{300}{16}$
= 18.75 km/hr
Then, z - y = 18.75 - 16 = 2.75 km/hr

Sol.6.(a) Speed of first 10 km = 40 km/hr,
then time = $\frac{1}{4}$ hr
Time taken in fourth 10 km = $\frac{1}{4}$ hr
Time taken in the second 10 km = $\frac{1}{8}$ hr
Time taken in third 10 km = $\frac{1}{8}$ hr
Average speed = $\frac{total\ distance}{total\ time}$
$= \frac{40}{\frac{1}{4}+\frac{1}{4}+\frac{1}{8}+\frac{1}{8}} = \frac{160}{3}$ km/hr

Sol.7.(d)
Ratio - initial : final
Speed - 12 : 18
Distance - 12 : 18 (because speed is directly proportional to distance)
Difference in distance = 18 - 12 = 6 units
6 units = 24 km
(Actual distance) 12 units = 48 km

Sol.8.(a)
Required speed = $\frac{60}{9-1}$
= $\frac{60}{8}$ = 7.5 km/h

Sol.9.(d) Ratio of time taken = 2 : 3 : 5
As we know:- time ∝ $\frac{1}{speed}$
Hence, ratio of speeds = $\frac{1}{2} : \frac{1}{3} : \frac{1}{5}$
= 15 : 10 : 6

Sol.10.(b) Let total distance = 80 units
Average speed = $\frac{80}{\frac{28}{70}+\frac{32}{80}+\frac{20}{50}}$
$= \frac{80}{\frac{4}{10}+\frac{4}{10}+\frac{4}{10}} = \frac{800}{12}$
$= \frac{200}{3} = 66\frac{2}{3}$ km/h

Sol.11.(a)

Ratio =	1st person	:	2nd person
Speed =	18	:	24
Time =	24	:	18

Difference in time (6 units) = 20 min.
Final time (18 units) = 1 hour
Total journey time = 24 × 1 hour = 24 km

Sol.12.(c) Distance travelled by train A in 2 hr. = 75 × 2 = 150 km
Remaining distance = 690 - 150 = 540 km
Their relative speed
= (105 + 75) = 180 km/hr
Require time = $\frac{540}{180}$ = 3 hr.
So , time when they meet
= 8 p.m. + 3 hr. = 11 p.m.

Sol.13.(c)
Ratio = Initial : final
Speed = 15 : 20
Time = 20 : 15
Difference in time (5 units) = 15 min.
Initial time (20 units) = 60 min. or 1 hr.
Required distance = 15 × 1 = 15 km

Sol.14.(d) $Force \propto \frac{weight \times (speed)^2}{radius}$
$Force = k\frac{weight \times (speed)^2}{radius}$
According to question,
$6125 = k \times \frac{2750 \times (35)^2}{550}$
$k = \frac{6125 \times 550}{2750 \times 1225} = \frac{6125}{5 \times 1225} = 1$
Now ,
$Force = 1 \times \frac{3600 \times (50)^2}{750} = \frac{3600 \times 2500}{750}$
= 12000 pound - force

Sol.15.(b)
Let , the speed of police man = x
Distance travelled by thief in 4 min.
= 15 × $\frac{4}{60}$ = 1 km.
Their relative speed = $(x - 15)$ km/hr.
Distance covered in 16 min. = 800 m
So , $(x - 15) = \frac{0.8 \times 60}{16}$ ⇒ x = 18 km/hr.
Time taken to cover 1000 m at relative speed = 16 min. = 800 m
⇒ 20 min. = 1000 m
Distance travelled by thief in (20 + 4) min. = 15 × $\frac{24}{60}$ = 6 km.

Sol.16.(a) Time taken by Anil to reached point B = $\frac{192}{64}$ = 3 hours
So, Anil reached B at = 8 : 20 + 3
= 11: 20 a.m.
Now, distance covered by Tirath till 11 : 20 a.m. = 1.5 × 96 = 144 km
so, distance between Anil and Tirath at 11:20 a.m. = 192 – 144 = 48 km
Relative speed of Anil and Tirath
= 64 + 96 = 160 km/hr
Required time when they meet
= $\frac{48}{160}$ × 60 = 18 minute

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Time at which they meet = 11 : 20 + 18 min = 11 : 38 a.m.

Sol.17.(a) Total time of halts taken by Anuj = 10 × 3 = 30 min.= 0.5 hr
Total distance covered by Anuj
= 70 × (8.5 − 0.5) = 560 km
Total time of halts taken by Anup
= 15 × 4 = 60 min. = 1 hour
Hence, total time taken by Anup to reach place B = $\frac{560}{80}$ + 1hr. = 8 hours

Sol.18.(a) Distance covered in first lag = 50 × 5 = 250 km
For second lag :-
speed = 50 × $\frac{6}{5}$ = 60 km/hr.
Distance covered = 250 × $\frac{6}{5}$ = 300 km
Time = $\frac{300}{60}$ = 5 hrs.
For third lag :-
speed = $\frac{50+60}{2}$ = 55 km/hr.
Distance covered = 300 × $\frac{11}{10}$ = 330 km
Time taken in third lag = $\frac{330}{55}$ = 6 hour
So, total time taken = 5 + 5 + 6
= 16 hours

Sol.19.(d)
Distance traveled in 1st hour = 60 km.
According to question,
Sum of Distance covered (60, 70, 80....)
= 60 + 70 + 80 +.... = 1210
Now, $S_n = \frac{n}{2}[2a + (n-1)d]$
2420 = $10n[12 + n - 1]$
242 = $n[n + 11]$
242 = $11 \times [11 + 11] \Rightarrow n = 11$
So, it will take 11 hours to cover a distance of 1210 km.

Sol.20.(d)
Let the average speed of X be 'a' km/h and average speed of Y be 'b' km/h
According to question,
a = (b + 40) -------(1)
$\frac{1200}{b} - \frac{1200}{a} = 5 \Rightarrow \frac{1200}{b} - \frac{1200}{(b+40)} = 5$
$\Rightarrow \frac{1200b + 48000 - 1200b}{b(b+40)} = 5$
$\Rightarrow 5b^2 + 200b - 48000 = 0$
$\Rightarrow b^2 + 40b - 9600 = 0$
$\Rightarrow b^2 + 120b - 80b - 9600 = 0$
$\Rightarrow b = -120, +80$
Speed cannot be negative
Therefore, speed of Y = 80 km/h
Time taken by Y to cover 1200 km
= $\frac{1200}{80}$ = 15 hours

Sol.21.(c) Let Original Speed be x
According to question,
$\frac{480}{x} - 4 = \frac{480}{(x+10)}$
$\Rightarrow \frac{480-4x}{x} = \frac{480}{(x+10)}$
$\Rightarrow 4x^2 + 40x - 4800 = 0$
$\Rightarrow x^2 + 10x - 1200 = 0$
$\Rightarrow x^2 + 40x - 30x - 1200 = 0$
$\Rightarrow x(x+40) - 30(x+40) = 0$
$\Rightarrow (x+40)(x-30) = 0$
$\Rightarrow x = 30$ km/hr
[because Speed can't be negative]

Sol.22.(b) Formula :- $\frac{ws - s}{ws}$
S = including stoppage
Ws = without stoppage
$\Rightarrow \frac{60-54}{60} = \frac{1}{10} \times 60 = 6$ min.

Sol.23.(a) Formula:- $\frac{Ws - S}{Ws}$
S = including stoppage
Ws = without stoppage
$\Rightarrow \frac{90-75}{90}$ hr = $\frac{1}{6} \times 60 = 10$ min.

Sol.24.(b) According to the question,
Circumference of the wheel = $2\pi r$
= $2 \times \frac{22}{7} \times 14 = 88$ cm
Therefore, distance travelled by wheel in 10 revolution = 88 × 10 = 880 cm

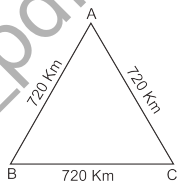
Sol.25.(a) Distance travelled by A in 1 hr
= 25 × 1 = 25 km
Now, the distance between two cars
= 135 - 25 = 110 km
Relative speed between A and B, when running in opposite direction
= 25 + 30 = 55 km/hr
Now, the time taken for them to meet
= $\frac{110}{55}$ = 2 hr
So, they meet 2 hrs after 9 a.m
= 9 + 2 = 11:00 am

Sol.26.(a)
let the speed of the bus be x km/hr
According to question,
Distance travelled by bus in (30 - 20) min.= 10 min. = distance travelled by Z in 20 min.
Distance covered by bus in $\frac{10}{60}$ hour
= distance travelled by Z in $\frac{20}{60}$ hour
$\Rightarrow (\frac{10}{60})x = 25 \times \frac{20}{60}$
$\Rightarrow x = \frac{500}{10} = 50\ km/h.$

Sol.27.(a) Average speed if distance is same = $\frac{2 \times v1 \times v2}{v1 + v2}$
Let distance PQ = QR = RS = d km
Average speed for PR
= $\frac{2 \times 20 \times q}{20 + q} = \frac{280}{11} \Rightarrow$ q = 35 km / h
Average speed for QR = $\frac{2 \times 35 \times r}{35 + r}$
= $\frac{112}{3} \Rightarrow$ r = 40 km / h

Sol.28.(d) Let the time taken for the journey be t hrs
ATQ,
$\Rightarrow \frac{40 \times 35}{40 - 35} \times \frac{15}{60} = t \times 35$
$\Rightarrow \frac{1400}{5 \times 4} = 35t \Rightarrow 70 = 35t$
$\Rightarrow t = \frac{70}{35} = 2$ hrs = 2 × 60 = 120 min

Sol.29.(a) We have been given that A, B and C are vertices of equilateral triangle so AB = BC = CA,
Let the side of triangle = 720 km (LCM of 40, 60, 72)



So average speed =
$\frac{3 \times 720}{\frac{720}{40} + \frac{720}{60} + \frac{720}{72}}$ = 54 km/h

Sol.30.(b) Total distance travelled = 49 km
4 + 5 + 8 + 10 = 27 km
Remaining = 22 km,
Only two possible value of stretches is 10 and 12 which is divisible by 5 and 4 respectively.
Distance covered at 40 km/h
= 4 + 8 + 12 = 24 km
Time taken = $\frac{24}{40} \times 60$ = 36 minutes
Distance covered at 60 km/h
= 5 + 10 + 10 = 25 km
Time taken = $\frac{25}{60} \times 60$ = 25 minutes
Time taken while resting=5 × 6=30 minutes.
Total time = 36 + 25 + 30 = 91 minutes
Required speed = $\frac{49}{91} \times 60 = \frac{420}{13}$
= $32\frac{4}{13}$km/h

Sol.31.(b) Distance traveled in 5 minutes = $3 \times \frac{5}{60} \times 1000$ = 250 m
Diagonal of the cube = $\sqrt{2}a$
According to the question
250m = $\sqrt{2}a$
Then $a^2 = \frac{(250)^2}{(\sqrt{2})^2} = \frac{62500}{2}$ = 31250 m^2

Sol.32.(d) Let, the speed of A = A
Let, the speed of B = B

Search on Telegram @apna_pdf

$\frac{40}{A} - \frac{40}{B} = 2$ ----- (1) and

$\frac{80}{2A} - \frac{80}{B} = \frac{3}{2} \Rightarrow \frac{40}{2A} - \frac{40}{B} = \frac{3}{4}$ ---- (2)

⇒ Equ.{ (1) - (2) }

$\frac{40}{A} - \frac{40}{2A} = \frac{5}{4} \Rightarrow \frac{40}{2A} = \frac{5}{4}$

A = 16 km/h

$\frac{40}{16} - \frac{40}{B} = 2 \Rightarrow \frac{40}{B} = \frac{5}{2} - 2$

B = 80 km/h

Time to travel 120 km/h = $\frac{120}{80} = 1\frac{1}{2}$ hour

Sol.33.(c) ATQ,

Ratio of Time :	Distance(total) :	Speed
Train - 4 h :	28 km	: 7 km/h
Car - 3.5 h :		: 8 km/h

28 km = Lcm of 4, 3.5

Distance covered by train in 30 minutes (by 8 am) = $\frac{1}{2} \times 7 = 3.5$ km

Now remaining distance

= 28 – 3.5 = 24.5 km

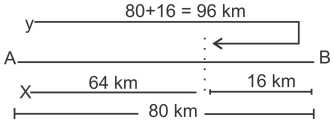
The time, when A and B will meet

= $\frac{24.5}{7+8}$h = $\frac{245}{150} \times 60$ minute= 98 minute

They will meet 8:30 am + 98 minute

= 10:08 am

Sol.34.(d)



Ratio of distance covered by x and y

= 64 : 96 = 2 : 3

So ratio of speed = 2 : 3 _____(time is constant)

Here difference 1 unit corresponds to 4 km/h, then speed of y = 3 units corresponds = 4 × 3 = 12 km/h

Sol.35.(c) Let the speed of Vaibhav = a

Speed of Vignesh = b

a + b = 91 kmph ⇒ a = 91 - b

$\frac{78}{91-b} + \frac{78}{b} = \frac{7}{2}$

$78 \times \frac{(b+91-b)}{b(91-b)} = \frac{7}{2}$

⇒ 2028 = 91b - b^2 ⇒ b^2- 91b + 2028 = 0

⇒ b^2- 52b - 39b + 2028 = 0

⇒ b(b - 52) - 39(b - 52) = 0

⇒ (b - 52) (b - 39) = 0 ⇒ b = 52, 39 (a > b)

⇒ a = 52, b = 39

Sol.36.(d) $\frac{S_1 \times S_2}{S_1 - S_2}$ × time difference

= total distance,(S = speed)

Let speed of train A = s

$\frac{s \times 2s}{s} \times (\frac{9}{5} + \frac{3}{5}) = 360$

$2s \times \frac{12}{5} = 360 \Rightarrow s = 75$

A takes time to travel 360 km = $\frac{360}{75} = \frac{24}{5}$

B takes time to travel 360 km = $\frac{24}{5} - \frac{9}{5}$

= $\frac{15}{5}$ = 3 hours

Speed of B = $\frac{360}{3}$ = 120 km/h

Alternate method : -

Ratio of speed (A) = 1 : 2,

then ratio of time(A) = 2 : 1 _____

(because distance is constant)

Here difference between time is 1 unit

which corresponds to $\frac{9}{5} + \frac{36}{60} = \frac{12}{5}$ hrs

So original time of A = 2 unit = $\frac{24}{5}$ hours

Time taken by B = $\frac{24}{5} - \frac{9}{5}$ = 3 hours

Hence speed of B = $\frac{360}{3}$ = 120 km/h

Sol.37.(d) Distance 140 km is due to the difference in speed of 20 km/h

Time = $\frac{140}{20}$ = 7hr

And total distance = total speed × time

= 160 × 7 = 1120 km

Sol.38.(a) Let speed for going = x

Time for going = $\frac{300}{x}$

Speed for coming = x + 10

Time for coming = $\frac{300}{x} - 5$

According to question

$(x + 10) \times (\frac{300}{x} - 5) = 300$

$300 - 5x + \frac{3000}{x} - 50 = 300$

$3000 = 5x^2 + 50x$

$x^2 + 10x - 600 = 0 \Rightarrow (x + 30)(x - 20) = 0$

x = 20, as speed cannot be negative

Speed for coming = 30

Average speed = $\frac{2ab}{a+b} = \frac{2 \times 20 \times 30}{50}$ = 24

Alternate method:- Let the speed of person while going = xkm/h

Return speed = y km/h

Distance = $\frac{xy}{y-x} \times difference\ of\ time$

$300 = \frac{xy}{10} \times 5 \Rightarrow$ xy = 600

y - x = 10, so y = 30 and x = 20

Now average speed = $\frac{2 \times 20 \times 30}{50}$

= 24 km/h

Sol.39.(a) Average speed of boy

= $\frac{2 \times 32 \times 24}{(32+24)} = \frac{2 \times 32 \times 24}{56} = \frac{8 \times 24}{7}$

Total time taken by delivery boy (10 am to 11:25 am) = 1 hours 25 minutes

Net time = 1 hours 10 minutes = $\frac{7}{6}$ hr.

Total distance = $\frac{8 \times 24}{7} \times \frac{7}{6}$ = 32 km

Sol.40.(d) Let the speed of faster train = x km/h, speed of passenger train = x - 70 km/h ⇒ $\frac{1176}{x-70} - \frac{1176}{x} = 5$

$\Rightarrow \frac{1176x - 1176x + 1176 \times 70}{x(x-70)} = 5$

$\Rightarrow 1176 \times 14 = x^2 - 70x$

$\Rightarrow x^2 - 70x - 16464 = 0$

$\Rightarrow x^2 - 168x + 98x - 16464 = 0$

⇒ x(x - 168) + 98(x - 168) = 0

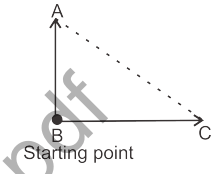
⇒ (x - 168) (x + 98) = 0, So x = 168

Now speed of passenger train

= 168 - 70 = 98 Km/hr

Time taken by train to travel 1176 km distance = $\frac{1176}{98}$ = 12 hours

Sol.41.(d)



AB = $54 \times \frac{5}{18} \times 20$ = 300 m

BC = $72 \times \frac{5}{18} \times 20$ = 400 m

AC = $\sqrt{300^2 + 400^2}$ = 500 m

Sol.42.(c) Distance travelled by first train in 2 hours = 60 × 2 = 120 km

Remaining distance to be travelled

= 280 - 120 = 160

Relative speed of trains after two hours

= 60 + 20 = 80 km/h

Meeting time = $\frac{160}{80}$ = 2 hours

Total time taken by first train to meet the second train = 2 + 2 = 4 hours

Sol.43.(b) Let the speed of the train be T and the speed of the bus be B.

As per question

$\frac{150}{T} + \frac{90}{B} = \frac{7}{2}$.....(1)

$\frac{100}{T} + \frac{140}{B} = \frac{11}{3}$.....(2)

On multiplying eq 1 by 14 and eq 2 by 9 and then subtracting, we get

$\frac{2100 - 900}{T} = 16$

⇒ T = $\frac{1200}{16} = \frac{600}{8}$ = 75 km/hr

Sol.44.(d) Let the length of train A = L

⇒ the length of train B = 3L

Relative speed of the trains

= (50 + 58) km/h

According to the question

$\frac{3L}{(50+58) \times \frac{5}{18}} = 15$

⇒ 3L = 15 × 30 ⇒ L = 150 m

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.45.(d) 50% = $\frac{1}{2}$

	Car	:	Train
Speed →	2	:	3
Time →	3	:	2

According to the question
(3 - 2) unit = 2 hours
2 unit = 2 × 2 = 4 hours
⇒ Speed of train = $\frac{360}{4}$ = 90 km/h

Sol.46.(a) Let PQ = 1 unit ⇒ QR = 2 unit
⇒ PR = 1 + 2 = 3 unit
Average speed of the journey
$= \frac{Total\ distance}{Total\ time} = \frac{3+3}{\frac{1}{\mu}+\frac{2}{3\mu}+\frac{3}{\mu/2}}$
$= \frac{6}{\frac{3+2+18}{3\mu}} = \frac{18\mu}{23}$

Sol.47.(b) Total distance to be covered
= 400 + 1200 + 200 = 1800 metres
Speed of the train = 72 km/h
or 72 × $\frac{5}{18}$ = 20 m/s
Time taken to cover this distance
= $\frac{1800}{20}$ = 90 sec. or 1.5 minutes

Sol.48.(d) The time in which train covered its length and length of the platform = 55 seconds
The time in which Train covered its length = 24 seconds
⇒ Time in which train covered platform = 55 - 24 = 31 seconds
Speed of train = $\frac{360}{24}$ = 15 m/s
Length of platform = 15 × 31 = 465 m

Sol.49.(b) Let the total distance = 80 km
Speed = 80 km/h,
So, total taken time = 1 hour
ATQ, 60 km distance covered in 40 min,
So remaining distance = 20 km
And remaining time = 20 min
So Remaining speed = $\frac{20}{20}$ × 60 = 60 km/h

Sol.50.(c)
The average speed of the journey
$= \frac{2\times s_1\times s_2}{s_1+s_2} = \frac{2\times 12\times 9}{12+9} = \frac{72}{7}$ km/h
, Total time = $2\frac{1}{3}$h
Total distance travelled = $\frac{72}{7}\times\frac{7}{3}$ = 24 km

Sol.51.(b) Let speed of slower train = s and faster train = f
According to the question
f = (s + 25) km/h ⇒ Also $\frac{250}{s} - \frac{300}{f} = 4$
⇒ $\frac{250}{s} - \frac{300}{s+25} = 4$
⇒ $50\{\frac{5(s+25)-6s}{s(s+25)}\} = 4$
⇒ - 50s + (125 × 50) = 4s(s + 25)
⇒ $4s^2$ + 150s - 6250 = 0
⇒ $2s^2$ + 75s - 3125 = 0
⇒ $2s^2$ + 125s - 50s - 3125 = 0
⇒ $2s(s$ + 62.5) - 50(s + 62.5) = 0
⇒ s = 25 km/h and f = s + 25
⇒ 25 + 25 = 50 km/h

Sol.52.(c) We know that, if time taken to cover same distance at speed S_1 is T_1 and time taken at speed S_2 is T_2 then,
$\frac{S_1}{S_2} = \sqrt{\frac{T_2}{T_1}}$
Here S_2= 16.8 km/h, T_1= $\frac{49}{8}$h and T_2= 8h
⇒ $\frac{S_1}{16.8} = \sqrt{\frac{8}{49/8}}$
⇒ S_1= $\frac{8}{7}$ × 16.8 = 19.2 km/h

Sol.53.(a) Let the speed of A and B be a and b respectively,
ATQ: $\frac{15}{a} - \frac{15}{b} = \frac{1}{2}$ ---- (i)
and, $\frac{15}{b} - \frac{15}{2a} = 1$ ---- (ii)
Adding (i) and (ii) $\frac{15}{2a} = \frac{3}{2} \Rightarrow a = 5$
Putting the value of a in eq (i), we get
$3 - \frac{15}{b} = \frac{1}{2} \Rightarrow b = 6\ km/h$
Alternate Method :
Here , Distance is constant , so
Ratio of speed (A) = 1 : 2
Then ratio of time(A) = 2 : 1
Here time difference 1 unit corresponds to $\frac{3}{2}$ hours,
then taken time by A = 2 units = 3 hours
Now time taken by B = 2.5 hours
Hence speed of B = $\frac{15}{2.5}$ = 6 km/h

Sol.54.(d) Initial speed = $\frac{35}{1}$ = 35 kmph
Distance covered in 1st hour = 35
Distance covered in the 2nd hour = 35 + 2 = 37 and so on.
First term = 35
Common difference = 37 - 35 = 2
Number of terms = 12
Total distance covered
= $\frac{12}{2}$ [2(35) + (12 - 1)2] = 552 km

Sol.55.(d) Distance = speed × time
According to the question,
18(t + 12) = 864
t + 12 = 48 ⇒ t = 36 second
Hence, speed of policeman
= $\frac{864}{36}$ = 24 m/sec.

Sol.56.(c) Both trains running towards each other then,
Relative speed = 62 + 46 = 108 km/h
⇒ 108 × $\frac{5}{18}$ = 30 m/sec
Required time = $\frac{148+152}{30}$
= $\frac{300}{30}$ = 10 sec.

Sol.57.(d) Speed ∝ Distance

Ratio →	Policeman	:	Thief
Speed →	6	:	5
Distance →	6	:	5

Now,
(6 - 5) = 1 unit = 150 m
6 units = 150 × 6 = 900 m
Hence, the policeman cover the distance to the thief = 900 m

Sol.58.(d) Speed ∝ $\frac{1}{Time}$

Ratio →	Policeman	:	Thief
Speed →	10	:	8 or 5 : 4
Time →	4	:	5

Now,
(5 - 4) = 1 unit = 15 minutes
4 units = 15 × 4 = 60 minutes
Hence, the policeman catch the thief to the time taken = 60 minutes

Sol.59.(d)
Trains running in opposite direction then,
Relative speed = 45 + 51 = 96km/h
⇒ 96 × $\frac{5}{18}$ = $\frac{80}{3}$ m/sec.
Now, let length of other train be l meter
Then, 21 = $\frac{290+l}{\frac{80}{3}}$
21 = (290 + l) × $\frac{3}{80}$ ⇒ 1680 = 870 + 3l
3l = 810 ⇒ l = 270 meter.

Sol.60.(b)
Speed of the first train = 60 km/h
Speed of the second train = 84 km/h
According to question,
Relative speed = 84 - 60 = 24 km/h
The first train has traveled for 2.5 hours before the second train starts,
So, Distance = 60 × 2.5 = 150 km
Time taken by the second train to cover the distance,
Time = $\frac{150}{24}$ = 6.25 hours
Now,
Distance from station A = 84 × 6.25
= 525 km

Sol.61.(c) Total distance = 8 km/h
Time taken = 1 hr
Now, he covers $\frac{1}{4}$th distance in $\frac{1}{3}$rd of time
Remaining distance = 8 - 8 × $\frac{1}{4}$ = 6 km

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Remaining time = 1 - 1 × $\frac{1}{3}$ = $\frac{2}{3}$ hr.

Hence, required speed = $\frac{6}{\frac{2}{3}}$ = $\frac{18}{2}$

= 9 km/h

Sol.62.(c)
Time taken by police to catch the thief
= $\frac{540}{18}$ = 30 second
Distance covered by police = 540 meter
Let thief runs for t seconds
Then, total distance covered by thief
= 12t
Both covers the same distance, so by equating the distance covered by both
540 = 12t ⇒ t = 45 seconds
Hence, required time = (45 - 30) = 15 seconds.

Sol.63.(b) Let the speed of slow train and fast train be x and y respectively,
According to question,
$\frac{96}{x}$ - $\frac{96}{y}$ = 1 .....(i)
After checking all the options one by one, only option (b) satisfied.
Hence, the speed of slow train = 24 km/h and speed of fast train = 32 km/h

Sol.64.(b)
Average speed = $\frac{Total\ Distance}{Total\ time\ taken}$
= $\frac{5+5}{1+\frac{75}{60}}$ = $\frac{10}{\frac{9}{4}}$
= 10 × $\frac{4}{9}$ = $\frac{40}{9}$ = 4$\frac{4}{9}$ km/h

Sol.65.(b) Relative speed = (4 - 2)
= 2 km/h = 2 × $\frac{5}{18}$ = $\frac{5}{9}$ m/s
Length of train = $\frac{5}{9}$ × 9 × 10 = 50 m
Alternate method:-
According to question,
(S - 4) × $\frac{5}{18}$ × 10 = (S - 2) × $\frac{5}{18}$ × 9
10S - 40 = 9S - 18 ⇒ S = 22 m/s
Now,
Length of the train = (22 - 4) × $\frac{5}{18}$ × 10
= 50 m

Sol.66.(c) Time = $\frac{Distance}{Speed}$
⇒ 5 hr = $\frac{120}{80}$ + $\frac{150}{75}$ + $\frac{130}{x}$
⇒ 5 hr = 1.5 + 2 + $\frac{130}{x}$
⇒ $\frac{130}{x}$ = 5 - 3.5 = 1.5
⇒ x = $\frac{130}{1.5}$ = 86.66 km/h

Sol.67.(c) In 1st hour, distance covered by person at the speed 2km/h = 2 km
In 2nd hour , distance covered by person at the speed of 4 km/h = 4 km
In 3rd hour ,distance covered by person at the speed of 2km/h = 2 km
In 4th hour , distance covered by person at the speed of 4km/h = 4 km
Total distance covered = 2 + 4 + 2 + 4
= 12 km
Total time taken = 1 + 1 + 1 + 1 = 4 hour
Average speed = $\frac{total\ distance}{total\ time}$
= $\frac{12}{4}$ = 3 km/h

Sol.68.(a) Let speed of A and B be x and y respectively,
Relative speed = (x + y) = $\frac{1200}{24}$ = 50
x + y = 50 ---------(i)
when B starts 10 hour before A then,
Distance covered by B in 10 hours = 10y
Now, they are travelling towards each other and time taken 20 hours
So, 10y + 20x + 20y = 1200
20x + 30y = 1200
2x + 3y = 120---------(ii)
By the equation (ii) - 2 × (i) we get;
2x + 3y - 2(x + y) = 120 - 2 × 50
y = 20 km/h
Put y = 20 km/h in eq .(i)
x = 30 km/h
Hence, speed of A and B be 30 km/h and 20 km/h respectively,

Sol.69.(c) When distance is constant then,Time ∝ $\frac{1}{Speed}$
Ratio - Speed - 5 : 3 : 7
Time - $\frac{1}{5}$: $\frac{1}{3}$: $\frac{1}{7}$

Sol.70.(c)
Time taken by A to reach at Y = 4 hour
Time taken by B to reach at X = 6 hour
There are distance is constant then,
Ratio - A : B
Time - 4 : 6
speed - 6 : 4

Distance - 24 : 24
Distance = 24 unit
Relative speed = (6 + 4) = 10 unit
Time taken by them to meet each other = $\frac{24}{10}$ = 2.4 hour
= 2hr + $\frac{4}{10}$ × 60 min. = 2hr + 24 min.
Hence, required time = 9 A.M.+ 2hr + 24 min. = 11:24 A.M.

Sol.71.(b) When time is constant then speed α $distance$
Ratio → train 1 : train 2
Speed → 120 : 80
Distance → 120 : 80
(120 - 80) unit = 60 km or 40 unit = 60 km
Distance between two stations
= (80 + 120) unit = $\frac{60}{40}$ × 200 = 300 km

Sol.72.(c) Relative speed of ramesh
= 25 - 20 = 5 km/h
Time taken by Ramesh to catch Rohan
= $\frac{250}{5 \times \frac{5}{18}}$ = 180 second
Distance travel by Rohan in 180 seconds
= 20 × $\frac{180}{60 \times 60}$ km = 1 km

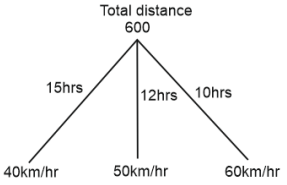
Sol.73.(c) Time taken at 60 km/h
= $\frac{30}{60}$ hours = 0.5 hours
Remaining time = 3 hour - 0.5 hours = 2.5 hours
Speed of cycle = $\frac{20}{2.5}$ km/h = 8 km/h

Sol.74.(b) Let total distance = 3x km
$\frac{x}{40}$ + $\frac{2x}{60}$ = 21 ⇒ $\frac{3x+4x}{120}$ = 21
7x = 21 × 120 ⇒ x = 360 km
Hence, total distance= 3x = 3 × 360
= 1080

Sol.75.(b)
1 km (on map) = 250 km (actual)
6.5 km (on map) = 6.5 × 250 = 1625 km (actual)

Sol.76.(d)
Ratio → Initial : Final
Speed → 8 : 9
Time → 9 : 8
1 unit = 20 minute
9 unit = 9 × 20 = 180 minute

Sol.77.(a)



Average speed of the bus
= $\frac{600 \times 3}{15+12+10}$ = $\frac{1800}{37}$ = 48.65 km/hr

Sol.78.(a) Let the speed of two cars be x km/h and y km/h respectively,
According to the question,
When car travel in the same direction,
(x - y) × 1 = 20
(x - y) = 20 .....(i)
When car travel in the opposite direction,
(x + y) × $\frac{12}{60}$ = 20
(x + y) = 100 .....(ii)
Add the equation (i) and (ii)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$2x = 120 \Rightarrow x = 60$ km/h
Put the value of x in equation (i),
$60 - y = 20 \Rightarrow y = 40$ km/h
Hence, the speed of two cars will be 60 km/h and 40 km/h respectively.

Sol.79.(c) PQ = 72 km
They are meeting at point R, means within same time Akshara travels PR and Siddharth travels PQ + QR,
When time is the same, distance travelled is proportional to speed.
$\frac{PR}{PQ+QR} = \frac{8}{10}$
$\Rightarrow \frac{PQ-RQ}{PQ+QR} = \frac{8}{10}$
$\Rightarrow$ 10PQ - 10RQ = 8PQ + 8QR
$\Rightarrow$ 2PQ = 18RQ
$\Rightarrow$ 2 × 72 = 18RQ $\Rightarrow$ RQ = 8 km
So, the distance between P to R
= PQ - RQ = 72 - 8 = 64 km

Sol.80.(c) Let speed of trains
= x m/s and y m/s
Relative speed , when they run in the same direction = x - y
ATQ,
$\Rightarrow x - y = \frac{150+250}{20}$ = 20m/s ....(i)
Relative speed , when they run in the opposite direction = x + y
$\Rightarrow x + y = \frac{150+250}{5}$ = 80m/s ....(ii)
After solving (i) and (ii) we get ,
x = 50m/s or $50 \times \frac{18}{5}$ = 180km/h
y = 30 m/s or $30 \times \frac{18}{5}$ = 108km/h

Sol.81.(c) Relative speed = 27 - 22
= 5 km/h = $5 \times \frac{5}{18} = \frac{25}{18}$ km/h
Time to cover the initial gap
$= \frac{195}{\frac{25}{18}} = \frac{195 \times 18}{25}$ seconds
Now,
Distance cover by the thief
= speed × time
$= 22 \times \frac{5}{18} \times \frac{195 \times 18}{25} = 22 \times 39$
= 858 m

Sol.82.(b) Let time taken by policeman to catch the thief = t hr
Now , Distance travel by thief = 21t
Distance travel by policemen = 23t
According to question ,
Distance travel by policeman = distance traveled by thief + $\frac{100}{1000}$
$\Rightarrow 23t = 21t + \frac{1}{10} \Rightarrow t = \frac{1}{20}$hr
Distance travel by thief
$= 21 \times \frac{1}{20} \times 1000$ = 1050m

Sol.83.(a) Time taken by train to cross each other $= \frac{132+108}{(32+40) \times \frac{5}{18}}$
$= \frac{240 \times 18}{72 \times 5}$ = 12 sec

Sol.84.(b)
Relative speed = 82 - 64 = 18 km/h
In m/s = $18 \times \frac{5}{18}$ = 5 m/s
Time taken by policeman to catch the thief = $\frac{1300}{5}$ = 260 seconds

Sol.85.(b)
Relative speed = 24 - 8 = 16 km/h
Distance travel by A in 8 hours = 64 km
Time taken by B to Catch A
$= \frac{64}{16}$ = 4 hours
Total Distance travel by A in 12 hours
= 12 × 8 = 96 km

Sol.86.(b)
Time taken by police car to cover 1750 m
$= \frac{1750 \times \frac{1}{1000}}{70} hr = \frac{25}{1000} hr$
Speed of thief = $\frac{1.5}{\frac{25}{1000}} km/h$ = 60 km/h

Sol.87.(d)
Average speed = $\frac{total\ distance}{total\ time}$
Average speed = $\frac{60+90}{\frac{60}{40}+\frac{90}{45}}$
$= \frac{150}{\frac{3}{2}+2} = \frac{300}{7} = 42\frac{6}{7}$km/h

Sol.88.(b) Distance = speed × time
Distance covered by walking
$= 5 \times 3\frac{3}{4}$ km = 18.75 km
Time taken by cycle = 2 hours 10 min.
= 130 min.
Required speed = $\frac{18.75 \times 60}{130}$
$= 8\frac{17}{26}$ km/h

Sol.89.(d)
Average speed = $\frac{total\ distance\ covered}{total\ time\ taken}$
Average speed = $\frac{110+120+60}{\frac{110}{55}+\frac{120}{60}+1}$
$= \frac{290}{5}$ = 58 miles/hour

Sol.90.(b)
Average speed = $\frac{total\ distance\ covered}{total\ time\ taken}$
Ram travels an equal distance
Average speed = $\frac{x+x+x}{\frac{x}{40}+\frac{x}{45}+\frac{x}{60}}$
$= \frac{3x}{\frac{9x+8x+6x}{360}} = \frac{360 \times 3x}{23x}$ = 46.96 km/hr

Sol.91.(d)
Ratio - Usual : After
Speed - 7 : 6
Time - 6 : 7

Time difference (7 - 6) unit = 20 min
So, usual time (6 unit) = 6 × 20
= 120 min = 2 hours.

Sol.92.(a)
Average speed = $\frac{total\ distance}{total\ time}$
Average speed = $\frac{(50+30) \times 60}{(90+15+35)}$
$= \frac{80 \times 60}{140} = \frac{240}{7} = 34\frac{2}{7}$ km/h

Sol.93.(c)
Relative speed = 120 - 90 = 30 km/h
Time taken to caught thief =
$\frac{1.5}{30} = \frac{1}{20}$ hour
1 hour = 120 km
$\frac{1}{20}$ hours $= \frac{120}{1} \times \frac{1}{20}$ = 6 km

Sol.94.(a) Relative speed
= 130 + 158 = 288 km/h or 80 m/s
Time = $\frac{distance}{speed}$
Time = $\frac{310+330+160}{80}$ = 10 seconds

Sol.95.(a) Distance covered by train T1 in 2 hours = 45 × 2 = 90 km
Remaining distance = 300 - 90 = 210 km
Relative speed = 45 + 60 = 105 km/h
Meeting time of the trains after 10 am
$= \frac{210}{105}$ = 2 hours
Required time = 10 + 2 = 12 : 00 p.m.

Sol.96.(c) Distance covered in first 3 hours = 3 × 70 = 210 km
Remaining distance = 240 - 210 = 30 km
Remaining time = 4 - 3 = 1 hour
Required speed = $\frac{30}{1}$ = 30 km/h

Sol.97.(d)
They walking in the opposite direction
Relative speed = $(5\frac{1}{4} + 3) = \frac{33}{4}$ km/h
Time taken when they are 44 km apart from each other = $\frac{44}{\frac{33}{4}} = \frac{16}{3}$ hr.
= 5 hr. + $\frac{1}{3}$ × 60 min.
= 5 hours 20 minutes

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.98.(d) Average speed = $\frac{2xy}{x+y}$

Average speed = $\frac{2 \times 40 \times 20}{40+20}$

= $\frac{1600}{60}$ = $26\frac{2}{3}$ km/h

Sol.99.(b) Distance = 36 × $\frac{85}{60}$ = 51 km

Now, car covers 51 km in 51 minute

Hence, required speed = $\frac{51}{51}$ × 60

= 60 km/h

Sol.100.(b) A girl travel in 1 hour = 9 km
A girl travel in 60 minutes = 9 km
A girl travel in 45 minutes

= $\frac{9}{60}$ × 45 = 6.75 km = 6750 m

So, length of the bridge = 6750 m

Sol.101.(a) Distance = speed × time

Distance = 60 × $\frac{45}{60}$ = 45 km

Required speed = $\frac{45 \times 60}{30}$ = 90 km/h

Sol.102.(d) Average speed

= $\frac{total\ distance}{total\ time}$

= $\frac{90 \times 1 + 120 \times 2}{1+2}$ = $\frac{330}{3}$ = 110 km/hr

Sol.103.(d) Relative speed

= (78 + 30) × $\frac{5}{18}$ = 30 m/sec

So, required time = $\frac{550+350}{30}$

= 30 seconds

Sol.104.(d)
Let the total distance be 240 km
According to question,

Average speed = $\frac{Total\ distance}{total\ time}$

= $\frac{240}{\frac{80}{80}+\frac{80}{60}+\frac{80}{30}}$ = $\frac{240}{1+\frac{4}{3}+\frac{8}{3}}$

= $\frac{240 \times 3}{3+4+8}$ = $\frac{720}{15}$ = 48 km/h

Sol.105.(c) Let distance be x km
According to question,

⇒ $\frac{x}{60}+\frac{x}{75}$ = 6

⇒ $\frac{5x\ +\ 4x}{300}$ = 6

⇒ $9x$ = 1800 ⇒ x = 200 km
Hence, total distance travelled
= 2 × 200 = 400 km

Sol.106.(d) Total distance

= 68 × $\frac{22.5}{60}$ + 72 × $\frac{12}{60}$

= 25.5 + 14.4 = 40 km (approx)

Sol.107.(d) Distance of station

= $\frac{6 \times 8}{8-6} \times \frac{(2+3)}{60}$ = 2 km

Sol.108.(a)
Ratio - thief : police
Speed - 4 : 5
Let the distance between police and thief = x km
Time is constant so,

Time = $\frac{distance}{speed}$

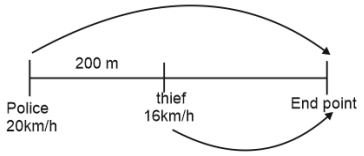
$\frac{6+x}{5}$ = $\frac{6}{4}$ ⇒ x = 1.5 km

Sol.109.(c)
Difference in time = 60 minute = 1 hour

$\frac{D}{3}$ - $\frac{D}{4}$ = 1

4D - 3D = 12 ⇒ D = 12 km

Sol.110.(c)



Distance between police and thief = 200 meter

Relative speed = (20 - 16) × $\frac{5}{18}$

= $\frac{10}{9}$ m/sec

Time taken by police to catch the thief

= $\frac{200}{\frac{10}{9}}$ = 180 second

Time taken by police = time taken by thief

Speed of thief = 16 km/h = 16 × $\frac{5}{18}$ m/sec

Distance travel by thief in 180 second =

180 × 16 × $\frac{5}{18}$ = 800 meter

Sol.111.(d) As we know, Time ∝ $\frac{1}{Speed}$

(when distance is constant)

	Original		New		
Time	16	:	12	= 4	: 3
Speed	3	:	4		

4 - 3 = 1 unit = 20 km/hr
3 unit = 20 × 3 = 60 km/hr
Total distance covered by the car
= 60 × 16 = 960 km

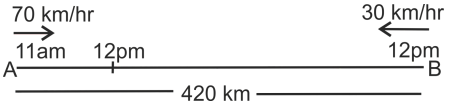
Sol.112.(b) Time ∝ $\frac{1}{Speed}$

(when distance is constant)
Time 4 : 3
Speed 3 : 4

Required % = $\frac{4-3}{3}$ × 100

= $\frac{100}{3}$ = $33\frac{1}{3}$%

Sol.113.(a)



Distance traveled by train towards B in 1 hr(at 12 pm) = 70 × 1 = 70 km
Remaining distance = 420 - 70 = 350 km
Relative speed of train , when travelling towards each other = 70 +30 = 100 km/hr
Time taken to meet each other

= $\frac{350}{100}$ = $\frac{7}{2}$ = 3 hr 30 minute

Required meeting time
= 12 + 3 : 30 = 3 : 30 pm

Sol.114.(d)
Let distance travel by bus = x km
Distance travel by train = (285 - x) km
According to question,

$\frac{x}{40}$ + $\frac{285-x}{55}$ = 6

$\frac{11x+8\ (285-x)}{440}$ = 6

11x + 2280 - 8x = 6 × 440

3x = 2640 - 2280 ⇒ x = $\frac{360}{3}$ = 120 km

Hence, distance travel by train
= 285 - x = 285 - 120 = 165km

Sol.115.(c)

Average speed = $\frac{Total\ distance}{Total\ time}$

= $\frac{20+25+15}{\frac{1}{4}+\frac{1}{4}+\frac{1}{4}}$ = $\frac{60}{\frac{3}{4}}$

= 60 × $\frac{4}{3}$ = 80km/h

Sol.116.(b)

	Car 1		Car 2				
Speed	45	:	55	=	9	:	11
Time	11	:	9				

11 - 9 = 2 unit ---------- 40 min

Then,11 unit ---------- $\frac{40}{2}$ × 11 = 220 min

Length of journey = 45 × $\frac{220}{60}$ = 165 km

Sol.117.(c)
Total distance = 255 + 745 = 1000 m

Speed of train = 72 km/h = 72 × $\frac{5}{18}$

= 20 m/sec

Required time taken to cross the platform = $\frac{1000}{20}$ = 50 sec

Sol.118.(b)

Average speed = $\frac{50+75}{\frac{1}{60}(40+40)}$ = $\frac{125}{\frac{4}{3}}$

= 125 × $\frac{3}{4}$ = $\frac{375}{4}$ = $93\frac{3}{4}$ km/hr

Sol.119.(d) Average speed

= $\frac{total\ distance}{total\ time\ taken}$ = $\frac{12.5+12.5}{(30+20)\times\frac{1}{60}}$

= $\frac{25 \times 6}{5}$ = 30 km/h

Sol.120.(c)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

One way distance = $\frac{S_1 \times S_2}{S_1 + S_2}$ × total time

= $\frac{12 \times 8}{12 + 8} \times \frac{15}{4} = \frac{24}{20} \times 15$ = 18 km

Total distance travelled = 18 × 2 = 36 km

Sol.121.(a) Average speed

= $\frac{37.5}{90 \times \frac{1}{60}}$ km/h = $\frac{75}{3}$ km/h = 25 km/h

Sol.122.(b)

Average speed = $\frac{total\ distance\ travelled}{total\ time\ taken}$

= $\frac{11 + 25 + 30}{\frac{11}{7} + \frac{25}{10} + \frac{30}{20}} = \frac{66}{\frac{11}{7} + \frac{5}{2} + \frac{3}{2}}$

= $\frac{66}{\frac{22 + 35 + 21}{14}} = \frac{66 \times 14}{78}$

= $\frac{11 \times 14}{13} = \frac{154}{13} = 11\frac{11}{13}$ km/h

Sol.123.(d)

Average speed = $\frac{total\ distance\ travelled}{total\ time\ taken}$

= $\frac{1200 + 1600 + 1000 + 200}{\frac{1200}{80} + \frac{1600}{40} + \frac{1000}{400} + \frac{200}{50}}$

= $\frac{4000}{15 + 40 + 2.5 + 4}$

= $\frac{4000}{61.5}$ = 65.04 km/h

Sol.124.(b)

Distance travelled by P in 2 hour = 50 km

Remaining distance = 275 - 50 = 225

Time taken to meet = $\frac{225}{25 + 20} = \frac{225}{45}$

= 5 hours

Hence, they will meet at 5:00 (12 noon + 5 hrs) pm.

Sol.125.(c) Speed of train = $\frac{850}{45}$m/s

In km/h = $\frac{850}{45} \times \frac{18}{5}$ = 34 × 2

= 68 km/h

Hence, distance cover by train in 1 hour = 68 km

Sol.126.(a)

Average speed = $\frac{total\ distance}{total\ time}$

= $\frac{72 + 28 + 160}{\frac{72}{45} + \frac{28}{4} + \frac{160}{20}} = \frac{260}{1.6 + 7 + 8}$

= $\frac{260}{16.6}$ = 15.66

Sol.127.(b) Length of faster train = relative speed of train × time taken to cross man in slower train

= (60 - 42) × $\frac{5}{18}$ × 36

= 18 × $\frac{5}{18}$× 36 = 180 m

Sol.128.(a)

Average speed = $\frac{total\ distance\ travelled}{total\ time\ taken}$

40 = $\frac{60 + 20 + 20}{\frac{40}{60} + \frac{50}{60} + \frac{20}{x}}$

⇒ 40 = $\frac{100}{\frac{4x + 5x + 120}{6x}}$

⇒ 40 = $\frac{100 \times 6x}{4x + 5x + 120}$

⇒ 4x + 5x + 120 = 15x

⇒ 15x - 9x = 120

⇒ 6x = 120 ⇒ x = 20 km/h

Sol.129.(c) Time = $\frac{length\ of\ (first\ train + second\ train)}{(sum\ of\ speed) \times \frac{5}{18}}$

$y = \frac{320 + 240}{(44 + 56.8) \times \frac{5}{18}}$

⇒ $y = \frac{560}{100.8 \times \frac{5}{18}}$

= $\frac{560}{5.6 \times 5}$ = 20 seconds

Sol.130.(d) When same distance travel with different speed,

Average speed = $\frac{2 \times s_1 \times s_2}{s_1 + s_2}$

= $\frac{2 \times 90 \times 65}{90 + 65} = \frac{11700}{155}$ = 75.48

Sol.131.(b)

Speed of train + speed of person = $\frac{234}{6}$

Speed of train + 9 × $\frac{5}{18}$ = 39

Speed of train = 36.5 m/s

Time taken by train to pass another person = $\frac{234}{36.5 - 23.4 \times \frac{5}{18}}$

= $\frac{234}{36.5 - 6.5} = \frac{234}{30}$ = 7.8 seconds

Sol.132.(b) Length of train P = 110 m

Length of Train Q = 140 m

Speed of train P = 70 km/h

Time taken by train P to cross Train Q = 5 seconds

Let the speed of train Q = x km/h

Relative speed in opposite direction = (70 + x) km/h

Formula used: speed = $\frac{Distance}{Time}$

(70 + x) = $\frac{(110 + 140)}{5} \times \frac{18}{5}$ km/h

(70 + x) = $\frac{250}{5} \times \frac{18}{5}$ km/h

(70 + x) = 180 km/h

x = 180 - 70 = 110 km/h

Sol.133.(c) Since, the student stops for 10 minutes in his whole journey. Then, time taken by him = 60 - 10 = 50 minutes

Average speed = $\frac{total\ distance\ covered}{total\ time\ taken}$

= $\frac{5}{\frac{50}{60}}$ = 5 × $\frac{60}{50}$ = 6 km/hr

Sol.134.(b)

Distance travel = speed × Time

= 60 × 3 = 180 km

Time taken to cover 180 km at 40 km/h

= $\frac{180}{40}$ = 4.5 hours = 4 hour 30 min

Sol.135.(d) Let the distance be 120 km i.e. LCM of (60, 40)

average speed = $\frac{120 \times 2}{\frac{120}{60} + \frac{120}{40}} = \frac{240}{2+3}$

= $\frac{240}{5}$ = 48 km/hr

Sol.136.(b) Distance

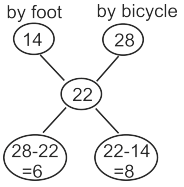
= (3 + $\frac{200}{1000}$)km = 3 + 0.2 = 3.2 km

Time = 25 min = $\frac{25}{60} = \frac{5}{12}$ hr

Speed = $\frac{3.2 \times 12}{5} = \frac{38.4}{5}$ = 7.68 km/hr

Sol.137.(c) If he travelled all the time on foot = 2 × 7 = 14 km

And if he travelled all the time by bicycle = 4 × 7 = 28 km



Hence, time taken = 6 + 8 = 14 unit = 7 hrs

⇒ time taken by foot = 3 hrs

And time taken by bicycle = 4 hrs

Now, distance travelled on foot = 3 × 2 = 6 km.

Sol.138.(d)

Let the total distance = 12 (LCM of 2,3,4)

Average speed = $\frac{Total\ distance}{Total\ time}$

Then,

First Time = $\frac{12}{2}$ = 6 hrs

Second time = $\frac{12}{3}$ = 4 hrs

Third time = $\frac{12}{4}$ = 3 hrs

Hence,

Average speed = $\frac{12 + 12 + 12}{6 + 4 + 3}$

= $\frac{36}{13}$ = 2.76 ≈ 2.77 km/hrs

Sol.139.(c)

Let the length of the train = l meter

A train passes a 500 m long platform in 12 seconds

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

⇒ speed of train = $\frac{l+500}{12}$ m/s

train crossed the man in 4 second

Hence, speed of train = $\frac{l}{4}$ m/s

$\frac{l+500}{12} = \frac{l}{4}$ ⇒ $4l + 2000 = 12l$

⇒ $8\,l = 2000$ ⇒ $l = 250$ meter

Now, speed of train = $\frac{250}{4}$ m/s

⇒ S = $\frac{250}{4} \times \frac{18}{5}$ = 225 km/hr

Sol.140.(c) Distance = 500m
Speed of thief = 12 km/hr
Speed of policeman = 13 km/hr
⇒ Relative speed = (13 -12) km/hr

= 1 km/hr = $\frac{5}{18}$ m /sec.

distance between them after 12 minutes

= 500 - $\frac{5}{18}$ × 12 × 60

= 500 - 200 = 300 m.

Sol.141.(c)

Average Speed = $\frac{Total\ distance}{Total\ Time}$

⇒ Total Distance = 45 × 2 + 50 × 2.5 + 60 × 3 + 70 × 2 + 80 × 2.5

⇒ Total Distance = 90 + 125 + 180 + 140 + 200 = 735

And total time = 2 + 2.5 + 3 + 2 + 2.5 = 12

Hence,

Average speed = $\frac{735}{12}$ = 61.25 km/hr

Sol.142.(c) We know that,

⇒ $\frac{S1}{S2} = \sqrt{\frac{T2}{T1}}$ ⇒ $\frac{56}{S2} = \sqrt{\frac{16}{9}} = \frac{4}{3}$

⇒ $S_2 = \frac{56 \times 3}{4}$ = 42 km/hr

Sol.143.(b) ATQ,

$((\frac{4}{5}n + 50) \times \frac{3}{5}) + 10 = 520$

$((\frac{4}{5}n + 50) \times \frac{3}{5}) = 510$

$(\frac{4}{5}n + 50) = 850$ ⇒ $\frac{4}{5}n = 800$

$n = 800 \times \frac{5}{4} = 1000$

Sol.144.(b)

Average speed = $\frac{40 \times 4 + 50 \times 3}{4+3+1}$

= $\frac{160+150}{8} = \frac{310}{8}$ = 38.75 km/hr

Sol.145.(a)

Required distance = $\frac{8 \times 2}{8+2} \times 4$

= $\frac{16 \times 4}{10} = \frac{64}{10}$ = 6.4 km

Sol.146.(a) Required distance covered by car in 1 litre of petrol = $\frac{45.6}{2.4}$ = 19 km

Sol.147.(c) Let the length of train be x

Speed of train = $\frac{x}{12}$ m/sec

Also, $(x+108) = \frac{x}{12} \times 36 = 3x$

$x + 108 = 3x$ ⇒ $2x = 108$ ⇒ $x = 54$

So, the speed of train = $\frac{54}{12} \times \frac{18}{5} = \frac{81}{5}$

= 16.2 km/hr

Sol.148.(d)
Total length = 350 + 1250 = 1600 m

Speed of train = $\frac{1600}{80}$ = 20 m/sec

= 20 × $\frac{18}{5}$ = 72 km/hr

Sol.149.(b) Speed ∝ Distance (When time is constant)

	P	:	Q
Speed →	75	:	100 = 3 : 4
Distance →	3	:	4

Now, (4 - 3) = 1 unit = 50 km
Then, (3 + 4) = 7 unit = 7 × 50 = 350 km
So, the distance between two stations = 350 km

Sol.150.(c)
Let the length of each train be x meter

Speed of train 1 = $\frac{x}{10}$ m/sec

Speed of train 2 = $\frac{x}{20}$ m/sec

Relative speed of train when moving in same direction = $\frac{x}{10} - \frac{x}{20} = \frac{x}{20}$

According to question

$\frac{x}{20} \times t = 2x$ ⇒ t = 40 sec

Hence, they take 40 sec to cross each other.

Sol.151.(c) Average speed

= $\frac{45+80+6}{\frac{45}{15}+\frac{80}{40}+\frac{6}{2}} = \frac{131}{3+2+3} = \frac{131}{8}$

= 16.38 km/hr

Sol.152.(b) Let the speed of thief be x and the driving speed of police be y
ATQ,

(60 - x) × $\frac{15}{60}$ = D ---------- (1)

(45 - x) × $\frac{1}{2}$ = D ---------- (2)

(y - x) × $\frac{10}{60}$ = D ---------- (3)

From eqn(1) and (2), we get ;

(60 - x) × $\frac{15}{60}$ = (45 - x) × $\frac{1}{2}$

$\frac{(60-x)}{4} = \frac{(45-x)}{2}$

60 - x = 90 - 2x ⇒ x = 30

Now, D = (60 - 30) × $\frac{15}{60} = \frac{15}{2}$

From eqn(3) , we get ;

(y - x) × $\frac{10}{60}$ = D

(y - 30) × $\frac{1}{6} = \frac{15}{2}$

y - 30 = 45 ⇒ y = 45 + 30 = 75 km/hr

Sol.153.(c)

Speed = $\frac{Distance}{Time} = \frac{1200}{30}$ = 40 km /hrs

= 40 × $\frac{5}{18}$ = $11\frac{1}{9}$ m/s

Sol.154.(c) We know

Average speed (S) = $\frac{total\ distance}{total\ time}$

S = $\frac{70+60}{40+30} = \frac{130\ km}{70\ minutes} = \frac{130\ km}{\frac{70}{60}\ hrs}$

= $\frac{130 \times 6}{7}$ ⇒ $\frac{780}{7} = 111\frac{3}{7}$ km/h

Sol.155.(b) Time taken by Veena from place A to place B = 8 hours
Time taken by Karmesh from place B to place A = 7 hours
Let total distance = 56 km
⇒ speed of Veena = 7 km/hr
And speed of Karmesh = 8 km/hr
Distance covered by Veena before = 7 × 2 = 14 km
Remaining distance = 56 - 14 = 42 km
And relative speed = 7 + 8 = 15 km/hr
⇒ Karmesh and Veena will meet after

= $\frac{42}{15}$ = 2 : 48 hrs

⇒ They will meet at 10 + 2 : 48 = 12 : 48 pm.

Sol.156.(d) Given
Distance = 400 km
Speed = 50 km /hr ⇒ time = 8 hrs
First she covered = 200km
Time = 2 hrs ⇒ speed = 100 km /hr
Then, Speed = 50 km/hr
Time = 1 hr ⇒ distance = 50 km
Now, remaining distance = 400 - 250 = 150 km
Remaining time = 8 - 3 = 5 hrs

⇒ required speed = $\frac{150}{5}$ = 30 km/hr

Sol.157.(c) Let P's initial speed = x km/hr
After every hour he doubles his speed
Hence total speed
= $x + 2x + 4x + 8x + 16x = 31x$
Fifth hour speed = $16x$
⇒ $16x$ = 128 km/hr ⇒ x = 8 km/hr
Hence total speed = 31 × 8 = 248 km/hr

⇒ Average speed = $\frac{248}{5}$ = 49.6 km/hr

Sol.158.(d)
Time taken by first train = 4 hours
Time taken by second train = 3 : 30 hours

= $\frac{7}{2}$ hours

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Let total distance = 28 km
⇒ speed of first train = 7 km/hr
Speed of second train = 8 km/hr
Relative speed = 7 + 8 = 15 km/hr
Since second train leaves after two hours of first
Distance covered by first train in 2 hours = 7 × 2 = 14 km
Remaining distance = 28 -14 = 14 km
⇒ time taken to cross each other
= $\frac{14}{15}$ hrs
Total time taken = 2 + $\frac{14}{15}$
= 2 hrs 56 minutes
⇒ they will meet at 6:56 A.M.

Sol.159.(c)
Average speed of truck = $\frac{total\ distance}{total\ time}$
= $\frac{75+33}{1+1}$ = $\frac{108}{2}$ = 54 km/hr

Sol.160.(d)
Let the total distance be 500 km

Distance →	200	300
Speed →	40	60

Average speed = $\frac{200+300}{\frac{200}{40}+\frac{300}{60}}$ = $\frac{500}{5+5}$
= $\frac{500}{10}$ = 50 km/hr

Sol.161.(b)
Let the length of total journey = 800 km
Time taken to cover $\frac{1}{4}th$ journey
= $\frac{200}{25}$ = 8 hrs
Time taken to cover $\frac{1}{2}th$ journey
= $\frac{400}{40}$ = 10 hrs
Time taken to cover remaining distance
= $\frac{200}{50}$ = 4 hrs
∴ Average speed of whole journey
= $\frac{800}{8+10+4}$ = $\frac{800}{22}$ = $36\frac{4}{11}$ km/h

Sol.162.(a) Let the total distance of the journey be 360x km
ATQ,
$\frac{120x}{30}$ + $\frac{240x}{40}$ = 12 ⇒ 4x + 6x = 12
10x = 12 ⇒ x = $\frac{12}{10}$ = 1.2
So, the total distance of the journey
= 360 × 1.2 = 432 km

Sol.163.(a) Average speed = $\frac{2\,S1\,S2}{S1+S2}$
= $\frac{2\times36\times60}{36+60}$ = 45 km/hr

Sol.164.(b) Time taken to catch the thief
= $\frac{288}{42-30}$ = 24 $minutes.$

Sol.165.(b) According to the question,
Let the speed of the car in first 45 min.
= x km/h
Average speed = $\frac{total\ distance}{total\ time}$
73 = $\frac{x\times\frac{45}{60}+85\times\frac{75}{60}+70\times3}{5}$
365 = $x\times\frac{3}{4}$ + 85 × $\frac{5}{4}$ + 210
365 = $\frac{3x+425+840}{4}$
1460 = 3x + 1265
x = $\frac{1460-1265}{3}$ = 65 km/h

Sol.166.(a) According to the question,
Let the initial speed be x
$\frac{1000}{x-75}$ - $\frac{1000}{x}$ = 3
$\frac{1000(x-x+75)}{(x-75)(x)}$ = 3
75000 = $3x^2-225x$
$x^2-75x-25000$
$x^2-(200-125)x-25000$
x = 200, x = −125
So the original duration of the travel
= $\frac{1000}{200}$ = 5 hours

Sol.167.(b) According to the question,
Ratio of their speeds = $\frac{1}{12}:\frac{1}{15}:\frac{1}{10}$
= 5 : 4 : 6

Sol.168.(d) Jimmy covers half of the journey in $\frac{3}{4}th$ of the time
So, jimmy covers $\frac{1}{2}$ × 88 = 44 km in $\frac{3}{4}$ × 16 = 12 hours
Then, remaining distance = 44 km
Remaining time = 4 hours
Hence, required speed = $\frac{44}{4}$ = 11 km/h

Sol.169.(b) We know that if the distance is constant then speed ratio is inversely proportional to time ratio.

		Usual		final
Speed	→	4	:	1
Time	→	1	:	4

Difference between the time →
3 unit = 45 min
Usual time to cover the same distance →
1unit = 15 min

Sol.170.(b)
Relative speed = 12 km - 10 km = 2 km
In extra 30 minutes, distance covered by the thief = 5 km
Now, time taken by the police to catch the thief = $\frac{5}{2}$ = 2.5 hr
Required time = 8 : 00 PM + 2 hr 30 min
= 10 : 30 PM

Sol.171.(a) Let the speed of soma be x and Julie x + 4
According to the question,
Relative speed = x + (x + 4) = 2x + 4
Distance covered in 4 hours = 4(2x + 4)
4(2x + 4) = 40
x = $\frac{40-16}{8}$ = 3
So the speed of julie and soma will be 7 and 3 km/h respectively.

Sol.172.(b) Let the speeds of slow train and fast train x and x + 10 respectively
According to the question,
$\frac{150}{x}$ - $\frac{150}{x+10}$ = $\frac{3}{4}$
With the help of the option let the value of slow train 40 km/h.
Now,
$\frac{150}{40}-\frac{150}{40+10}$ = $\frac{3}{4}$
$\frac{15}{4}-3$ = $\frac{3}{4}$ (satisfied)
So the speed of slow train be 40 km/h

Sol.173.(a) Average speed
= $\frac{total\ distance}{total\ time}$ = $\frac{3\times60+4\times60}{3+1+4}$
= $\frac{420}{8}$ = 52.5 km/h

Sol.174.(a) According to the question,
Relative speed = 12 - 7 = 5 m/s
Required time = $\frac{110+85}{5}$ = 39 sec.

Sol.175.(c) According to the question,
LCM of 77 and 88 = 616
So the required answer will be 616 cm

Sol.176.(c)
Let the distance between A and B is d km
According the question,
$\frac{d}{32}-\frac{d}{40}$ = $\frac{15}{60}$
$\frac{8d}{32\times40}$ = $\frac{1}{4}$ ⇒ d = 40 km

Sol.177.(d)
Total distance = 56 × $\frac{3}{2}$ = 84 km
Required speed = $\frac{84}{7}$ = 12 km/h

Sol.178.(b) Relative speed of the train
= (90 − 80) km/h = 10 km/h
Required distance = 10 × 5 = 50 km

Sol.179.(d) According to the question,
Relative speed = 70 - 52
= 18 km/h or 5 m/s
Required time = $\frac{120+150}{5}$ = 54 sec.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.180.(b) According to the question,
Time taken by bicycle one way
$= \frac{10}{2} = 5$ hours
and time taken by the scooter one way
$= 8\frac{1}{2}$ hr - 5 hr = $3\frac{1}{2}$ hr
required time = $(3\frac{1}{2}) \times 2 = 7$ hours

Sol.181.(a) Relative speed = 9 - 8 = 1 m/s
1 second → 1 meter
2 minute (120 second) = 120 meter
Required distance = 185 - 120 = 65 meter

Sol.182.(a)
Average speed = $\frac{total\ distance}{total\ time}$
Average speed = $\frac{(72 \times 2) + 120}{2 + 1.5} = \frac{264}{3.5}$
= 75.42 (75 km/h approx)

Sol.183.(d) Relative speed
$= (54 - 36) \times \frac{5}{18} = 5$ m/sec
Length of both trains = 48 × 5
= 240 meter
So, length of each train = 120 meter

Sol.184.(d)
Relative speed = 50 + 70 = 120 km/h
Time taken by both trains to meet each other = 1 hr 20 min. = $\frac{4}{3}$ hour
So, required distance = $120 \times \frac{4}{3} = 160$ km

Sol.185.(d) Relative speed =
$(118.8 - 90) \times \frac{5}{18} = 8$ m/sec
Distance between them = 98 meter
So, required time = $\frac{98}{8} = 12\frac{1}{4}$ sec

Sol.186.(c) Let total distance is d km
Average speed = $\frac{total\ distance}{total\ time}$
According to the question,
Average speed = $\frac{d}{\frac{2d}{5 \times 45} + \frac{3d}{5 \times 63}}$
$= \frac{45 \times 63 \times 5}{261} = 54.31 = 54$ km/h

Sol.187.(a)
Relative speed = (128 − 110)
$= 18 \times \frac{5}{18} = 5$m/s
Required time = $\frac{210 + 150}{5} = \frac{360}{5}$
= 72 seconds

Sol.188.(c) Time = $\frac{distance}{speed}$
According to the question,
$\frac{60}{x - y} = 6 \Rightarrow x - y = 10$ ---------(1)
$\frac{60}{x + y} = \frac{3}{2} \Rightarrow x + y = 40$ ---------(2)
With the help of equation (1) and (2) we get;
$x = \frac{10 + 40}{2} = 25$ km/h
And , $y = \frac{40 - 10}{2} = 15$ km/h
Hence,
speed of cars = 25km/h and 15 km/h

Sol.189.(d)
Total time taken by train = 5 hours
Required distance = 140 × 5 = 700 km

Sol.190.(d) Relative speed
$= (60 - 30) \times \frac{5}{18} = \frac{25}{3}$ m/sec
According to the question,
$400 + l_2 = \frac{25}{3} \times 2 \times 60$
Length of train B (l_2)
= 1000 − 400 = 600 meter

Sol.191.(c) According to the question,
Distance covered by thief in 20 min.
$= 8 \times \frac{20}{60} = \frac{8}{3}$ km
Speed = $\frac{distance}{time}$
Speed of police = $\frac{\frac{200}{1000} + \frac{8}{3}}{\frac{20}{60}}$
$= \frac{(600 + 8000)60}{3000 \times 20} = 8.6$ km/h

Sol.192.(d)
Average speed = $\frac{60 \times 6 + 40 \times 6}{6 + 6}$
= 50 miles/hour

Sol.193.(c)
$\frac{2}{3}rd$ of the distance = $7.5 \times \frac{2}{3} = 5$ km
Time taken to cover 5 km distance = $\frac{5}{5}$
= 1 hour
Remaining distance = 2.5 km
Remaining time = 12 minutes = 0.2 hour
So, required speed = $\frac{2.5}{0.2} = 12.5$ km/h

Sol.194.(b)
Let the speed of the smita's x km/h
According to the question,
$\frac{48}{x} + \frac{48}{14 - x} = 28 \Rightarrow \frac{14}{x(14 - x)} = \frac{28}{48}$
$\Rightarrow x^2 - 14x + 24 = 0 \Rightarrow (x - 12)(x - 2) = 0$
$x = 12$ km/h , 2 km/h
But the speed of smita is faster than Pihu's
Therefore $x = 12$ km/h

Sol.195.(a) Let the distance is d km
According to the question,
$\frac{d}{15} + \frac{d}{10} = \frac{5}{2} \Rightarrow \frac{d}{6} = \frac{5}{2} \Rightarrow d = 15$ km

Sol.196.(b) Let , total distance = $2x$ km
$\frac{x}{40} + \frac{x}{60} = 7$ hrs.
$\frac{3x + 2x}{120} = 7$ hrs. $\Rightarrow x = \frac{840}{5} = 168$ km
Average speed = $\frac{2 \times 168}{7} = 48$ km/hr

Sol.197.(b) Let distance = x km
$\frac{x}{10} + \frac{x}{5} = 1.5 \Rightarrow x = 5$ km

Sol.198.(a)
Total distance = 80 × 5 = 400 km
Required time = $\frac{400}{150} = 2.7$ hours

Sol.199.(b)
Time taken to cover 8 km = $\frac{8}{10} = 48$ min.
Remaining time = 78 − 48 = 30 min.
Required speed = $\frac{(12 - 8) \times 60}{30} = 8$ km/h

Sol.200.(a) Average speed
$= \frac{60 \times 3 + 50 \times 4 + 50 \times 5}{3 + 4 + 5}$
$= \frac{180 + 200 + 250}{12} = 52.5$ km/h

Sol.201.(a) Required distance
$= (63 \times \frac{5}{18}) \times 10 = 7 \times 5 \times 5 = 175$ m

Sol.202.(b)
Relative speed = 80 − 26 = 54 km/h
$54 \times \frac{5}{18} = \frac{L1 + L2}{30}$
L1 + L2 = 15 × 30 = 450 m

Sol.203.(a) Distance travelled by P in 24 min. = $30 \times \frac{24}{60} = 12$ km
Remaining distance = 181 − 12 = 169 km
Their relative speed = 30 + 35 = 65 km/h
Required time = $\frac{169}{65} = 2\frac{3}{5}$ hour or 2 hour and 36 min.
Time when they meet = 8 : 54 AM + 2 hour and 36 min = 11 : 30 AM

Sol.204.(b) D = 125 + 99 = 224 meters
Relative speeds = (40 + 32) km/h
$= 72 \times \frac{5}{18} = 20$ m/s
T = $\frac{224}{20} = 11.2$ seconds

Sol.205.(b)
Total distance = 40 × 7 = 280 km
So, required speed = $\frac{280}{5} = 56$ km/h

Sol.206.(d) Relative speed = (70 + 56) km/h = $126 \times \frac{5}{18} = 35$ m/sec

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Total distance = 320 + 205 = 525 meter

So, required time = $\frac{525}{35}$ = 15 seconds.

Sol.207.(c) According to question,
Distance covered by thief in 1 hour = 57 km
Relative Speed = (76 – 57) = 19 km/hr
Time required to catch the thief
= $\frac{57}{19}$ = 3 hours
Therefore, Required time
= 4 : 00 am + 3hrs. = 7 : 00 a.m.

Sol.208.(c) Jahagir had to cover 90 km distance in 60 min.
Distance covered in 25 min.
= $\frac{15.2 \times 25 \times 60}{1000}$ km
= $\frac{15.2 \times 60}{40} = \frac{912}{40}$ km = 22.8 km
Remaining distance = 90 - 22.8 = 67.2 km
Required speed = $\frac{67.2 \times 1000}{35 \times 60} = \frac{6720}{35 \times 6}$
= 32 m/s

Sol.209.(d)
Relative speed = 50 – 30 = 20 m/ min.
Require time to catch thief = $\frac{225}{20}$
= 11.25 min = 11 minute 15 seconds

Sol.210.(a) In the distance of 7 km :-
Total rest taken by men = 6 × 7 = 42 min.
So, required time = 42 min + $\frac{7}{14}$ hour
= 72 min. = $1\frac{1}{5}$ hours

Sol.211.(c)
Average Speed = $\frac{Total\ Distance}{Total\ Time}$
According to question,
10 = $\frac{(8.5 \times 4) + (20 \times 1.5) + (4 \times y)}{4 + 1.5 + y}$
55 + 10y = 64 + 4y ⇒ y = 1.5 hours

Sol.212.(b) Speed = $\frac{Distance}{Time}$
Speed on day 1 ⇒ $v = \frac{x}{t}$
Speed on day 2
⇒ S = $\frac{2.5x}{0.75t} = \frac{250x}{75t} = \frac{10x}{3t}$ ⇒ S = $\frac{10}{3}v$

Sol.213.(a) Total distance covered by thief in 20 minute = 12 × $\frac{20}{60}$ = 4 metre
According to the question,
(x - 12) × $\frac{20}{60}$ = 4
Speed of security guard (x) = 24 meter/hour

Sol.214.(a) Total drink break taken by ram = 8 × 5 = 40 min.
Time taken to cover 84 km
= $\frac{84}{36} = \frac{21}{9}$ hours = 140 min.
Total time = 140 + 40 = 180 min.

Sol.215.(c)
Distance = 72 × $7\frac{1}{2}$ = 540 km
Final speed = 72 × $\frac{5}{4}$ = 90 km/h
Time = $\frac{540}{90}$ = 6 hr.
Time saved = $7\frac{1}{2} - 6 = 1\frac{1}{2}$ hr.

Sol.216.(d) Distance travelled by train A in 1 hour = 65 × 1= 65 km
Remaining distance = 195 – 65 = 130 km
Their relative speed = 65 + 35 = 100 km/hr.
Time taken to meet = $\frac{130}{100}$
= 1.3 hr or 1 hr. 18 min.
Time at which they meet = 5:00 pm + 1 hr. 18 min. = 6 : 18 pm

Sol.217.(d)
Ratio = $Man_1 : Man_2$
Speed = 9 : 12
Time = 12 : 9

Difference in time (3 units) = 20 min.
Time taken by Man_1 (12 units) = 80 min.
Total distance = 9 × $\frac{80}{60}$ = 12 km

Sol.218.(b)
Speed of bus = $\frac{60}{80} = \frac{3}{4}$ km/min.
According to the question,
Speed of aeroplane
= $\frac{3}{4}$ × 5 = $\frac{15}{4}$ km/min.
So,
Required distance = $\frac{15}{4}$ × 25 = 93.75 km.

Sol.219.(b)
Average speed = $\frac{total\ distance}{total\ time}$
= $\frac{250 + 250}{\frac{250}{75} + \frac{250}{85}} = \frac{500}{\frac{170 + 150}{51}} = \frac{500 \times 51}{320}$
= 79.69km/h

Sol.220.(d) Total distance covered by thief in 6 minute = 2 km
So, policeman covered the total distance in 24 minute = 2000 – 400 = 1600 metre
Now, according to the question,
(x – 20) × $\frac{24}{60} = \frac{1600}{1000}$
Speed of police (x) = 20 + 4 = 24 km/h
Now , total distance covered by policeman to catch the thief = 24 × $\frac{1}{2}$
= 12 km

Sol.221.(c)
Speed ∝ $\frac{1}{Time}$ (As, distance is constant)

	A		B	
Speed ⟶	4	:	6	= 2 : 3
Time ⟶	3	:	2	

(3 - 2) = 1 unit ---------- $\frac{1}{2}$ hr
3 unit ---------- $\frac{3}{2}$ hr
So, the distance travelled by them
= 4 × $\frac{3}{2}$ = 6 km

Sol.222.(d)

	1st person		2nd person
Distance -	4	:	1
Time -	1	:	3
Speed -	4	:	$\frac{1}{3}$ = 12 : 1

Sol.223.(b)
Let the length of first train be x
Then $Speed_1 = \frac{x}{7}$
In second case :- $Speed_2 = \frac{2x}{10} = \frac{x}{5}$
Now , Time require to cross each other
= $\frac{x + 2x}{Speed_1 + Speed_2} = \frac{3x}{\frac{x}{7} + \frac{x}{5}} = \frac{3x \times 35}{12x}$
≈ 9 seconds

Sol.224.(c) Let the Speed of train be x and length of train be y.
According to question,
$(x - 5.85) \times \frac{5}{18} = \frac{y}{11.6}$
$(x - 5.85) \times \frac{5}{18} \times 11.6 = y$ -------- e.q(1)
$(x - 6.3) \times \frac{5}{18} = \frac{y}{11.8}$
$(x - 6.3) \times \frac{5}{18} \times 11.8 = y$ --------- e.q .(2)
Equating the length of train ,
$(x - 5.85) \times \frac{5}{18} \times 11.6$
$= (x - 6.3) \times \frac{5}{18} \times 11.8$
$\frac{(x - 5.85)}{(x - 6.3)} = \frac{11.8}{11.6}$ ⇒ x = 32.4 km/hr.

Sol.225.(d)
Distance covered = 60 × $\frac{50}{60}$ = 50 km
Required speed = $\frac{50 \times 60}{20}$ = 150 km/hr

Sol.226.(b)
Speed of the bus = $\frac{45}{\frac{45}{60}}$ = 60km/h
New speed = 60 – 20 = 40 km/h
Required time = $\frac{45}{40}$ × 60 = 67.5 minutes

Sol.227.(d)
Average speed = $\frac{Total\ distance}{Total\ time\ taken}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Average speed = $\frac{20}{\frac{6}{2}+\frac{(6-2)}{2}} = \frac{20}{5}$

= 4 miles/hour

Sol.228.(a)

Ratio - initial : final

Speed - 8 : 7

Time - 7 : 8

Difference in time = 1 unit

1 unit = 9 min.⇒ 7 units = 9 × 7 = 63 min.

Sol.229.(c)

Average speed = $\frac{total\ distance}{total\ time}$

= $\frac{10+10+30}{\frac{10}{2.5}+\frac{10}{5}+\frac{30}{30}} = \frac{50}{4+2+1}$

= 7.14 km/h

Sol.230.(b) Speed = $\frac{distance}{time}$

Speed of truck = $\frac{540}{9}$ = 60 km/h

Speed of car = 60 + 16 = 76 km/h

Required time = $\frac{540+68}{76}$ = 8 hours

Sol.231.(c) Let the total distance = $100x$

According to the question,

Average speed = $\frac{50x+20x+30x}{\frac{50x}{25}+\frac{20x}{8}+\frac{30x}{18}}$

= $\frac{100x}{2x+2.5x+\frac{5x}{3}}$

= $\frac{100x}{\frac{6x+7.5x+5x}{3}} = \frac{300x}{18.5x} = \frac{600}{37}$ km/h

Sol.232.(c) Average speed = $\frac{2xy}{x+y}$

Let the returning speed = y km/h

$\frac{660}{17} = \frac{2\times 55\times y}{55+y}$ ⇒ 330 + 6y = 17y

Returning speed (y) = $\frac{330}{11}$ = 30 km/h

Sol.233.(c)

Total distance = 650 + 650 = 1300 km

Total time = 1.5 + 2.5 = 4 hour

So, average speed = $\frac{total\ distance}{total\ time}$

= $\frac{1300}{4}$ = 325 kmph

Sol.234.(b) Distance covered by 1st train in 1 hours = 40 km

Remaining distance = 230 − 40 = 190

Remaining distance covered by both trains,

Time = $\frac{190}{40+55}$ = 2 hours

Meeting time = 5 a.m + 2 hours = 7 a.m

Sol.235.(a) Formula used :-

distance = $\frac{S_1\times S_2}{S_1-S_2}\times \Delta t$(difference of time)

Distance = $\frac{12\times 16}{16-12}\times\frac{(8-(-12))}{60}$

= 16km

Sol.236.(a) Let the Distance be 20 units.

According to question,

Average Speed = $\frac{20}{\frac{10}{60}+(\frac{4}{12}+\frac{6}{18})}$

= $\frac{20}{\frac{1}{6}+(\frac{1}{3}+\frac{1}{3})} = \frac{20}{\frac{5}{6}}$ = 24 km/hr

Sol.237.(c) Let the Total distance be $4x$

According to question,

Average Speed

= $\frac{4x}{\frac{x}{140}+\frac{x}{70}+\frac{x}{35}+\frac{x}{17.5}} = \frac{4x}{\frac{3x}{28}}$

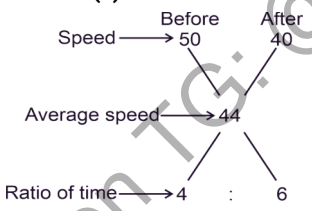
= $\frac{112}{3}$ km/hr

Sol.238.(d) When time is constant then the ratio of distance equal to the ratio of speed,

So distance covered by Krish and bus will be = 1 : 3

3 units = 4.8 km Distance covered by Krish (1 unit) = $\frac{4.8}{3}$ × 1 = 1.6 km

Sol.239.(c)



Ratio = 2 : 3 ⇒ 2 units = 2 hours

So, 3 units = 3 hours

Sol.240.(b) Let the distance be $4x$.

According to question,

$\frac{x}{5}+\frac{3x}{15}$ = 50 ⇒ $\frac{6x}{15}$ = 50 ⇒ x = 125

Total Distance = $4x$ = 4 × 125 = 500 km

Sol.241.(c) According to question,

Distance between X and Y = 80 × 4

= 320km

Distance between Y and Z

= $\frac{80\times 180}{100}$ × 1 = 144 km

Average Speed = $\frac{320+144}{4+1}$ = 92.8 km/hr

Sol.242.(d)

Let the speed of slower train be x.

Then,

Speed of faster train = (10 + x) km/hr

Now, relative Speed = (10 + x + x) km/hr

According to question,

24 = $\frac{720}{(10+2x)}$ ⇒ 240 + 48x = 720

x = 10 km/hr

Sol.243.(d) Distance covered by train A in 5 hours = 5 × 20 = 100 km

Remaining distance = 600−100 = 500 km

Remaining distance will be covered by both trains.

Time = $\frac{500}{20+60}$ = 6 hours 15 min.

Meeting time = 3 : 00 pm + 5 hours + 6 hours 15 min. = 2 : 15 am

Sol.244.(a)

Let time taken by B to catch up A be x.

According to question,

(20 + x) × 10 = x × 15

200 + 10x = 15x ⇒ x = 40

Required Distance = 40 × 15 = 600 km

Sol.245.(a) According to the question,

When they run in the same direction then their speed will be subtracted.

Now their relative speed will be = 70 − 44

= 26 km/h

Let the length of the fastest train = x

Speed = $\frac{distance}{time}$ ⇒ $\frac{5}{18}$ × 26 = $\frac{x}{72}$

(Length of the fastest train) x = 520 m

Sol.246.(a) According to question,

Average Speed = $\frac{total\ distance}{total\ time\ taken}$

= $\frac{36}{10+8}$ = 2 miles/hr

Sol.247.(a)

Total time taken by train = 7.5 hours

So, required distance = 80 × 7.5 = 600 km

Sol.248.(a) Distance covered by suraj in first 3 hours (till 5 pm) = 3 × 40 = 120 km

Distance covered by Suraj from 5 to 6 pm (in 1 hour) = 30 km

Time to overtake suraj by rahul

= $\frac{120+30}{80-30}$ = 3 hours

Required time = 6 pm + 3 hours

= 9 : 00 pm

Sol.249.(a)

Total distance travelled by car = 60km

Let original speed of the car → x km/h

According to the question,

$\frac{60}{x}-\frac{60}{x+8} = 2$

⇒ $x^2 + 8x - 240 = 0$ -------(1)

By solving (eq .1) → x = 12 and −20

(speed never be in -ve)

Therefore,

the original speed of the car(x) = 12 km/h

Sol.250.(b) Let the usual time and the speed of the car is t and s respectively

According to the question ,

⇒ $\frac{280}{s}-\frac{280}{s-14} = 1$

⇒ $\frac{s-14-s}{s(s-14)} = \frac{1}{280}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\Rightarrow s^2 - 14s + 3920 = 0$ ---- (1)
By solving eq .1 $\Rightarrow$ s = (- 56 and 70)
Speed never be in -ve
Therefore,
usual speed of the car = 70 km/h

Sol.251.(a) Circumference of the wheel (1 revolution) = $\frac{44000}{500}$ = 88 m

$\therefore 2\pi r = 88 \Rightarrow r = \frac{88 \times 7}{2 \times 22}$ = 14 m

Sol.252.(a)

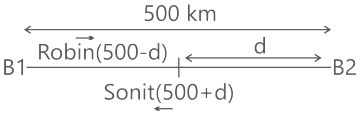
Ram has covered $\frac{3}{5}th$ distance in 3.5 hours then ,

remaining distance = $\frac{2}{5} \times 250$ = 100km

, and remaining time = 6 - 3.5 = 2.5 hr
Therefore, speed required to reach the destination 30 min early = $\frac{100}{2.5 - 0.5}$
= 50 km/h

Sol.253.(d)
According to the question,
Vivek and neeraj meet each other
= $\frac{70 \times 4}{120 - 70}$ = 5 : 36 pm
And Total distance covered by both Neeraj and Vivek between 8 am to 4 pm
= $8 \times 70 + 4 \times 120$
= 560 + 480 = 1040 km
Therefore only statement 1st correct

Sol.254.(c)



Let , the speed of Robin be x km/h , then the speed of Sonit be $(x + 80)$ km/h.
According to the question,
$\frac{500 + D}{x + 80}$ = 6 $\Rightarrow$ D − $6x$ = − 20 .....e.q .(1)
$\frac{500 - D}{x}$ = 6 $\Rightarrow$ D + $6x$ = 500 .....e.q .(2)
On solving e.q .(1) and e.q .(2) , we get
x (speed of robin)= $\frac{130}{3}$ km/ hr.
Distance covered by Sonit in 6 hr.
= $(80 + \frac{130}{3}) \times 6$ = 740 km.
Neither (I) nor (II) are correct.

Sol.255.(c) According to the question, Manoj increase his speed by 2km/h and cycled 15km more
So, 2 km/h → 15km
then , manoj covered actual distance by the speed 10km/h = 75km

Sol.256.(a) According to the question, Ratio of the speed of a train and car = 13 : 10 Then, Ratio of the time taken of a train and car = 10 : 13
train stops for 30 minutes at a station and they reached at point Q at the same time as car reached then, difference between their time (3 unit) = 30min
So, time taken by train (10 unit) = 100 min = $1\frac{2}{3}$ hr Therefore,
speed of train = $\frac{130}{\frac{5}{3}}$ = 78 km/hr

Sol.257.(b) After repairing, the speed of the car = 108 km/hr.
Distance in 3 hours after repairing = 108 × 3 = 324 km
Before repairing, the speed of the car = 72 km/hr.
Required time = $\frac{5 \times 324}{72}$ = 22.5 hr
= 22 hours 30 minutes.

Sol.258.(b) If the distance is equal then the ratio of time is inversely proportional to the speed
Ratio → ram : mohan
Time → 8 : 4
Speed → 1 : 2
1 unit = 10 km/h
Speed of mohan (2 units) = 20 km/h
Sum of their speed(3 units) = 30 km/h
So both I and II is correct

Sol.259.(c)
Ratio → bus : bus + mohit
Time → 50 : 10
Speed → 1 : 5
Speed of Mohit (4 units) = 50km/h
Speed of Bus (1 unit) = 12.5 km/h

Sol.260.(d) Total distance between P and Q = 720 km
Speed of the train = 20 × $\frac{18}{5}$ = 72 km/h
With the stoppage of $\frac{3}{2}$ hour total time taken by the train to reached at Q
= $\frac{720}{72} + \frac{3}{2}$ = $11\frac{1}{2}$,. hour
train leaves P at 6 am then, he reached at Q = (6 am + $11\frac{1}{2}$) = 5 : 30 pm

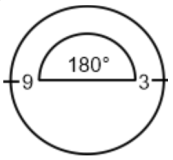
Sol.261.(b) 1 revolution of wheel ($2\pi r$)
= $2 \times \frac{22}{7} \times \frac{7}{2}$ = 22 cm ⇒ 0.22 meter
Total distance covered by cycle
= $36.3 \times \frac{75}{60}$ × 1000 = 45375 meter
therefore , total revolution by the wheel
= $\frac{45375}{0.22}$ = 2,06,250

Sol.262.(d) Distance between A and B = 220 km (at 10:30 AM)
At 12 PM A travel distance = $\frac{40}{1}$ = 40 km
Now distance = 220 − 40 = 180 km
Relative speed = 10 km/hr
Then,time will they meet = $\frac{180}{10}$ = 18hr
= (12 PM + 18 hours) = 6:00 AM

Sol.263.(d)
Speed of 1st train = $\frac{300}{20}$ = 15 m/s
When two trains run in opposite directions then speed will be added.
Let the speed of 2nd train = x
According to the question,
15 + x = $\frac{300 + 300}{25}$ ⇒ x = 9m/s
So the speed of 2nd train = 9m/s

Sol.264.(b) Time taken by train to reached at place T = $\frac{9}{2}hour$
Speed of the train = 40 × $\frac{18}{5}$= 144 km/h
Then, total distance covered by train
=144 × $\frac{9}{2}$ = 648 km

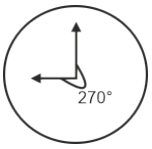
Sol.265.(c)



Length of hour hand clock (r) = 6 inch
Distance covered from 9pm to 3am
= $\frac{180°}{360°} \times 2\pi r = \pi r = 6\pi$ inch

Sol.266.(d)
$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$
Speed = $\frac{distance}{time} = \frac{125y^3 - 1}{(5y - 1)}$
= $(25y^2 + 5y \times 1 + 1^2)$
Speed = $(25y^2 + 5y + 1)$ km/h

Sol.267.(b)



Length of minute hand clock (r) = 2 cm
The minute hand subtends an angle of 360° in 60 minutes.
So angle subtends in 45 minutes
= $\frac{360}{60} \times 45$ = 270°
Distance covered in 45 minutes
= $\frac{270°}{360°} \times 2\pi r = \frac{3}{2}\pi r = 3\pi$ cm

Sol.268.(b) the speed of the First car be 20 km/h and the speed of the second car be 30 km/h Let 't' be the time taken by the second car to complete the journey.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Then time taken by the first car to complete the journey = (1.5 + t + 2.5)hrs.
Now, equating the total distance in both cases, we get :-
30 × t = 20 × (1.5 + t + 2.5) hrs
30t = 80 + 20t ⇒ t = 8 hr
Now, total distance = 30 × t = 30 × 8
= 240 km.

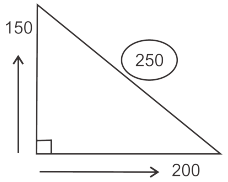
Sol.269.(d) Distance travelled by thief before he discovered = $48 \times \frac{1}{2}$ = 24 km
Now, the relative speed of bike owner and thief = 58 - 48 = 10 km/h
Time taken by bike owner to catch thief
= $\frac{24}{10} = \frac{12}{5}\ hr$ = 2hr 24 min.
Time at which thief caught
= 12 : 30 pm + 30 min + 2hr 24min
= 3 : 24 pm

Sol.270.(d) Policeman is chasing chain snatcher so, relative speed of policeman and chain snatcher = $15 - 5$ = 10 m/s
Chain snatcher visible to policemen at a distance of 500 m.
Time require by policeman to catch chain snatcher = $\frac{500}{10}$ = 50 sec
Distance travelled by chain snatcher in 50 sec = 5 m/s × 50 sec = 250 m

Sol.271.(d) Speed of walking = 5 km/h,
Speed of Jogging = 10 km/h
Speed of Running = 20 km/h
Now, average speed during going to office = $\frac{2 \times 5 \times 10}{15} = \frac{20}{3}$ km/h
Average speed during returning
= $\frac{2 \times 10 \times 20}{30} = \frac{40}{3}$ km/h
Total average speed in the whole journey
= $\frac{2 \times \frac{20}{3} \times \frac{40}{3}}{20} = \frac{80}{9}$ km/h

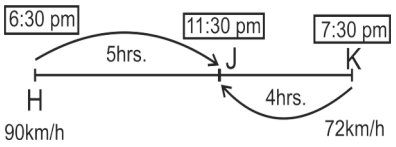
Sol.272.(d)
(a) 20 m/s = 20 × $\frac{18}{5}$ = 72 km/h
(b) time = $\frac{distance}{speed}$
(c) When distance is constant, time is inversely proportional to speed. That is, the lesser the time, the higher the speed.
(d) 99 km/h = 99 × $\frac{5}{18}$ = 27.5 m/s
So we can say that only option (d) is incorrect.

Sol.273.(c)
Speed of 1st tourist bus = 48 km/h
= 48 × $\frac{5}{18}$ m/s = $\frac{40}{3}$ m/s
Distance travelled in 15 seconds = 200 m
Speed of 2nd tourist bus = 36 km/h
= 36 × $\frac{5}{18}$ m/s = 10 m/s
Distance travelled in 15 seconds = 150 m



Triplets (150 , 200 , 250)
Distance between the buses after 15 seconds = 250 m.

Sol.274.(a)



Distance travel by train from H to J at speed of 90 km/h = 90 × 5 = 450 km
Distance travel by train from K to J at speed of 72 km/h = 72 × 4 = 288 km
Required Ratio = 450 : 288 ⇒ 25 : 16

Sol.275.(c) Distance covered by A in 7 jumps is equal to distance covered by B in 5 jumps .
Let the distance be 35 meters.
According to Questions ,
Distance covered by A per jump
= $\frac{35}{7}$ = 5 meters
Distance covered by B per jump
= $\frac{35}{5}$ = 7 meters
Now, A jump 8 times : B jump 6 times
Speed of A = 8 × 5 = 40
Speed of B = 7 × 6 = 42
Required Ratio :- 20 : 21

Sol.276.(b) Let the distance from point A to point C be x
Distance travelled by Menu = x km
Distance travelled by Daya = x + 2(105 -x)
= (210 - x) km
since time taken by menu and daya is equal,
$\frac{x}{10} = \frac{210 - x}{25}$ ⇒ 25x = 2100 - 10x
35x = 2100 ⇒ x = $\frac{2100}{35}$ = 60 km

Sol.277.(b)
Let the speed of thief be 'x' km/hr
Relative speed between thief and police
= (10 - x) km/hr
ATQ, Distance = relative speed × time
$\frac{100}{1000}$ = (10 - x) × $\frac{3}{60}$
= $\frac{60}{30}$ = (10 - x) x = 10 - 2 = 8 km/hr

Sol.278.(a)
Total distance travelled by Students
= (12 + 2 + $\frac{18}{5}$ + 12) km = ($\frac{148}{5}$) km
Total time taken
= (2 + 1 + 1 + $\frac{1}{2}$ + 1 + 3) hr = ($\frac{17}{2}$) hr
Average speed = $\frac{Total\ distance}{Total\ time\ taken}$
= $\frac{(\frac{148}{5})}{(\frac{17}{2})} = \frac{296}{85}$ = (3.48)km/hr

Sol.279.(a) Time taken by Ram = 6 hrs
Time taken by Raju = 10 hrs
The ratio of the speed of Ram and Raju
= 10 : 6 = 5 : 3 (speed ∝ $\frac{1}{time}$)
Relative speed of person when traveling in opposite direction = 5 + 3 = 8 km/hr
Distance covered by both person
= 5 × 6 = 30 km
Time of meeting = $\frac{30}{8}$ = 3 hr 45 min
So, both person will meet each other at 11 : 45 am i.e.(8 + 3:45)

Sol.280.(b) Let the speed of B and length of train A be x km/hr and y m respectively
Relative speed of train when running in same direction = (81 - x) km/hr
Relative speed of train when running in opposite direction = (81 +x) km/hr
ATQ,
(81 - x) × 72 × $\frac{5}{18}$ = (81 + x) × 36 × $\frac{5}{18}$
(81- x) × 20 = (81+ x)10 ⇒ 162 - 2x = 81+ x
⇒ 3x = 81 ⇒ x = $\frac{81}{3}$ = 27 m/sec
Now ,the length of (train A + trainB)
= (81 + 27)10 = 1080 = 600 + y = 1080
y = 1080 - 600 = 480 m

Sol.281.(a) Let the speed of slower and faster train be x and (x + 4) km/hr respectively.
Relative speed of train when running in opposite direction = x + x + 4 = (2x + 4) km/hr ATQ, 2x + 4 = $\frac{400}{10}$ = 40
⇒ 2x = 40 - 4 = 36 ⇒ x = $\frac{36}{2}$ = 18 km/hr
So, the speed of slower train = 18 km/hr

Sol.282.(b) Let the speed of car = x km/hr
Relative speed of car w.r.t. bus
= (x - 42) km/hr
ATQ, $\frac{30 + 60}{3}$ = (x - 42)
⇒ 30 = x - 42 ⇒ x = 72 km/hr

Sol.283.(b) Speed ∝ Distance (when time is constant)
Speed ⇒ 80 : 95 = 16 : 19
Distance ⇒ 16 : 19
Here,
19 - 16 = 3 unit corresponds to 180 km
Then, 35 unit i.e. (16 + 19) corresponds

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

to $\frac{180}{3}$ × 35 = 2100 km

So, the distance between Bangalore and Chennai = 2100 km

Sol.284.(c) Distance between the two station = 120 km

Distance covered by train A in 1 hour(from 8 am to 9 am) = 20 km

Remaining distance = 120 - 20 = 100 km

Relative speed = 20 + 30 = 50 km/h

Time required to meet both the trains

= $\frac{100}{50} = 2\ hr$ ⇒ So, they will meet at

= 8 a.m + 3 hr = 11 : 00 a.m

Sol.285.(a)

Let the speed of car in the third lap be x

ATQ,

50 = $\frac{200 + 162 + 4x}{4 + \frac{162 \times 5}{15 \times 18} + 4}$ ⇒ 50 = $\frac{362 + 4x}{4 + 3 + 4}$

50 = $\frac{362 + 4x}{11}$ ⇒ 550 - 362 = 4x

⇒ x = $\frac{188}{4}$ = 47 km/hr

sol.286.(b) Distance covered by bus for the first $\frac{1}{2}$hr = 100 × $\frac{1}{2}$ = 50 km

Remaining distance = 290 - 50 = 240 km

So, the time taken to travel 240 km distance at speed of 80km/hr = $\frac{240}{80}$ = 3 hrs

Total time taken to cover 290 km distance is (0.5 + 3) hrs = 3.5 hours

Sol.287.(a)

Let the speed of the train be x km/h

$(x - 4)12 = (x - 6)14$

$\Rightarrow 12x - 48 = 14x - 84$

$\Rightarrow 2x = 36 \Rightarrow x = 18$

So, the speed of the train is 18 km/h

Sol.288.(a)

Required time = $\frac{450 + 300 + 300}{(162 + 108) \times \frac{5}{18}}$

= $\frac{1050}{270 \times \frac{5}{18}}$ = $\frac{1050}{75}$ = 14 seconds

Sol.289.(b) Relative speed of thief and policeman = 21 - 20 = 1 km/hr

= 1 × $\frac{5}{18}$ = $\frac{5}{18}$ m/sec

Distance covered by them in 18 sec

= $\frac{5}{18}$ × 18 = 5 m

Since the speed of the thief is more than the policeman , So, the final distance after 18 sec. = 80 + 5 = 85 m

Sol.290.(d) Let the original speed of the bike be x km/h.

ATQ, $\frac{180}{x-8}$ - $\frac{180}{x} = 6$

$\Rightarrow 180x - 180x + 1440 = 6x(x - 8)$

$\Rightarrow 1440 = 6x^2 - 48x \Rightarrow x^2 - 8x - 240 = 0$

$\Rightarrow x^2 - 20x + 12x - 240 = 0$

$\Rightarrow (x - 20)(x + 12) = 0$

$\Rightarrow x = 20, x = -12$

Here we can't take -12 because speed never can be negative.

Hence, the original speed of the bike is 20 km/h

Short trick :-

Distance = $\frac{S_1 \times S_2}{S_1 - S_2}$ × time difference

180 = $\frac{S_1 \times S_2}{8}$ × 6 ⇒ $S_1 \times S_2$ = 240

⇒ $S_1 \times S_2$ = 20 × 12 ⇒ $S_1 - S_2$ = 8

So , S_1 = 20 and S_2 = 12

Hence original speed of bike = 20 km/h

Sol.291.(b) Let the speed of a man for the last 45 minutes be x

Average speed of a man

= $\frac{3 \times 54 + 2.25 \times 68 + 3 \times 90 + 0.75 \times x}{9}$

72 = $\frac{162 + 153 + 270 + 0.75x}{9}$

72 = $\frac{585 + 0.75x}{9}$

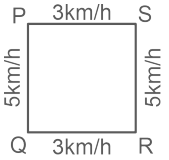
648 = 585 + 0.75x ⇒ 63 = 0.75x

⇒ x = $\frac{63}{0.75}$ = 84 km/hr

Sol.292.(a) Average speed of the whole journey = $\frac{75 \times 4}{2(\frac{75}{5} + \frac{75}{3})}$

= $\frac{300}{2(15 + 25)}$ = $\frac{300}{80}$ = 3$\frac{3}{4}$ km/hr

Short trick :-



PQRS is a square so PQ = QR = RS = SP

Here we can see half of the journey traveled by 3 km/h and rest of the journey travelled by 5 km/h,

Average speed = $\frac{2 \times 3 \times 5}{8}$ = $\frac{15}{4}$

= 3$\frac{3}{4}$ km/h

Sol.293.(c) Distance travelled by thief in 1$\frac{1}{2}$hrs = $\frac{3}{2}$ × 50 = 75 km

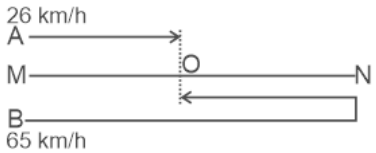
Relative speed of person when travelling in the same direction = 65 - 50 = 15 km/hr

Time taken to catch the thief = $\frac{75}{15}$ = 5 hr

So,

the required distance = 65 × 5 = 325 km

Sol.294.(b)



From above figure we can see that A and B together travelled 2 times of MN

= 2 × 245 = 490 km

Ratio of their speed = 26 : 65 = 2 : 5

So ratio of covered distance = 2 : 5 (because time is constant)

Here total distance 7 units = 490 km

Distance covered by A = MO = 2 units

= 140 km

Required distance = 245 - 140 = 105 km

Sol.295.(b)

Balancing the given ratio, we have :

Bus	:	Train	:	Car
15	:	27	:	
3	:		:	4) × 5

15	:	27	:	20

So, the ratio of the speed of bus, train, car = 15 : 27 : 20

Speed of car = $\frac{720}{9}$ = 80 km/hr which corresponds to 20 unit

So, the speed of train = 27 unit

= $\frac{80}{20}$ × 27 = 108 km/hr

The distance covered by train in 7 hrs

= 108 × 7 = 756 km

Sol.296.(d) According to the question

A traveled in 1 hour = 10km

Now, Distance between them

= 200 - 10 =190 km

Therefore time for meeting

= $\frac{Distance\ between\ them}{effective\ speed}$

= $\frac{190}{10 + 20}$ = $\frac{190}{30}$ = 6 hours 20 min.

So ,Time of meeting,

11.00am + 6 hours 20 min ⇒ $5:20\ p.m$

Sol.297.(c) When distance is constant We know that Ratio of time is inversely proportional to ratio of speed

	P		Q
Time →	8	:	9
Speed →	9	:	8

Let ,Total distance = 72 km

P starts 2 hours earlier than Q

So distance traveled by P in 2 hour = 18 km

Remaining distance between P and Q

72 - 18 = 54 km

Time taken for meeting = $\frac{54}{17}$ hour

distance traveled by P = $\frac{54}{17}$ × 9 + 18

and distance traveled by Q = $\frac{54}{17}$ × 8 ,

Search on TG : @apna_pdf

Search on Telegram @apna_pdf

P : Q

$\Rightarrow \frac{54}{17} \times 9 + 18 : \frac{54}{17} \times 8$

$\Rightarrow 18(\frac{27}{17} + 1) : \frac{54}{17} \times 8 \Rightarrow \frac{44}{17} : \frac{24}{17}$

So ratio of P : Q = 44 : 24

Q : P = 6 : 11

Sol.298.(c) Let speed of Vishu = x km/h
Therefore speed of Ashu = x + 15 km/h
In same direction Effective speed
X + 15 - X = 15 km/h
The meeting time

$= \frac{initial\ distance\ between\ them}{effective\ speed}$

$\Rightarrow 6 = \frac{distance}{15}$

Therefore, Distance = 15 × 6 = 90 km

Sol.299.(c) Let the length of train is, l according to the question,
Speed

$\Rightarrow \frac{l}{18} = \frac{l+650}{44} \Rightarrow 44l = 18l + 11700$

$\Rightarrow 26l = 11700 \Rightarrow l = 450$ m

Short trick :-

Speed of train $= \frac{650}{44-18} = 25$ m/s

Length of train = 25 × 18 = 450 m

Sol.300.(b) Let the distance between the hilltop and foothill be D.

$\frac{D}{3} + \frac{D}{5} = 10, \Rightarrow \frac{8}{15}D = 10$

Distance(D) = 18.75 mi

Sol.301.(b) Let the length of train P be x meter. $\frac{x+200}{15} = 30$ then , $x = 250\ m$

Time taken by train P to cross man= $\frac{250}{15 + \frac{15}{2}} = 11.1 sec$

Sol.302.(d) Let the speed of scooter be $5x\ km/h$ and speed of bus be $6x$ km/h

$\frac{60}{5x} - \frac{60}{6x} = \frac{1}{6} \Rightarrow x = 12$

Then, speed of bus= 6 × 12 = 72 km/h

Sol.303.(d) Length of train T = 2L
Length of platform = 2T = 6L

Speed of train L = $\frac{6L+L}{28} = \frac{7L}{28}$

Time = $\frac{(2L+L) \times 28}{7L} = 12\ sec$

Sol.304.(c)
Let the speed of train = X km/h
According to the question,
Distance is constant
Therefore, ⇒ X × 3 =(X + 10) 2.5
⇒ 3X = 2.5X + 25 ⇒ 0.5X = 25
So, X = 50 km/h

Sol.305.(c) Let the taken time = t hours

ATQ, $\Rightarrow 40 \times t = \frac{t}{2}\{2 \times 30 + (t-1)5\}$

⇒ 80 = 55 + 5t ⇒ t = 5 hours

Sol.306.(c) Number of lines in the document = 8 × 6 × 60 = 2880

Time = $\frac{2880}{15} = 192\ sec$

$= 3\ minutes\ 12\ sec$

Sol.307.(a)
Ratio of speed ($T_1 : T_2$) = 6 : 5
Ratio of time ($T_1 : T_2$) = 5 : 6
Here time difference = 1 unit = 10 min.
So actual time = 5 units = 50 min.

Hence speed of $T_1 = \frac{500}{50} \times 60$

= 600 km/h

Sol.308.(a)

Distance = $\frac{S_1 \times S_2}{S_1 - S_2}$ × time difference

Distance of the entire journey

$= \frac{42 \times 14}{42-14} \times \frac{35}{60} = \frac{42 \times 14 \times 35}{28 \times 60} = \frac{49}{4}$

= 12.25 km

Sol.309.(b) Time $\propto \frac{1}{speed}$
(when distance is constant)
Time = 6 : 9
Speed = 9 : 6 or 3 : 2
(3 - 2) = 1 unit ---------- 13 km/hr
3 unit ---------- 13 × 3 = 39 km/hr
Distance between the two station
= 39 × 6 = 234 km

Sol.310.(d)

Average speed = $\frac{Total\ distance}{total\ time}$,

Average speed = $\frac{75+45}{\frac{75}{45} + \frac{45}{70}}$

$= \frac{120 \times 42}{97} = 51\frac{93}{97}$ km/hr

Sol.311.(d) Let the distance traveled by Ravina and Suhel be 4x and 7x respectively

7x = 63 km (Given) ⇒ x = $\frac{63}{7}$ = 9 km

Required distance = 4x = 4 × 9 = 36 km

Sol.312.(d) Distance traveled by train from A to B at speed of 60 km/hr in 3 hrs = 60 × 3 = 180 km
Distance traveled by train from B to C at speed of 90 km/hr in 2hrs = 90 × 2
= 180 km
Average speed of train from A to C

$= \frac{180+180}{3+2} = \frac{360}{5} = 72$ km/hr

Sol.313.(c)

Speed of Rani = $\frac{475}{60} \times \frac{18}{5} = \frac{57}{2}$ km/hr

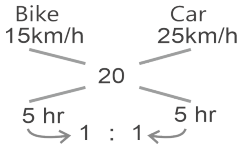
New speed = $\frac{57}{2} \times \frac{12}{10} = 34.2$ km/hr

So, the distance covered by Rani in 1 hr = 34.2 km

Sol.314.(a) Speed of Ram to cover 200 km distance in the entire journey

$= \frac{200}{10} = 20$ km/hr

Speed of bike = 15 km/hr
Speed of car = 25 km/hr
Now, using an alligation method. we have,



Distance covered by bike = 1 × 15= 15 km
Distance covered by car = 1 × 25 = 25 km
So, the required ratio = 15 : 25 or 3 : 5

Sol.315.(d) According to the question,
Average speed of car

$= 1\frac{3}{5}$ × Average speed of bus

So, $\frac{Average\ speed\ of\ car}{Average\ speed\ of\ bus} = \frac{8}{5}$

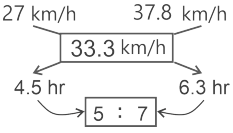
Speed of tractor = $\frac{1150}{23}$ = 50 km/h

So, speed of bus = 2 × Speed of tractor = 2 × 50 = 100 km//h

Speed of car = $\frac{100 \times 8}{5}$ = 160 km/h

Hence, distance covered by car in 4 hrs = 160 × 4 = 640 km

Sol.316.(c)
Speed = 450 m/min or 27 km/h
Speed for the rest of the journey
= 27 × 1.4 = 37.8 km/h
By alligation method,



Ratio of time = 5 : 7
12 unit = 60 min ⇒ 5 unit = 25 min

Distance traveled = 27 × $\frac{25}{60}$ = 11.25 km

Sol.317.(a) Distance covered by Train A in 1 hr (from 3pm to 4pm)
= 83 × 1 = 83 km
Time after which both trains meet

$= \frac{Relative\ Distance}{Relative\ Speed} = \frac{494-83}{83+54}$

$= \frac{411}{137}$ = 3 hrs

Time at which both trains meet
= 4 p.m. + 3 hrs = 7 p.m.

Sol.318.(c)
Initially A takes 3 hour more than B

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

If A double its speed then he take 1 hour less than B
difference between time
= 3 hour + 1 hour = 4 hour
Concept: If distance is fixed then time and speed are inversely proportional For A

	initial	:	final
Speed →	1	:	2
Time →	2	:	1

Difference of time = 1 unit = 4 hour
So initial time = 2 units = 2 × 4 hours
= 8 hours

Sol.319.(b) Let distance = 130 km
Time = $\frac{distance}{speed}$ = $\frac{130}{130}$ = 1 hour
If 75% of distance is covered then 25% of distance remained
25% of 130 is = $\frac{25}{100}$ × 130 = $\frac{130}{4}$km
If $\frac{2}{3}$ of time is over then $\frac{1}{3}$ time is left
$\frac{1}{3}$ of 1 hour = $\frac{1}{3}$ hour
Required speed(x) = $\frac{\frac{130}{4}}{\frac{1}{3}}$ = 97.5
$\frac{x}{2}$ = $\frac{97.5}{2}$ = 48.75 km/h

Sol.320.(d) LCM (40, 50) = 200
Let the distance between A and B be
3 × 200 = 600 km
And distance between B and C be
5 × 200 = 1000 km
Total distance = 1600 km
Total time = $\frac{1600}{40}$ = 40 hours.
Time from B to C = $\frac{1000}{50}$ = 20 hours.
Time from A to B = 40 - 20 = 20 hours.
So, x = $\frac{600}{20}$ = 30 km/h
(x - 10) : (x + 1) = 30 - 10 : 30 + 1 = 20 : 31.

Sol.321.(b) Formula:-
Distance = $\frac{S(S \pm X)}{X}$ × t,
where S is the original speed,
X is the increased or decreased speed and t is the increased or decreased time.
240 = $\frac{S(S-8)}{8}$ ×1 ⇒ 240 × 8 = s^2- 8S
⇒ s^2- 8S - 1920 = 0
(S - 48)(S + 40) = 0 ⇒ S = 48 or S = - 40
Negative value of S not possible so
S = 48
Required time = $\frac{480}{48}$ = 10 hours.

Sol.322.(d)
Let the speed of bus = x km/h
According to the question,
$(75 - x) \times \frac{5}{18} = \frac{80+40}{15}$
$(75 - x) \times \frac{5}{18} = \frac{120}{15}$
$(75 - x) \times \frac{5}{18}$ = 8 ⇒ 75 − x = 28.8
So, x = 46.2 km/h

Sol.323.(c) Speed in (m/s) = $\frac{8\,(2\pi r)}{time\ taken}$
= $\frac{8\,(2 \times \frac{22}{7} \times 7)}{220}$ = $\frac{16}{10}$ m/s
So, Speed in (km/h) = $\frac{16}{10} \times \frac{18}{5} = \frac{144}{25}$

Sol.324.(c)
Let the speed of car x = p km/h
and speed of car y = q km/h
According to the question,
For same direction case,
q − p = $\frac{140}{7}$ = 20 .....(1)
For opposite direction case,
q + p = $\frac{140}{1}$ = 140 .....(2)
On solving equation (1) and (2), we get
q = 80 km/h
So, speed of car y = 80 km/h

Sol.325.(c)
Speed of wind (in m/s) = $\frac{10^5}{10^3}$
= 10^2 = 100 m/s
Required time to travel 1 km = $\frac{1000}{100}$
= 10 seconds

Sol.326.(c)
Earth completes one complete rotation of 360° in 24 hours,
So time taken by earth to cover 135°
= $\frac{135 \times 24}{360}$ = 9 hours
= 9 × 3600 seconds = 32400 seconds

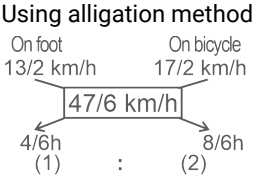
Sol.327.(d) Let speed of B be "b km/h"
Speed of A will be (b + 20) km/h
According to the question,
$\frac{240}{b}$ - $\frac{300}{b+20}$ = 2
⇒ $\frac{240(b+20) - 300b}{b(b+20)}$ = 2
⇒ 4800 - 60b = 2(b^2+20b)
⇒ 2b^2 + 100b - 4800 = 0
⇒ b^2 + 50b - 2400 = 0
⇒ b^2 + 80b - 30b - 2400 =0
⇒ b(b + 80) - 30(b + 80) = 0
⇒ (b - 30)(b + 80) = 0 ⇒ b = 30 or b = - 80
Speed cant be negative so b = 30
Speed of A = b + 20 = 50 km/h

Sol.328.(d)
Let the speed of the car be 8x.
According to question,
8x × x = 450 ⇒ x^2 = $\frac{450}{8}$ = $\frac{225}{4}$
x = $\sqrt{\frac{225}{4}}$ = $\frac{15}{2}$ = 7$\frac{1}{2}$
So, required time = 7$\frac{1}{2}$hours.

Sol.329.(c) Speed in km/h:-
For Outward journey = 5$\frac{5}{9}$ × $\frac{18}{5}$
= $\frac{50}{9}$ × $\frac{18}{5}$ = 20 km/h
For Return journey = 5 × $\frac{18}{5}$ = 18 km/h
According to question,
7$\frac{3}{5}$ = $\frac{x}{20}$ + $\frac{x}{18}$ ⇒ $\frac{38}{5}$ = $\frac{19x}{180}$
x = 72 km/h
So, x + 3 = 72 + 3 = 75 km/h

Sol.330.(c) Let the speed of car and bus be 3x and 2x respectively.
According to the question,
$\frac{3}{2}$ = $\frac{189}{2x}$ − $\frac{189}{3x}$ ⇒ $\frac{3}{2}$ = $\frac{189}{6x}$
x = 21 So, speed of bus
= 2x = 2(21) = 42 km/h
Alternate method:- Difference between time taken by car and bus
= 1 + $\frac{1}{2}$ = $\frac{3}{2}$ hours
Ratio of their speed = 3 : 2
Then ratio of taken time
= 2 : 3 ____(distance is constant)
Here 1 unit = $\frac{3}{2}$ hours
Time taken by bus = 3 units = $\frac{9}{2}$ hours
Speed of bus = $\frac{189}{9}$ × 2 = 42 km/h

Sol.331.(a)
Let the distance travelled on foot = x,
so distance travelled on bicycle = 47 − x
6 = $\frac{x}{\frac{13}{2}}$ + $\frac{47-x}{\frac{17}{2}}$
⇒ 6 = $\frac{2x}{13}$ + $\frac{2(47-x)}{17}$
⇒ 6 = $\frac{2x}{13}$ + $\frac{94-2x}{17}$
⇒ 6 = $\frac{34x + 1222 - 26x}{221}$
⇒ 1326 = 8x + 1222 ⇒ 8x = 104
⇒ x = 13 km
Short trick :-
Using alligation method



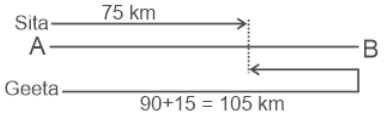
Here 3 unit = 6 hours
So time taken on foot = 1 unit = 2 hours
Hence distance covered on foot
= 2 × $\frac{13}{2}$ = 13 km

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.332.(c) Let original speed = $4x$, so new speed = 75% of $4x$ = $3x$, and original time = p, new time = q
Here the distance is constant.
According to the question,
$4x \times p = 3x \times q \Rightarrow \frac{p}{q} = \frac{3x}{4x} = \frac{3}{4}$
So, required fraction = $\frac{4-3}{3} = \frac{1}{3}$

Sol.333.(d)



Total distance traveled by Sita
= (90 - 15) = 75 km
Total distance traveled by Geeta
= (90 + 15) = 105 km
As time is same for both sita and Geeta, ratio of speed is same as ratio of distance = 75 : 105 = 5 : 7
Here difference of their speed
= 2 units = 3 km/h
Speed of Sita = 5 units = $\frac{3}{2} \times 5$ = 7.5 km/h

Sol.334.(c) Here the distance is constant. So, the speed ratio becomes inversely proportional to the time ratio.
Time ratio of A and B = 12 : (25 – 10)
= 12 : 15 = 4 : 5
So, speed ratio of A and B = 5 : 4
So, speed of B = $\frac{5 \times 4}{5}$ = 4 km/h

Sol.335.(d)
Let the remaining distance = $12x$,
so distance covered = $\frac{5}{12} \times 12x = 5x$
Total distance = $5x + 12x$
= $17x$ and $17x = 51$ so $x = 3$
Speed = $\frac{5x}{1\frac{40}{60}} = \frac{5(3)}{\frac{5}{3}}$ = 9 km/h

Sol.336.(a) Let speed of insect be "y"
Relative speed in same direction
= (y - 4) cm/s ⇒ (y - 4) = $\frac{18}{6}$
y - 4 = 3 ⇒ y = 7 cm/sec

Sol.337.(d) 40% = $\frac{2}{5}$, let initial speed
= 5 units, then increased speed = 7 units

	Initial	:	New
Ratio of speed =	5	:	7
Ratio of time =	7	:	5

Clearly, 2 units of time will cover the delay of 45 minutes.
So, 5 units of time = $\frac{45}{2} \times 5$ minutes
New or increased speed
= $\frac{total\ distance}{new\ time} = \frac{2100 \times 60 \times 2}{45 \times 5}$
= 1120 km.

Sol.338.(a)
speed for the outward journey = x
speed for the return journey = $x + 10$
According to the question,
$\frac{150}{x} - \frac{150}{x+10} = 2.5$
$150x + 1500 - 150x = 2.5x(x + 10)$
$x(x + 10) = 600$ (x will be 20)
Required speed = 20 + 10 = 30 km/h

Sol.339.(c) Distance covered in 75 min at 56 km/h = $\frac{75}{60} \times 56$ = 70 km
Time taken to cover next 90 km at 60 km/h = $\frac{90}{60}$ = 1.5 hour
Required speed = $\frac{Remaining\ Distance}{Remaining\ Time}$
= $\frac{260-(70+90)}{4-(1.5+1.25)} \Rightarrow \frac{100}{1.25}$ = 80 km/h

Sol.340.(d) We convert the entire time to minutes, 2 hour 33 minutes 36 seconds
= $(2 \times 60 + 33 + \frac{36}{60})$ minutes
= $\frac{768}{5}$ minutes.
1 hour 26 minutes 24 seconds
= $(1 \times 60 + 26 + \frac{24}{60})$ min. = $\frac{432}{5}$ min.
We know that $\frac{S_1}{S_2} = \sqrt{\frac{T_2}{T_1}}$
$\Rightarrow \frac{S_1}{S_2} = \sqrt{\frac{\frac{432}{5}}{\frac{768}{5}}} = \sqrt{\frac{144}{256}} = \frac{12}{16}$
So, $S_1 : S_2$ = 12 : 16 = 3 : 4.

Sol.341.(d) 1 km = 10^{12} $nanometres.$
⇒ 384000 km
= 3.84×10^{17} $nanometres.$
Required time
= $\frac{3.84 \times 10^{17}}{3 \times 10^{17}} = 1.28\ seconds.$

Sol.342.(c) Difference between 11 am on sunday and 10 pm on friday
= 5 day 11 hour
So, 1st clock gain 5 min + $\frac{11}{24}$ min
2nd clock lose same time so total loss time for 2nd clock = 10 min + $\frac{11}{12}$ min
So required time = 10 pm - $10\frac{11}{12}$
= 9 hours $49\frac{1}{12}$ min

Sol.343.(b) Speed of A = 1 : 2
Time of A = 2 : 1
(2 - 1) unit = (8 - 3) hours = 5 hours
⇒ 2 unit = 10 hours
Time of B is 8 hours less than A
Time of B = 10 - 8 = 2 hours
Speed of B = $\frac{160}{2}$ = 80 km/h

Sol.344.(b) Let the speed be x then
$\frac{150}{x-10} - \frac{150}{x} = \frac{1}{2} \Rightarrow x^2 - 10x = 3000$
$\Rightarrow x^2 - 10x - 3000 = 0 \Rightarrow (x - 60)(x + 50) = 0$
x = 60 because speed can't be negative
So,
Time taken = $\frac{90}{60-15}$ = 2 hours

Sol.345.(c) Total invested time in travelling = 5 - 1.5 = 3.5hr
Average speed = $\frac{2ab}{a+b}$
= $\frac{2 \times 4.5 \times 6}{10.5} = \frac{36}{7}$ Km/hr
Average speed × total time = total distance ⇒ Distance = $\frac{7}{2} \times \frac{36}{7}$ = 18km
Distance from A to B = $\frac{18}{2}$ = 9Km

Sol.346.(c) Ratio of speed = 5 : 7,
Here 5 units = 60 km/h
So 7 units = 84 km/h
Speed of car Y = 84 kmph
Time taken to meet these cars
= $\frac{216}{60+84} = \frac{3}{2}$ hours = 90 minutes

Sol.347.(b) Time = $\frac{1485}{66} = 22.5\ h$
Actual time to cover the distance =
1 day = 24 hours
Total Halts time = 24 - 22.5 = 1.5 hours
= 90 min
Time taken by train at each junction
= $\frac{90}{5}$ = 18 min

Sol.348.(b) Total distance covered by Atul = $\frac{45}{60} \times 8$ = 6 km
1 round or circumference of park
= $\frac{6000}{15}$ = 400 m
Total distance covered by Sekhar
= 400 × 10 = 4000 m = 4 km
Speed of Sekhar = $\frac{4}{40} \times 60$ = 6 km/h

Sol.349.(d)

Distance travelled by Ajit in first 4 hours(from 9:30 to 1:30)
= 44 × 4 = 176 km
Remaining distance = 416 - 176 = 240 km
Relative speed = 44 + 52 = 96 km/h
Time = $\frac{240}{96}$ = 2.5 hours
1 : 30 + 2.5 hours = 4 pm

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.350.(a) Ratio → A : B
speed → 6 : 5
Time → 5 : 6
Ratio of speed and time after meeting

$\frac{S_2}{S_1} = \sqrt{\frac{T_1}{T_2}}$, ⇒ S_1 (p) = $\frac{25}{36} \times \frac{36}{5}$ = 5 h

Sol.351.(d) Total distance
= $\frac{s_1 \times s_2}{s_1 - s_2}$ × difference between time
According to the question,
= $\frac{3.5 \times 4.5}{4.5 - 3.5} \times \frac{6+10}{60}$ = 4.2 km

Sol.352.(b) Here distance is same
Let actual time taken = x minute
According to question,
60 × (x + 20) = 75 × (x - 44)
x = 300 minute = 5 hours
So, distance (D) = 60 × (x + 20) × $\frac{1}{60}$
= 320 km
Average speed (s) = $\frac{320}{5}$ = 64 km/h
Sum = (D) 320 + (S)64 = 384

Sol.353.(c) Distance = 1800 km
Relative speed = 44 + 46 = 90 km/h
Time = $\frac{1800}{90}$ = 20 hours
Distance travelled by first train
= 20 × 44 = 880 km from A
So, option (C) is the correct answer.

Sol.354.(c) Perimeter of Square = 4 × 75
= 300 meter
⇒ Speed = 6 km/h
Time = $\frac{300}{6 \times \frac{5}{18}}$ = 180 sec or 3 min

Sol.355.(c) Distance covered by train at a speed of 80 km/h in 45 min = 60 km
If speed is increased by 125%, then speed of train = 180 km/h
Time taken by train to cover 8/5 of the same distance
= $\frac{60}{180} \times \frac{8}{5} \times 60 = 32\ min$

Sol.356.(c) Total distance
= $\frac{s_1 \times s_2}{s_1 - s_2}$ × difference between time
= $\frac{10 \times 16}{6} \times \frac{18}{60}$ = 8 km
Time taken when he reached the school
8 min. Late = $\frac{8}{10}$ × 60 = 48 min
Required time = 8 : 20 + (48 - 8) = 9 : 00 am
Alternate method:-
Ratio of speed = 10 : 16 = 5 : 8
Ratio of time = 8 : 5 _____(because distance is constant)
Here difference between time = 3 units = (8 + 10) = 18 min.
So actual taken time = 8 units = 48 min.
Actual taken time to reach the right time = 48 - 8 = 40 min.
Hence required time = 8 : 20 + 40 min.
= 9 : 00 am

Sol.357.(a)
Distance between A and B = 144 km
Let speed of A = a km/h
Speed of B = b km/h
For same direction, meeting time
= 12 hour
⇒ 12 × (a - b) = 144 ...(i)
For opposite direction, meeting time
= $\frac{9}{8} hr$, ⇒ $\frac{9}{8}$ × (a + b) = 144 ...(ii)
We get: 12 × (a - b) = $\frac{9}{8}$ × (a + b)
a : b = 35 : 29 , a = 35x , b = 29x
Put values in (i): 12 × (6x) = 144
x = 2 ⇒ a = 70 km/h
Short trick :-
Let the speed of the first car and second car be x and y respectively.
ATQ, x - y = $\frac{144}{12}$ = 12 km/h
x + y = $\frac{144 \times 8}{9}$ = 128 km/h
On solving this equation, we get
x = 70 km/h, and y = 58 km/h
Hence speed of fasted car = 70 km/h

Sol.358.(d) Speed ∝ $\frac{1}{time}$ ____(when distance is constant)
If time decrease by 25%, i.e. t → 4 : 3
Thus, speed change from 3 : 4
% increase = $33\frac{1}{3}$%

Sol.359.(a) Speed of A = 6 km/h
Speed of B = 8 km/h
Let 'D' be distance between A and B
Time taken by B to cover D distance is 25 minutes less than time taken by A to cover the same distance.
Therefore, $\frac{D}{6} = \frac{D}{8} + \frac{25}{60}$ ⇒ D = 10 km

Sol.360.(c) Speed of car A = 40 km/h
Speed of car B = 50 km/h
Distance travelled by car A in 30 minutes = 20 km
Meeting time = $\frac{20}{50 - 40}$ = 2 hour
Distance travelled by car B in 2 hours
= 50 × 2 = 100 km

Search on TG: @apna_pdf

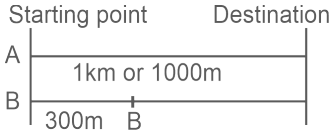
Search on Telegram @apna_pdf

Linear/Circular Race

Important terms used in race :

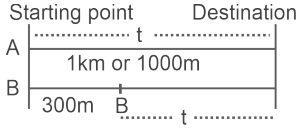
Linear race - it is a straight path such that the starting and finishing point don't coincide with each other.
Circular race - it is a circular path such that the starting and finishing point coincide with each other.
Dead Heat or Dead Lock - A dead heat situation is when all participants reach the finishing point at the same time.
Head-start - when a racer gets a start ahead of the starting point .It is called head start.

Some cases of linear race



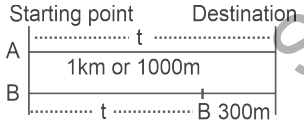
A starts the race from the starting point, whereas, B starts 300 metres ahead of A . To cover a race of 1000 metres in this case, A will have to cover 1000 metres while B will have to cover only (1000 - 300) = 700 metres.

• When the same race ends in a dead heat.



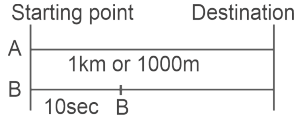
A dead heat situation is when all participants reach the finishing point at the same instant of time.

● In a race of 1 km,A wins over B by 300 meter

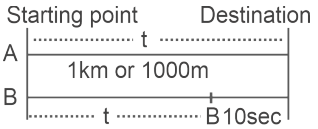


At the same time, A reached the winning point, whereas, B is behind A by 300 m.
To cover a race of 1000 metres in this case , A has covered 1000 metres while B has covered only (1000 - 300) = 700 metres.

● In a race of 1 km,A gives B a start of 10 sec

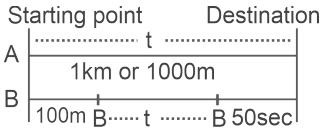


A will start 10 seconds after B starts from the starting point. Both A and B will reach the finishing point at the same time.
● In a race of 1 km, A wins over B by 10 sec



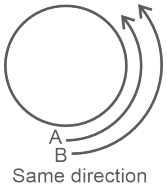
Here, time required by B to finish the race is (t + 10) seconds .

● In a race of 1 km, A gives a start of 100 m to B and still wins over B by 50 sec.



Circular race concepts
● Let A and B be two racers running in a circular path of length of L with speed S_1 and S_2 respectively. (S_1>S_2)

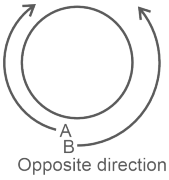
Case 1 : when both racers running in the same direction /



(I) Time taken to meet for the 1st time at the starting point = LCM of $(\frac{L}{S_1}, \frac{L}{S_2})$

(II) Time taken to meet for the 1st time at anywhere on the track = $(\frac{L}{S_1 - S_2})$

Case 2 : when both racers running in the opposite direction /



(I) Time taken to meet for the 1st time at the starting point = LCM of $(\frac{L}{S_1}, \frac{L}{S_2})$

(II) Time taken to meet for the 1st time at anywhere on the track = $(\frac{L}{S_1 + S_2})$

Number of meeting points :
• All the distant meeting points are equidistant in a circular path and the same goes for time.
• It is independent of the length of the track
• To get the no of different meeting points, find the simplest ratio of the two speeds i.e. x : y

Case1 : No. of meeting points when two runners running in same direction = x - y

Case2 : No. of meeting points when two runners running in opposite direction= x + y

Variety Questions

Q.1. M and N walk along a circular track. They start at 5:00 a.m. from the same point in the opposite directions. M and N walk at a speed of 5 rounds per hour and 2 rounds per hour, respectively. How many times will they cross each other before 6.30 a.m. on the same day ?
SSC CGL 12/09/2024 (1st Shift)
(a) 10 (b) 3 (c) 5 (d) 7

Q.2. In a circular path of 619 m, Preeti and Rani start walking in opposite directions from the same point at the speed of 2.85 km/h and 5.4 km/h, respectively. When will they meet for the first time approximately ?
Matriculation Level 20/06/2024 (Shift - 1)
(a) After 4.75 minutes
(b) After 6.05 minutes
(c) After 4.50 minutes
(d) After 6.75 minutes

Q.3. Two friends P and Q simultaneously start running from the same point around a circular track. They run in the same direction. P runs at 6 m/sec and Q runs at b m/sec. If they cross each other at exactly two points on the circular track and b is a natural number less than 6, then how many values can b take ?
SSC CGL 14/07/2023 (3rd shift)
(a) 2 (b) 1 (c) 4 (d) 3

Q.4. In a 150-m race, if R gets a 5-metre head start, then he would beat S by 35 metres. If S gets a 25-metre head start in a 100-metre race, then _____ would win the race by _____ metres.
Graduate Level 20/06/2024 (Shift - 3)
(a) S; 4.44 (b) R; 4.44
(c) R; 5.44 (d) S; 5.44

Q.5. Ram and Shyam are racing along a circular track. The speed of Ram is thrice the speed of Shyam. The length of the circular track is 1440 m. After the start of the race from the same point simultaneously, Ram meets Shyam for the first time at the end of the 8th minute. If Ram and Shyam start the race again from the same starting point simultaneously, then the time taken by Shyam to finish the race is: (given that the length of the race is same as the length of the track)
SSC CGL 26/07/2023 (2nd shift)
(a) 7.5 min (b) 16 min
(c) 30 min (d) 22.5 min

Q.6. In a race, there are 4 members in a team. Each member has to cover 5 km one after another. If the total time taken is 30 minutes, then what would have been the average speed ?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 06/12/2022 (4th Shift)

(a) 50 $\frac{km}{hr}$ (b) 40 $\frac{km}{hr}$

(c) 50 $\frac{m}{sec}$ (d) 40 $\frac{m}{sec}$

Q.7. A and B are running on a circular track of length 1400 metres. The speed of A is 33 m/sec and the speed of B is 47 m/sec. They start from the same point at the same time in the opposite direction. After how much time will they meet for the second time ?

SSC CHSL 17/08/2023 (2nd Shift)

(a) 33 sec (b) 38 sec

(c) 35 sec (d) 32 sec

Q.8. In a 120 metre race, P beats S by 6 metres. If S starts with a head start of 7.5 metres and it is a 100 metre race, then who wins the race and how many metres? (Correct to 2 decimal places)

SSC CHSL 14/08/2023 (3rd Shift)

(a) S, 2.63 (b) P, 3.63

(c) S, 3.63 (d) P, 2.63

Q.9. Savitha and Pranika decided to run a 2250 m long race on a track as long as the length of the race. But Savitha gave Pranika a 396 m head start and also allowed her to start 9 seconds before Savitha started running. Pranika ran at 6 m /per second and Savitha caught up with Pranika 250 seconds after Savitha started running. What was Savitha's speed (in m/s) during the race ?

SSC CHSL 11/08/2023 (4th Shift)

(a) 7.2 (b) 7.8 (c) 8 (d) 7.5

Q.10. Two people A and B started running from the same point on a circular track of length 400 m in opposite directions with initial speeds of 10 m/s and 40 m/s, respectively. Whenever they meet, A's speed doubles and B's speed halves. After what time from the start will they meet for the third time?

SSC CHSL 09/08/2023 (4th Shift)

(a) 30 sec (b) 24 sec

(c) 26 sec (d) 28 sec

Q.11. In a 1000 m race, Arjun, Balaji and Charan are running. Arjun beats Balaji by 100 m, and Balaji beats Charan by 100 m. In the next 1000 m race (the speeds are the same as in the previous), Balaji gives Charan a trail of 100 m, and Arjun gives Balaji a trail of 100 m. Find the distance by which the winner is ahead of the person just behind him.

SSC CGL 13/12/2022 (1st Shift)

(a) 10 m (b) 40 m (c) 30 m (d) 20 m

Q.12. In a 1500 m race, if vehicle P gives vehicle Q a start of 200 m, then vehicle P wins the race by 8 sec. Alternatively, if vehicle P gives vehicle Q a start of 400 m, the race ends in a dead heat. How long does vehicle P take to run 1500 m ?

SSC CGL 07/12/2022 (1st Shift)

(a) 44 sec (b) 45 sec (c) 40sec (d) 60 sec

Q.13. In a circular race of 2500 m, a man and a woman start from a point towards opposite directions with speeds of 37 km/h and 35 km/h, respectively. After how much time from the start of the race will they meet for the first time?

SSC CHSL 02/06/2022(Morning)

(a) 2 min 40 sec (b) 2 min 30 sec

(c) 2 min 5 sec (d) 2 min 20 sec

Q.14 In a 200 m walk race, Zakia walks at an average speed of 5 km/h. She gives a start of 20 m to Veena and still beats her by 18 seconds. What is the average speed of Veena (in km/h)?

SSC MTS 20/10/2021 (Morning)

(a) 4.2 (b) 4.5 (c) 4 (d) 3.5

Q.15. In the 100 m race A beats B by 10 m and B beats C by 10m. By what distance A beats C (in m) ?

SSC MTS 9/08/2019 (Afternoon)

(a) 19 (b) 18 (c) 20 (d) 21

Practice Questions

SSC CHSL 2024 Tier - 2

Q.16. Tarun gives Hari a head-start of 60 seconds in a 2400 m race and still beats him by 40 seconds. If the speed of Hari is 6 m/s, find the speed of Tarun.

SSC CHSL Tier II (18/11/2024)

(a) 8 m/s (b) 7 m/s

(c) 8.5 m/s (d) 7.5 m/s

SSC MTS 2024 Tier - 1

Q.17. In a circular race of 1500 m, P and Q start from the same point and at the same time, at speeds of 20 km/h and 35 km/h, respectively. After what time will they meet for the first time on the track if they are running in the same direction ?

SSC MTS 30/09/2024 (Evening)

(a) 340 sec (b) 640 sec

(c) 840 sec (d) 360 sec

Q.18. In a 5-km race, A beats B by 750 metres and C by 1260 metres. By how many metres does B beat C in the same race ?

SSC MTS 08/10/2024 (Afternoon)

(a) 700 metres (b) 600 metres

(c) 500 metres (d) 400 metres

Q.19. Three students of class VII participated in a race during a school sports day. In a 1 km race, A wins the race with B by 100 m, and in a 300 m race, B beats C by 50 m. Then in the race of 1 km, with what margin will A beat C ?

SSC MTS 15/10/2024 (Afternoon)

(a) 700 m (b) 750 m

(c) 150 m (d) 250 m

Q.20. Ajit walks around a circular field at the speed of two rounds per hour, while Mohit runs around it at the speed of 10 rounds per hour. They start in the same direction from the same point at 6.30 a.m. Find the time at which they cross each other.

SSC MTS 16/10/2024 (Morning)

(a) 06 : 37 : 50 (b) 06 : 37 : 20

(c) 06 : 37 : 30 (d) 06 : 40 : 00

Q.21. Two athletes X and Y are jogging on a circular path whose circumference is 500 m. Athlete X jogs at a speed of 18 km/h and Y jog at 9 km/h, jogging in opposite directions. The time at which they will meet for the first time is:

SSC MTS 29/10/2024 (Evening)

(a) 66.66 s (b) 50 s

(c) 200 s (d) 27.77 s

Q.22. A and B start running on a circular race track whose length is 3240 m. A and B start from the same point and at the same time, but in opposite directions. If A runs at a speed of 10 m/s and they cross each other 3 minutes after they start running, then what is B's speed (in m/s) ?

SSC MTS 05/11/2024 (Afternoon)

(a) 8.5 (b) 9 (c) 7.5 (d) 8

SSC CGL 2024 Tier - 1

Q.23. In a circular race of 840 m, A and B start running in the same direction at the same time from the same point at the speeds of 6 m/s and 12 m/s, respectively. After how much time will they meet next?

SSC CGL 09/09/2024 (1st Shift)

(a) 140 s (b) 20 s (c) 40 s (d) 70 s

Q.24. Atul gives Vishu a head-start of 20 seconds in a 900 m race and beats him by 135 m. While running the same race again Atul gives a start of 189 m and beats him by 8 seconds. In how much time can Vishu complete the full race of 900 m?

SSC CGL 11/09/2024 (1st Shift)

(a) 3 minutes 30 seconds

(b) 2 minutes 50 seconds

(c) 3 minutes 20 seconds

(d) 3 minutes 10 seconds

Q.25. P and Q start running in opposite directions on a circular track from the

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

same point. If their speeds are 10 m/s and 8 m/s, respectively, then after what time will they meet if the length of the track is 1620 m ?
SSC CGL 13/09/2024 (2nd Shift)
(a) 110 seconds (b) 70 seconds
(c) 120 seconds (d) 90 seconds

Q.26. Arvind and Chetan started running simultaneously from the same point in the same direction on a circular track of length 210 m. If Arvind takes 180 seconds to complete one round, and Chetan takes 420 seconds to complete one round, after how much time will they meet for the first time at the starting point on the track ?
SSC CGL 17/09/2024 (3rd Shift)
(a) 10 minutes (b) 15 minutes
(c) 21 minutes (d) 28 minutes

Q.27. Seema walks around a circular field at the rate of 3 rounds per hour, while Priya runs around it at the rate of 8 rounds per hour. They start in the same direction from the same point at 11 : 54 p.m. They shall first cross each other at:
SSC CGL 25/09/2024 (3rd Shift)
(a) 12:06 p.m. (b) 12:00 a.m.
(c) 12:06 a.m. (d) 11:59 p.m.

Q.28. In a circular race of 1600 m in length, Bhaskar and Vinay start with speeds of 27 km/h and 45 km/h starting at the same time from the same point. When will they meet for the first time on the track when running in the opposite directions and the same direction, respectively ?
SSC CGL 26/09/2024 (3rd Shift)
(a) 1 minute 20 seconds and 5 minutes 20 seconds
(b) 1 minute 40 seconds and 5 minutes 20 seconds
(c) 2 minutes 40 seconds and 5 minutes 40 seconds
(d) 2 minutes 20 seconds and 4 minutes 20 seconds

SSC CHSL 2024 Tier - 1

Q.29. Arun and Bhaskar run a race of 3 km. First, Arun gives Bhaskar a head start of 400 m and beats him by 30 seconds. While coming back, Arun gives Bhaskar a lead of 2.5 minutes and gets beaten by 500 m. What is the difference between the times in minutes in which Arun and Bhaskar can run the race for one side separately ?
SSC CHSL 04/07/2024 (2nd Shift)
(a) 2 min (b) 1.5 min (c) 2.5 min (d) 3 min

Q.30. In a 100-m race. A beats B by 20 m and B beats C by 5 m. In the same race, find the distance by which A beats C.
SSC CHSL 04/07/2024 (4th Shift)
(a) 26 m (b) 24 m (c) 22 m (d) 25 m

Q.31. In a 2 km linear race, if P completes the race in 200 second and Q in 220 seconds, then the distance by which P beats Q is:
SSC CHSL 09/07/2024 (1st Shift)
(a) $181\frac{9}{11}$ metres (b) $167\frac{6}{11}$ metres
(c) $191\frac{7}{11}$ metres (d) $173\frac{7}{11}$ metres

SSC Selection Post (Phase - XII)

Q.32. In a 200-m race, if A gives B a head start of 35 m, then A wins the race by 20 sec. Alternatively, if A gives B a head start of 55 m, the race ends in a dead heat. How long does A takes to run 200 m ?
Matriculation Level 21/06/2024 (Shift - 1)
(a) 165 sec (b) 145 sec
(c) 150 sec (d) 155 sec

Q.33. In a 3000 m race, if vehicle A gives vehicle B a start of 400 m, then vehicle A wins the race by 10 s. If vehicle A gives vehicle B a start of 750 m, then the race ends in a dead heat. How long does vehicle A take to run 3000 m ?
Matriculation Level 21/06/2024 (Shift - 1)
(a) 64.3 s (b) 92.5 s (c) 90.5 s (d) 100 s

Q.34. In a 300 m race, A beats B by 22.5 m or 6 seconds. Which of the following options is equal to B's time over the course ?
Matriculation Level 21/06/2024 (Shift - 4)
(a) 30 sec (b) 300 sec
(c) 82 sec (d) 80 sec

Q.35. In a circular race of 2,500 m, Reeta and Geeta start running in the same direction from the same point and at the same time with speeds of 36 km/h and 54 km/h, respectively. After how much time will they meet for the first time on the track ?
Higher Secondary 25/06/2024 (Shift - 4)
(a) 480 second (b) 510 second
(c) 490 second (d) 500 second

Q.36. In a race of 400 m, Bhim gave Saral a head start by 20 m at the start of the race. Saral took 48 seconds to complete the race. What was the speed (in m/s) of Bhim if Saral defeated Bhim by a margin of 2 seconds ?
Higher Secondary 26/06/2024 (Shift - 2)
(a) 7.6 (b) 8 (c) 8.7 (d) 7.4

Q.37. A and B are participants in a 1,800 m circular race. A is running at a speed of 24 km/h and B is running at a speed of 15 km/h. If both start from the same point and at the same time and run in the same direction, find the time when they will meet again. (up to two decimal points)
Higher Secondary 26/06/2024 (Shift - 2)
(a) 500 sec (b) 720 sec
(c) 600 sec (d) 400 sec

SSC CPO 2023 Tier - 1

Q.38 Reema runs $\frac{5}{4}$ times as fast as Rekha. In view of this, Reema allows Rekha a lead of 50 metres to Rekha in a friendly race competition. What is the distance from the starting point where both Reema and Rekha meet?
SSC CPO 03/10/2023 (2nd Shift)
(a) 200 m (b) 225 m (c) 240 m (d) 250 m

Q.39. In a 1200 m race, Rakesh reaches the final point in 36 seconds and Rajesh reaches in 40 sec. By how much distance does Rakesh beat Rajesh?
SSC CPO 05/10/2023 (3rd Shift)
(a) 150 m (b) 140 m (c) 130 m (d) 120 m

SSC CHSL 2023 Tier - 1

Q.40. In a 5 km race, S gave a 500 m head start to T. If they finished the race at the same time and the speed of T is 13.5 km/h, the speed of S is:
SSC CHSL 02/08/2023 (3rd Shift)
(a) 15 km/h (b) 20 km/h
(c) 17.5 km/h (d) 16.5 km/h

Q.41. In a 140 m race, Pankaj runs at a speed of $\frac{5}{2}$ m/s. He gives a start of 20 m to Arun and still defeats him by 4 seconds. The speed of Arun is:
SSC CHSL 10/08/2023 (4th Shift)
(a) 1.75 m/s (b) 1.25 m/s
(c) 2 m/s (d) 1.5 m/s

SSC CGL 2023 Tier - 1

Q.42. A, B and C run simultaneously , starting from a point, around a circular track of length 1200 m, at respective speeds of 2m/s, 4m/s and 6m/s. A and B run in the same direction, while C runs in the opposite direction to the other two. After how much time will they meet for the first time?
SSC CGL 17/07/2023 (2nd shift)
(a) 10 minutes (b) 9 minutes
(c) 12 minutes (d) 11 minutes

Q.43. Racer A and racer B run a race of 18 km on a circular track of length 800 m. Both complete one round in 200 sec and 250 sec, respectively. After how

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

much time from the start will the faster person meet the slower person for the last time?
SSC CGL 17/07/2023 (4th shift)
(a) 2700 sec (b) 4000 sec
(c) 2250 sec (d) 1800 sec

Q.44. In a 1170 m race, Raman reaches the final point in 65 seconds and Mohan reaches the final point in 90 seconds. By how much distance does Raman beat Mohan?
SSC CGL 19/07/2023 (1st shift)
(a) 325m (b) 300m (c) 375m (d) 350m

Q.45. Two persons started running on a circular track simultaneously with speeds of 20 m/s and 30 m/s in opposite directions. If the circumference of the circular track is 100 m, then find at how many distinct points they will cross each other ?
SSC CGL 19/07/2023 (2nd shift)
(a) 3 (b) 2 (c) 10 (d) 5

Q.46. Ashok runs $2\frac{2}{3}$ times as fast as Bharat. If Ashok gives Bharat a head start of 160m, then how far must the winning post be so that Ashok and Bharat can reach it at the same time ?
SSC CGL 19/07/2023 (4th shift)
(a) 225m (b) 256m (c) 240m (d) 200m

Q.47. P gives Q a head-start of 2 seconds in a 400 m race, but both finish the race at the same time. Find the time taken by P to finish the race if the speed of Q is 2 m/sec.
SSC CGL 20/07/2023 (3rd shift)
(a) 198 seconds (b) 199 seconds
(c) 200 seconds (d) 195 seconds

Q.48. In a 200-m linear race, if A gives B a start of 25 m, then A wins the race by 10 seconds. Alternatively, if A gives B a start of 45 m, the race ends in a dead heat. How long does A take to run 200m ?
SSC CGL 24/07/2023 (3rd shift)
(a) 78 seconds (b) 77 seconds
(c) 78.5 seconds (d) 77.5 seconds

Q.49. Having started from the same point and at the same time, two runners P and Q are running around a circular track of length 500 m in opposite directions with the speeds of 6 m/s and 10 m/s, respectively. If they exchange their speeds after meeting for the first time, who will reach the starting point first ?
SSC CGL 25/07/2023 (4th shift)
(a) Q
(b) P
(c) Both P and Q will reach at the same time
(d) No one of the P and Q

SSC Selection Post (Phase - XI)

Q.50. In an 800 m race, the ratio of the speeds of two contestants Alka and Mira is 4 : 7. If Alka has a start of 520 m, then, Alka will win by:
Matriculation Level 30/06/2023 (Shift - 4)
(a) 490 m (b) 280 m (c) 310 m (d) 210 m

SSC CHSL 2022 Tier - 2

Q.51. In a 1200 m circular race, A and B start at the same time from the same position in the same direction at speeds of 18 km/h and 27 km/h, respectively. In how much time after the start of race will they meet for the first time on the track?
SSC CHSL Tier II (26/06/2023)
(a) 300 seconds (b) 480 seconds
(c) 520 seconds (d) 240 seconds

SSC CHSL 2022 Tier - 1

Q.52. Farhan and Aman are going from Delhi to Haryana. The difference and sum of their speeds are 40 km/hour and 60 km/hour respectively. If in a race Farhan can finish 8 minutes earlier than Aman, then find the distance they both should cover.
SSC CHSL 21/03/2023 (1st Shift)
(a) $\frac{5}{3}$ km (b) $\frac{8}{3}$ km
(c) $\frac{3}{5}$ km (d) $\frac{3}{8}$ km

SSC CGL 2022 Tier - 1

Q.53. In a 1500 m race, Anil beats Bakul by 150 m and in the same race Bakul beats Charles by 75 m. By what distance does Anil beat Charles?
SSC CGL 01/12/2022 (1st Shift)
(a) 217.50 m (b) 200.15 m
(c) 293.50 m (d) 313.75 m

Q.54. In a 400 - metre race, A runs at a speed of 16 m/sec. If A gives B a start of 15 metres and still beats him by 10 sec, then what is the speed of B?
SSC CGL 02/12/2022 (2nd Shift)
(a) 11 m/sec (b) 10 m/sec
(c) 13 m/sec (d) 9 m/sec

Q.55. In a 1200 m race, bike A beats bike B by 100 m. Bike B beats bike C by 100 m in a 600 m race. If bike A beats bike C by 30 sec in a 720 m race, then what is the speed of bike C ?
SSC CGL 03/12/2022 (4th Shift)
(a) $\frac{17}{3}$ m/sec (b) $\frac{26}{9}$ m/sec
(c) $\frac{17}{9}$ m/sec (d) $\frac{26}{3}$ m/sec

SSC CPO 2022 Tier - 1

Q.56. Geeta runs $\frac{5}{2}$ times as fast as Babita. In a race, if Geeta gives a lead of 40 m to Babita, find the distance from the starting point where both of them will meet (correct up to two decimal places).
SSC CPO 10/11/2022 (Morning)
(a) 66.67m (b) 65m (c) 65.33m (d) 66m

Q.57. A and B run a 12 km race on a circular track of length 1200 m. They complete one round in 300 seconds and 400 seconds, respectively. After how much time from start will the faster person meet the slower person for the last time ?
SSC CPO 10/11/2022 (Evening)
(a) 2400 seconds (b) 8400 seconds
(c) 9600 seconds (d) 10800 seconds

Q.58. A gives B a head-start of 10 seconds in a 1500 m race and both finish the race at the same time. What is the time taken by A (in minutes) to finish the race if the speed of B is 6 m/s?
SSC CPO 11/11/2022 (Afternoon)
(a) 3 (b) 4 (c) 8 (d) 5

SSC Selection Post (Phase - X)

Q.59. Joy and Kat run around a circular track of length 1100 m in opposite directions with initial speed of 6 m/sec and 4 m/sec, respectively. Starting from the same point whenever they meet, Joy's speed halves and Kat's speed doubles. After how much time from the beginning will they meet for the second time ?
Graduate Level 05/08/2022 (Shift - 3)
(a) 190 sec (b) 210 sec
(c) 220 sec (d) 200 sec

Q.60. Rahul runs at a speed of 6 km/h in a 100-metre race. Rahul gives Bharat a start of 4 metres and still beats him by 4 seconds. Find Bharat's speed.
Higher Secondary 01/08/2022 (Shift - 3)
(a) 4.5 km/h (b) 4.9 km/h
(c) 5.4 km/h (d) 5.8 km/h

SSC MTS 2021 Tier - 1

Q.61. A can beat B in a 100-meter race by 10 meters. B can beat C in a 100-meter race by 10 meters. What is the ratio ($t_A : t_B : t_C$), which are the respective times taken by A, B and C to complete the race?
SSC MTS 07/07/2022 (Morning)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) 100 : 90 : 81 (b) 90 : 81 : 100
(c) 100 : 81 : 90 (d) 81 : 90 : 100

Q.62. In a 100-m race, A beats B by 20 m and B beats C by 5 m. in the same race, A beats C by:
SSC MTS 11/07/2022 (Morning)
(a) 26 m (b) 22 m (c) 25 m (d) 24 m

Q.63. In a race of 100 m, A beats B by 10 m. In a race of 100 m, B beats C by 10 m. By what distance will A beat C in a race of 100 m?
SSC MTS 11/07/2022 (Afternoon)
(a) 19 m (b) 21 m (c) 18 m (d) 20 m

SSC CHSL 2021 Tier - 1

Q.64. Malay walks around a circular field at the rate of 7 rounds per hour,while Neha runs around it at the rate of 11 rounds per hour. They start in the same direction from the same point at 02:45 p.m. They shall first cross each other at:
SSC CHSL 30/05/2022 (Evening)
(a) 03:00 p.m. (b) 03:05 p.m.
(c) 02:50 p.m. (d) 03:00 a.m.

Q.65. Shyamal covers 1 km in 10 min, whereas Radha covers the same distance in 8 min. By what distance does Radha beat Shyamal ?
SSC CHSL 01/06/2022 (Evening)
(a) 300m (b) 400m (c) 200m (d) 500m

Q.66. In a 1200 m race, the ratio of the speeds of two contestants Meenal and Nitu is 5 : 7. If Meenal has a start of 500 m,then Meenal wins by:
SSC CHSL 09/06/2022 (Morning)
(a) 220 m (b) 240 m
(c) 250 m (d) 225 m

Q.67. Riya runs $\frac{3}{2}$ times as fast as Prerna. In a race, if Riya gives a lead of 100 m to Prerna, find the distance Riya has to run before both of them meet.
SSC CHSL 09/06/2022 (Afternoon)
(a) 315 m (b) 300 m (c) 265 m (d) 240 m

Answer Key :-

1.(a)	2.(c)	3.(b)	4.(d)
5.(b)	6.(b)	7.(c)	8.(a)
9.(b)	10.(c)	11.(d)	12.(a)
13.(c)	14.(c)	15.(a)	16.(a)
17.(d)	18.(b)	19.(d)	20.(d)
21.(a)	22.(d)	23.(a)	24.(c)
25.(d)	26.(c)	27.(c)	28.(a)
29.(b)	30.(b)	31.(a)	32.(b)
33.(a)	34.(d)	35.(d)	36.(b)
37.(b)	38.(d)	39.(d)	40.(a)
41.(c)	42.(a)	43.(b)	44.(a)
45.(d)	46.(b)	47.(a)	48.(d)
49.(c)	50.(c)	51.(b)	52.(a)
53.(a)	54.(a)	55.(a)	56.(a)
57.(a)	58.(b)	59.(b)	60.(c)
61.(d)	62.(d)	63.(a)	64.(a)
65.(c)	66.(a)	67.(b)	

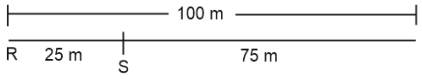
Solutions :-

Sol.1.(a) Relative speed = 5 + 2
= 7 rounds per hour
Distance covered by A + B in 1 hour
= 7 rounds
Distance covered by A + B in 30 minutes
= 3.5 rounds
Rounds cover till 6 :30am
= 7 + 3.5 = 10.5 rounds
Hence they will cross each other 10 times in 1 : 30 hours.

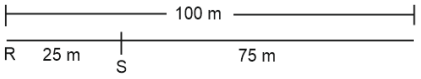
Sol.2.(c) Distance = 619m = 0.619 km
Relative speed when they are in opposite direction = 2.85 + 5.4 = 8.25 km/hr
Meeting time
$= \frac{0.619}{8.25} \times 60 = \frac{3714}{825} = 4.50$ min

Sol.3.(b) Let length of track = L metre.
Their relative speed = (6 − b) m/s
Time when they meet for 1st time
$= \frac{L}{(6-b)}$ sec.
Time taken by P to complete one round
$= \frac{L}{6}$ sec.
Time taken by Q to complete one round
$= \frac{L}{b}$ sec.
L.C.M. $\left(\frac{L}{6}, \frac{L}{b}\right) = \frac{L}{6b}$
No. of times they meet on starting point
$= \frac{L}{(6-b)} \times \frac{6b}{L} = 2$
$6b = 12 - 2b \Rightarrow b = 1.5$ m/s
Only one value of 'b' is possible.

Sol.4.(d) Distance covered by R in 150 m race = 150 - 5 = 145 m
Distance covered by S in 150 m race
= 150 - 35 = 115 m
Distance ratio of R and S
= 145 : 115 = 29 : 23
Ist case : If R wins in the 100 m race.



Distance ratio of R & S = 29 : 23
⇒ 29 unit = 100 m
Then,
23 unit $= \frac{100}{29} \times 23 = \frac{2300}{29} = 79.31$ m
Clearly, we can see that the maximum distance covered by S is 75 m but here, the distance covered by S is 79.31 m which is not possible.
Therefore, Ist case gets eliminated.
2nd case : If S wins in 100 m race.



Distance ratio of R & S = 29 : 23
⇒ 23 unit = 75 m
Then,
29 unit $= \frac{75}{23} \times 29 = \frac{2,175}{23} = 94.56$ m
Clearly, we can see that the maximum distance covered by R is 100 m but the distance covered by R is only 94.56 m
Hence, S would win the race by 5.44 m i.e.(100 - 94.56)

Sol.5.(b)
Ratio of speed :- Ram : Shyam = $3x : x$
Relative speed = $3x - x = 2x$
According to question,
$\frac{1440}{2x} = 8 \times 60 \Rightarrow x = \frac{720}{480} = \frac{3}{2}$
Shyam's speed $(x) = \frac{3}{2}$ m/s
Time required by Shyam to complete the race $= \frac{1440 \times 2}{3 \times 60} = 16$ minutes

Sol.6.(b)
Average speed $= \frac{total\ distance\ travelled}{total\ time\ taken}$
Total distance by 4 members
= 5 × 4 = 20km
Total time taken by them
= 30 minutes $= \frac{1}{2}$hr,
Average Speed $= \frac{20 \times 2}{1} = 40$ km/h

Sol.7.(c) Total length of circular track
= 1400 meter
Relative speed of A and B
= 33 + 47 = 80 m/sec
They will meet each other at the first time
$= \frac{1400}{80} = \frac{35}{2}$ seconds
Hence, they meet second time after
$= \frac{35}{2} \times 2 = 35$ seconds

Sol.8.(a) According to the question,
Distance covered by P and S in 120 meter race = 120 and 114 meter respectively

Ratio -	P	:	S
Distance -	20	:	19
Speed -	20	:	19

Now , in 100 m race
Distance covered by P = 100 m
Distance covered by S = 92.5 m
Time taken to P to cover 100 m distance
$= \frac{100}{20} = 5$ sec

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

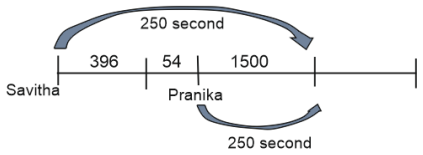
Time taken to S to cover 92.5 m distance

$= \frac{92.5}{19} = 4.868$ sec

Now, distance covered by P in 4.86 seconds = 20 × 4.868 = 97.37 meter

Hence, S wins the race = 100 – 97.37 = 2.63 meter

Sol.9.(b)



Savitha gives Pranika to 396 m head starts and 9 seconds gain

So, distance covered by Pranika in 9 seconds = 9 × 6 = 54 meter

Now,

Savitha catch pranika after 250 seconds then, total distance covered by Pranika in 250 seconds = 250 × 6 = 1500 meter

And total distance covered by Savitha in 250 seconds = (396 + 54 + 1500) = 1950 meter

Therefore ,

speed of Savitha = $\frac{1950}{250}$ = 7.8 m/sec.

Sol.10.(c) Time taken when they meet for 1st time = $\frac{400}{10+40}$ = 8 sec.

Time taken when they meet for 2nd time = $\frac{400}{20+20}$ = 10 sec.

Time taken when they meet for 3rd time = $\frac{400}{40+10}$ = 8 sec.

Total time = 8 + 10 + 8 = 26 sec.

Sol.11.(d) Ratio of distance covered by Arjun, Balaji and Charan = 1000 : 900 : 810

Now,

ratio of their speed = $\frac{1000}{t} : \frac{900}{t} : \frac{810}{t}$

According to question ,

Distance to be covered by C, B and A = 1000m , 1100m and 1200 m respectively.

Ratio of time taken in 1000 meter race ,

Arjun : Balaji : Charan

⇒ $\frac{12t}{10} : \frac{11t}{9} : \frac{100t}{81}$

Here , A wins the race as $\frac{12t}{10}$ is the lowest among them and B comes second

Distance covered by B in $\frac{12t}{10}$ time

$= \frac{900}{t} \times \frac{12t}{10} = 1080$

Now, Arjun ahead of Balaji by (1000 + 100) - 1080 = 20 m.

Sol.12.(a) Let the speed of P is x m/s and the speed of Q is y m/s .

According to question ,

P gives Q a start of 400 m , then the race ends in a dead heat i.e. they reach at same time.

Time = $\frac{distance}{speed}$

$\frac{1500}{x} = \frac{1100}{y} \Rightarrow \frac{x}{y} = \frac{15}{11}$

Again ,

P gives vehicle Q a start of 200m , and Vehicle P wins the race by 8 sec.

⇒ Speed of Q = $\frac{200}{8}$ = 25 m/s

Speed of P = 15 units = $\frac{25 \times 15}{11}$

Time taken by P to cover 1500 m

$= \frac{1500 \times 11}{25 \times 15}$ = 44 sec.

Sol.13.(c) Relative speed when both are in opposite directions

= 37 + 35 = 72 km/hr

Total distance = $\frac{2500}{1000}$ = 2.5 km

First meeting of a man and woman

$= \frac{2.5}{72} = \frac{5}{144}$hr $= \frac{5}{144} \times 60$

= 2 min 5 sec

Sol.14.(c) Time taken by Zakia

$= \frac{200}{5 \times \frac{5}{18}}$ = 144 seconds

Zakia gives a start of 20 m to Veena and still beats her by 18 seconds.

So, Veena travels (200 – 20) 180m in (144 + 18) 162 seconds

So, Veena's speed = $\frac{180}{162} = \frac{10}{9}$ m/s

⇒ $\frac{10}{9} \times \frac{18}{5}$ = 4 km/h

Sol.15.(a)

	A	:	B
Distance →	100	:	90
	B	:	C
Distance →	100	:	90

Balancing the ratio for B

A : B : C

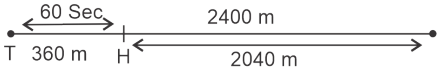
Distance → 1000 : 900 : 810

⇒ In a race of 1000 meters A beats C by 190 meters

So, in the race of 100 meters A beats C by 19 meters.

Sol.16.(a) Given , Speed of Hari = 6m/s

Distance travelled in 60 sec = 360m



	Tarun	Hari
Distance →	2400	2040
Time →	T	T + 40

Speed = $\frac{Distance}{Time}$ ⇒ 6 = $\frac{2040}{T+40}$

⇒ 6T = 2040 - 240 = 1800 ⇒ T = 300 sec

∴ Tarun's speed = $\frac{2400}{300}$ = 8m/s

Sol.17.(d) Time when the meet for the first time on track = $\frac{1500}{(35-20) \times \frac{5}{18}}$

$= \frac{1500 \times 18}{15 \times 5}$ = 360sec

Sol.18.(b)

Ratio -	A	:	B	:	C
Distance -	5km	:	4.25km	:	3.74km

Now, total distance covered by C in the same race till B finish the race

$\frac{4.25}{5}$ × 3.74 = 4.4 km

Hence, distance by which B beats C = 5 - 4.4 = 0.6km = 600 meter.

Sol.19.(d) In 1km race

	A		B
Distance →	1000	:	900

In 300m race

	B		C
Distance →	300	:	250

Hence ,

	A		B		C
Distance→	1000	:	900		
	300×3	:	250×3		

	A		B		C
Distance →	1000	:	900	:	750

Margin between A beat C

= 1000 - 750 = 250m

Sol.20.(d) Let the distance be 10 m

Relative speed = 10 - 2 = 8 round/hour

Now,

Time = $\frac{10}{8}$ = 1.25 hours

= 1 hour + 15 min

Hence, they cross each other at the time = 06 : 40 : 00

Sol.21.(a) Time taken to meet again for the first time = $\frac{500}{(18+9) \times \frac{5}{18}}$

$= \frac{500 \times 2}{5 \times 3}$ = 66.66sec

Sol.22.(d) Let speed of B = xm/s

According to question ,

⇒ $\frac{3240}{10+x}$ = 3 × 60

⇒ 3240 = 1800 + 180x ⇒ x = $\frac{1440}{180}$ = 8

∴ Speed of B = 8m/s

Sol.23.(a)

Relative Speed = 12 - 6 = 6 m/s

Distance = 840 m

⇒ required time = $\frac{distance}{speed}$

$= \frac{840}{6}$ = 140 seconds

Sol.24.(c) According to the question,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Condition (1):- Vishu complete the race at the same time as Vishu if he take (20 second + 135 m) head start

Condition (2):- Vishu complete the race at the same time as Vishu if he take (8 second + 189m) head start

From the condition (1) and (2) we get;

20 second + 135 m = 8 second + 189 m

12 second = 54 m

Speed of Vishu = $\frac{54}{12} = \frac{9}{2}$ m/sec

Hence, time taken by Vishu to complete the full race of 900 m = $\frac{900}{\frac{9}{2}}$ = 200 min.

= 3 minutes 20 seconds

Sol.25.(d) Relative speed of P and Q running opposite direction=10+8=18 m/s

Time taken to meet = $\frac{1620}{18}$ = 90 sec

Sol.26.(c) Ratio of time → 180 : 420

3 : 7

Ratio of speed → 7 : 3

Relative speed = 7 + 3 = 10

They will meet first time

= $\frac{210}{10}$ = 21 minutes

Sol.27.(c)

Let measure of one round = x km

Relative speed = $8x$ - $3x$

= $5x$ round per hour

Time taken to cross each other

= $\frac{x}{5x}$hour = $\frac{1}{5} \times 60$ = 12 minute

They shall cross each other at 12:06 a.m.

Sol.28.(a) Time taken to meet in opposite direction = $\frac{1600}{(27+45)\times\frac{5}{18}}$ sec

= $\frac{1600}{72\times\frac{5}{18}}$ sec = 80 sec = 1 min 20 sec

Time taken to meet in same direction

= $\frac{1600}{(45-27)\times\frac{5}{18}}$ sec = $\frac{1600}{18\times\frac{5}{18}}$ sec

= 320 sec = 5 min 20 sec

Sol.29.(b) Case 1 :

Arun : Bhaskar

Distance → 3000 : 2600

Time → t : $t + 0.5$

Time taken to cover 3000 m = t minutes

For 2500 m = $\frac{t}{3000} \times 2500$

= $\frac{5t}{6}$ minutes

Case 2:

Arun : Bhaskar

Distance → 2500 : 3000

Time → $\frac{5t}{6}$: $\frac{5t}{6} + 2.5$

Now speed of Bhaskar will be same for both side

Hence, from case 1 and case 2

$\frac{2600}{t+0.5} = \frac{3000}{\frac{5t}{6}+2.5}$

$\frac{13}{t+0.5} = \frac{90}{5t+15}$

65t + 195 = 90t + 45 ⇒ 25t = 150

t = 6 minute

Time taken by arun to travel 3000 m

= 6 minute

Time taken by Bhaskar to travel 3000 m

= $\frac{5t}{6} + 2.5$ = 7.5 minute

Required difference = 7.5 - 6 = 1.5 minutes

Sol.30.(b)

Ratio - A : B : C

100 : 80 : **80**

100 : 100 : 95

Final - 10000 : 8000 : 7600

Distance covered by A and C is 100 and 76 m,

So we can say that A beats C 100 - 76

= 24 m

Sol.31.(a)

Distance covered by Q in 200 seconds

= $\frac{2000}{220} \times 200 = \frac{20000}{11}$ metres

Hence, desired distance

= 2000 - $\frac{20000}{11} = \frac{2000}{11}$

= $181\frac{9}{11}$ metres

Sol.32.(b) A gives B a head start of 35 m

⇒ Distance covered by A = 200 m

And distance covered by B

= 200 - 35 = 165 m

Time taken by A = t -20 sec

Time taken by B = t sec

⇒ speed of A = $\frac{200}{t-20}$ m/s

And speed of B = $\frac{165}{t}$ m/s

if A gives B a head start of 55 m

Distance covered by A = 200m

And distance covered by B

= 200 - 55 = 145 m

Now time taken by A = time taken by B

⇒ $\frac{200}{\frac{200}{t-20}} = \frac{145}{\frac{165}{t}}$

⇒ 165 t - 3300 = 145 t

⇒ 20t = 3300 ⇒ t = 165 sec

Time taken by A = t - 20

= 165 - 20 = 145 sec

Alternate method :-

According to question,

⇒ 20 sec = (55 - 35) m = 20 m

⇒ 1 m = 1 sec.

⇒ Speed of A = 1 m/sec.

time taken by A to cover 200 m = time taken by B to cover 145 m

So, A will take 145 seconds to cover a distance of 200 metres.

Sol.33.(a)

Distance covered by A = 3000 m

Distance covered by B

= 3000 - 400 = 2600 m

Time taken by A = t s

Time taken by B = (t + 10) s

⇒ Speed of A = $\frac{3000}{t}$ m/s

And speed of B = $\frac{2600}{t+10}$ m/s

Now, Distance covered by A = 3000 m

Distance covered by B

= 3000 - 750 = 2250 m

According to question,

$\frac{3000}{\frac{3000}{t}} = \frac{2250}{\frac{2600}{t+10}}$

⇒ t = $\frac{2250\,(t+10)}{2600}$

⇒ 2600 t = 2250 t + 22500

⇒ 350 t = 22500

⇒ t = $\frac{450}{7}$ s = 64.28 s ≈ 64.3 s

Alternate method:-

⇒ 10 sec = (750 - 400) m = 350 m

⇒ 1 sec = 35 m

Now, the speed of A = 35 m/sec.

time taken by A to cover 3000 m = time taken by B to cover 2250 m

Time taken by A to cover a distance 3000

= $\frac{2250}{35}$ = 64.28 ≈ 64.3 sec.

Sol.34.(d)

Speed of B = $\frac{22.5}{6} = \frac{15}{4}$ m/sec

Time taken by B to complete the whole race = 300 × $\frac{4}{15}$ = 80 sec

Sol.35.(d)

Relative speed = 54 - 36 = 18 km/hr

= 18 × $\frac{5}{18}$ = 5 m/s

Given distance = 2500 m

time of meeting = $\frac{2500}{5}$ = 500 second

Sol.36.(b) Time taken by saral to complete the race = 48sec

So , time taken by Bhim to complete the race = (48 + 2) sec

Now , Distance covered by Bhim = 400m

Hence required speed

= 40048 + 2 = 40050 = 8m/s

Sol.37.(b) A's speed = 24 km/hr

= 24 × $\frac{5}{18} = \frac{20}{3}$ m/s

B's speed = 15 km/hr

= 15 × $\frac{5}{18} = \frac{25}{6}$ m/s

Relative speed = $\frac{20}{3} - \frac{25}{6} = \frac{15}{6}$ m/s

Hence,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Time of meeting = $\frac{1800}{\frac{15}{6}}$ = 720 sec.

Sol.38.(d) According to the question,
Ratio → Reema : Rekha
Speed → 5 : 4
Distance → 5 : 4
Difference = 5 - 4 = 1 units
1 units = 50 m
(required distance) 5 units = 250 m

Sol.39.(d)
Total distance of race = 1200 m
Rakesh reaches the final points in 36 seconds .
Rajesh reaches the final points in 40 seconds .
Rajesh's speed = $\frac{1200}{40}$ = 30 m/s
Distance covered by Rajesh in 36 seconds = 30 × 36 = 1080 m.
Rakesh beats Rajesh by = 1200 – 1080 = 120 m

Sol.40.(a) Distance travelled by T = 4500 m or 4.5 km
Time taken by T to complete the race
= $\frac{4.5}{13.5}$ = $\frac{1}{3}$ hr.
Now , Speed of S = $\frac{5 \times 3}{1}$ = 15 km/h

Sol.41.(c) Time taken by Pankaj to finish the race = $\frac{140 \times 2}{5}$ = 56 sec.
Time taken by arun = 56 + 4 = 60 sec.
Speed of arun = $\frac{140 - 20}{60}$ = 2 m/s

Sol.42.(a) Speed of A, B and C = 2, 4 and 6 m/s respectively
Time when A and B meet
= $\frac{1200}{4-2}$ = 600 sec.
Time when A and C meet
= $\frac{1200}{2+6}$ =150sec.
Time when B and C meet
=$\frac{1200}{4+6}$ = 120 sec.
Time when all of them meet for the first time = L.C.M.(600, 150, 120)
= 600 sec= 10 minutes

Sol.43.(b) Total round to complete the race = $\frac{18000}{800}$ = 22.5 rounds
L.C.M. (200 sec. , 250 sec.) = 1000 sec.
In 1000 sec. Racer A completed 5 rounds.
In 1000 sec. Racer B completed 4 rounds.
L.C.M. (5 , 4) = 20
Time when faster person meet slower person last time =$\frac{1000}{5}$× 20 = 4000 sec.

Sol.44.(a) Total distance of race = 1170 m
Raman reaches the final points in 65 seconds .
Mohan reaches the final points in 90 seconds .
Mohan's speed = $\frac{1170}{90}$ = 13 m/s
Distance covered by Mohan in 65 seconds = 13 × 65 = 845 m.
Raman beats Mohan by
= 1170 – 845 = 325 m

Sol.45.(d) Time taken by 1st person to complete one round = $\frac{100}{20}$ = 5 sec.
Time taken by 2nd person to complete one round = $\frac{100}{30}$ = $\frac{10}{3}$ sec.
Now, LCM (5 , $\frac{10}{3}$) = 10 sec.
Their relative speed = 20 + 30
= 50 m/sec
Required time when they meet for the first time = $\frac{100}{50}$ = 2 sec.
So , distinct points where they meet
= $\frac{10}{2}$ = 5

Sol.46.(b) According to question,
$\frac{Speed\ of\ Ashok(v)_1}{Speed\ of\ bharat\ (v)_2} = \frac{8}{3}$
$\frac{d_1}{v_1} = \frac{d_2}{v_2} \Rightarrow \frac{d_1}{d_2} = \frac{v_1}{v_2} = \frac{8}{3}$
$\Rightarrow \frac{d_1 - d_2}{d_2} = \frac{8-3}{3} = \frac{5}{3}$
$\Rightarrow 160 = \frac{5d_2}{3} \Rightarrow d_2$ = 96 m
Required distance (d_1) = 160 + 96 = 256 m
Short trick :-
Their relative speed = 8 – 3 = 5 m/s
Time when they reach = $\frac{160}{5}$ = 32 s
Distance travelled by Ashok
= 32 × 8 = 256 m.

Sol.47.(a) Speed of Q is 2 m/sec
Then, in 2 second he runs 4 meter
So , total distance covered by Q
= 400 – 2 × 2 = 396 meter
Now, according to the question,
Time taken by Q = time taken by P
therefore , Time taken by P to complete the race = $\frac{396}{2}$ = 198 second

Sol.48.(d) Case 1 :-
Distance travelled by A and B , 200 m and 175 m respectively.
$\frac{175}{b} - \frac{200}{a}$ = 10 ....e.q .(1)
Case 2 :- Distance travelled by A and B , 200 m and 155 m respectively.
$\frac{155}{b} = \frac{200}{a} \Rightarrow a = \frac{40b}{31}$ ....e.q .(2)
Putting the value of 'a' in e.q .(1) ,
$\frac{175}{b} - \frac{200 \times 31}{40b}$ = 10
$\frac{175}{b} - \frac{200 \times 31}{40b}$ = 10
⇒ b = 2 m/s a = $\frac{80}{31}$ m/s
Time taken by A to cover 200 m race
= $\frac{200 \times 31}{80}$ = 77.5 m/s
Short trick : The given distance is 200m
Let the time taken by A = t sec
⇒ A's speed = $\frac{200}{t}$ m/s
A gives B a start of 25 m, then A wins the race by 10 seconds
⇒ B's speed = $\frac{175}{t+10}$ m/s _____ (1)
And also if A gives B a start of 45 m, the race ends in a dead heat
⇒ B's speed = $\frac{155}{t}$ m/s _____ (2)
From eq . (1) and (2)
$\frac{175}{t+10} = \frac{155}{t}$ ⇒ t = 77.5 m/s

Sol.49.(c)
Length of the circular track = 500 m
Speed of P = 6m/s and speed of Q = 10 m/s
Now, relative speed (in opposite direction) = 16m/s
Time taken by them to meet for the first time = $\frac{500}{16}$ = 31.25 seconds.
Distance covered by P
= 31.25× 6 = 187.5 m
Now, distance covered by Q
= 31.25 × 10 = 312.5 m
According to the question, their speed is exchanged. Time taken by P to cover the rest of the path with new speed (10 m/s)
= $\frac{500 - 187.5}{10}$ = 31.25 seconds
So, Time taken by Q to cover the rest of the path with new speed (6 m/s)
= $\frac{500 - 312.5}{6}$ = 31.25 seconds
Hence, both P and Q reach at the same time at the starting point.

Sol.50.(c) According to question,
Distance = (800–520) = 280 m
While Alka cover 280 m, Mira covers
= $\frac{280 \times 7}{4}$ = 490 m
So, Alka will win by = 800 – 490 = 310 m

Sol.51.(b)
Relative speed = (27 - 18) × $\frac{5}{18}$ = $\frac{5}{2}$ m/s
Time when they meet for the first time on the track = $\frac{1200 \times 2}{5}$ = 480 seconds

Sol.52.(a) Let speed of Farhan be x km/hr ,

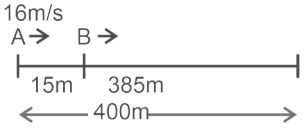
Search on TG: @apna_pdf

Search on Telegram @apna_pdf

And speed of Aman be y km/hr ,
According to question;
(x + y) = 60 km/hr ----------e.q (1)
(x − y) = 40 km/hr ----------e.q (2)
By adding both e.q (1) and e.q (2); we get
x = 50 km/hr
Time = $\frac{D}{50}$ hr
and y = 10 km/hr ⇒ time = $\frac{D}{10}$ hr
Difference in time = $\frac{8}{60}$
$\frac{D}{10} - \frac{D}{50} = \frac{8}{60}$ ⇒ D = $\frac{5}{3}$ km

Sol.53.(a)
Case 1:- Anil beat Bakul by 150 m.
Ratio of the distance covered by them
Anil : Bakul
1500 : 1350
Case 2:- Bakul beat Charles by 75 m.
Ratio of the distance covered by them
Bakul : charles
1500 : 1425
Equating the ratio of distance covered by them
Anil : Bakul : charles
600 : 540 : 513
600 unit → 1500 m
Then , 87 units → 217.50 m

Sol.54.(a)

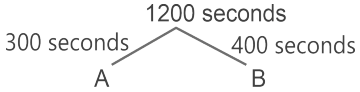


A beat B by 10 sec. Means B has taken 10 sec. more than A.
Time taken by A to complete 400m race
= $\frac{400}{16}$ = 25 sec
Now , According to question ,
Time taken by B to reach the end point
= 25 + 10 = 35 sec.
And Distance travelled by B
= 400 -15 = 385 metres
Speed of B = $\frac{385}{35}$ = 11 m/sec.

Sol.55.(a) Ratio of distance travelled by A and B = 1200 : 1100
Ratio of distance travelled by B and C
= 600 : 500
Equating the ratio of distance travelled ⇒
A : B : C = 72 : 66 : 55
or 720 : 660 : 550 ....eq (1)
According to question,
In a race of 720 m A beat C by 30 Sec.
from eq (1) , we can conclude that
In a race of 720 m A beat C by 170 meters .
Now, speed of C = $\frac{170}{30}$ = $\frac{17}{3}$ m/s

Sol.56.(a) Speed of Geeta = 5 m/sec
Speed of Babita = 2 m/sec
Relative speed of Geeta wrt Babita
= 5 - 2 = 3 m/sec
Time taken to cover 40m distance
= $\frac{40}{3}$ sec
Now, the distance from the starting point where they meet
= 5 × $\frac{40}{3}$ = $\frac{200}{3}$ = 66.67m

Sol.57.(a) A complete one round in 300 sec. and B in 400 sec. having one round equal to 1200 m, In a race of 12 km
Race will be completed in 10 rounds.
Total time taken by A to travel 10 rounds
= 3000 seconds
Similarly Total time taken by B to travel 10 rounds = 4000 seconds



L.C.M. (300,400) = 1200 sec.
Time taken by A to meet B for first time
= 1200 seconds
Time taken by A to meet B for second time = 2400 seconds
Time taken by A to meet B for third time
= 3600 seconds
But A completes the race in
= 3000 seconds
So A meets with B for last time
= 2400 seconds

Sol.58.(b) Speed of B = 6 m/s
Time taken by B to complete the race
= $\frac{1500}{6}$ = 250 sec
So, time taken by A to complete the race
= 250 - 10 = 240 sec or 4 minutes

Sol.59.(b) In opposite, direction relative speed = 4 + 6 = 10 m/sec
Time when they meet for first time
= $\frac{1100}{10}$ = 110 sec
Now, New Speed of Joy = 3 m/sec
and New Speed of Kat = 8 m/sec
New relative speed = 3 + 8 = 11 m/sec
Time when they meet for the second time = $\frac{1100}{11}$ = 100 sec
Total time from beginning
= 110 + 100 = 210 sec

Sol.60.(c) Speed = $\frac{distance}{time}$
Distance = 100m
Speed of Rahul = 6 × $\frac{5}{18}$ = $\frac{5}{3}$m/s
Time taken by Rahul = $\frac{100}{\frac{5}{3}}$ = 60 sec,
Rahul gives Bharat a start of 4 meters and still beats him by 4 sec that means Bharat covers 96m distance in 64 sec.
Speed of Bharat = $\frac{96}{64}$ m/s
= $\frac{96}{64}$ × $\frac{18}{5}$ km/hr = 5.4 km/hr

Sol.61.(d) Balancing the given ratio :

A	B	C
10	9	) × 10
	10	9) × 9

Distance ratio = 100 : 90 : 81
Time taken by A to complete the race
= $\frac{8100}{100}$ = 81
Time taken by B to complete the race
= $\frac{8100}{90}$ = 90
Time taken by C to complete the race
= $\frac{8100}{81}$ = 100
So , the required ratio = 81 : 90 : 100

Sol.62.(d) Given , the race = 100 m
A : B : C
100 : 80
100 : 95
100 : 80 : 76
So, A will beat C by,
⇒ 100 - 76 = 24 m

Sol.63.(a) given that total race = 100 m
Distance ratio of A and B = 100 : 90
Distance ratio of B and C = 100 : 90
After balancing their ratio we get,
A : B : C = 100 : 90 : 81
So difference between A and C
= (100 - 81) = 19 m

Sol.64.(a) The relative speed between malaya and neha = 11 - 7 = 4 rounds/h (when they run in the same direction)
Time taken to complete one round at this speed = $\frac{1}{4}$ h = $\frac{1}{4}$ × 60 = 15 min.
So they cross each other
= 2 : 45 + 15 = 3 : 00 pm

Sol.65.(c) For shyamal -
10 min. = 1000 m
8 min. = $\frac{1000}{10}$ × 8 = 800 m
For radha - 8 min. = 1000 m
Required distance = 1000 - 800 = 200 m

Sol.66.(a) To win Meenal has to cover distance = 1200 - 500 = 700m
Distance covered by Meenal = 700 m ,
At the same time, distance covered by
Nitu = 700 × $\frac{7}{5}$ = 980 m
So, Meenal wins by : 1200 - 980 = 220 m

Sol.67.(b)

	Riya	:	Prerna
Speed →	3	:	2
Distance →	3	:	2

At the time when Riya covers 3 units, Prerna covers 2 unit distance .
Since Riya gives a lead of (3 - 2) = 1 unit corresponds to 100 m
So, the distance covered by Riya before meeting = 3 unit = 3 × 100 = 300 m

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Boat and Stream

Important Terms

1). **Still Water Speed**: Speed of a thing in water which is not flowing.

2). **Speed of Current**: The speed at which water is flowing.

3). **Downstream speed**: Speed of a thing, moving in the same direction as that of the current.

Downstream speed = speed of boat in still water + Speed of current

4). **Upstream Speed**: Speed of a thing, moving in opposite direction as that of the current.

Upstream speed = speed of boat in still water - Speed of current

Let's take an example:

A man can swim at 20 km/h in still water. He is swimming in a river flowing at 10 km/h.

Here, Speed of current is = 10 km/h

If the man swims downstream i.e. with the flow of the river, his speed = 20 + 10 = 30 km/h

If the man swims upstream i.e. against the flow of the river, his speed = 20 – 10 = 10 km/h

Remember

1). $Still\ water\ speed$

$= \frac{Downstream\ speed + Upstream\ Speed}{2}$

2). Speed of the current

$= \frac{Downstream\ speed - Upstream\ Speed}{2}$

Let's verify in the given example:

Still water speed of the man

$= \frac{30+10}{2} = \frac{40}{2} = 20\ km/h$

Speed of the current

$= \frac{30-10}{2} = \frac{20}{2} = 10\ km/h$

Note: Changing km/h to m/s

$\frac{km}{h} = \frac{1000\ m}{3600\ s} = \frac{5}{18} m/s$

∴ To change km/h to m/s, multiply it by $\frac{5}{18}$.

To change m/s to km/hr, multiply it by $\frac{18}{5}$.

Please note :- (In the following formulas B = speed of boat and S = speed of stream .)

1.) If the total time taken by the boat to row a distance of D and reach back to its initial position is T then,

(a) Distance between the two places = $\frac{T(B^2 - S^2)}{2B}$

(b) Average speed of the boat = $\frac{(B^2 - S^2)}{2B}$

2.) If it takes T hours more to go to a point upstream than downstream for the same distance. Then,

Distance = $\frac{T(B^2 - S^2)}{2S}$

3.) If a boat travels a distance downstream in T_1 hours and returns the same distance upstream in T_2 hours. Then :-

Speed of a man in still water = $\frac{S(T_1 + T_2)}{(T_2 - T_1)}$

4.) If the time taken by the boat to row same distance in downstream is T_1 and in upstream is T_2. then the ratio of speed of the boat to the speed of stream :-

$$\frac{B}{S} = \frac{(T_2 + T_1)}{(T_2 - T_1)}$$

Variety Questions

Q.1. The ratio of the speed of a boat to that of the current water is 35 : 8. The boat goes along with the current in 5 hours 10 minutes. What will be the time taken by the boat to come back ?
SSC CPO 29/06/2024 (3rd Shift)
(a) 5 hours 15 minutes 58 seconds
(b) 6 hours 45 minutes 10 seconds
(c) 8 hours 13 minutes 42 seconds
(d) 9 hours 30 minutes 49 seconds

Q.2. The speed of a boat in still water is 30 km/h and the speed of the stream is 7.5 km/h. What is the time in hours taken by the boat in the stream to go from point A to B and then back to A covering a total distance of 90 km ?
SSC MTS 05/09/2023 (1st Shift)
(a) 3.2 (b) 2.8 (c) 3.4 (d) 3.0

Q.3. A boat takes 20 hours for travelling downstream from point A to point B and comes back to a midpoint C between A and B. The speed of the stream is 5 km/h and the speed of the boat in still water is 10 km/h. Find the distance between A and B (in km).
SSC MTS 01/09/2023 (1st Shift)
(a) 100 (b) 120 (c) 150 (d) 75

Q.4. A boat takes 11 hours to travel a distance upstream and takes 5 hours to travel the same distance downstream. If the speed of the boat in still water is $2\frac{2}{9}$ m/sec, then the speed of the stream (in km/h) is
SSC CHSL 04/08/2023 (4th Shift)
(a) 2 (b) 3 (c) 1 (d) 4

Q.5. A boat can go 60 km downstream and 40 km upstream in 12 hours 30 minutes. It can go 84 km downstream and 63 km upstream in 18 hours 54 minutes. What is the speed (in km/h, to the nearest integer) of the boat in still water ?
SSC CGL 20/07/2023 (1st shift)
(a) 7 (b) 8 (c) 9 (d) 10

Q.6. The speed of a boat upstream is 8 km/hr and the speed of stream is 4 km/hr. The boat covers a distance of x km upstream and x km downstream. If the total time taken by the boat is 9 hours, then what is the value of x?(in km)
SSC MTS 13/06/2023 (Evening)
(a) 60 (b) 72 (c) 48 (d) 36

Q.7. Time taken by boat to cover a distance of x km upstream is 3 hours more than the time taken by the boat to cover the same distance downstream. Speed of the boat upstream is 8 km/hr. Which of the following statement(s) is/are correct?
I. If the value of x is 48 km, then the speed of the boat in downstream is 16 km/hr.
II. If the speed of boat in downstream is 12 km/hr, then the value of x is 48 km.
SSC MTS 12/05/2023 (Afternoon)
(a) Neither I nor II (b) Only II
(c) Only I (d) Both I and II

Q.8. A man can swim at a speed of 14 km/hr in still water. If he takes twice as long to swim opposite the flow of the river than with the flow of the river, find the rate of stream.
SSC MTS 09/05/2023 (Evening)
(a) $\frac{14}{5}$ km/hr (b) $\frac{11}{5}$ km/hr
(c) $\frac{11}{4}$ km/hr (d) $\frac{14}{3}$ km/hr

Q.9. The ratio of the speed of the boat in still water to the speed of the stream is 8 : 3 and the boat can travel 22 km downstream in 24 minutes. Then, how much time will the boat take to cover 50 km upstream?
SSC CHSL 13/03/2023 (2nd Shift)
(a) 3 hrs (b) 4 hrs (c) 2.5 hrs (d) 2 hrs

Q.10. A man can row a distance of 8 km

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

downstream in a certain time and can row 6 km upstream in the same time. If he rows 24 km upstream and the same distance downstream in $1\frac{3}{4}$ hours, then the speed (in km/h) of the current is:
SSC CGL 17/8/2021 (Evening)
(a) 4 (b) 4.5 (c) 3 (d) 2.5

Q.11. X, Y are two points in a river. Points P and Q divide the straight line XY into three equal parts. The river flows along XY and the time taken by a boat to row from X to Q and from Y to Q are in the ratio 4 : 5. The ratio of the speed of the boat downstream to that of the river current is equal to:
SSC CGL 13/8/2021 (Morning)
(a) 3 : 10 (b) 3 : 4 (c) 10 : 3 (d) 4 : 3

Q.12. A man can row a boat in still water at a speed of 5 m/s. He covers a stretch of 200 m in a river downstream during high and low tides in 10 s and 25 s respectively. What is the ratio of the speed (in m/s) of the water flowing in the river during high and low tides?
SSC MTS 16/08/2019 (Morning)
(a) 5 : 3 (b) 5 : 1 (c) 3 : 2 (d) 4 : 3

Q.13. The speed of a boat in still water is 6 km/h. Time taken by the boat to cover a certain distance upstream is 3 hours more than the time taken to cover the same distance downstream. If the speed of the stream is 2 km/h, then what is the total distance, upstream and downstream, covered by the boat?
SSC MTS 08/08/2019 (Morning)
(a) 72 km (b) 24 km (c) 48 km (d) 36 km

Q.14. A person can row a distance of 4 km upstream in 1 hour 20 minutes and can row back to the starting point in just 24 minutes. How much time (in hours) will he take to row 13 km in still water?
SSC CGL 07/06/2019 (Afternoon)
(a) 2 (b) 3.5 (c) 3 (d) 2.5

Q.15. The speed of a boat in still water is 6 km/h. If it takes four times more time to go against the current than to go in the direction of the current, what will be the speed of the current?
SSC CPO 14/03/2019 (Evening)
(a) 2.5 km/h (b) 5 km/h
(c) 4.2 km/h (d) 3.6 km/h

Practice Questions

SSC MTS 2024 Tier - 1

Q.16. The speed of a boat in still water is 8 km/h, while it takes 2 hours for the boat to cover a distance of 20 km downstream. What is the speed (in km/h) of the stream ?
SSC MTS 09/10/2024 (Evening)
(a) 2.5 (b) 1.75 (c) 2 (d) 1.5

Q.17. A boat can travel at a speed of 28 km/h in still water. If the speed of the stream is 4 km/h, what is the average speed (in km/h) of the boat if it travels 192 km downstream, stops there for one hour and then returns to the starting point ?
SSC MTS 14/10/2024 (Morning)
(a) 25.6 (b) 24.8 (c) 36.5 (d) 28.5

Q.18. A boat can travel at a speed of 42 km/hr in still water. If the speed of the stream is 3 km/hr, how much time (in hours and minutes) will be taken by the boat to go 157.5 km downstream, and then 78 km upstream ?
SSC MTS 21/10/2024 (Morning)
(a) 6 h 20 min (b) 4 h 45 min
(c) 5 h 30 min (d) 7 h 25 min

Q.19. A man rows downstream 27 km and upstream 18 km, taking one hour each time. What is the speed of the current ?
SSC MTS 12/11/2024 (Afternoon)
(a) 4.5 km/h (b) 6 km/h
(c) 1.5 km/h (d) 9 km/h

SSC CGL 2024 Tier - 1

Q.20. The speed of a boat in still water is 18 km/h and the speed of the stream is 3 km/h. How much time (in hours) will it take to cover a distance of 105 km downstream and in coming back ?
SSC CGL 10/09/2024 (3rd Shift)
(a) 12 (b) 10 (c) 15 (d) 9

Q.21. A boat can go 54 km upstream in 6 hours. If the speed of the stream is 4.8 km/h, then how much time (in hours) will the boat take to cover a distance of 279 km downstream?
SSC CGL 11/09/2024 (3rd Shift)
(a) 20 (b) 15 (c) 18 (d) 16

Q.22. A boatman goes 2 km against the current of the stream in 1 hour and goes 1 km along with the current in 10 minutes. How long will it take to go 6 km in stationary water?
SSC CGL 12/09/2024 (3rd Shift)
(a) 1 hr 30 min (b) 1 hr 15 min
(c) 2 hr 30 min (d) 1 hr 45 min

Q.23. A boat can travel 78 km upstream and back in a total of 32 hours. It can travel 15 km upstream and 52 km downstream in a total of 9 hours. How much distance will the boat cover in 12 hours in still water?
SSC CGL 13/09/2024 (1st Shift)
(a) 92 km (b) 96 km
(c) 104 km (d) 100 km

Q.24. A boatman rows to a place 30 km distant and back in 14 hours. He finds that he can row 10 km with the stream at the same time as 4 km against the stream. Find the speed (in km/h) of the stream.
SSC CGL 13/09/2024 (3rd Shift)
(a) $\frac{9}{2}$ (b) $\frac{9}{4}$ (c) $\frac{2}{9}$ (d) $\frac{4}{9}$

Q.25. A motorboat travelling at some speed can cover 24 km upstream and 40 km downstream in 17 hours. At the same speed it can travel 32 km downstream and 12 km upstream in 10 hours. The speed of the stream is:
SSC CGL 18/09/2024 (1st Shift)
(a) 5 km/h (b) 4 km/h
(c) 2 km/h (d) 3 km/h

Q.26. A man can row a distance of 6 km in 1 hour in still water. He can row the same distance in 45 minutes with the current. Find the total time taken by him to row a distance of 16 km with the current and to return to the starting point.
SSC CGL 18/09/2024 (3rd Shift)
(a) 4 hours and 40 minutes
(b) 6 hours
(c) 4 hours
(d) 6 hours and 40 minutes

Q.27. A motorboat, whose speed is 15 km/h in still water, goes 50 km downstream and comes back in a total of 7 hours 30 minutes. The speed of the stream (in km/h) is:
SSC CGL 23/09/2024 (2nd Shift)
(a) 9 (b) 5 (c) 11 (d) 7

Q.28. A boat covers a distance of 55 km downstream in 5 hours while it takes 11 hours to cover the same distance upstream. What is the speed of the boat?
SSC CGL 23/09/2024 (3rd Shift)
(a) 8 km/h (b) 9 km/h
(c) 11 km/h (d) 7 km/h

SSC CHSL 2024 Tier - 1

Q.29. A man can row 18 km/h in still water. It takes him two times as long to row up as to row down the river. Find the rate of the stream.
SSC CHSL 01/07/2024 (3rd Shift)
(a) 9 km/h (b) 12 km/h
(c) 24 km/h (d) 6 km/h

Q.30. A boat can travel 60km downstream in 4 hours. If the speed of the boat in still water is 13 km/h, then in what time will it cover 30 km upstream?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 02/07/2024 (1st Shift)

(a) $3\frac{5}{7}$ hours (b) $3\frac{4}{7}$ hours

(c) $2\frac{4}{7}$ hours (d) $2\frac{8}{11}$ hours

Q.31. The ratio of the speeds of a boat while going upstream and going downstream is 2 : 3 and the sum of these two speeds is 15 km/h. What is the speed of the stream?

SSC CHSL 08/07/2024 (2nd Shift)

(a) 3.5 km/h (b) 1.5 km/h

(c) 3 km/h (d) 2.5 km/h

Q.32. A man can row a boat at speed 8 km/h in still water. It takes thrice as long to row upstream as it does to row downstream. Find the speed of the stream (in km/h).

SSC CHSL 08/07/2024 (4th Shift)

(a) 6 (b) 4 (c) 5 (d) 3

Q.33. If the speed of a boat in still water is 3 km/h and if its speed upstream is 1 km/h, find the speed of the stream.

SSC CHSL 11/07/2024 (3rd Shift)

(a) 0.25 km/h (b) 1 km/h

(c) 2 km/h (d) 0.5 km/h

SSC CPO 2024 Tier - 1

Q.34. A man wishes to cover 1 km distance in river water. In still water he takes 12 minutes to cover it, but in the flowing river he takes 13 minutes. The speed of the flowing water of the river is:

SSC CPO 27/06/2024 (1st Shift)

(a) 25 km/h (b) $\frac{5}{13}$ km/h

(c) 22 km/h (d) $\frac{7}{12}$ km/h

Q.35. A man's speed in still water is 4 km/h more than the speed of the current. If the man takes a total of 10 h to cover 45 km downstream and 35 km upstream, then the speed of the man in still water is:

SSC CPO 27/06/2024 (3rd Shift)

(a) 20 km/h (b) 18 km/h

(c) 15 km/h (d) 22 km/h

Q.36. A boat covers 24 km upstream and 36 km downstream in 10 hours, and 36 km upstream and 24 km downstream in 12 hours. The speed of the current is:

SSC CPO 28/06/2024 (1st Shift)

(a) $\frac{26}{9}$ km/h (b) $\frac{33}{13}$ km/h

(c) $\frac{25}{8}$ km/h (d) $\frac{24}{7}$ km/h

Q.37. A boat can travel 16.9 km downstream in 52 min. If the speed of the current is 3 km/h, then how much time (in hours) will the boat take to travel 84 km upstream ?

SSC CPO 29/06/2024 (1st Shift)

(a) 6 (b) 13.5 (c) 6.22 (d) 7.5

Q.38. A man rows 48 km and back in 48 hours. He can row 4 km with the stream in the same time as 3 km against the stream. The speed of the stream (in km/h) is:

SSC CPO 29/06/2024 (2nd Shift)

(a) $\frac{5}{21}$ (b) $\frac{7}{21}$ (c) $\frac{7}{24}$ (d) $\frac{3}{29}$

SSC Selection Post (Phase - XII)

Q.39. A man can row 9 km/h in still water. If the river is running at 4 km/h, it takes 8 hours more in upstream than to go downstream for the same distance. How far is the place?

Matriculation Level 24/06/2024 (Shift - 1)

(a) 65 km (b) 60 km (c) 75 km (d) 55 km

Q.40. The speed of a boat in still water is 6 km/h and the speed of the stream is 1.5 km/h. In going from point A to point B and returning to A, the boatman takes 2 hours 40 min. Find the distance between points A and B.

Higher Secondary 24/06/2024 (Shift - 2)

(a) 7.5 km (b) 8 km (c) 7 km (d) 8.5 km

Q.41. A boat covers a certain distance downstream in 2 hours, while it returns in $2\frac{1}{2}$ hours. If the speed of the stream is 3 km/h, then what is the speed of the boat in still water?

Graduate Level 24/06/2024 (Shift - 3)

(a) 25 km/h (b) 29 km/h

(c) 27 km/h (d) 20 km/h

Q.42. A motorboat, whose speed is 15 km/h in still water goes 20 km downstream and comes back in a total of 4 hours. The speed of the stream (in km/h) is:

Graduate Level 26/06/2024 (Shift - 4)

(a) 4√3 (b) 7√3 (c) 6√3 (d) 5√3

SSC CHSL 2023 Tier - 2

Q.43. A boat is moving 3 km against the current of the stream in 1 hour and moves 1 km in the direction of the current in 12 minutes. How long will it take the boat to go 6 km in stationary water ?

SSC CHSL Tier II 10/01/2024

(a) 1 hour and 25 minutes

(b) 1 hour and 15 minutes

(c) 1 hour and 30 minutes

(d) 1 hour and 20 minutes

SSC CPO 2023 Tier - 1

Q.44. The speed of a boat in still water is 20 km/h, while the river is flowing at a speed of 8 km/h and the time taken to cover a certain distance upstream is 6 h more than the time taken to cover the same distance downstream. Find the distance.

SSC CPO 03/10/2023 (3rd Shift)

(a) 126 km (b) 125 km

(c) 120 km (d) 336 km

Q.45. The speed of a boat in standing water is 6 km/h and the speed of the stream is 2.5 km/h. A man rows to a place at a distance of 59.5 kilometers and comes back to the starting point. The total time taken by him is:

SSC CPO 04/10/2023 (1st Shift)

(a) 22 hours (b) 18 hours

(c) 16 hours (d) 24 hours

Q.46. The upstream speed of a boat is 8 km/h and the downstream speed is 15 km/h. What is the speed of the boat in still water and the speed of the stream (in km/h), respectively ?

SSC CPO 04/10/2023 (2nd Shift)

(a) 11.5 and 3.5 (b) 3.5 and 11.5

(c) 3 and 11 (d) 11 and 3

SSC MTS 2023 Tier - 1

Q.47. A sailor rows a boat 36 km downstream and 24 km upstream in 6 hours. When it rows 24 km downstream and 36 km upstream the sailor takes 6 and half hours. Then the speed of the current is:

SSC MTS 01/09/2023 (3rd Shift)

(a) 1.5 km/h (b) 4 km/h

(c) 3 km/h (d) 2 km/h

Q.48. A boatman goes 6 km against the current of the stream in 2 hours and goes 1.5 km along the current in 7.5 minutes. How long will (in hours) it take to go 30 km in still water?

SSC MTS 04/09/2023 (3rd Shift)

(a) 2.5 (b) 3.5 (c) 3.0 (d) 4.0

Q.49. A motorboat can row 12 km/h in still water. If the speed of the current is 2 km h. it takes 1.5 hours more in covering some distance upstream than it does downstream for covering the same distance. The one-side distance is:

SSC MTS 08/09/2023 (3rd Shift)

(a) 52.5 km (b) 50 km

(c) 51.5 km (d) 53 km

Q.50. The time taken by a boat to cover a distance of x km upstream is double the time taken by the boat to cover the same

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

distance downstream. The sum of the speeds of the boat and the stream is 90 km/h. The speed of the stream is _____ km/h.
SSC MTS 12/09/2023 (3rd Shift)
(a) 22.5 (b) 37.5 (c) 27.5 (d) 33.5

Q.51. A boat travels upstream from B to A and downstream from A to B in 3 hours. If the speed of the boat in still water is 9 km/h and the speed of the current is 3.5 km/h, the distance between A and B is: (correct up to two decimal places)
SSC MTS 13/09/2023 (1st Shift)
(a) 14.46 km (b) 13.46 km
(c) 12.46 km (d) 11.46 km

SSC CHSL 2023 Tier - 1

Q.52. A ship goes at 18 km/h downstream and at 16 km/h upstream. What will be the speed of the ship in still water?
SSC CHSL 07/08/2023 (4th Shift)
(a) 14 km/h (b) 17 km/h
(c) 16 km/h (d) 15 km/h

Q.53. Sanjana can row a boat at 9 km/h in still water. It takes her twice as long to row up a certain distance as to row down the same distance in the river. What is the rate of the stream (in km/h)?
SSC CHSL 10/08/2023 (2nd Shift)
(a) 4 (b) 1 (c) 3 (d) 2

SSC CGL 2023 Tier - 1

Q.54. A man takes 15 minutes to row 16 km downstream, which is 25% less than the time he takes to row the same distance upstream. How many kilometers can the man row in an hour in still water?
SSC CGL 14/07/2023 (4th shift)
(a) 56 (b) 60 (c) 58 (d) 54

Q.55. The speed of boat down the stream is 125% of the speed in still water. If the boat takes 30 minutes to cover 20 km in still water, then how much time (in hours) will it take to cover 15 km upstream?
SSC CGL 19/07/2023 (3rd shift)
(a) $\frac{3}{4}$ (b) $\frac{1}{2}$ (c) $\frac{1}{4}$ (d) 1

Q.56. The ratio of the speed of a motorboat to that of the current of water is 31 : 6. The motorboat starts from a point and covers a certain distance along the current in 4 h 10 min. Find the time taken by the motorboat to come back to its initial point.
SSC CGL 20/07/2023 (4th shift)
(a) 4 h 10 min (b) 5 h 10 min
(c) 5 h 50 min (d) 6 h 10 min

Q.57. A boat can cover 120 km upstream and back in a total of 30 hours, and 25 km upstream and 40 km downstream in a total of 7 hours. How much distance will the boat cover in 16 hours in still water?
SSC CGL 24/07/2023 (1st shift)
(a) 200 km (b) 180 km
(c) 175 km (d) 225 km

Q.58. A boat running upstream takes 10 hours to cover a certain distance, while it takes 7 hours to cover the same distance running downstream. What is the ratio between the speed of the boat and that of the water current, respectively?
SSC CGL 25/07/2023 (3rd shift)
(a) 17 : 5 (b) 3 : 17 (c) 2 : 17 (d) 17 : 3

SSC MTS 2022 Tier - 1

Q.59. Ajay can row his boat in still water, at a speed of 11 km/hr. If the speed of the stream is 7 km/hr, how long will it take to a distance of 54 km downstream?
SSC MTS 03/05/2023 (Afternoon)
(a) 4 hours (b) 2 hours
(c) 2.5 hours (d) 3 hours

Q.60. Two boats go downstream in a river at a speed of 35 km/hr and 25 km/hr. The speed of the stream is 4 km/hr. The distance between both boats initially is 60 km. In how much time will they meet if the boats are going downstream?
SSC MTS 15/05/2023 (Evening)
(a) 10 hours (b) 13 hours
(c) 6 hours (d) 8 hours

SSC CHSL 2022 Tier - 1

Q.61. Ankit went to Manali, for river rafting. He rows at the rate of 12 km/h in still water. To cover the same distance, it takes him twice as long to row up as to row down the river. Find the rate of flow of the river.
SSC CHSL 15/03/2023 (3rd Shift)
(a) 6 km/h (b) 4 km/h
(c) 8 km/h (d) 2 km/h

SSC CGL 2022 Tier - 2

Q.62. A man can row 10 km/h in still water. When the river is running at a speed of 4.5 km/h, then it takes him 2 h to row to a place and comes back to the initial point. How far is the place (in km) (rounded off to two decimal places)?
SSC CGL Tier II (02/03/2023)
(a) 5.50 (b) 8.98 (c) 7.98 (d) 6.25

SSC CGL 2022 Tier - 1

Q.63. A swimmer swims from a point P against the current for 6 min and then swims back along the current for next 6 min and reaches at a point Q . If the distance between P and Q is 120 m then the speed of the current (in km/h) is:
SSC CGL 01/12/2022 (3rd Shift)
(a) 0.4 (b) 0.2 (c) 1 (d) 0.6

Q.64. A boat racer can row $21\frac{3}{2}$ km/h in still water. If the speed of river is 12.5 km/hr, it takes him 40 minutes to row to a place and back, how far off is the place ?
SSC CGL 06/12/2022 (1st Shift)
(a) $5\frac{5}{27}$km (b) $5\frac{2}{5}$ km
(c) $4\frac{5}{27}$km (d) $3\frac{5}{27}$km

Q.65. A man rows to a place 48 km distant and comes back in 14 hours. He finds that he can row 4 km with the stream in the same time as 3 km against the stream. The speed of the stream is:
SSC CGL 07/12/2022 (2nd Shift)
(a) 1.5 km/h (b) 3.5 km/h
(c) 1.8 km/h (d) 1 km/h

SSC CPO 2022 Tier - 1

Q.66 A boat can go 40 km downstream and 25 km upstream in 7 hours 30 minutes. It can go 48 km downstream and 36 km upstream in 10 hours. What is the speed (in km/h) of the boat in still water?
SSC CPO 09/11/2022 (Evening)
(a) 6 (b) 12 (c) 9 (d) 15

Q.67. The speed of a boat in still water is thrice the speed of the stream. If the boat takes 15.5 sec to go to a certain place downstream, then find the additional time required to cover the same distance traveling upstream.
SSC CPO 11/11/2022 (Afternoon)
(a) 15.5 sec (b) 29 sec
(c) 31 sec (d) 35 sec

SSC Selection Post (Phase - X)

Q.68. A person can row downstream 49 km in 7 hours and upstream 36 km in 9 hours. What is the speed of the current?
Higher Secondary 02/08/2022 (Shift - 2)
(a) 1.5 km/h (b) 2 km/h
(c) 2.5 km/h (d) 3 km/h

SSC MTS 2021 Tier - 1

Q.69. The speed of a boat in still water is 16 km/h. The time taken by the boat to

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

cover a distance of 18 km upstream is equal to the time taken by the boat to travel 30 km downstream. What is the speed of the stream?(in km/h)
SSC MTS 06/07/2022 (Evening)
(a) 4 (b) 7 (c) 5 (d) 6

Q.70. A man rows from J and K (upstream) and back from K and J (downstream) in a total time of 15 hours. The distance between J and K is 300 km. The time taken by the man to row 9 km downstream is identical to the time taken by him to row 3 km upstream. What is the approximate speed of the boat in still water?(in km/h)
SSC MTS 12/07/2022 (Evening)
(a) 51.33 (b) 47.67 (c) 53.33 (d) 43.67

SSC CHSL 2021 Tier - 1

Q.71. A man can row 5 km/h in still water. If the speed of the current is 2.5 km/h, it takes 4 hours more in upstream than in the downstream for the same distance. The distance is :
SSC CHSL 24/05/2022 (Afternoon)
(a) 10.5 km (b) 15 km
(c) 7.5 km (d) 12 km

SSC CGL 2021 Tier - 1

Q.72. A motorboat whose speed is 20 km/h in still water takes 30 minutes more to go 24 km upstream than to cover the same distance downstream. If the speed of the boat in still water is increased by 2 km/h, then how much time will it take to go 39 km downstream and 30 km upstream?
SSC CGL 11/04/2022 (Morning)
(a) 2 hrs 40 m (b) 3 hrs 10 m
(c) 3 hrs 40 m (d) 4 hrs 50 m

Q.73. A boat can cover a distance of 56 km downstream in 3.5 hours. The ratio of the boat in still water and the speed of the stream is 3 : 1. How much time will it take to cover a distance of 41.6 km downstream?
SSC CGL 18/04/2022 (Morning)
(a) 2.1 (b) 1.5 (c) 2.6 (d) 1.8

SSC MTS 2020 Tier - 1

Q.74. A boat sails downstream from a point P to point Q, which is 24 km away from P, and then returns to P. If the actual speed of the boat(in still water) is 6 km/h, the entire trip from P to Q takes 3 hours less than that from Q to P. What should be the actual speed (in km/h) of the boat to sail from P to Q in 2 hours?
SSC MTS 08/10/2021 (Morning)
(a) 12 (b) 15 (c) 10 (d) 22

SSC CGL 2020 Tier - 1

Q.75. A boat covers a round trip journey between two points A and B in a river in T hours. If its speed in still water becomes 2 times, it would take $\frac{80}{161}$T hours for the same journey. Find the ratio of its speed in still water to the speed of the river.
SSC CGL 23/08/2021 (Morning)
(a) 11 : 1 (b) 161 : 40 (c) 1 : 11 (d) 2 : 1

SSC CHSL 2020 Tier - 1

Q.76. Ravi can row a boat in still water at the speed of 14 km/h. If a river is flowing at the speed of 2km/h and Ravi takes 3 hours to cover a certain distance upstream, then how much time will he take to cover the same distance downstream?
SSC CHSL 06/08/2021 (Morning)
(a) 2h 20m (b) 2h
(c) 2h 15m (d) 2h 30m

SSC CPO 2020 Tier - 1

Q.77. The speed of a boat in still water is 15 km/h, and the speed of the current is 5 km/h, in how much time (in hours) will the boat travel a distance of 60 km upstream and the same distance downstream?
SSC CPO 25/11/2020 (Evening)
(a) 12 (b) 9 (c)10 (d) 20

Answer Key :-

1.(c)	2.(a)	3.(b)	4.(b)
5.(c)	6.(c)	7.(c)	8.(d)
9.(d)	10.(a)	11.(c)	12.(b)
13.(c)	14.(a)	15.(d)	16.(c)
17.(a)	18.(c)	19.(a)	20.(a)
21.(b)	22.(a)	23.(b)	24.(b)
25.(d)	26.(b)	27.(b)	28.(a)
29.(d)	30.(d)	31.(b)	32.(b)
33.(c)	34.(b)	35.(a)	36.(c)
37.(c)	38.(c)	39.(a)	40.(a)
41.(c)	42.(d)	43.(c)	44.(a)
45.(d)	46.(a)	47.(d)	48.(d)
49.(a)	50.(a)	51.(d)	52.(b)
53.(c)	54.(a)	55.(b)	56.(d)
57.(a)	58.(d)	59.(d)	60.(c)
61.(b)	62.(c)	63.(d)	64.(a)
65.(d)	66.(c)	67.(a)	68.(a)
69.(a)	70.(c)	71.(b)	72.(b)
73.(c)	74.(c)	75.(a)	76.(c)
77.(b)			

Solutions :-

Sol.1.(c)
Ratio → Downstream : Upstream
Speed → 43 : 27
Time → 27 : 43
ATQ,
27 unit (Downstream) -------- $5\frac{1}{6} = \frac{31}{6}$ hrs
Then, 43 unit(upstream)------ $\frac{31}{6 \times 27} \times 43$
$= \frac{1333}{162}$ = 8 hours 13 minute 42 seconds

Sol.2.(a) Let total time taken is T hours
$T = \frac{45}{30+7.5} + \frac{45}{30-7.5} \Rightarrow \frac{45}{37.5} + \frac{45}{22.5}$
= 1.2 + 2 = 3.2 hours

Sol.3.(b) According to the question,
Let the total distance = 2d
Time = $\frac{distance}{speed}$
$20 = \frac{2d}{10+5} + \frac{d}{10-5}$
$20 = \frac{2d+3d}{15}$, d = 60 km
Total distance (2d) = 2 × 60 = 120 km

Sol.4.(b)
Ratio → upstream : downstream
Time → 11 : 5
Speed → 5 : 11

Speed of current = $\frac{11-5}{2}$ = 3 units
Speed of boat in still water = $\frac{11+5}{2}$
= 8 units
8 units = $\frac{20}{9}$ m/s
3 units = $\frac{20}{9 \times 8} \times 3 \times \frac{18}{5}$ = 3 km/h

Sol.5.(c) Let speed of boat be x km/hr. and speed of stream be y km/hr.
$\frac{60}{(x+y)} + \frac{40}{(x-y)}$ = 12.5 ...e.q .(1)
$\frac{84}{(x+y)} + \frac{63}{(x-y)}$ = 18.9 .... E.q .(2)
Let, $\frac{1}{(x+y)}$ km/hr. = a , and $\frac{1}{(x-y)}$ km/hr. = b
$60a + 40b$ = 12.5 ...e.q .(3)
$84a + 63b$ = 18.9 ...e.q .(4)
$\{e.q.(3) \times 7\} - \{e.q.(4) \times 5\}$, we get
$-35b = -7 \Rightarrow b = \frac{1}{5} \Rightarrow (x - y) = 5$
Putting value of b in e.q .(3) , we get

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$60a = 4.5 \Rightarrow a = \frac{3}{40} \Rightarrow (x + y) = \frac{40}{3}$

So , $x = \frac{5 + \frac{40}{3}}{2} = \frac{55}{6} \approx 9$ km/hr.

Sol.6.(c) Let the speed of the boat be (a) and given that the distance is x km.
Speed of boat in upstream $(a - 4)$ = 8 km/h
Speed of boat in downstream $(a + 4)$
= (12 + 4) = 16 km/h
According to the question,

$9 = \frac{x}{8} + \frac{x}{16} \Rightarrow 3x = 144 \Rightarrow x = 48$ km

Sol.7.(c) By Statement I :
Distance = 48 km

Time (upstream) = $\frac{48}{8}$ = 6 hr

So, time (downstream) = $(6 - 3)$ = 3 hr
Then,

Downstream Speed = $\frac{48}{3}$ = 16 km/hr

By Statement II :
Downstream speed = 12 km/h

$\frac{x}{8} - \frac{x}{12} = 3 \Rightarrow x = 72 \neq 48$

Therefore, only Statement I is correct.

Sol.8.(d) Let speed of stream = x km/h
According to the question,
Time taken in upstream = 2 × time taken in downstream

$\frac{D}{14 - x} = 2 \times \frac{D}{14 + x}$

$\Rightarrow 14 + x = 28 - 2x$

$\Rightarrow 3x = 14 \Rightarrow x = \frac{14}{3}$ km/h

Sol.9.(d) Let the speed of boat in still water and stream = 8x and 3x respectively
Speed of the boat to travel 22 km downstream in 24 min

$\Rightarrow$ (8x + 3x) = $\frac{22}{\frac{24}{60}}$ = 11x = 55 km/h

= x = 5 km/h
Then, speed of boat in still water and stream = 40km/h and 15km/h respectively
therefore , boat take to cover 50 km upstream = $\frac{50}{40 - 15}$ = 2 hours

Sol.10.(a) Let the downstream = x + y
And the upstream = x - y
If the time is same then the ratio of the speed and the distance is same

$\frac{x + y}{x - y} = \frac{8}{6}$

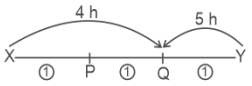
x = 7 unit and y = 1 unit
According to the question

$\frac{24}{x + y} + \frac{24}{x - y} = \frac{7}{4}$

$\frac{24}{8unit} + \frac{24}{6\ unit} = \frac{7}{4} \Rightarrow \frac{7}{1\ unit} = \frac{7}{4}$

1 unit = 4 km/hr so the speed of the current is 4km/hr

Sol.11.(c)



Let XP = PQ = QY = 1 unit

Speed of downstream = $\frac{2}{4} = \frac{1}{2}$unit/h

Speed of upstream = $\frac{1}{5}$ unit/h

Speed of stream = $\frac{1}{2} \times (\frac{1}{2} - \frac{1}{5}) = \frac{3}{20}$

Hence, required ratio = $\frac{1}{2} : \frac{3}{20}$ = 10 : 3

Sol.12.(b)
Speed of boat in still water = 5 m/s
Distance = 200 m
Downstream speed in high tide

= $\frac{200}{10}$ = 20 m/s

Downstream speed in low tide

= $\frac{200}{25}$ = 8 m/s

Stream speed in high tide
= 20 - 5 = 15 m/s
Stream speed in low tide = 8 - 5 = 3 m/s
Required ratio = 15 : 3 = 5 : 1

Sol.13.(c)
The speed of a boat in still water = 6 km/h
the speed of the stream = 2 km/h
Downstream speed = 6 + 2 = 8 km/h
Upstream speed = 6 - 2 = 4 km/h
Let the time taken to cover the distance downstream = t hours.
According to the question
8 x t = 4 (t + 3)
4t = 12 ⇒ t = 3 hours
One side distance = 8 × 3 = 24 km
Total distance covered = 24 + 24 = 48 km
Short trick :-
Distance between initial and final point

= $\frac{T(B^2 - S^2)}{2S} = \frac{3(6^2 - 2^2)}{2 \times 2}$ = 24 km

Total covered distance = 24 × 2 = 48 km

Sol.14.(a) Let the speed of boat = b km/h
And speed of stream = s km/h
Upstream speed (b - s)

= $\frac{4}{\frac{4}{3}}$ = 3 km/h .....(1)

Downstream speed (b + s)

= $\frac{4}{\frac{24}{60}}$ = 10 km/h .....(2)

Add (1) and (2)
(b - s) + (b + s) = 3 + 10
2b = 13 ⇒ b = 6.5 km/h
Time taken to travel the distance

= $\frac{13}{6.5}$ = 2 h

Sol.15.(d) Let the speed of stream be a.

Given,	Upstream	:	Downstream
Time =	4	:	1
Speed =	1	:	4

So, $\frac{6 - a}{6 + a} = \frac{1}{4} \Rightarrow a = 3.6\ km/h$

Sol.16.(c)
Let the speed of the stream be x
According to question,

$\Rightarrow \frac{20}{8 + x} = 2 \Rightarrow 10 = 8 + x \Rightarrow x = 2$ km/h

Sol.17.(a) Speed of boat in downstream
= $(x + y)$ = (28 + 4) = 32 km/h
Time taken by boat to go downstream

= $\frac{192}{32}$ = 6 hour

Speed of boat in upstream = $(x - y)$
= (28 - 4) = 24 km/h
Time taken by boat to go upstream

= $\frac{192}{24}$ = 8 hour

Total distance (both ways) = 2 × 192
= 384 km
Total time taken (both ways) = (6 + 8 + 1)
= 15 hour

Now, average speed = $\frac{Total\ Distance}{Total\ time\ taken}$

= $\frac{384}{15}$ = 25.6 km/h

Sol.18.(c) Speed of a boat downstream
= 42 + 3 = 45 km/h
Speed of a boat upstream
= 42 - 3 = 39 km/h
According to question,

Time taken by boat = $\frac{157.5}{45} + \frac{78}{39}$ = 3.5 + 2 = 5.5 hours = 5 h 30 min

Sol.19.(a) Let speed of boat = x km/h
Speed of current = y km/h
According to question,

$\frac{27}{x + y} = 1 \Rightarrow x + y = 27$ ... (i)

$\frac{18}{x - y} = 1 \Rightarrow x - y = 18$ ... (ii)

Form (i) and (ii)
$2x = 45 \Rightarrow x = 22.5$ km/h
Hence,
Speed of current = 27 - 22.5 = 4.5 km/h

Sol.20.(a) Time taken to cover the distance in downstream

= $\frac{distance}{speed\ of\ boat + speed\ of\ stream}$

$\Rightarrow \frac{105}{18 + 3} = \frac{105}{21}$ = 5 hours

Time taken to cover the distance in upstream

= $\frac{distance}{speed\ of\ boat - speed\ of\ stream}$

$\Rightarrow \frac{105}{18 - 3} = \frac{105}{15}$ = 7 hours

Total time taken = 5 + 7 = 12 hours

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.21.(b) Let the speed of boat be B

Upstream speed = $\frac{54}{6}$ = 9 km/hr

⇒ B - 4.8 = 9 ⇒ B = 9 + 4.8 = 13.8 km/hr

Then, Downstream speed

= 13.8 + 4.8 = 18.6 km/hr

Required time taken by boat

= $\frac{279}{18.6}$ = 15 hrs

Sol.22.(a)

Let speed of boat in stationary water = x

And speed of stream = y

According to question ,

$\frac{2}{x-y}$ = 60 ... (i)

⇒ $\frac{1}{x+y}$ = 10 .....(ii)

⇒ x - y = $\frac{1}{30}$ .....(iii)

⇒ x + y = $\frac{1}{10}$ .... (iv)

Adding eqn (iii) and (iv)

2x = $\frac{1}{30}$ + $\frac{1}{10}$ ⇒ x = $\frac{2}{30}$

Now , time taking to go 6 km in stationary water

= $\frac{6 \times 30}{2}$ = 90 min = 1 hr 30 min

Sol.23.(b)

Let the speed of a boat be x km/h and the speed of a stream be y km/h

$\frac{78}{x+y}$ + $\frac{78}{x-y}$ = 32 .....(i)

$\frac{52}{x+y}$ + $\frac{15}{x-y}$ = 9 .....(ii)

We will assume that ($x + y$ = 13) and ($x - y$ = 3) satisfies the equation (i) and (ii)

Then,

$x + y$ = 13 .....(iii)

$x - y$ = 3 .....(iv)

Add equation (iii) and (iv), we get

2x = 16 ⇒ x = 8 km/h

Now, Distance covered by boat in still water = 12 × 8 = 96 km

Sol.24.(b) Let the speed of boat in still water = x km/h

Speed of stream =y km/h

⇒ $\frac{10}{x+y} = \frac{4}{x-y}$ ⇒ $\frac{x-y}{x+y} = \frac{2k}{5k}$

$x = 3.5k$ *and* $y = 1.5k$

According to question ,

$\frac{30}{x+y}$ + $\frac{30}{x-y}$ = 14

$\frac{30}{5k}$ + $\frac{30}{2k}$ = 14 ⇒ k = $\frac{21}{14}$

∴ Speed of stream = 1.5k

= 1.5 × $\frac{21}{14}$ = $\frac{9}{4}$ km/h

Sol.25.(d)

Let speed of boat in still water = xkm/h

Speed of stream = y km/h

According to question,

⇒ $\frac{24}{x-y}$ + $\frac{40}{x+y}$ = 17 ..... (i)

⇒ $\frac{12}{x-y}$ + $\frac{32}{x+y}$ = 10 ....(ii)

Multiply eq (ii) by 2

⇒ $\frac{24}{x-y}$ + $\frac{64}{x+y}$ = 20 ....(iii)

Subtract eq (i) from eq . (iii) we get

⇒ $\frac{24}{x+y}$ = 3 ⇒ x + y = 8 ....(iv)

Put this value in eqn (ii) we get

⇒ x -y = 2 ....(v)

After solving eqn (iv) and (v) we get

x = 5 km/h , y = 3 km/h

speed of the stream = 3km/h

Sol.26.(b)

Speed of man in still water (x) = 6 km /h

Downstream speed

= $\frac{6}{45 \times \frac{1}{60}}$ = 8 km / h

Speed of current (y) = 8 - 6 = 2 km/h

Time taken to row and return to starting point = $\frac{16}{x+y}$ + $\frac{16}{x-y}$ = $\frac{16}{8}$ + $\frac{16}{4}$

= 2 + 4 = 6 hours

Sol.27.(b)

Let the speed of a stream be x km/h

⇒ $\frac{50}{15-x}$ + $\frac{50}{15+x}$ = 7.5

In this type of question by using hit and trial method,

Put the value of x = 5,

LHS = $\frac{50}{15-x}$ + $\frac{50}{15+x}$

= $\frac{50}{15-5}$ + $\frac{50}{15+5}$ = $\frac{50}{10}$ + $\frac{50}{20}$

= 5 + 2.5 = 7.5 = RHS

Value of x satisfies the equation,

So, the speed of a stream is 5 km/h

Sol.28.(a)

Let the speed of the boat and stream be x km/h and y km/h respectively,

According to the question,

⇒ $\frac{55}{x+y}$ = 5 ⇒ x + y = 11 ..... (i)

⇒ $\frac{55}{x-y}$ = 11 ⇒ x - y = 5 ..... (ii)

Add equation (i) and (ii),

2x = 16 ⇒ x = 8 km/h

Sol.29.(d) Let the speed of the boat and stream be x and y km/h respectively.

Ratio - (x - y) : (x + y)

Time - 2 : 1

Speed - 1 : 2

Speed of the boat = $\frac{1+2}{2}$ = $\frac{3}{2}$ units

Speed of the stream = ($\frac{2-1}{2}$) = $\frac{1}{2}$ units

$\frac{3}{2}$ units = 18 km/h

(Speed of the stream) $\frac{1}{2}$ units

= $\frac{18 \times 2}{3}$ × $\frac{1}{2}$ = 6 km/h

Sol.30.(d) Speed of Boat = 13 km/h

Let the speed of stream be y km/h

Time = $\frac{distance}{speed}$

According to the question,

4 = $\frac{60}{13+y}$ ⇒ 52 + 4y = 60

4y = 8 ⇒ y = 2 km/h

So, time taken by boat to cover 30 km in upstream = $\frac{30}{13-2}$ = $\frac{30}{11}$ = 2$\frac{8}{11}$ hours

Sol.31.(b) Let Speed of upstream and downstream be 2x and 3x respectively,

According to the question,

(2x + 3x) = 15 ⇒ 5x = 15 ⇒ x = 3 km/h

Then, speed of upstream and downstream be 6km/h and 9 km/h respectively,

Now, speed of current = $\frac{9-6}{2}$ = $\frac{3}{2}$

= 1.5 km/h

Sol.32.(b) speed of boat = 8 km/h

Let speed of current be y km/h

According to the question,

3 × upstream speed = downstream speed

3(8 - y) = (8 + y) ⇒ 24 - 3y = 8 + y

4y = 16 ⇒ y = 4 km/h

Sol.33.(c)

Speed of boat in still water (x) = 3 km/h

Let speed of stream = y km/h

$x - y = 1$

$3 - y = 1$

$- y = -2$

$y = 2\ km/h$

Sol.34.(b) Speed of man in still water(B)

= $\frac{1 \times 60}{12}$ = 5 km/hr

Speed of man in flowing river(B - S)

= $\frac{1 \times 60}{13}$ = $\frac{60}{13}$ km/hr

So, speed of flowing water of the river(S)

= 5 - $\frac{60}{13}$ = $\frac{5}{13}$ km/hr

Sol.35.(a) Let speed of current = x km/h then, speed of man = (x + 4) km/h

According to question,

$\frac{45}{2x+4}$ + $\frac{35}{4}$ = 10

$\frac{45}{2x+4}$ = 10 - 8.75 ⇒ $\frac{45}{2x+4}$ = 1.25

45 = 2.5x + 5 ⇒ 2.5x = 40 ⇒ x = 16

Speed of man = x + 4 = 20 km/h

Sol.36.(c) Let the speed of boat be x and speed of stream be y

Upstream speed (U) = x - y

Downstream speed (D) = x + y

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

According to question

$\frac{24}{U} + \frac{36}{D} = 10$ ---------- (i)

$\frac{36}{U} + \frac{24}{D} = 12$ ---------- (ii)

Solving eqn(i) and (ii) we get ;

$\frac{108}{D} - \frac{48}{D} = 6 \Rightarrow \frac{60}{D} = 6 \Rightarrow D = 10$

Now,putting D = 10 in eqn (i), we get ;

$\frac{24}{U} + \frac{18}{5} = 10$

$\frac{24}{U} = 10 - \frac{18}{5} \Rightarrow \frac{24}{U} = \frac{32}{5}$

$U = \frac{24 \times 5}{32} = \frac{15}{4}$

So, speed of current = $\frac{D-U}{2}$

$= (10 - \frac{15}{4}) \times \frac{1}{2} = \frac{25}{8}$ km/hr

Sol.37.(c)

Downstream speed = $\frac{16.9}{\frac{52}{60}}$ = 19.5 km/h

Speed of (boat + current) = 19.5

Speed of boat = 19.5 - 3 = 16.5 km/h

Time taken upstream = $\frac{84}{16.5-3} = \frac{84}{13.5}$

$= \frac{84}{13.5} = 6.22$

Sol.38.(c)

Let the speed of a boat be x km/h and the speed of a stream be y km/h

According to the question,

$\Rightarrow \frac{48}{x+y} + \frac{48}{x-y} = 48$ .....(i)

And,

$\Rightarrow \frac{4}{x+y} = \frac{3}{x-y}$

$\Rightarrow 4x - 4y = 3x + 3y$

$\Rightarrow x = 7y$ .....(ii)

Put the value of x in equation (i)

$\Rightarrow \frac{48}{7y+y} + \frac{48}{7y-y} = 48$

$\Rightarrow \frac{48}{8y} + \frac{48}{6y} = 48 \Rightarrow \frac{6}{y} + \frac{8}{y} = 48$

$\Rightarrow \frac{14}{y} = 48 \Rightarrow y = \frac{7}{24}$ km/h

Sol.39.(a) Let the distance be x

Downstream speed = 9 + 4 = 13 km/hr

Upstream speed = 9 - 4 = 5 km/hr

According to the question,

$\frac{x}{5} - \frac{x}{13} = 8 \Rightarrow \frac{13x-5x}{65} = 8$

$\frac{8x}{65} = 8 \Rightarrow x = 65$ km

Sol.40.(a)

speed of a boat in still water = 6 km/h

the speed of the stream = 1.5 km/h

Downstream = 6 + 1.5 = 7.5 km/hr

Upstream = 6 - 1.5 = 4.5 km/hr

Total distance = speed × time

$\Rightarrow$ time = $\frac{D}{7.5} + \frac{D}{4.5}$

$\Rightarrow 2 + \frac{2}{3} = \frac{3D+5D}{22.5}$

$\Rightarrow \frac{8D}{22.5} = \frac{8}{3} \Rightarrow D = 7.5$ Km

Sol.41.(c)

Let the speed of boat be x km/hr

Downstream speed = $(x + 3)$ km/hr

Upstream speed = $(x - 3)$ km/hr

ATQ, $(x + 3) \times 2 = (x - 3) \times 2.5$

$\frac{x+3}{x-3} = \frac{2.5}{2} = \frac{5}{4}$

Using componendo and dividendo rule, we have ;

$\frac{x}{3} = \frac{9}{1} \Rightarrow x = 27$ km/hr

Sol.42.(d) Let speed of stream be x

ATQ,

$\frac{20}{15+x} + \frac{20}{15-x} = 4$

$20(\frac{15-x+15+x}{(15-x)(15-x)}) = 4$

$\frac{30}{225-x^2} = \frac{1}{5} \Rightarrow 225 - x^2 = 150$

$\Rightarrow x^2 = 75 \Rightarrow x = 5\sqrt{3}$ km/h

Sol.43.(c) Let the speed of boat = x km/h

And speed of current = y km/h

boat moving against current$(x - y)$ = 3 km/h

boat moving with current $(x + y)$

$= \frac{1}{12} \times 60 = 5$ km/h

∴ speed of boat in still water = x = 4 km/h

Required time = $\frac{6}{4} \times 60$ = 1 hour 30 min.

Sol.44.(a) Let the covered distance = x km

Speed of the boat = 20 km/hr

Speed of the water = 8 km/hr

According to question,

$\frac{x}{12} - \frac{x}{28} = 6 \Rightarrow \frac{16x}{12 \times 28} = 6$

$\Rightarrow x = 126\ km$

Sol.45.(d) speed of boat in upstream = (6 - 2.5) = 3.5 km/h

speed of boat in downstream = (6 + 2.5) = 8.5 km/h

Total time taken by him

$= \frac{59.5}{8.5} + \frac{59.5}{3.5} = 7 + 17 = 24\ hours$

Sol.46.(a) According to the question.

Let the speed of boat and stream will be x and y respectively.

$x + y = 15$.....(1)

$x - y = 8$.....(2)

On adding e.q (1) and (2)

$x = \frac{15+8}{2} = 11.5$ km/h

So, $y = \frac{15-8}{2} = 3.5$ km/h

Sol.47.(d) Let the speed of the boat in still water is x km/h and the speed of the current is y km/h

According to the question,

$\frac{36}{x+y} + \frac{24}{x-y} = 6$ ....eq .1

$\frac{24}{x+y} + \frac{36}{x-y} = 6.5$ ....eq .2

From eq .1 and eq .2 we get

$x + y = 12$, $x - y = 8$

$y = 2$ km/h

Sol.48.(d) According to the question,

Let the speed of the boat and current will be x and y.

$x - y = \frac{6}{2} = 3$ km/h.....(1)

$x + y = \frac{1.5 \times 60}{7.5} = 12$ km/h.....(2)

On adding e.q . (1) and (2) we get.

$x = \frac{3+12}{2} = 7.5$ km/h

Required time = $\frac{30}{7.5}$ = 4 hours

Sol.49.(a) Let the distance is d km

According to the question,

$\frac{d}{12-2} - \frac{d}{12+2} = 1.5 \Rightarrow \frac{d}{10} - \frac{d}{14} = 1.5$

$\Rightarrow \frac{d}{5 \times 7} = 1.5 \Rightarrow d = 52.5$

Sol.50.(a) Let the speed of the boat instill water is y km/h and the speed of stream is z km/h

According to the question,

$(y + z) \times 1 = (y - z) \times 2$

$90 \times 1 = (y - z) \times 2$

$(y - z) = 45$ ....eq .1

$(y + z) = 90$ ....eq .2

Subtract equation 1 from equation 2 we get

$2z = 45$

Speed of stream (z) = 22.5 km/h

Sol.51.(d) Speed of downstream $(x + y)$ = 9 + 3.5 = 12.5 km/h

Speed of upstream $(x - y)$ = (9 − 3.5) = 5.5 km/h

Then , $\frac{d}{12.5} + \frac{d}{5.5} = 3$

$d\ (\frac{1}{2.5} + \frac{1}{1.1}) = 3 \times 5$

Distance (d) = $\frac{15 \times 2.75}{(1.1+2.5)}$ = 11.46 km

Sol.52.(b) Speed of ship in still water

$= \frac{18+16}{2} = 17$ km/h

Sol.53.(c) Let speed of current = x km/h

Speed in downstream = $(9 + x)$ km/h

Speed in upstream = $(9 - x)$ km/h

Ratio	= Downstream	:	Upstream
Time	= 1	:	2
Speed	= 2	:	1

$\frac{9+x}{9-x} = \frac{2}{1} \Rightarrow x = 3$ km/h

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.54.(a) Speed of man in downstream

$(x + y) = \frac{16}{\frac{15}{60}}$ = 64 km/h

Ratio → upstream : downstream

Time → 4 : 3

Speed → 3 : 4

Speed of upstream$(x - y) = \frac{64}{4} \times 3$

= 48 km/h

Now, speed of a man in still water (x)

$= \frac{64 + 48}{2}$ = 56 km/h

So, required distance = 1 × 56 = 56 km

Sol.55.(b) Let the speed of boat be x km/hr. and speed of stream be y km/hr.

Speed in downstream = $(x + y)$

According to the question ,

$\frac{(x+y)}{x} = \frac{5}{4} \Rightarrow 4x + 4y = 5x \Rightarrow y = \frac{x}{4}$

Speed of boat $(x) = \frac{20 \times 2}{1}$ = 40 km/hr

Now , Speed of stream $(y) = \frac{40}{4}$ = 10 km/hr

Speed in upstream = $(x - y)$ = 30 km/hr

Require time = $\frac{15}{30} = \frac{1}{2}$ hr.

Sol.56.(d) Let the speed of boat = $31x$ and the speed of water = $6x$

Time taken to cover a distance downstream = 4 hr 10 min

Total covered distance = time × speed

$= 4\frac{1}{6} \times (31x + 6x) = \frac{925x}{6}$

Time taken to come back to initial point

$= \frac{D}{(31x - 6x)}$

$= \frac{925x}{6 \times 25x} = \frac{37}{6}$ hr = 6 hr 10 minutes.

Sol.57.(a) According to the question,

$\frac{120}{x+y} + \frac{120}{x-y}$ = 30 ----------(1)

And , $\frac{40}{x+y} + \frac{25}{x-y}$ = 7 ----------(2)

From e.q .(1) and e.q .(2) , we get

$(x + y)$ = 20 km/h and

$(x - y)$ = 5 km/h

Now , $x = \frac{20+5}{2}$ = 12.5 km/h

Required distance = 12.5 × 16 = 200 km

Sol.58.(d) Let the speed of boat = x km/hr and speed of current = y km/hr

Upstream speed = (x - y) km/h and downstream speed = (x + y) km/h

Ratio = Upstream : downstream

Time = 10 : 7

Speed = 7 : 10

Required ratio = x : y

$= (\frac{10+7}{2}) : (\frac{10-7}{2})$ = 17 : 3

Sol.59.(d) Speed of downstream = 11 + 7 = 18 km/h

Required time = $\frac{54}{18}$ = 3 hours

Sol.60.(c) Relative speed of boats = 35 – 25 = 10 km/h

Time taken to meet boats= $\frac{60}{10}$ = 6 hours

Sol.61.(b) When distance is constant , then speed is inversely proportional to time.

Let , the rate of flow of the river is x km/hr.

Ratio → Upstream : downstream

Time → 2 : 1

Speed → 1 : 2

Now , $\frac{Upstream\ speed}{downstream\ speed} = \frac{1}{2}$

$\frac{(12-x)}{(12+x)} = \frac{1}{2} \Rightarrow 24 - 2x = 12 + x$

$\Rightarrow x$ = 4 km /h

Sol.62.(c) Let distance be 'd' km.

Speed of man in still water be 10 km/h and speed of river be 4.5 km/h

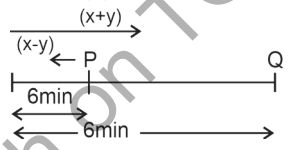
$\frac{d}{14.5} + \frac{d}{5.5} = 2\ hr$

$\frac{2d}{29} + \frac{2d}{11} = 2\ hr$

$\frac{80d}{319} = 2 \Rightarrow d = \frac{638}{80}$ km

Therefore , d = 7.98 km (approx).

Sol.63.(d)



Formula :- $Speed = \frac{Distance}{Time}$

Here , the difference of distance covered in downstream and upstream is 120 m.

6 min. $= \frac{6}{60}\ hr.$ and 120m = 0.120 km

Let the speed of swimmer x and speed of current y

According to question ,

$(x + y) \times \frac{6}{60} - (x - y) \times \frac{6}{60} = 0.12$

6x + 6y - 6x + 6y = 7.2 ⇒ 12y = 7.2

⇒ y = 0.6 km/h

Sol.64.(a) Speed of boat in still water(u) = 22.5 km/h

Speed of river (v) = 12.5 km/h

Total time taken to row to place and back is 40 min.

Let , Distance from the starting to end point is x km.

According to question ,

$\frac{x}{22.5 + 12.5} + \frac{x}{22.5 - 12.5} = \frac{40}{60}$

$= \frac{x}{35} + \frac{x}{10} = \frac{2}{3} \Rightarrow x = \frac{140}{27} = 5\frac{5}{27}$ km

Sol.65.(d) Let the speed of the boat is x km/h and speed of the stream is y km/h

$\frac{4}{x+y} = \frac{3}{x-y} \Rightarrow \frac{x-y}{x+y} = \frac{3k}{4k}$

$\Rightarrow x = 3.5k\ and\ y = 0.5k$

Now, $\frac{48}{3.5k + 0.5k} + \frac{48}{3.5k - 0.5k} = 14,$

$\frac{48}{4k} + \frac{48}{3k} = 14 \Rightarrow k = 2$

Hence, the speed of the stream is 0.5 k = 1 km/h

Short trick :-

Ratio of distance covered by upstream and downstream = $4x : 3x$

Ratio of their speed= $4x : 3x$____(because time is constant)

Average speed = $\frac{4x \times 3x}{7x}$

Total distance =

$\frac{2 \times 4x \times 3x}{7x} \times 14 = 2 \times 48 \Rightarrow x = 2,$

upstream$(4x)$ = 8 km/h

Downstream $(3x)$ = 6 km/h

So speed of stream(y) = 1 km/h

Sol.66.(c) Let the speed of boat in still water and speed of stream be x and y respectively

ATQ,

$\frac{40}{x+y} + \frac{25}{x-y} = \frac{15}{2}$

$\frac{8}{x+y} + \frac{5}{x-y} = \frac{3}{2}$ ------- (1)

$\frac{48}{x+y} + \frac{36}{x-y} = 10$

$\frac{24}{x+y} + \frac{18}{x-y} = 5$ --------- (2)

Subtracting eq . (1) × 3 from (2) we get :

x – y = 6 and x + y = 12

So, the speed of boat in still water

$= \frac{6+12}{2} = \frac{18}{2}$ = 9 km/hr

Sol.67.(a) Let the speed of the stream be x m/s then, speed of the boat is $3x$ m/s

And the total distance be D.

$\frac{D}{x+3x} = 15.5 \Rightarrow D = 62x$

Now, time taken to cover the distance in upstream = $\frac{62x}{3x - x} = 31\ sec$

Additional time required

= 31 - 15.5 = 15.5 sec

Sol.68.(a) Let x be the speed of boat in still water and y be the speed of stream.

Downstream speed (x + y) = $\frac{49}{7}$

= 7 km/hr -------(i)

Upstream speed(x - y) = $\frac{36}{9}$

= 4 km/hr -------(ii)

Subtracting equation (ii) from (i),

2y = 3 ⇒ y = 1.5 km/hr

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.69.(a)
Let the speed of stream be x km/hr
Upstream speed = (16 - x) km/hr
Downstream speed = (16 + x) km/hr
ATQ,
$\frac{18}{16-x} = \frac{30}{16+x} \Rightarrow \frac{16+x}{16-x} = \frac{30}{18}$
$\Rightarrow \frac{16}{x} = \frac{5+3}{5-3} = \frac{8}{2} = 4$
(using componendo and dividendo rule)
x = $\frac{16}{4}$ = 4 km/hr
So, the speed of stream = 4 km/hr
Short trick :-
Ratio of speed of boat in upstream and downstream = 18 : 30 = 3 : 5
So speed of boat = 4 units = 16 km/h
Hence speed of stream = 1 unit = 4 km/h

Sol.70.(c)

	Downstream	:	Upstream
Distance →	9	:	3
Speed →	9	:	3

(because time is constant)
Let the speed boat in Downstream and upstream be $9x$ and $3x$ respectively.
So average speed in whole journey =
$\frac{2 \times 9x \times 3x}{12x} = \frac{2 \times 300}{15} \Rightarrow x = \frac{80}{9}$
So speed of boat =
$\frac{9x+3x}{2} = 6x = 6\times \frac{80}{9}$ = 53.33 km/h

Sol.71.(b)
Speed of boat in still water = 5 km/h
Speed of stream = 2.5 km/h
Downstream speed = 5 + 2.5 = 7.5 km/h
Upstream speed = 5 - 2.5 = 2.5 km/h
Speed $\propto \frac{1}{time}$ (Distance is constant)

Ratio →	Downstream	:	Upstream
Speed →	7.5	:	2.5
Time →	2.5	:	7.5

Distance = (7.5 × 2.5) unit = 18.75 unit
(7.5 - 2.5) = 5 unit = 4 hrs (Given)
1 unit = $\frac{4}{5}$ = 0.8
Distance = 18.75 × 0.8 = 15 km
Short trick :-
Distance = $\frac{T(B^2 - S^2)}{2S}$
D = $\frac{4(5^2 - 2.5^2)}{2 \times 2.5}$ = 15 km

Sol.72.(b)
Let the speed of the stream be "S"
According to the question,
$\frac{24}{20-S} - \frac{24}{20+S} = \frac{1}{2}$
On solving, we get S = 4 km/h.
Downstream speed after 2 km/h increase = 22 + 4 = 26 km/h.
Upstream speed after 2 km/h increase = 22 - 4 = 18 km/h.
Required time = $\frac{39}{26} + \frac{30}{18} = \frac{3}{2} + \frac{5}{3}$
= $\frac{19}{6}$ hours = 3 hours 10 minutes.

Sol.73.(c) Speed of boat in downstream = $\frac{56}{3.5}$ = 16 km/h
Time taken to cover 41.6 km downstream = $\frac{41.6}{16}$ = 2.6 hrs

Sol.74.(c) According to the question,
$\frac{24}{6-x} - \frac{24}{6+x} = 3 \Rightarrow \frac{24(6+x-6+x)}{36-x^2} = 3$,
$16x = 36 - x^2 \Rightarrow x^2 + 16x = 36$,
Clearly, $x = 2$ satisfies this,
Speed of stream = 2 km/h.
Downstream speed to cover 24 km in 2 hours = 12 km/h
So the required speed of the boat
= (12 - 2) = 10 km/h.

Sol.75.(a)
Let the distance between A and B = D

Ratio	→ Initial	:	Final
Speed of boat →	x	:	$2x$

Speed of water = y
$\frac{D}{x+y} + \frac{D}{x-y}$ = T ------ (1)
$\frac{D}{2x+y} + \frac{D}{2x-y} = \frac{80}{161}$T ---- (2)
From eq . (1) and (2)
$\frac{80}{161}(\frac{D}{x+y} + \frac{D}{x-y}) = \frac{D}{2x+y} + \frac{D}{2x-y}$
$\Rightarrow \frac{80}{161}(\frac{2x}{x^2-y^2}) = \frac{4x}{4x^2-y^2}$
$\Rightarrow 160x^2 - 40y^2 = 161x^2 - 161y^2$
$\Rightarrow 121y^2 = x^2 \Rightarrow x : y = 11 : 1$

Sol.76.(c) Speed of boat in downstream = 14 + 2 = 16 km/h
Speed of boat in upstream = 14 - 2 = 12 km/h
Distance covered by him in upstream in 3 hours = 3 × 12 = 36 km
Time taken by him to cover 36 km in downstream = $\frac{36}{16}$ = 2 h 15 m

Sol.77.(b)
speed of a boat in still water = 15 km/h
speed of the current = 5 km/h
Downstream speed = 15 + 5 = 20 km/h
Upstream speed = 15 - 5 = 10 km/h
Time for downstream = $\frac{60}{20}$ = 3hr
Time for upstream = $\frac{60}{10}$ = 6hr
Total time = 3 + 6 = 9 hr

Search on Tg: @apna_pdf

Search on Telegram @apna_pdf

Percentage

Key Points :-

What does a percentage, say 20% mean?

20% simply means $\frac{20}{100}$ of something.

Also, you can see $\frac{20}{100} = \frac{1}{5} = 0.2$

i.e. 0.2 of something is the same as 20% of that thing.

- Percentage change
  $= \frac{New\ value - Original\ value}{Original\ value} \times 100$
- Percentage point change means difference between two percentage rates. For instance, 50% - 30% = 20%, so here the percentage point change is 20.
- If the price of a product increases by a%, then to keep expenditure same, percentage reduction in consumption required
  $= (\frac{a}{100+a} \times 100)\%$
- If the price of a product decreases by a%, then to keep expenditure same, percentage increase in consumption required
  $= (\frac{a}{100-a} \times 100)\%$
- If A is R% more than B, then B is less than A by = $(\frac{R}{100+R} \times 100)\%$
- If A is R% less than B, then B is more than A by = $(\frac{R}{100-R} \times 100)\%$
- If the number is first increased by x% and then decreased by x%, then the net result is always decrease and it is equal to = $(\frac{x^2}{100})\%$. Same result will be obtained in the vice-versa case.

Successive percentage change :

1. Two successive percentage change : If the number is first increased by a% and then increased by b% then,
   Effective percentage change
   $= (a + b + \frac{ab}{100})\%$
   Similarly, if the number is first increased by a% and then decreased by b%, then
   Effective percentage change
   $= (a - b - \frac{ab}{100})\%$
2. Three successive percentage change : If the number is first increased by a% then by b% and then by c%, then
   Effective percentage change =
   $(a + b + c + \frac{ab+bc+ca}{100} + \frac{abc}{10000})\%$

Important Fractions and their equivalent Percentage

1) $\frac{1}{2}$ = 50% **2)** $\frac{1}{3}$ = $33\frac{1}{3}$% = 33.33%

3) $\frac{1}{4}$ = 25% **4)** $\frac{1}{5}$ = 20%

5) $\frac{1}{6}$ = 16.67% **6)** $\frac{1}{7}$ = $14\frac{2}{7}$% = 14.28%

7) $\frac{1}{8}$ = 12.5% **8)** $\frac{1}{9}$ = $11\frac{1}{9}$% = 11.11%

9) $\frac{1}{10}$ = 10% **10)** $\frac{1}{11}$ = $9\frac{1}{11}$% = 9.09%

11) $\frac{1}{12}$ = $8\frac{1}{3}$% **12)** $\frac{1}{13}$ = 7.69%

13) $\frac{1}{14}$ = 7.14% **14)** $\frac{1}{15}$ = 6.67%

15) $\frac{1}{16}$ = 6.25% **16)** $\frac{5}{6}$ = $83\frac{1}{3}$%

17) $\frac{3}{8}$ = 37.5% **18)** $\frac{5}{8}$ = 62.5%

19) $\frac{7}{8}$ = 87.5% **20)** $\frac{3}{11}$ = 27.27%

21) $\frac{2}{3}$ = $66\frac{2}{3}$% = $\frac{200}{3}$%

22) $\frac{7}{3}$ = $2\frac{1}{3}$ = $233\frac{1}{3}$%

23) $\frac{9}{8}$ = $1\frac{1}{8}$ = 112.5%

24) $\frac{2}{7}$ = 28.56%

These fractions are very common and it will be very helpful to learn them.

Variety Questions

Q.1. Every month, a man consumes 20 kg of rice and 8 kg of wheat. The price of rice is 20% of the price of wheat, resulting in a total expenditure of ₹300 per month for rice and wheat combined. If the price of wheat is increased by 20%, what percentage reduction in rice consumption is needed to maintain the same expenditure of ₹300? (Given that the price of rice and consumption of wheat is constant.)
SSC CGL 12/09/2024 (2nd Shift)
(a) 40% (b) 38% (c) 24% (d) 22%

Q.2. In an election between two candidates, y% of the voters did not vote. 10% of the votes cast were declared invalid, while all the valid votes were cast in favour of either of the two candidates. The candidate who got 59.375% of the valid votes cast was declared elected by 2484 votes. If the number of people eligible to vote in that election was 16,000, what is the value of y ?
SSC CGL 09/09/2024 (1st Shift)
(a) 7.2 (b) 8.4 (c) 8 (d) 7.5

Q.3. Last year, Geeta's monthly salary was ₹12,000 and Seeta's monthly salary was ₹10,000. This year, Geeta's monthly salary is ₹14,400, while Seeta's monthly salary is ₹12,500. If the percentage increase in Seeta's monthly salary this year over her monthly salary last year is denoted by x%, and the percentage increase in Geeta's monthly salary this year over her monthly salary last year is denoted by y%, then what is the value of ($\frac{x-y}{y} \times 100)\%$?
SSC CHSL 04/07/2024 (3rd Shift)
(a) 22 (b) 20 (c) 24 (d) 25

Q.4. In an election between two candidates, the defeated candidate secured 42% of the valid votes polled and lost the election by 2545800 votes. If 365500 votes were declared invalid and 30% people did not cast their vote, what was the approximate number of people (in millions) in the electorate who did NOT cast their votes?
SSC CHSL 03/07/2024 (1st Shift)
(a) 7 (b) 8 (c) 6 (d) 5

Q.5. At the beginning of day 1 of a month, Rajesh has 500 eggs. He sells 20% of the eggs by the end of the day and added b% of the eggs at the beginning of the next day and sold 20% of the eggs at the end of the next day. This pattern continued up to the end of the third day of the month when he is left with 1024 eggs. The value of b is equal to:
SSC CHSL 02/07/2024 (4th Shift)
(a) 500 (b) 20 (c) 100 (d) 10

Q.6. In an election between P, R and S, $\frac{1}{10}$ of the total votes polled are invalid. Votes polled in favour of R and S are half of the total votes polled, and they get equal votes. Due to a fault in the machine, half of the votes of S and half of the invalid votes are counted additionally in favour of R. What is the overall percentage of votes secured by R due to the fault?
SSC CPO 28/06/2024 (3rd Shift)
(a) 37.55% (b) 41.55% (c) 38.5% (d) 42.5%

Q.7. In an election between A and B, every fifth vote polled was marked as invalid by the machine. In the remaining votes, A wins the election with a margin of 2500 votes or 10% of the total votes

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

polled, over B. If 90% of the invalid votes would have been in favour of B, then which of the following would have been the result of the election?
SSC CPO 28/06/2024 (2nd Shift)
(a) B would have won by 8%
(b) B would have won by 3%
(c) A would have won by 3%
(d) A would have won by 8%

Q.8. In an election, 12% of the voters in the voter list did not cast their votes, whereas 84 voters cast their ballot papers blank. There were only two candidates: Ramagya and Shravan. The winner, Ramagya, was supported by 54% of all the voters in the list. He got 1456 more votes than his rival, Shravan. Find the total number of voters in the list.
SSC CPO 27/06/2024 (1st Shift)
(a) 5690 (b) 6670 (c) 7860 (d) 6860

Q.9. In an examination, there were two papers, A and B, and the maximum mark in each of the two papers was 10. However, the weights assigned to papers A and B were in the ratio 2 : 1, respectively. Riddhi scored 8 out of 10 in Paper B, and an overall 70% in the examination. How much did she score in Paper A out of 10 ?
Matriculation Level 25/06/2024 (Shift - 1)
(a) 5 (b) 6.5 (c) 6 (d) 5.5

Q.10. In an election between two candidates, 64% of the voters cast their votes, out of which 4% of the votes were declared invalid. A candidate got 12,288 votes which were 64% of the total valid votes. Find the total number of votes enrolled in that election.
SSC CHSL Tier II (02/11/2023)
(a) 30,250 (b) 32,152
(c) 31,250 (d) 20,152

Q.11. Ayush spends 25% of an amount of money on an insurance policy, 26% on food, 23% on children's education and 19% on recreation. He deposits the remaining amount of ₹26,600 in the bank. What is the total amount (in ₹) that he spends on food and recreation together?
SSC CPO 05/10/2023 (3rd Shift)
(a) 1,95,000 (b) 1,83,000
(c) 1,62,000 (d) 1,71,000

Q.12. The cost price of pulses is 12% less than the selling price. Using a faulty weighing machine, the shopkeeper is able to earn 25% profit. How much percent of the faulty machine shows more weight as compared to the actual weight (Rounded off to the nearest integer) ?
SSC CPO 04/10/2023 (3rd Shift)
(a) 10% (b) 14% (c) 13% (d) 15%

Q.13. Swastik saves 20% of his income while spending the remaining amount on food, rent, education and shopping. 15% of the income is spent on food, while ₹12,800 is spent on rent, ₹32,000 on education and ₹7,200 on shopping. The amount spent on shopping is 11.25% of the total expenditure. How much money (in ₹) is spent on food?
SSC CPO 03/10/2023 (2nd Shift)
(a) 9600 (b) 12000 (c) 15000 (d) 10800

Q.14. A number is first increased by 16% and then increased by 20%. The number so obtained is now decreased by 40%. The net decrease percentage in the original number is:
SSC CHSL 14/08/2023 (4th Shift)
(a) $16\frac{12}{25}$ % (b) $15\frac{9}{25}$ %
(c) $11\frac{13}{25}$ % (d) $13\frac{7}{25}$ %

Q.15. A number first increased by 8% and then decreased by 3% to get 2619. What is 5% of that number ?
SSC CHSL 10/08/2023 (3rd Shift)
(a) 125 (b) 135 (c) 130 (d) 140

Q.16. A spends 68% of his monthly income. If A's monthly income increases by 25% and his monthly saving increases by 15%, then the percentage increase in his monthly expenditure will be:
SSC CHSL 09/08/2023 (1st Shift)
(a) $27\frac{13}{17}$ % (b) $29\frac{12}{17}$ %
(c) $33\frac{7}{17}$ % (d) $31\frac{6}{17}$ %

Q.17. Harsha's expenditure is 45% of her income. If the income from the next month is increased by 15% and the amount she saved each month remains the same, then find the percentage increase in her expenditure (rounded off to 2 decimal places).
SSC CHSL 07/08/2023 (4th Shift)
(a) 33.33% (b) 15.00%
(c) 45.00% (d) 27.50%

Q.18. The price of an article is increased by r%. The new price was decreased by r% later. Now the latest price is Rs.1.What was the original price of the article?
SSC CGL 20/07/2023 (3rd shift)
(a) $\frac{10000}{10000-r^2}$ (b) $\frac{10000-r^2}{10000}$
(c) $\frac{100}{100-r^2}$ (d) $\frac{100}{1-r^2}$

Q.19. Aditya buys 300 mangoes for Rs.1,100. Some of these mangoes are rotten and are thrown away. He sells the remaining mangoes at Rs.5 each and makes a profit of Rs.150. Find the percentage of mangoes thrown away.
SSC CGL 19/07/2023 (4th shift)
(a) $16\frac{1}{2}$% (b) $15\frac{2}{3}$%
(c) $16\frac{2}{3}$% (d) $16\frac{1}{3}$%

Q.20. In an election, 15% of the voters on the voters list did not cast their votes and 100 voters cast their ballot paper blank. There were only two candidates Ram and Shyam. The winner, Ram, was supported by 69% of all the voters in the list and he got 630 votes more than Shyam. Find the number of voters on the list.
Matriculation Level 30/06/2023 (Shift - 3)
(a) 1200 (b) 1000 (c) 1100 (d) 1300

Q.21. If the price of rice is increased by 25 percent, then by what percentage consumption of rice should be decreased so that the expenditure incurred on rice gets decreased by 40 percent?
SSC CHSL 21/03/2023 (4th Shift)
(a) 52 % (b) 43.33 % (c) 42 % (d) 48 %

Q.22. Shiva's monthly salary is Rs.75,000. He spends Rs.12,000 on household items, Rs.14,000 on LIC and mutual funds, Rs.15,000 on his children's education, and keeps Rs.10,000 for miscellaneous expenses. His savings are Rs.21,000 per month and he donates the rest of the amount to an orphanage. The percentage of his income that he donates is:
SSC CGL 13/12/2022 (3rd Shift)
(a) 3% (b) 6% (c) 8% (d) 4%

Q.23. The expenditure on the cost of living of a man and his family is 60% of his salary. He gets two increments of 30% and 60% in his salary. If his saving increases by 250% of his initial saving, then the new cost of living expenditure is what percentage (rounded off to the nearest integer) of the increased salary?
SSC CGL 12/12/2022 (4th Shift)
(a) 32.7 Percent (b) 43.6 Percent
(c) 29.5 Percent (d) 36.6 Percent

Q.24. A mask manufacturing company manufactured 'X' number of masks in 2018. It increased its manufacturing capacity by 30% in 2019 and further increased its manufacturing by 15% in 2020. In 2021, due to the machinery breakdown, its manufacturing declined by 40%. What is the value of 'X' if it manufactured 179400 masks in 2021 ?
SSC CGL 07/12/2022 (1st Shift)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) 180000 (b) 230000
(c) 200000 (d) 210000

Q.25. The population of country A decreased by p% and the population of country B decreased by q% from the year 2020 to 2021. Here 'p' is greater than 'q'. Let 'x' be the ratio of the population of country A to the population of country B in the given year. What is the percentage decrease in 'x' from 2020 to 2021 ?
SSC CGL 06/12/2022 (2nd Shift)
(a) $\frac{100(p-q)}{(100-q)}$ (b) $\frac{100(p-q)}{100+q}$
(c) $\frac{100(p-q)}{100-p}$ (d) $\frac{100(p-q)}{100}$

Q.26. In an election between two candidates, the defeated candidate secured 42% of the valid votes polled and lost the election by 7,68,400 votes. If 82,560 votes were declared invalid and 20% people did NOT cast their vote, then the invalid votes were what percentage (rounded off to 1 decimal place) of the votes which people did NOT cast ?
SSC CGL 02/12/2022 (2nd Shift)
(a) 10.6 Percent (b) 9.8 Percent
(c) 12.9 Percent (d) 6.8 Percent

Q.27. 40% of Ranita's income is equal to 56% of Bhaskar's income. If Ranita's income was ₹800 more than what it is and Bhaskar's income was ₹ 2,000 more than what it is, then the ratio of the incomes of Ranita and Bhaskar would have been 4 : 3. What is the actual combined income of Ranita and Bhaskar?
SSC CHSL 09/06/2022 (Morning)
(a) ₹67,200 (b) ₹68,200
(c) ₹66,800 (d) ₹67,800

Q.28. Sonam is a cab driver, who plies within a city. The number of kilometres that she drives on a Tuesday was 12.5% less than the number of kilometres that she drives on the day before.On the other hand, the number of kilometres that she drives on Wednesday was 20% more than the number of kilometres that she drives on Tuesday. If Sonam drives a total of 336 km on Wednesday, how many kilometers did she drive on Monday ?
SSC CHSL 02/06/2022 (Morning)
(a) 315 (b) 318 (c) 320 (d) 324

Q.29. In an election, there were three candidates: A, B and C. 10% of the eligible voters did not vote. Out of those who voted, 45% voted for A, 35% voted for B and the remaining 20% voted for C. 30% of the votes polled for A and 20% of the votes polled for B were later deemed invalid, while all the votes polled for C were deemed valid. If A got 882 more valid votes than B did, how many valid votes did C receive?
SSC CHSL 27/05/2022 (Afternoon)
(a) 5020 (b) 5040 (c) 5050 (d) 5060

Q.30. A fruit seller sells 45% of the oranges that he has along with one more oranges to a customer . He then sells 20% of the remaining oranges and 2 more oranges to a second customer. He then sells 90% of the now remaining oranges to a third customer and is still left with 5 oranges. How many oranges did the fruit seller have initially?
SSC CGL 19/04/2022 (Evening)
(a) 100 (b) 111 (c) 121 (d) 120

Q.31. The price of petrol shot up by 5%. Before the hike, the price was Rs. 82 per litre. A man travels 3045 km every month and his car gives a mileage of 15 km per litre. What is the increase in the monthly expenditure (to the nearest Rs.) on the man's travel due to the hike in the petrol prices?
SSC CGL 12/04/2022 (Morning)
(a) 832 (b) 859 (c) 758 (d) 944

Q.32. In a manufacturing unit, it was noted that the price of raw material has increased by 25% and the labor cost has gone up from 30% of the cost of raw material to 38% of the cost of raw material. What percentage of the consumption of raw material be reduced to keep the cost the same as that before the increase?
SSC CGL 11/04/2022 (Evening)
(a) 20.7% (b) 30.2% (c) 24.6% (d) 25.6%

Q.33. Due to some crisis, some people from State A migrated to State B, and thereby the population of the second State increased by 19.96%. However, at a later stage , all of them returned to State A. Then by what percentage (correct up to two decimal places) did the population of State B decrease ?
SSC MTS 05/10/2021 (Morning)
(a) 19.96 (b) 16.64 (c) 18.24 (d) 17.54

Q.34. By mistake, the reciprocal of a positive fraction got typed in place of itself, and thereby its value got reduced by $\frac{175}{4}$%. What was the value of the fraction?
SSC CGL 24/08/2021 (Evening)
(a) $\frac{1}{2}$ (b) $\frac{4}{3}$ (c) $\frac{3}{4}$ (d) $\frac{1}{4}$

Q.35. The income of A is 20% less than the income of B and the income of C is 70% of the sum of incomes of A and B. The income of D is 25% more than the income of C. If the difference between the incomes of B and D is Rs 23000, then what is the income (in Rs) of A ?
SSC CGL 18/08/2021 (Afternoon)
(a) 32000 (b) 25000 (c) 26000 (d) 28000

Q.36. A certain number of students from school X appeared in an examination and 20% students failed. From school Y, 130% more students than that from school X, appeared in the same examination. If 90% of the total number of students appeared from both the schools passed, then what is the percentage of students from school Y who failed (correct to one decimal place)?
SSC CGL 17/08/2021 (Morning)
(a) 8.3% (b) 10% (c) 6.4% (d) 5.7%

Q.37. In a workshop with 80 students and 10 resource persons, sweets were distributed at the end of the workshop. The amount spent for distributing sweets to each student was 30% of the total number of students and the amount spent towards each resource person was 40% of the total number of students. The total amount spent for sweets distribution in the workshop was:
SSC CHSL 10/08/2021 (Afternoon)
(a) Rs. 2400 (b) Rs. 2440
(c) Rs. 2420 (d) Rs. 2240

Q.38. In a constituency, 55% of the total number of voters are males and the rest are females. If 40% of the males are illiterate and 40% of the females are literate, then by what percentage is the number of illiterate females more than that of the illiterate males(correct to the one decimal place)
SSC CHSL 04/08/2021 (Evening)
(a) 22.7% (b) 16.4% (c) 21.5% (d) 20.8%

Q.39. A reduction of 20% in the price of sugar enables a purchaser to obtain 4 kg more for Rs.160. The original price of sugar per kg is:
SSC CHSL 20/10/2020 (Morning)
(a) 12 (b) 10 (c) 14 (d) 15

Q.40. A student multiplied a number with $\frac{3}{4}$ instead of $\frac{4}{3}$. What is the error percentage?
SSC CHSL 15/10/2020 (Afternoon)
(a) 59.67% (b) 43.75%
(c) 67.45% (d) 39.34%

Q.41. A crate of fruits contains one spoiled fruit for every 25 fruits. 60% of the spoiled fruits were sold. If the seller had sold 48 spoiled fruits, then the number of fruits in the crate were:

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 14/10/2020 (Afternoon)
(a) 2000 (b) 2400 (c) 3000 (d) 1200

Q.42. If each edge of a cube is increased by 10%, then the percentage increase in its surface area is:
SSC CHSL 13/10/2020 (Afternoon)
(a) 21% (b) 19% (c) 22% (d) 20%

Q.43. In a school, 4% of the students did not appear for the annual exams. 10% of the students who appeared for the exams could not pass the exam. Out of the remaining students, 50% got distinction marks and 432 students passed the exam but could not get distinction marks. The total number of students in the school is:
SSC CGL 06/03/2020 (Afternoon)
(a) 960 (b) 1000 (c) 878 (d) 1200

Q.44. A, B and C donate 8%,7% and 9%, of their salaries respectively to a charitable trust. The salaries of A and B are the same and the difference between their donations is ₹259. The total donation of A and B is ₹1,185 more than that of C. The total donation of A and C is what percentage of the total salaries of A, B and C ? (Correct to one decimal place)
SSC CGL 04/03/2020 (Evening)
(a) 6.2 % (b) 5.8 % (c) 6.4 % (d) 7.1%

Q.45. The population of town B is 300% more than that of town A. For the next two years, the population of A increases by x% per year and that of B decreases by the same percentage per year. After 2 years, if the population of A and B become equal, then the value of x is ____.
SSC CPO 13/12/2019(Evening)
(a) $30\frac{2}{3}$ (b) 40 (c) 25 (d) $33\frac{1}{3}$

Q.46. The monthly salary of a person was Rs.50,000. He used to spend on three heads- personal and family expenses (E), taxes(T), philanthropy (P), and the rest were his savings. E was 50% of the income, T was 20%of E and P was 15% of T. When his salary got raised by 40%, he maintained the average level of E, but T became 30% of E and P became 20% of T. By what percentage is the new savings more or less than the earlier savings?(correct upto one decimal place)
SSC CPO 09/12/2019 (Morning)
(a) 16.4% more (b) 8.2% more
(c) 16.4% less (d) 8.2% less

Q.47. In an examination, A obtained 10% more marks than B, B obtained 20% more marks than C and C obtained 32% less marks that D. If A obtained 272 more marks than C, then the marks obtained by B is :
SSC CGL Tier II (13/09/2019)
(a) 850 (b) 816 (c) 1020 (d) 952

Q.48. If A is 28% more than B and C is 25% less than the sum of A and B, then by what percent will C be more than A (correct to one decimal place) ?
SSC CGL Tier II (11/09/2019)
(a) 32.2% (b) 28% (c) 43% (d) 33.6%

Q.49. When the price of an item was reduced by 25%, then its sale was increased by x%. If there is an increase of 20% in the receipt of the revenue, then the value of x will be :
SSC CGL Tier II (11/09/2019)
(a) 50% (b) 60% (c) 45% (d) 75%

Q.50. With reference to a number greater than one, the difference between itself and its reciprocal is 25% of the sum of itself and its reciprocal. By how much percentage (correct one decimal place) is the fourth power of the number greater than its square?
SSC CHSL 11/07/2019 (Morning)
(a) 57.8 (b) 62.5 (c) 64.5 (d) 66.7

Q.51. For an examination of a practical based subject, the total marks is 100. The break-up for theory, practical, project and viva voce is 40%, 30%, 20%, 10%. A candidate scored 80% in theory, 70% in practical, 60% in project and 50% in viva voce. What was her aggregate percentage ?
SSC CHSL 09/07/2019 (Evening)
(a) 70 (b) 72 (c) 68 (d) 67

Q.52. Sudha decided to donate 12% of her monthly income to an orphanage. On the day of donation, she changed her decision and donated a sum of Rs. 4800 which was equal to 80% of what she had decided earlier. What is 27% of her monthly income ?
SSC CHSL 04/07/2019 (Morning)
(a) Rs. 13959 (b) Rs. 11934
(c) Rs. 14040 (d) Rs. 13500

Q.53. If decreasing 120 by x% gives the same result as increasing 40 by x% then x% of 210 is what percent less than (x + 20)% of 180?
SSC CGL 04/06/2019 (Morning)
(a) $33\frac{1}{3}$ (b) 18 (c) $16\frac{2}{3}$ (d) 20

Q.54. The price of an article increases by 20% every year. If the difference between the prices at the end of the third and fourth years is Rs. 259.20, then 40% of the price (In Rs.) at the end of the second year is :
SSC CHSL 03/06/2019 (Evening)
(a) 484 (b) 432 (c) 384 (d) 472

Q.55. In an examination, Shreya scored 84 out of 90 in Mathematics, 45 out of 50 in Science, 23 out of 25 in Computer Science and 68 out of 80 in English. In which subject did Shreya score the highest percentage?
SSC CPO 16/03/2019 (Afternoon)
(a) Mathematics (b) English
(c) Science (d) Computer Science

Q.56. A marketing agent earns a commission of 2% on first Rs. 2,00,000, 1.5% on next Rs 2,00,000 and 1% on the remaining amount of sales made in a month. If the sales achieved by the agent for the month of April 2018 are Rs. 5,68,000. The commission earned is
SSC CPO 15/03/2019 (Morning)
(a) Rs.8680 (b) Rs.7730
(c) Rs.8240 (d) Rs.7105

Practice Questions

SSC MTS 2024 Tier - 1

Q.57. Two successive increases of 15% each, is by what percentage more than the two successive decreases of 12% each ? (Rounded off to 2 decimal places)
SSC MTS 01/10/2024 (Morning)
(a) 30.56% (b) 42.95%
(c) 28.25% (d) 22.12%

Q.58. A sum of ₹2,380 is lent out into two parts, one at 25% p.a. and another at 20% p.a. . If the total annual income is ₹500, find the money (in ₹) lent at 25% rate.
SSC MTS 07/10/2024 (Morning)
(a) 320 (b) 240 (c) 480 (d) 560

Q.59. The cost of a raw material increased with equal percentage in two years. The price increased to ₹145.20 from ₹120. What is the equal annual percentage increase ?
SSC MTS 09/10/2024 (Evening)
(a) 10.5% (b) 10% (c) 11.5% (d) 11%

Q.60. The number of schools in a city is directly proportional to the population of the city. In 2020, there were 125 schools and the population of the city was 1,80,000. In 2023, the number of schools in the city is 180. What is the percentage increase in the population of the city from 2020 to 2023 ?
SSC MTS 16/10/2024 (Morning)
(a) 44% (b) 42% (c) 45% (d) 46%

Q.61. Aniruddh invested ₹15,000 in the shares of a company. The shares rose by 15% one day and fell by 10% on the other day. What is the current value (in ₹) of

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Aniruddh's investment ?
SSC MTS 16/10/2024 (Afternoon)
(a) 15450 (b) 15525 (c) 15750 (d) 15500

Q.62. If the height of a triangle is increased by 20% and the base is increased by 12%. What is the new area (in cm^2) if the old area of the triangle was 200 cm^2 ?
SSC MTS 16/10/2024 (Evening)
(a) 234.4 (b) 254.4 (c) 268.8 (d) 216.7

Q.63. The price of a commodity is increased by 20% and then again by 25%. By what per cent should the increased price be reduced to get back to the initial price ?
SSC MTS 21/10/2024 (Afternoon)
(a) $33\frac{1}{3}$% (b) 45% (c) $22\frac{1}{2}$% (d) 25%

Q.64. When 80% of a number is added to 80, the result is the same number. Find the number.
SSC MTS 22/10/2024 (Morning)
(a) 420 (b) 380 (c) 320 (d) 400

Q.65. A's salary increases by 60% and then decreases by 30%. On the whole, A's salary is increased by _____?
SSC MTS 22/10/2024 (Evening)
(a) 48% (b) 30% (c) 12% (d) 72%

Q.66. A girl spends 76% of her income. If her income increases by 18% and her expenditure increases by 25%, then what is the percentage increase or decrease in her savings ? (Correct to one decimal place)
SSC MTS 23/10/2024 (Morning)
(a) Decrease by 4.2% (b) Increase by 5%
(c) Decrease by 3.8% (d) Increase by 3.6%

Q.67. A man's working hours per day were increased by 10% and his wages per hour were increased by 5%. By how much per cent were his daily earnings increased ?
SSC MTS 29/10/2024 (Evening)
(a) 10.3% (b) 12.2% (c) 5% (d) 15.5%

Q.68. The salary of a worker is first increased by 30% and later reduced by 28.5%. What is the net change in his salary ?
SSC MTS 30/10/2024 (Afternoon)
(a) 9.05% decrease (b) 7.05% decrease
(c) 6.05% increase (d) 8.05% increase

Q.69. Out of his monthly income, Mr. Sharma spends 24% on house rent and 70% on household expenses and saves the balance. If every month, he saves ₹1,200, then what is his monthly income?
SSC MTS 11/11/2024 (Afternoon)
(a) ₹20,000 (b) ₹32,000
(c) ₹27,000 (d) ₹25,000

Q.70. If a reduction of 10% in the price of rice enables a person to obtain 22 kg more for ₹250, then the original price of the rice per kg is: (correct to two decimal place)
SSC MTS 12/11/2024 (Afternoon)
(a) ₹1.20 (b) ₹1.22 (c) ₹1.26 (d) ₹1.24

Q.71. In an election there were only two candidates, Geeta and Shyama. Geeta received 15% of the total votes and Shyama received 8700 votes. 60% of the voters did not cast their vote to either of the two candidates. Find the total percentage of votes that Shyama received, assuming that all the votes cast were valid.
SSC MTS 12/11/2024 (Evening)
(a) 22% (b) 23% (c) 24% (d) 25%

Q.72. Ravish had ₹1,500 with him. Sunaina had 24% more money than what Ravish had, while Sanatan had 10% less money that what Sunaina had. How much money did Sanatan have ?
SSC MTS 14/11/2024 (Morning)
(a) ₹1,674 (b) ₹1,664
(c) ₹1,764 (d) ₹1,774

Q.73. If the numerator of a fraction is increased by 12% and its denominator is diminished by 8%, then the value of the fraction is. $\frac{56}{69}$ Find the original fraction.
SSC MTS 14/11/2024 (Evening)
(a) $\frac{4}{3}$ (b) $\frac{3}{2}$ (c) $\frac{3}{4}$ (d) $\frac{2}{3}$

SSC CGL 2024 Tier - 1

Q.74. A person earns ₹16,000 per month and spends 80% of his income and saves the remaining amount. If his income increases by 20% and expenditure by 10%, find the percentage of increase in his savings.
SSC CGL 09/09/2024 (2nd Shift)
(a) 140% (b) 90% (c) 120% (d) 60%

Q.75. A number is first increased by 12% and then increased by 23%. The number, so obtained, is now decreased by 34%. What is the net increase or decrease percent in the original number (nearest to an integer) ?
SSC CGL 09/09/2024 (3rd Shift)
(a) 10% increase (b) 9% decrease
(c) 10% decrease (d) 9% increase

Q.76. In an election between Sunita and Mamata, 85% of voters cast their votes but 2% of votes were invalid. If Sunita got 64,974 votes which is 78% of valid votes, then the total number of voters enrolled in the election was:
SSC CGL 10/09/2024 (3rd Shift)
(a) 1,25,000 (b) 1,00,000
(c) 1,65,000 (d) 1,80,000

Q.77. In an election between two candidates P and Q, P got 78% of the total valid votes. If the total votes of the electorate were 75,60,000, then what was the number of valid votes that Q got if 10% of the voters did not cast their vote and 15% of the votes polled were declared invalid ?
SSC CGL 11/09/2024 (1st Shift)
(a) 1,41,372 (b) 1,41,732
(c) 12,72,348 (d) 1,47,312

Q.78. Mrudula starts her job with a certain monthly salary and earns a fixed increment every year. If her salary was ₹28,400 after six years of service and ₹52,997 after fifteen years, find her annual increment.
SSC CGL 11/09/2024 (1st Shift)
(a) ₹12,002 (b) ₹1,200
(c) ₹2,733 (d) ₹1,824

Q.79. The salary of a worker is first increased by 25%, then it is decreased by 12%. The percentage change in his salary is:
SSC CGL 11/09/2024 (2nd Shift)
(a) 10% increase (b) 13% increase
(c) 10% decrease (d) 13% decrease

Q.80. A woman spends $\frac{2}{3}$ of her income. If her income increases by 18% and the expenditure increases by 24%, then the percentage increase in her savings will be:
SSC CGL 11/09/2024 (3rd Shift)
(a) 6% (b) 3% (c) 5% (d) 4%

Q.81. The proportion of Suresh's spending to saving is 3 : 1. His salary rises by 25%. What percentage of his expenditure will increase if his saving grows by 10% ?
SSC CGL 12/09/2024 (3rd Shift)
(a) 40% (b) 20% (c) 10% (d) 30%

Q.82. In an election between R and S, R gets 110% of the votes of S and beats S by 770 votes. If there were no invalid votes, then the total number of votes polled is:
SSC CGL 13/09/2024 (1st Shift)
(a) 17610 (b) 17160 (c) 16170 (d) 16710

Q.83. Kalyan spends 80% of his income. His income increases by 15% and his expenditure also increases by 5%. The percentage of increase in his savings is:
SSC CGL 13/09/2024 (3rd Shift)
(a) 50% (b) 20% (c) 55% (d) 40%

Q.84. In a company, all employees are

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

getting equal wages. If the number of employees is increased by 20% and their wages per head are decreased by 18%, what is the percentage decrease in total wages ?
SSC CGL 17/09/2024 (1st Shift)
(a) 2.4% (b) 1% (c) 1.6% (d) 1.4%

Q.85. In a constituency, 45% of the total number of voters are males and the rest are females. If 60% of the males are illiterate and 60% of the females are literate, then by what percent is the number of illiterate females more than that of literate males ?
(Rounded off to 2 decimal places)
SSC CGL 18/09/2024 (1st Shift)
(a) 19.11% (b) 27.23%
(c) 30.24% (d) 22.22%

Q.86. Refer the below table and answer the question that follows.

Discipline	Boys	Girls
Engineering	120	80
Medical	80	120

What percentage of students who chose medical are boys ?
SSC CGL 18/09/2024 (2nd Shift)
(a) 30% (b) 50% (c) 40% (d) 45%

Q.87. In an election between two candidates, the one who gets 88% of the votes is elected by a majority of 684 votes. What is the total number of votes polled ? (all polled votes are valid)
SSC CGL 18/09/2024 (2nd Shift)
(a) 900 (b) 800 (c) 850 (d) 750

Q.88. An investor invested ₹2,00,000 in shares. The shares rose by 18% on the first day, fell by 15% on the second day, and then fell by 3% on the third day. What is the net percentage increase or decrease in the value of the investor's shares ? (Rounded up to one decimal place)
SSC CGL 18/09/2024 (3rd Shift)
(a) increase by 2.2%
(b) increase by 2.7%
(c) decrease by 2.7%
(d) decrease by 2.2%

Q.89. The price of an item is increased twice successively. The final price is ₹2,295 and initial price was ₹1,000. The percentage increment the second time was twice the percentage increment the first time. By what percentage was the price increased the second time ?
SSC CGL 19/09/2024 (2nd Shift)
(a) 35% (b) 65% (c) 70% (d) 25%

Q.90. Three candidates X, Y and Z participated in an election. X got 30% more votes than Y, whereas Z got 25% more votes than Y. X also overtook Z by 5000 votes. If 71% of the voters voted and no invalid votes were cast, then what was the total number of voters in the voting list ?
SSC CGL 19/09/2024 (3rd Shift)
(a) 5,00,000 (b) 4,05,000
(c) 3,55,000 (d) 4,50,000

Q.91. R targets to score 85% marks in exams. He scores 450 marks and misses the target by 35%. How much increment in percentage should be there in his scored marks to meet the target ?
SSC CGL 23/09/2024 (1st Shift)
(a) 70 (b) 35 (c) 53 (d) 45

Q.92. In an election between two candidates, P received 42% of the valid votes and Q won by 45,360 votes. 20% people did not cast their vote. If 10% of the votes cast were found invalid, what is the total number of votes registered in the poll booth ?
SSC CGL 23/09/2024 (2nd Shift)
(a) 3,93,750 (b) 3,59,000
(c) 3,93,600 (d) 3,53,790

Q.93. If an employee's income is ₹72,000, the amount he spends is 40% higher than his savings. Therefore, his savings (in ₹) is:
SSC CGL 23/09/2024 (3rd Shift)
(a) 30000 (b) 34000
(c) 32000 (d) 28000

Q.94. In an election between two candidates, 80% of the voters cast their votes, out of which 4% votes were declared invalid. A candidate got 15,360 votes which were 80% of the valid votes. Find the total number of votes.
SSC CGL 24/09/2024 (1st Shift)
(a) 20,000 (b) 18,000
(c) 25,000 (d) 23,000

Q.95. The ratio of expenditure to savings of a woman is 4 : 1. If her income and expenditure are increased by 20% and 10%, respectively, then find the percentage change in her savings.
SSC CGL 25/09/2024 (2nd Shift)
(a) 40% (b) 50% (c) 60% (d) 30%

Q.96. The monthly income of Ramesh in year 2021 was ₹18,600 and his monthly expenditure was ₹12,400. In year 2022 his income increased by 15% and his expenditure increased by 8%. Find the percentage increase in his savings.
SSC CGL 25/09/2024 (3rd Shift)
(a) 29% (b) 32% (c) 25% (d) 27%

Q.97. Suresh's expenditure and savings are in the ratio of 3 : 1. His income increases by 25%. If his savings increase by 20%, then by how much percentage does his expenditure increase ?
SSC CGL 26/09/2024 (2nd Shift)
(a) $27\frac{2}{3}$% (b) $25\frac{2}{3}$%
(c) $28\frac{2}{3}$% (d) $26\frac{2}{3}$%

Q.98. Ram's income is 2.5% more than Shyam's income. By what percentage is Shyam's income less than Ram's income?
SSC CGL 26/09/2024 (3rd Shift)
(a) 2.43% (b) 3.43% (c) 1.43% (d) 4.43%

SSC CHSL 2024 Tier - 1

Q.99. A man spent 60% of his salary on household expenses, 20% of his salary on rent and out of remaining salary, he donated 80% to a trust. If he is left with ₹20,000, then what is his salary?
SSC CHSL 01/07/2024 (1st Shift)
(a) ₹5,50,000 (b) ₹5,00,000
(c) ₹4,00,000 (d) ₹50,000

Q.100. Mohan gets 12% increase in his sale amount in the first year and 15% increase in the second year, with that his present sale is ₹1,28,800. What was his sale two years ago ?
SSC CHSL 01/07/2024 (1st Shift)
(a) ₹1,75,000 (b) ₹1,25,000
(c) ₹1,00,000 (d) ₹1,50,000

Q.101. The price of an electric bike was ₹ 1,25,000 last year. This year, its price decreased by 30%. What is the price (in ₹) of the electric bike this year?
SSC CHSL 01/07/2024 (2nd Shift)
(a) 87,000 (b) 86,000
(c) 87,500 (d) 86,500

Q.102. If 18 toys out of 75 toys are for boys and the rest are for girls, what is the percentage of girls toys?
SSC CHSL 01/07/2024 (2nd Shift)
(a) 57% (b) 76% (c) 67% (d) 18%

Q.103. Three persons ran for office and got, 1136, 7636 and 11628 votes, respectively. What was the winning candidate's percentage of the total votes?
SSC CHSL 01/07/2024 (2nd Shift)
(a) 59% (b) 52% (c) 61% (d) 57%

Q.104. If the price of an article is raised by 35%, by how much percent must a householder reduce his consumption of that article, so as not to increase his expenditure?
SSC CHSL 01/07/2024 (3rd Shift)
(a) $25\frac{25}{27}$ % (b) $25\frac{23}{27}$ %

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(c) $25\frac{22}{27}$ % (d) $25\frac{24}{27}$ %

Q.105. In an election between two candidates A and B, A got 33% of total votes casted and still lost by 55,522 votes. Find the total number of votes got by B.
SSC CHSL 01/07/2024 (3rd Shift)
(a) 1,09,411 (b) 1,04,911
(c) 1,09,141 (d) 1,09,114

Q.106. The population of a city was 5000000 in 2020. The population grows 7.5% annually. The population in 2022 is _____.
SSC CHSL 01/07/2024 (4th Shift)
(a) 5558875 (b) 5887125
(c) 5875215 (d) 5778125

Q.107. Sumit's income in 2020 was ₹21,000. He gets an increment of 10% every year. What was his income in 2022 ?
SSC CHSL 01/07/2024 (4th Shift)
(a) ₹29,100 (b) ₹26,530
(c) ₹25,410 (d) ₹23,100

Q.108. In an election, a candidate secured 41% of the votes polled and lost the election by 97,632. What is the number of votes obtained by the winning candidate?
SSC CHSL 01/07/2024 (4th Shift)
(a) 542400 (b) 320016
(c) 360072 (d) 222384

Q.109. During the first year the population of a village increased by 5% and during the second year it diminished by 5%. At the end of the second year its population was 47,880. What was the population at the beginning of the first year?
SSC CHSL 02/07/2024 (1st Shift)
(a) 43500 (b) 53000 (c) 48000 (d) 45000

Q.110. In a group of 250 persons, 40% are males and 60% are females. If 30 more females join the group, then what will be the percentage of females in the new group? (Correct to 2 decimal places)
SSC CHSL 02/07/2024 (1st Shift)
(a) 90.25% (b) 62.58%
(c) 64.29% (d) 72.25%

Q.111. When a number is increased by 8, it becomes 120% of itself. The number is:
SSC CHSL 02/07/2024 (2nd Shift)
(a) 50 (b) 30 (c) 60 (d) 40

Q.112. From the salary of a software engineer, if 15% is used as house rent, 25% of the remaining is spent on household items, 25% of the remaining as income tax, and 15% of the remaining on clothing, then he is left with ₹10,404. Find his total salary.
SSC CHSL 02/07/2024 (2nd Shift)
(a) ₹25,600 (b) ₹22,600
(c) ₹23,600 (d) ₹24,600

Q.113. The price of an article is first increased by 40% and then decreased by 45%, due to reduction in sales. Find the net percentage change in the final price of the article.
SSC CHSL 02/07/2024 (3rd Shift)
(a) - 23% (b) 23% (c) 13% (d) - 13%

Q.114. What is the number which needs to be added to 20% of 460 to have the sum as 70% of 920 ?
SSC CHSL 02/07/2024 (3rd Shift)
(a) 762 (b) 926 (c) 335 (d) 552

Q.115. In an election between two candidates, one got 65% of the total valid votes. 20% of the votes were invalid. If the total number of votes was 7,500, the number of valid votes that the other candidate got was:
SSC CHSL 02/07/2024 (4th Shift)
(a) 4,300 (b) 1,900 (c) 2,100 (d) 1,700

Q.116. A man spends 35% of his monthly income on food and four-thirteenths of the remaining income on transport. He incurs some other expenses, but also saves Rs.6,300 per month, the latter being equal to 20% of the balance remaining just after spending on food and transport. What is his monthly income (in Rs.) ?
SSC CHSL 02/07/2024 (4th Shift)
(a) 63000 (b) 72,000
(c) 67500 (d) 70,000

Q.117. In an election between two candidates, a candidate who gets 78% of the votes is elected by a majority of 448 votes. What is the total number of votes polled?
SSC CHSL 03/07/2024 (1st Shift)
(a) 800 (b) 750 (c) 850 (d) 700

Q.118. Ramana spends 75% of his income. His income is increased by 25% and he increases his expenditure by 10%. By what percentage are his savings increased ?
SSC CHSL 03/07/2024 (2nd Shift)
(a) 50% (b) 60% (c) 40% (d) 70%

Q.119. A person wants to buy 10 chairs. The total cost of 10 chairs is ₹4,500. After bargaining, the shopkeeper agrees to decrease the cost of each chair by 20%. Then, the person purchased 10% more chairs. What will be the cost of the chairs that he purchased?
SSC CHSL 03/07/2024 (2nd Shift)
(a) ₹3,960 (b) ₹3,260 (c) ₹3,900 (d) ₹4,100

Q.120. A fraction $\frac{3}{5}$ is decreased by $\frac{2}{5}$. The resulting fraction is then increased by 20%. What is the percentage decrease/increase in the value of the original fraction?
SSC CHSL 03/07/2024 (2nd Shift)
(a) Increase, 60% (b) Increase, 50%
(c) Decrease, 60% (d) Decrease, 50%

Q.121. In an election between two candidates, 10% of the registered voters did not cast their vote. The winning candidate got 60% of the total votes cast and defeated the other candidate by 1242 votes. Find the total number of registered voters.
SSC CHSL 03/07/2024 (3rd Shift)
(a) 6200 (b) 8640 (c) 6900 (d) 9600

Q.122. If the income of P is 40% less than Q, then the combined income of P and Q is how much percent more than the income of P ?
SSC CHSL 03/07/2024 (3rd Shift)
(a) $166\frac{1}{3}$ (b) $166\frac{2}{3}$ (c) $164\frac{1}{3}$ (d) $164\frac{2}{3}$

Q.123. In an engineering college, there are four branches namely Computer Science (CS), Electronics (EC), Civil (CE), and Mechanical (ME). The respective ratio of the number of students in these branches is 11 : 5 : 6 : 7. What is the percentage of students belonging to CS and ME branches in the college (correct up to two decimal places) ?
SSC CHSL 03/07/2024 (4th Shift)
(a) 62.37 % (b) 62.07 %
(c) 61.37 % (d) 61.07 %

Q.124. A person spends 10% of his income on groceries, 10% on medicines, 20% on children's education, 15% on house rent, and he saves the remaining amount. If his monthly income is ₹30,000, find his savings.
SSC CHSL 04/07/2024 (1st Shift)
(a) ₹13,500 (b) ₹16,500
(c) ₹12,500 (d) ₹15,500

Q.125. In a state election between two parties, 83% of the voters cast their votes, out of which 4% of the votes were declared invalid. Party A got 156611 votes which were 83% of the total valid votes. Find the total number of votes enrolled in that election. (Consider integer part only)
SSC CHSL 04/07/2024 (1st Shift)
(a) 23,46,807 (b) 2,36,807
(c) 2,34,888 (d) 2,58,233

Q.126. Rahul spends 70% of his income. His income increased by 15% and his expenditure increased by 7.5%. What is

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

the percentage increase in his savings?
SSC CHSL 04/07/2024 (2nd Shift)
(a) 32.5% (b) 25.5% (c) 50% (d) 30.5%

Q.127. Last year, Ranjan's monthly salary was ₹34,500 and this year his monthly salary is ₹38,640. What is the percentage increase in Ranjan's monthly salary this year over his monthly salary last year ?
SSC CHSL 04/07/2024 (2nd Shift)
(a) 15 % (b) 13 % (c) 12 % (d) 20 %

Q.128. The cost of rice is increased by 25% but its consumption is decreased by 30%. Find the percentage increase or decrease in the expenditure of money.
SSC CHSL 04/07/2024 (2nd Shift)
(a) Decrease $12\frac{1}{2}$% (b) Decrease $13\frac{1}{3}$%
(c) Increase $12\frac{1}{2}$% (d) Increase $13\frac{1}{3}$%

Q.129. If the price of tea is increased by 40%, by how much percentage must the consumption of tea be decreased so as not to increase the expenditure ?
SSC CHSL 04/07/2024 (4th Shift)
(a) $35\frac{9}{2}$% (b) $28\frac{4}{7}$%
(c) $31\frac{3}{5}$% (d) $15\frac{2}{9}$%

Q.130. Ramu used to spend 72% of his income. His income has increased by 12%, and he increases his expenditure by 5%. If Ramu earlier saved y and after the increases he now saves x, then what is the value of $(\frac{x-y}{y} \times 100)$% ?
SSC CHSL 04/07/2024 (4th Shift)
(a) 25% (b) 22% (c) 27% (d) 30%

Q.131. If the income of Neha is 5% more than that of Monica, then the income of Monica is what percentage less than that of Neha ?
SSC CHSL 04/07/2024 (4th Shift)
(a) $4\frac{16}{21}$% (b) $4\frac{11}{21}$%
(c) $4\frac{13}{21}$% (d) $4\frac{5}{21}$%

Q.132. Monthly salary of Jitvik in the month of December 2020 was ₹24,800. Every year his salary increases by 5% from the month of January. What was his salary (in ₹) in the month of February 2022 ?
SSC CHSL 05/07/2024 (1st Shift)
(a) 27180 (b) 27486 (c) 26485 (d) 27342

Q.133. The difference between 31% and 26% of votes for the same party at different places is 2350. What is 7% of those votes?
SSC CHSL 05/07/2024 (1st Shift)
(a) 2270 (b) 4090 (c) 3090 (d) 3290

Q.134. The population of a town first decreased by 16% due to migration to a big city for better job opportunities. The next year, the population of the town increased by 21% as there were better facilities for jobs. What is the net percentage change (correct to 2 decimal places) in the population ?
SSC CHSL 05/07/2024 (1st Shift)
(a) Decrease by 2.54%
(b) Increase by 2.54%
(c) Decrease by 1.64%
(d) Increase by 1.64%

Q.135. In an election between two candidates, one candidate gets 72% of the total votes cast. If the total votes are 1000, by how many votes does the winner win the election?
SSC CHSL 05/07/2024 (2nd Shift)
(a) 360 (b) 720 (c) 250 (d) 440

Q.136. A number is first increased by 44% and then decreased by 30%. The net percentage change (rounded off to the nearest integer) in the original number is:
SSC CHSL 05/07/2024 (2nd Shift)
(a) increase by 1% (b) increase by 4%
(c) decrease by 1% (d) decrease by 4%

Q.137. Raju spends 80% of his income. His income increased by 20%, while his spending rise by 10%. The percentage of increase in his savings is:
SSC CHSL 05/07/2024 (2nd Shift)
(a) 48% (b) 30% (c) 60% (d) 40%

Q.138. R gives $\frac{3}{8}$ of the toffees he has with him to S. If now R has k% of the toffies with S, then find the value of k.
SSC CHSL 05/07/2024 (3rd Shift)
(a) $\frac{500}{3}$ (b) $\frac{200}{3}$ (c) 140 (d) 200

Q.139. A quantity $\frac{4}{5}$ is changed to $\frac{5}{6}$. How much percentage change is given to the quantity?
SSC CHSL 05/07/2024 (3rd Shift)
(a) 4.17% (b) 4.71% (c) 4.73% (d) 4.37%

Q.140. The price of a motorcycle was $750 last year. The price increased by 20% this year. What is the price of the motorcycle this year?
SSC CHSL 05/07/2024 (4th Shift)
(a) $600 (b) $790 (c) $750 (d) $900

Q.141. A person spends 60% of his salary on family expenses, 10% on medical expenses, 5% on charity, and saves the remaining amount. If the amount on savings is ₹4,000, find his monthly salary.
SSC CHSL 05/07/2024 (4th Shift)
(a) ₹12,000 (b) ₹15,000
(c) ₹14,000 (d) ₹16,000

Q.142. If the price of rice is reduced by 24%, it enables Alok to buy 10 kg more rice for ₹2,500. The reduced rate of rice per kg is:
SSC CHSL 08/07/2024 (1st Shift)
(a) ₹25 (b) ₹60 (c) ₹50 (d) ₹75

Q.143. An interval of 2 hours 25 minutes is wrongly estimated by 2 hours 30.5 minutes. The error percentage is :
SSC CHSL 08/07/2024 (1st Shift)
(a) $3\frac{23}{29}$% (b) $2\frac{27}{29}$%
(c) $3\frac{19}{29}$% (d) $2\frac{21}{29}$%

Q.144. Suresh studies the pattern of daily sale of a shop. He finds that on Monday, the sale was decreased by 10% in comparison to the sale on Sunday. On Tuesday, the sale was increased by 10% in comparison to the sale of Monday. If the sale on Tuesday was of ₹1,485, how much was the sale on Sunday?
SSC CHSL 08/07/2024 (2nd Shift)
(a) ₹1,495 (b) ₹1,485
(c) ₹1,475 (d) ₹1,500

Q.145. A's income is equal to 125% of the income of B, while B's savings are 120% of the savings of A. If the expenditure of B is 75% of the expenditure of A, then how much are B's savings as a percentage of her expenditure?
SSC CHSL 08/07/2024 (2nd Shift)
(a) 20% (b) $22\frac{1}{2}$% (c) $16\frac{2}{3}$% (d) $18\frac{3}{4}$%

Q.146. At an election involving two candidates, 68 votes are declared invalid. The winning candidate gets 52% of the valid votes and wins by 98 votes. The total number of votes polled is:
SSC CHSL 08/07/2024 (3rd Shift)
(a) 2518 (b) 2475 (c) 2500 (d) 2250

Q.147. Ramesh's pocket money was reduced by 25%, and then the reduced pocket money was increased by 20%. Find the net increase or decrease percentage in his original pocket money.
SSC CHSL 08/07/2024 (3rd Shift)
(a) Increase 12% (b) Decrease 12%
(c) Increase 10% (d) Decrease 10%

Q.148. In an election a candidate secured 47% of the votes and lost to his only opponent by 276 votes. Find the total number of votes polled.
SSC CHSL 08/07/2024 (3rd Shift)
(a) 3800 (b) 4600 (c) 4000 (d) 4200

Q.149. In an election contested by two

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

candidates, one candidate got 42% of the total votes and still lost by 800 votes. Find the total number of votes that were cast.
SSC CHSL 08/07/2024 (4th Shift)
(a) 7000 (b) 8000 (c) 2000 (d) 5000

Q.150. A person saves 45% of his income. Next year, his income increases by 200%. He increases his savings by five times the previous year's savings. By what percentage (correct to one place of decimal) has he increased/decreased his expenditure?
SSC CHSL 09/07/2024 (1st Shift)
(a) Increased, 63.4%
(b) Increased, 36.4%
(c) Decreased, 63.4%
(d) Decreased, 36.4%

Q.151. In an election between two candidates, 10% of the voters did not cast their votes and 5% of the votes polled were found invalid. The successful candidate got 52.5% of the valid votes and won by a majority of 1710 votes. The number of voters enrolled on the voters list was:
SSC CHSL 09/07/2024 (1st Shift)
(a) 42000 (b) 48000 (c) 36000 (d) 40000

Q.152. The total income of three families is ₹72,000. Their expenditures are 80%, 85% and 75%, respectively. If the savings are in the ratio 8 : 9 : 20, then the income of the second family is :
SSC CHSL 09/07/2024 (2nd Shift)
(a) ₹40,000 (b) ₹32,000
(c) ₹24,000 (d) ₹16,000

Q.153. A number is first decreased by 18% and the resulting number is then increased by 25%. What is the overall percentage change in the original number?
SSC CHSL 09/07/2024 (2nd Shift)
(a) Decrease by 3.5% (b) Increase by 2.5%
(c) Decrease by 2.5% (d) Increase by 3.5%

Q.154. The average marks scored by the students of a class is 75. If the average marks scored by the girls in the same class is 90 and that of boys is 70, what is the percentage of boys in the class?
SSC CHSL 09/07/2024 (3rd Shift)
(a) 60% (b) 70% (c) 65% (d) 75%

Q.155. In an election there were only two candidates. One of the candidates secured 35% of votes and is defeated by the other candidate by 381 votes. The total number of votes polled is:
SSC CHSL 09/07/2024 (3rd Shift)
(a) 1028 (b) 1270 (c) 635 (d) 514

Q.156. If 20% of 35% of a number is 240.8, then 18% of that number (rounded off to 1 decimal place) is:
SSC CHSL 09/07/2024 (4th Shift)
(a) 621.2 (b) 619.2 (c) 618.2 (d) 623.2

Q.157. The price of an electronic watch is first reduced by 25% and then increased by 50%. If the resulting price of the electronic watch is ₹7,650, then what was its original price (in ₹) ?
SSC CHSL 09/07/2024 (4th Shift)
(a) 6,600 (b) 6,800 (c) 6,900 (d) 6,500

Q.158. Ram spends 30% of his salary on food, 10% on house rent, 7% on entertainment, and 6% on conveyance. If at the end of a month his savings are ₹1,880, then his monthly salary is :
SSC CHSL 10/07/2024 (1st Shift)
(a) ₹4,000 (b) ₹4,500 (c) ₹5,000 (d) ₹5,500

Q.159. In an election between two candidates, A gets 63% of the total valid votes. If the total votes polled were 8,750, what is the number of valid votes that the other candidate B gets, if 20% of the total votes were declared invalid ?
SSC CHSL 10/07/2024 (1st Shift)
(a) 4,410 (b) 3,560 (c) 6,450 (d) 2,590

Q.160. In an election there were three candidates. The first candidate got 40% votes and second candidate got 35% votes. If the total votes in the election are 50,000, find the number of votes got by the third candidate.
SSC CHSL 10/07/2024 (2nd Shift)
(a) 13,500 (b) 12500 (c) 12000 (d) 1250

Q.161. After an increase of 9% in salary, a person received ₹6,300. What was his salary before the increase (consider integral part only) ?
SSC CHSL 10/07/2024 (2nd Shift)
(a) ₹5,000 (b) ₹3,879 (c) ₹5,779 (d) ₹4,000

Q.162. Two numbers are respectively 61% and 35% less than a third number. The first number is what percentage of the second number ?
SSC CHSL 10/07/2024 (4th Shift)
(a) 48% (b) 24% (c) 60% (d) 30%

Q.163. In an election between two candidates, 15% of the votes were invalid and one candidate got 52% of the total valid votes. If the total number of votes was 8000, what was the number of valid votes that the other candidate got ?
SSC CHSL 10/07/2024 (4th Shift)
(a) 3264 (b) 6800 (c) 3840 (d) 3536

Q.164. In an election between two candidates, Ananth and Aravind, Ananth got 55% of the total valid votes, and 20% of the votes were invalid. If the total number of votes was 30,000, find the number of valid votes that Aravind got.
SSC CHSL 10/07/2024 (4th Shift)
(a) 13200 (b) 24000 (c) 1080 (d) 10800

Q.165. The population of a village was 4,00,000. It increased by 20% in the first year and increased by 30% in the second year. Its population after two years is _____.
SSC CHSL 11/07/2024 (1st Shift)
(a) 6,25,000 (b) 5,40,000
(c) 5,20,000 (d) 6,24,000

Q.166. In an election between two candidates, 30% voters did not cast their votes and 200 votes were declared invalid. The winner got 65% of the valid votes. If he won by 1200 votes, then find the total votes.
SSC CHSL 11/07/2024 (2nd Shift)
(a) 6000 (b) 9000 (c) 8000 (d) 7000

Q.167. In an election, there were only two candidates. One of the candidates secured 44% of the votes and is defeated by the other candidate by 1440 votes. If there were no invalid votes. then the total number of votes polled is:
SSC CHSL 11/07/2024 (2nd Shift)
(a) 13000 (b) 12000 (c) 14000 (d) 15000

Q.168. The price of a product increases by 10% in the first year and 20% in the second year. What is the overall percentage increase in the price of the product over the two years?
SSC CHSL 11/07/2024 (3rd Shift)
(a) 28% (b) 32% (c) 36% (d) 30%

Q.169. Shantanu's income decreased from ₹42,800 to ₹37,236. Find the percentage decrease in his income.
SSC CHSL 11/07/2024 (3rd Shift)
(a) 13% (b) 11% (c) 14% (d) 12%

Q.170. An election was held between two candidates. The winning candidate scored 54% of the valid votes and won by 88 votes. If 58 votes were declared invalid, then find the total number of votes polled in the election.
SSC CHSL 11/07/2024 (4th Shift)
(a) 2000 (b) 1156 (c) 1158 (d) 1850

Q.171. If the price of a commodity is increased by 36%, by what percentage (rounded off to 1 decimal place) should its consumption be decreased so that the expenditure of the commodity stays the same ?
SSC CHSL 11/07/2024 (4th Shift)
(a) 29.5% (b) 26.5% (c) 36% (d) 32%

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CPO 2024 Tier - 1

Q.172. 57% of Ranita's weekly income is equal to 76% of Bhaskar's weekly income. If Ranita's weekly income was reduced by ₹400, while Bhaskar's weekly income did not change, the ratio of the weekly incomes of Ranita and Bhaskar, respectively, would have been 6 : 5. What is Bhaskar's weekly income (in ₹) ?
SSC CPO 27/06/2024 (1st Shift)
(a) 2800 (b) 4000 (c) 3000 (d) 3200

Q.173. In an election between two candidates, one got 60% of the total valid votes. 25% of the votes were invalid. If the total number of votes was 15,000, then find the number of valid votes that the other candidate got.
SSC CPO 27/06/2024 (1st Shift)
(a) 5,550 (b) 4,500 (c) 6,750 (d) 5,000

Q.174. On account of corona virus, 5% of the population of a village died. Out of the remaining population, 20% fled due to panic. If the present population is 4655, then what was the population of the village before the corona attack ?
SSC CPO 27/06/2024 (2nd Shift)
(a) 5995 (b) 6125 (c) 6000 (d) 5985

Q.175. In a class, the numbers of boys and girls are in the ratio of 3 : 5. What is the percentage of boys in the class?
SSC CPO 27/06/2024 (2nd Shift)
(a) 37.5 % (b) 60 % (c) 42.5 % (d) 12.5 %

Q.176. In an election, the winner was supported by 46% of all the voters in the list, and he got 410 votes more than his only rival. 10% of the voters on the voters' list did not cast their votes, and 60 voters cast their ballot papers blank. How many voters were on the list?
SSC CPO 27/06/2024 (2nd Shift)
(a) 17445 (b) 16550 (c) 17500 (d) 15750

Q.177. The strength of a school increases and decreases every alternate year by 15%. If it started with an increase in 2012, then the strength of the school in the beginning of 2015, as compared to that in 2012, had (correct to two decimal places):
SSC CPO 27/06/2024 (2nd Shift)
(a) Decreased by 12.41%
(b) Increased by 12.41 %
(c) Decreased by 13.85 %
(d) Increased by 13.85 %

Q.178. The population of a town increases 8% annually. If its present population is 1,42,560, what was the population one year ago?
SSC CPO 27/06/2024 (3rd Shift)
(a) 1,34,000 (b) 1,33,000
(c) 1,32,000 (d) 1,31,000

Q.179. In an election between two candidates, 10% of the voters did not cast their votes and 75 votes were found invalid. The winner got 50% of the total votes expected and won by 170 votes. How many voters were enrolled in the voters' list ?
SSC CPO 27/06/2024 (3rd Shift)
(a) 800 (b) 855 (c) 850 (d) 950

Q.180. Bhavani spends 68% of her income. Her income increases by 15% and her expenditure increases by 10%. How much is the increase in the percentage of saving? (Use decimal up to 2 digits)
SSC CPO 28/06/2024 (1st Shift)
(a) 20.57% (b) 25.62%
(c) 28.42% (d) 24.80%

Q.181. A number is first decreased by 10%, then increased by 30% and then further it is decreased by 20%. What is the net decrease percentage in the number ?
SSC CPO 28/06/2024 (1st Shift)
(a) $4\frac{1}{5}$% (b) $6\frac{2}{5}$% (c) $5\frac{3}{5}$% (d) $3\frac{4}{5}$%

Q.182. Ramnarayan's salary was reduced by $3\frac{1}{8}$% and then, the reduced salary was increased by $7\frac{2}{5}$%. By what percentage (rounded off to two decimal places) is his new salary more/less as compared to his original salary?
SSC CPO 28/06/2024 (2nd Shift)
(a) 3.03% less (b) 4.04% more
(c) 4.04% less (d) 3.03% more

Q.183. Shiya invests ₹1,53,000, which is 30% of her annual income, in mutual funds. What is her monthly income (in ₹)?
SSC CPO 28/06/2024 (2nd Shift)
(a) 52,300 (b) 45,800
(c) 42,500 (d) 55,600

Q.184. If the radius of a sphere is increased by 125%, then by what percentage will its surface area increase (correct to two decimal places)?
SSC CPO 28/06/2024 (2nd Shift)
(a) 506.25% (b) 509.54%
(c) 409.76% (d) 406.25%

Q.185. The population of a city increases every year at the rate of 5%. If the population of the city is 16000, what will be the population after 2 years?
SSC CPO 28/06/2024 (2nd Shift)
(a) 17640 (b) 17000 (c) 17700 (d) 17600

Q.186. If the number of school going children in a town is 64000 and it is increasing annually by 10%, then what will be the number of school going children in the town at the end of 3 years?
SSC CPO 28/06/2024 (3rd Shift)
(a) 85100 (b) 85184
(c) 85000 (d) 80000

Q.187. The cost of Compressed Natural Gas (CNG) per litre is increased by 65%. By what percentage must Manish reduce his consumption of CNG so as not to increase his expenditure? (correct up to two decimal places)
SSC CPO 28/06/2024 (3rd Shift)
(a) 39.39% (b) 30.13%
(c) 45.13% (d) 25.39%

Q.188. Two successive price increases of 25% and 25% of an article are equivalent to a single price increase of:
SSC CPO 29/06/2024 (1st Shift)
(a) 52.25% (b) 50.25%
(c) 56.25% (d) 48.50%

Q.189. A is 25% more than B and B is 30% less than C. If C is 20% more than D, then by what percentage is A more than D ?
SSC CPO 29/06/2024 (1st Shift)
(a) 3% (b) 6% (c) 5% (d) 2%

Q.190. The population of a town increases annually by 20%. If the present population is 80lakh, then what is the difference between the population three years ago and 2 years ago ?
SSC CPO 29/06/2024 (2nd Shift)
(a) 75592.6 (b) 85592.6
(c) 65592.6 (d) 925925.93

Q.191. The breadth of a rectangular lawn is decreased by 8% and its length is increased by 15%. Find the percentage change in the lawn area.
SSC CPO 29/06/2024 (2nd Shift)
(a) 8.5% increase (b) 8.5% decrease
(c) 5.8%decrease (d) 5.8% increase

Q.192. The total percentage change in the volume of a cuboid if its length and breadth are decreased by 15% and 25%, respectively, while its height is increased by 60% is:
SSC CPO 29/06/2024 (2nd Shift)
(a) 5% decrease (b) 2% decrease
(c) 5% increase (d) 2% increase

Q.193. If the radius of a sphere is increased by 20%, then find the percentage increase in its volume.
SSC CPO 29/06/2024 (3rd Shift)
(a) 70.6% (b) 75.5% (c) 72.8% (d) 68.5%

Q.194. The population of a town is

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

15000. If the population increases by 15% in the first year, by 25% in the second year and due to pollution it decreases by 6% in the third year, what will be its population after 3 years? (Round off number in answer)
SSC CPO 29/06/2024 (3rd Shift)
(a) 20269 (b) 15269 (c) 25269 (d) 28269

Q.195. If the length and breadth of a cuboid are increased by 6% and 8%, respectively, then the percentage increase in its volume (correct to two decimal places) is:
SSC CPO 29/06/2024 (3rd Shift)
(a) 13.96% (b) 12.96%
(c) 14.48% (d) 11.48%

Q.196. In a sweet, one-third is sugar. If the price of sugar now is $\frac{7}{6}$ of the previous price, what is the effective percentage increase in the cost of the sweet?
SSC CPO 29/06/2024 (3rd Shift)
(a) $\frac{100}{9}$% (b) $\frac{200}{9}$%
(c) $\frac{100}{18}$% (d) $\frac{100}{3}$%

Q.197. Ramesh spent ₹30,000 on Diwali shopping and ₹45,000 on buying a TV set, and the remaining 40% of the total amount he had as cash with him. What was the total amount (in ₹)?
SSC CPO 29/06/2024 (3rd Shift)
(a) 1,22,000 (b) 1,25,000
(c) 1,35,000 (d) 1,10,000

SSC Selection Post (Phase - XII)

Q.198. In a college election between two rivals, a candidate got 30% of the total votes polled. He was defeated by his rival by 200 votes. The total number of votes polled was:
Matriculation Level 20/06/2024 (Shift - 1)
(a) 500 (b) 300 (c) 400 (d) 600

Q.199. In a Panchayat election, three contestants - A, B, and C- are contesting. 75% of the total population of 8000 cast their votes. There were no invalid or NOTA votes in the election. A got the least votes, with only 300 votes. B got 66% of the total votes and won the election. How many votes did B get?
Matriculation Level 20/06/2024 (Shift - 1)
(a) 5280 (b) 3660 (c) 4060 (d) 3960

Q.200. In an election between two candidates , 75% of the voters cast their votes, out of which 4% of the votes were declared invalid. A candidate got 9504 votes, which were 80% of the valid votes. Find the total number of votes enrolled in that election.
Matriculation Level 20/06/2024 (Shift - 4)
(a) 12,672 (b) 13,200
(c) 16,500 (d) 12,375

Q.201. The price of a bike is first increased by 21% and later on, it is decreased by 34% due to reduction in sales. Find the net percentage change in the final price of the bike.
Matriculation Level 21/06/2024 (Shift - 1)
(a) Decrease of 13.25%
(b) Increase of 20.14%
(c) Decrease of 20.14%
(d) Increase of 13.25%

Q.202. In an election between two candidates, 10% of the voters did not cast their vote and 5% of the votes polled were found invalid. The successful candidate got 55% of the valid votes and won by a majority of 1,710 votes. The number of voters enrolled on the voters list was:
Matriculation Level 21/06/2024 (Shift - 1)
(a) 21,000 (b) 19,000
(c) 18,000 (d) 20,000

Q.203. The monthly salaries of A and B together amount to ₹45,000. A spends 75% of his salary and B spends 80% of his salary. If now their savings are the same, then the salary of B (in ₹) is:
Matriculation Level 21/06/2024 (Shift - 1)
(a) 25,000 (b) 20,000
(c) 15,000 (d) 30,000

Q.204. Antara's monthly income is ₹96,000, while Barnali's monthly income is ₹1,10,000. If y% of Barnali's income is equal to 55% of Antara's monthly income, find the value of y.
Matriculation Level 21/06/2024 (Shift - 4)
(a) 48 (b) 44 (c) 52 (d) 45

Q.205. In a constituency, the total number of people on the electoral roll was 2,75,000. Out of them, 90% cast their votes in an election and 15% of the votes cast were declared invalid. What was the number of valid votes cast ?
Matriculation Level 24/06/2024 (Shift - 4)
(a) 2,10,275 (b) 2,10,375
(c) 2,10,325 (d) 2,10,425

Q.206. In an election between two candidates, 75% of the voters cast their votes, out of which 2% of the votes were declared invalid. A candidate got 9,261 votes, which were 75% of the total valid votes. Find the total number of votes.
Matriculation Level 24/06/2024 (Shift - 4)
(a) 17,000 (b) 17,200
(c) 17,400 (d) 16,800

Q.207. If the GST on a certain article was Rs.600 two years back and it increased to Rs.750 this year, find the percentage increase in the GST on that article.
Matriculation Level 25/06/2024 (Shift - 1)
(a) 30% (b) 15% (c) 25% (d) 20%

Q.208. A city's population grows by 10% in the first year, 20% in the second year and 10% in the third year. If the population after 3 years is 8,71,200, then what was the original population 3 years ago?
Matriculation Level 25/06/2024 (Shift - 1)
(a) 7,00,000 (b) 7,92,000
(c) 6,60,000 (d) 6,00,000

Q.209. In an election, the total number of valid votes cast was 3,75,000. Candidate A secured 48% of the valid votes, with the rest of the valid votes going to the winner, Candidate B. By how many valid votes did Candidate B win over Candidate A ?
Matriculation Level 26/06/2024 (Shift - 1)
(a) 14,750 (b) 15,000
(c) 13,500 (d) 15,250

Q.210. Shweta spends 21% of her monthly salary on house rent, 14% on education, and 13% on entertainment, and still saves ₹5,408. What is her monthly salary (₹ in) ?
Matriculation Level 26/06/2024 (Shift - 1)
(a) 9,150 (b) 12,400
(c) 10,400 (d) 14,000

Q.211. In an examination, there were two papers, A and B, and the maximum mark in each of the two papers was 10. However, the weights assigned to papers A and B were in the ratio 2: 1, respectively. Jonathan scored 8 out of 10 in Paper A and an overall 70% in the examination. How much did he score in Paper B out of 10?
Matriculation Level 26/06/2024 (Shift - 1)
(a) 5.5 (b) 6.5 (c) 6 (d) 5

Q.212. In an election between two candidates, the first gets 75% of the total valid votes. If 20% votes are invalid among 2,48,000 votes, then how many votes were cast in the favour of the other candidate?
Higher Secondary 20/06/2024 (Shift - 2)
(a) 53800 (b) 46800 (c) 49600 (d) 56600

Q.213. The price of an AC increases and decreases in every alternate year by $1\frac{3}{5}$%. It started with an increase in 2004. The price of the AC in 2007, as compared to that in 2004 (correct to two places of decimals):
Higher Secondary 21/06/2024 (Shift - 2)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) increased by 1.57%
(b) decreased by 2.57%
(c) decreased by 1.57%
(d) increased by 2.57%

Q.214. If 70 is subtracted from 70% of a number, the remainder is 70. What is the number?
Higher Secondary 24/06/2024 (Shift - 2)
(a) 200 (b) 100 (c) 400 (d) 300

Q.215. Pass percentage of an examination is 35%. If a student who got 210 marks, failed by 14 marks, then what are the maximum marks of the examination?
Higher Secondary 25/06/2024 (Shift - 2)
(a) 640 (b) 600 (c) 620 (d) 660

Q.216. If an electricity bill is paid before the due date, one gets a reduction of 10% on the amount of the bill. By paying the bill before the due date, a person got a reduction of ₹23. The amount of his electricity bill (in ₹) was :
Higher Secondary 25/06/2024 (Shift - 2)
(a) 380 (b) 250 (c) 520 (d) 230

Q.217. A person spends 60% of his income. His income increased by 30% and he increased his expenditure by 20%. His percent savings will then be increased by:
Higher Secondary 25/06/2024 (Shift - 4)
(a) 48% (b) 45% (c) 46% (d) 42%

Q.218. Ramagya spends 22% of his salary on house rent and 75% of the rest on household expenses. If he saves ₹3,705, find his total income (in rupees).
Higher Secondary 26/06/2024 (Shift - 2)
(a) ₹19,000 (b) ₹21,000
(c) ₹17,000 (d) ₹18,000

Q.219. In an election, there were only two candidates. 12% of the voters did not cast their votes. The winner by obtaining 60% of the total votes defeated his opposite contestant by 1200 votes. Find the total number of votes.
Graduate Level 20/06/2024 (Shift - 3)
(a) 4000 (b) 3750 (c) 5730 (d) 3570

Q.220. Ramesh spends 60% of his income. If his income is increased by 30% and his expenditure is increased by 20%, then the percentage increase in the savings of Ramesh will be:
Graduate Level 20/06/2024 (Shift - 3)
(a) 50% (b) 35% (c) 45% (d) 30%

Q.221. During 2021, the population of a city increased by 8% and in 2022, it increased by 10%. At the end of 2022, its population was 47520. The population of the city at the end of 2021 was :
Graduate Level 21/06/2024 (Shift - 3)
(a) 40000 (b) 43200 (c) 42300 (d) 44000

Q.222. In a school, an exam was held for 80 marks in which 32 was the passing marks. Who among the following scored the minimum marks ?
Note: Round off upto one decimal only.
Graduate Level 21/06/2024 (Shift - 3)
(a) D, who got $\frac{12}{19}$ of the total marks
(b) C, who got 160% of the passing marks
(c) A, who got 72% marks in the exam
(d) B, who got $\frac{7}{11}$ of the total marks

Q.223. In a company, 35% of employees are from a science background and $\frac{1}{5}th$ are from an arts background. The rest are either illiterate or with a commerce background. The number of illiterate is 300 which is $\frac{1}{2}$ of the commerce background. How many employees are from science or arts background ?
Graduate Level 21/06/2024 (Shift - 3)
(a) 1100 (b) 1200 (c) 1500 (d) 1300

Q.224. The sum of the two numbers is 450. If the greater number is decreased by 4% and the smaller number is increased by 20%, then the numbers obtained are equal. The smaller number is:
Graduate Level 24/06/2024 (Shift - 3)
(a) 176 (b) 200 (c) 164 (d) 144

Q.225. The strength of a school increases and decreases every alternate year by 20%. It started with an increase in 2018. What is the strength of the school at the start of 2021 as compared to that of 2018 ?
Graduate Level 25/06/2024 (Shift - 3)
(a) Increase by 15.2%
(b) Decrease by 16.2%
(c) Increase by 16.2%
(d) Decrease by 15.2%

Q.226. Vinod and Sanjay were fighting against each other for the post of a village Pradhan. Sanjay got 47.5% votes and lost the election by 270 votes. How many votes did Vinod get (assuming that all the villagers participated in the voting)?
Graduate Level 26/06/2024 (Shift - 3)
(a) 2655 (b) 2835 (c) 2385 (d) 2565

Q.227. A person spends 40% of his salary on food items, 50% of the remaining on transport, and 30% of the remaining on clothes. After spending on food, transport and clothes, he saves ₹1,260 every month, what is his monthly salary?
Graduate Level 26/06/2024 (Shift - 3)
(a) ₹8,000 (b) ₹6,000
(c) ₹7,000 (d) ₹10,000

Q.228. A stock portfolio consists of three stocks. Stock A represents 30% of the portfolio and has a return of 5%. Stock B represents 40% of the portfolio and has a return of 10%. Stock C represents the remaining 30% of the portfolio and has a return of 8%. What is the average return of the portfolio?
Graduate Level 26/06/2024 (Shift - 3)
(a) 7.9% (b) 7.5% (c) 7.2% (d) 8.1%

Q.229. The number of toys manufactured by a machine in 2018 was 25,000, which increased by 20% in 2019. In 2020, the production was hindered by strike and it fell by 15%. How many total toys were manufactured in three years by the machine?
Graduate Level 26/06/2024 (Shift - 4)
(a) 80000 (b) 89500 (c) 25500 (d) 80500

SSC CHSL 2023 Tier - 2

Q.230. The population of the city was 1,75,000 two years ago. If it had increased by 4% and 5% in the last two years, find the present population of the city.
SSC CHSL Tier II (02/11/2023)
(a) 1,89,200 (b) 1,92,100
(c) 1,93,200 (d) 1,91,100

Q.231. A number is increased by 25% and then decreased by 16%, the final value of the number:
SSC CHSL Tier II (02/11/2023)
(a) decreases by 13%
(b) increases by 5%
(c) does not change
(d) decreases by 5%

Q.232. A dishonest shopkeeper sells rice at a cost price but makes a 25% profit by using faulty weights. He decides to give a discount to attract more customers. What percent of discount should he offer to make 10% profit ?
SSC CHSL Tier II (02/11/2023)
(a) 11% (b) 12% (c) 10% (d) 9%

Q.233. In an election, a candidate who gets 90% votes is elected by a margin of 800 votes. What is the total number of votes polled?
Note: There are only two candidates contesting the election and assume all the votes were valid.
SSC CHSL Tier II (10/01/2024)
(a) 1050 (b) 950 (c) 1000 (d) 900

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CPO 2023 Tier - 1

Q.234. In an election between two candidates, 80% of the voters cast their votes, out of which 5% votes were declared invalid. A candidate got 9500 votes which were 80% of the valid votes. Find the total number of voters enrolled in that election.
SSC CPO 04/10/2023 (1st Shift)
(a) 14780 (b) 15625 (c) 16100 (d) 15100

Q.235. The fraction equivalent to $\frac{1}{5}$% is:
SSC CPO 04/10/2023 (1st Shift)
(a) $\frac{1}{125}$ (b) $\frac{1}{500}$ (c) $\frac{1}{200}$ (d) $\frac{1}{40}$

Q.236. In an election between two candidates, 30% of the electorate did not cast their votes. 20% of the votes polled were found invalid. The winning candidate got 64% of the valid votes and won by a majority of 3136 votes. Find the number of voters enrolled in the voter list.
SSC CPO 04/10/2023 (3rd Shift)
(a) 24000 (b) 20000 (c) 25000 (d) 30000

Q.237. In an election between two candidates, the difference between the candidates who won and lost was 2,500 votes. The candidate who won got 75% of the votes, and there were no invalid votes. The total number of votes polled of the losing candidate was:
SSC CPO 04/10/2023 (3rd Shift)
(a) 1875 (b) 1250 (c) 5000 (d) 3750

Q.238. In an election between two candidates, 20% of the voters on the voters list did not cast their votes and 80 voters cast their ballot papers blank. The winner secured 45% of all the voters in the list and he got 280 votes more than his rival. The number of voters on the list was: SSC CPO 05/10/2023 (1st Shift)
(a) 2000 (b) 2800 (c) 2500 (d) 1500

Q.239. A family earns ₹75,000, out of which 10% is saved. 30% of the expenditure is incurred on education, while ₹30,375 is spent on health and the remaining amount is spent on food. What is the percentage of food expenditure to the total income?
SSC CPO 05/10/2023 (2nd Shift)
(a) 20% (b) 21.5% (c) 22.5% (d) 32.5%

SSC MTS 2023 Tier -1

Q.240. If the first number is 20% less than the third number and the ratio of the second to the third number is 7 : 10, then the average of the first and the third number is how much percent more than the second number ?
SSC MTS 01/09/2023 (1st Shift)
(a) $26\frac{4}{7}$ (b) $28\frac{2}{7}$ (c) $28\frac{4}{7}$ (d) $24\frac{2}{7}$

Q.241. A contractor reduces the working time of a week (Monday to Saturday) from 48 hours to 36 hours for his workers without changing the payment. What is the percentage increase in the hourly rate?
SSC MTS 05/09/2023 (3rd Shift)
(a) $30\frac{1}{3}$ % (b) $33\frac{1}{3}$ %
(c) $67\frac{2}{3}$ % (d) $70\frac{2}{3}$ %

Q.242. A family spends 20% of its monthly income on house rent. Out of the remaining amount, the family spends 50% on household expenditure and 20% on children's education. If after doing so, its monthly saving is ₹6,600, then what is the total monthly income of the family?
SSC MTS 13/09/2023 (1st Shift)
(a) ₹25,000 (b) ₹27,500
(c) ₹30,000 (d) ₹28,000

Q.243. Suresh could save 20% of his income. But 4 years later, when his income increased by 40%, he could save the same amount only as before. By how much percentage did his expenditure increase?
SSC MTS 14/09/2023 (2nd Shift)
(a) 23% (b) 50% (c) 22% (d) 45%

SSC CHSL 2023 Tier - 1

Q.244. Bhushan's monthly income is ₹45,000 and his monthly expenditure is ₹33,000. If his monthly income is increased by 22% while monthly expenditure is increased by 11%, then what is his new monthly savings (in ₹) ?
SSC CHSL 02/08/2023 (1st Shift)
(a) 18,270 (b) 18,690 (c) 18,000 (d) 19,000

Q.245. If the price of a movie ticket increased by $12\frac{1}{2}$% and the sale of tickets also increased by $8\frac{1}{2}$%, then find % change in income.
SSC CHSL 02/08/2023 (2nd Shift)
(a) 21.875% (b) 22.6750%
(c) 20.675% (d) 22.0625%

Q.246. In a village election between three candidates, 80% of the voters cast their votes, out of which 3% votes were declared invalid. The winning candidate got 42,680 votes which were 55% of the total valid votes. Find the number of valid votes received by the candidate who stood third, given that he received only 10% of the total valid votes.
SSC CHSL 03/08/2023 (1st Shift)
(a) 7760 (b) 7700 (c) 7670 (d) 7680

Q.247. A total of 7,50,000 voters participated in an election. A candidate received 3,82,500 votes which was 60% of the total valid votes. What was the percentage of invalid votes in the election?
SSC CHSL 04/08/2023 (1st Shift)
(a) 15% (b) 20% (c) 12% (d) 18%

Q.248. If the curved surface area of a cylinder is increased by 20%, and height is decreased by 4%, then the net decrease or increase in the volume will be:
SSC CHSL 08/08/2023 (3rd Shift)
(a) 36 % decrease (b) 20 % increase
(c) 50 % increase (d) 33 % decrease

Q.249. Ravi initially had a certain number of chocolates, while Bhanu initially had 80% of the number of chocolates that Ravi initially had. Ravi gave 10% of his chocolates to his sister while Bhanu received from his uncle another 35% of the number of chocolates he initially had. If Bhanu finally had 54 chocolates, how many chocolates did Ravi give to his sister?
SSC CHSL 09/08/2023 (2nd Shift)
(a) 3 (b) 6 (c) 5 (d) 4

Q.250. Rajat, Pooja and Abha participate in the election. If the total votes polled are 40,000 and 10% of votes are invalid, Rajat got 36% of valid votes and Pooja got 40% of valid votes, then find the number of votes Abha got.
SSC CHSL 14/08/2023 (3rd Shift)
(a) 9245 (b) 1024 (c) 8640 (d) 5760

Q.251. In an election between two candidates, 85% of the electorate cast their votes. 6% of the votes polled were declared invalid. If the winning candidate secured 60% of the valid votes, how many votes did the winning candidate receive if the number of eligible voters was 10000 ?
SSC CHSL 17/08/2023 (1st Shift)
(a) 4784 (b) 4804 (c) 4794 (d) 4824

Q.252. 65% of Samita's income is equal to 91% of Bhairav's income. If Samita's income was ₹1,500 more than what it is and Bhairav's income was ₹ 500 more than what it is, the ratio of the incomes of Samita and Bhairav would have been 3 : 2. What is the actual combined income (in ₹) of Samita and Bhairav?
SSC CHSL 17/08/2023 (3rd Shift)
(a) 18,500 (b) 17,500
(c) 20,000 (d) 18,000

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 2023 Tier - 1

Q.253. In an election, 2% persons enrolled in the voter list did not participate and 500 votes were invalid. Two candidates A and B fought the election, and A defeated B by 200 votes. If 43% of the persons enrolled in the voter list casted their votes in favour of A, then what is the number of the total casted votes?
SSC CGL 14/07/2023 (2nd shift)
(a) 2450 (b) 2800 (c) 3000 (d) 3250

Q.254. In an election between three candidates, Arjun, Bhaskar and Saral contested for a post. Arjun got 50% votes more than Saral, and Saral got 2% votes less than Bhaskar. The difference between the votes of Bhaskar and Saral is 1296. What is the half of the difference between the votes of Arjun and Bhaskar?
SSC CGL 14/07/2023 (3rd shift)
(a) 3888 (b) 13988 (c) 7766 (d) 15228

Q.255. Suhani pays tax at the rate of 30% on her entire income of ₹90,000 and Ritika pays tax at the rate of 40% on her entire income of ₹y. If the overall tax rate on their combined income comes to 37%, then what is the value of y?
SSC CGL 17/07/2023 (2nd shift)
(a) ₹2,04,000 (b) ₹2,16,000
(c) ₹2,13,000 (d) ₹2,10,000

Q.256. In a constituency, 90% of the total number of people on the electoral roll cast their votes during an election. 15% of the votes cast were declared invalid. Jeeta secured 60% of the valid votes. If Jeeta secured 91,800 valid votes, what was the total number of people on the electoral roll?
SSC CGL 17/07/2023 (3rd shift)
(a) 2,16,000 (b) 2,25,000
(c) 1,80,000 (d) 2,00,000

Q.257. In a constituency, 85% of the total number of people on the electoral roll cast their votes during an election. 10% of the votes cast were declared invalid. If there were 3,00,000 people on the electoral roll and Dharam secured 1,37,700 valid votes, what percentage of the total number of valid votes did Dharam secure ?
SSC CGL 18/07/2023 (3rd shift)
(a) 50.5% (b) 70.2% (c) 45.9% (d) 60.0%

Q.258. If the price of petrol increased by 7%, then by what percentage should the consumption be decreased by the consumer, if the expenditure on petrol remains unchanged ?
SSC CGL 19/07/2023 (4th shift)
(a) $6\frac{58}{107}\%$ (b) $5\frac{11}{107}\%$
(c) $3\frac{49}{107}\%$ (d) $4\frac{99}{107}\%$

Q.259. In a certain year, the population of a city was 18000. If in the next year, the population of males increased by 5% and that of females increased by 7%, and the total population increased to 19200, then what was the ratio of the populations of males and females in that given year?
SSC CGL 20/07/2023 (1st shift)
(a) 2 : 5 (b) 1 : 5 (c) 4 : 3 (d) 3 : 5

Q.260. In January 2022, Kriti paid an EMI, which was 22% of her monthly salary. She spent the remaining salary on shopping of groceries and clothes in the ratio 7 : 5. She spent ₹18200 on shopping of clothes. If, in February 2022, her salary increased by 16%, then what was her salary (in ₹) in February?
SSC CGL 24/07/2023 (1st shift)
(a) 66,350 (b) 68,520
(c) 70,250 (d) 64,960

Q.261. A person spends 25% of his income on goods of daily uses. Furthermore, he spends 18% of the rest on house rent and 16% of the rest on travel. After that, only ₹861 is left with him. What is his salary?
SSC CGL 24/07/2023 (3rd shift)
(a) ₹$1852\frac{1}{3}$ (b) ₹$1666\frac{2}{3}$
(c) ₹$1563\frac{1}{3}$ (d) ₹$1426\frac{1}{3}$

Q.262. In an examination a candidate had to sit for three papers A, B, and C. The candidate secured 75% marks in Paper A, 80% marks in Paper B, and 60% marks in Paper C. If the weightage assigned to Papers A, B, and C were 40%, 50% and 10%, respectively, then find the weighted percentage of marks obtained by the candidate, when all the three papers were taken together.
SSC CGL 24/07/2023 (4th shift)
(a) 77% (b) 74% (c) 72% (d) 76%

Q.263. Out of the total toffees, $\frac{1}{10}$ are wasted. 35% of the rest are given to S and $\frac{1}{8}$ of the total are given to N. If the toffees with N are 10 more than the wasted toffees, then how many toffees were given to S ?
SSC CGL 25/07/2023 (1st shift)
(a) 126 (b) 150 (c) 110 (d) 135

Q.264. A family income is ₹35,000 in a month. The family spends the income on various expenditures, viz., food, health, education, entertainment, and rent. After incurring all the expenditures, 8% is saved every month. The expenditure on health is 50% more than that of food. While food is three times of the expenditure on entertainment, the expenditure on health is half of the expenditure on education. The expenditure on rent is one-third of the combined expenditure on food, health and education. How much expenditure (in ₹) is incurred on education?
SSC CGL 25/07/2023 (2nd shift)
(a) 12600 (b) 8400 (c) 13200 (d) 7700

Q.265. Tarun owned a plot of land having an area that was 10% more than the area of the plot owned by Basab, while the area of the plot of land owned by Nakul was 40% more than the area of the plot owned by Tarun. If the area of the plot owned by Nakul was 2695 square feet, what was the area (in square feet) of the plot owned by Basab ?
SSC CGL 25/07/2023 (4th shift)
(a) 1750 (b) 1740 (c) 1780 (d) 1800

Q.266. A father gives 8% of his monthly income to both his sons as pocket money. The elder son gets 85% of the total amount given to both the sons. He spend 90% of the amount and saves ₹17. What is the monthly income of father ?
SSC CGL 26/07/2023 (3rd shift)
(a) ₹ 5,000 (b) ₹ 4,500
(c) ₹ 3,500 (d) ₹ 2,500

SSC Selection Post (Phase - XI)

Q.267. During the previous year, the price of an electronic item increased by 10%, and this year, the price of the same item decreased by 10%. If the price of the electronic item at present is ₹66,000, then what was the price of the discussed electronic item in the beginning of the previous year? (Rounded off to one decimal place)
Graduate Level 28/06/2023 (Shift - 3)
(a) ₹91,262.5 (b) ₹72,432.4
(c) ₹66,666.7 (d) ₹ 82,345.4

Q.268. If the numerator of a fraction is increased by 12% and its denominator is reduced by 8%, it gives a new fraction $\frac{16}{17}$. What is the original fraction?
Higher Secondary 27/06/2023 (Shift - 3)
(a) $\frac{92}{119}$ (b) $\frac{23}{28}$ (c) $\frac{28}{23}$ (d) $\frac{119}{92}$

Q.269. The monthly income of a person was Rs.80,000 and his monthly expenditure was Rs.45,000. Next year, his income increased by 16% and his

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

expenditure increased by 8%. Find the percentage increase in his savings (correct to 2 decimal places).
Higher Secondary 30/06/2023 (Shift - 2)
(a) 25.35% (b) 26.29%
(c) 30.25% (d) 44.36%

Q.270. While playing cards, a man loses 75% of his money in the first round, 75% of the remaining in the second round, and 75% of the remaining in the third round. If he is left with Rs.100, how much money does he have initially?
Matriculation Level 27/06/2023 (Shift - 2)
(a) Rs.6,400 (b) Rs.2,400
(c) Rs.1,600 (d) Rs.3,200

Q.271. In an election between two candidates, one candidate got 60% of the valid votes. If the total number of votes polled were 8850, and 10% of the votes were invalid, then find the number of valid votes that the other candidate got.
Matriculation Level 28/06/2023 (Shift - 1)
(a) 3816 (b) 3186 (c) 3681 (d) 3618

Q.272. In an election between two candidates, 84 votes were declared as invalid. The winning candidate secures 62% of the valid votes and wins by 96 votes. The number of votes polled is:
Matriculation Level 28/06/2023 (Shift - 1)
(a) 424 (b) 543 (c) 641 (d) 484

Q.273. A family member spends 25% of his monthly income on food, 35% of the remaining on a home loan and other bank debts, and half of the rest on the education of the children. If the member saves $46,215 every year, then the monthly income of the member is:
Matriculation Level 30/06/2023 (Shift - 4)
(a) $15,800 (b) $190,248
(c) $15,520 (d) $19,200

SSC CHSL 2022 Tier - 2

Q.274. The annual growth rate of a city is 2%. If its population in the year 2020 was 1,50,000, then what will its population be in 2023?
SSC CHSL Tier II (26/06/2023)
(a) 1,59,181 (b) 1,58,765
(c) 1,58,413 (d) 1,59,000

Q.275. Gita purchases an apartment and pays EMI for that. Her monthly income is ₹80,000. She spends 15% on the education of her children, 40% on household affairs, sends 10% to GPF, saves 15% in a savings bank account and pays the rest of the amount as EMI. How much EMI does she pay?
SSC CHSL Tier II (26/06/2023)
(a) ₹14,000 (b) ₹18,000
(c) ₹16,000 (d) ₹20,000

Q.276. In an election between two candidates. 20% of the registered voters did not cast their vote and 40 votes were declared invalid. The winner got 42% of the registered votes and was declared the winner by 112 votes. The number of registered voters was:
SSC CHSL Tier II (26/06/2023)
(a) 1500 (b) 1200 (c) 1800 (d) 3800

SSC MTS 2022 Tier - 1

Q.277. The price of a mobile is Rs. 30,000. The value of the mobile depreciates by 12% at the end of the first year and at the end of next year, it depreciates by 15%. What will be the value of the mobile after 2 years ? (In Rs.)
SSC MTS 03/05/2023 (Afternoon)
(a) 25,255 (b) 22,440 (c) 20,000 (d) 25,000

Q.278. A alone can complete half of a work in 150 days. In 50 days, what percentage of the work will be completed by A ?
SSC MTS 03/05/2023 (Evening)
(a) 16.67 percent (b) 15 percent
(c) 20 percent (d) 22.5 percent

Q.279. Manisha has Rs. 8000 in her wallet. Then she increased it by 10%. Now she spent 5% of it. The final value of money in her wallet will be how much percent greater than the initial amount?
SSC MTS 09 05/2023 (Evening)
(a) 5% (b) 6% (c) 4.5% (d) 5.5%

Q.280. The annual salary of Aniket increased from Rs. 1000000 to Rs. 1400000. What is the percent increase?
SSC MTS 16/05/2023 (Afternoon)
(a) 14% (b) 40% (c) 20% (d) 4%

Q.281. If both length and breadth of a cuboid is increased by 12 percent, then by how much percent its height should be reduced so that the volume of the cuboid remains same?
SSC MTS 16/05/2023 (Afternoon)
(a) 14.56 percent (b) 24.72 percent
(c) 20.28 percent (d) 28.44 percent

Q.282. If the price of onion increases from Rs. 60/kg to Rs. 75/kg, then by what percentage a household should decrease the consumption of onion so that expenditure remains same ?
SSC MTS 19/05/2023 (Evening)
(a) 40 % (b) 25 % (c) 20 % (d) 30 %

Q.283. A man multiplied a number by $\frac{8}{5}$ instead of $\frac{5}{8}$, what is the percentage error in the calculation?
SSC MTS 13/06/2023 (Afternoon)
(a) 124% (b) 162% (c) 156% (d) 100%

Q.284. Vikas gave 3 examinations. The respective ratio of marks scored by him in the 3 examinations is 3 : 5 : 6. The respective ratio of maximum marks of the 3 examination is 7 : 11 : 10. If he scored 50 percent marks in total, then in how many examination has he scored marks more than 50 percent?
SSC MTS 13/06/2023 (Afternoon)
(a) None (b) 1 (c) 3 (d) 2

Q.285. If 60 is subtracted from 30 percent of a number, then the result is 120. What is the value of the number?
SSC MTS 13/06/2023 (Evening)
(a) 550 (b) 600 (c) 700 (d) 630

Q.286. In an examination out of 6000 students 60% boys and 90% girls are passed. If total pass percentage was 65%, then what would be the number of boys?
SSC MTS 20/06/2023 (Evening)
(a) 3500 (b) 5000 (c) 4500 (d) 5500

SSC CHSL 2022 Tier - 1

Q.287. If 20 percent of P is added to 40 percent of Q, then the resultant comes as 80 percent of Q . P is what percentage of Q ?
SSC CHSL 09/03/2023 (1st Shift)
(a) 125 % (b) 200 % (c) 225 % (d) 150 %

Q.288. Out of two numbers, 20 percent of the smaller number is equal to 14 percent of the Larger number. If the sum of both the numbers is 8942, then what is the value of larger number ?
SSC CHSL 09/03/2023 (3rd Shift)
(a) 4920 (b) 5260 (c) 5040 (d) 5160

Q.289. In the Lok Sabha election, Party A got 30% of the total votes. Party B got 25% of the total votes. Party C got the remaining votes and they got 9000 more votes than Party A. Find the number of votes Party B got.
SSC CHSL 10/03/2023 (2nd Shift)
(a) 12000 (b) 18000 (c) 21000 (d) 15000

Q.290. The price of a commodity is decreased by 25 percent and therefore a household increased the consumption of that commodity by 20 kg to keep the expenditure same. What was the earlier consumption?
SSC CHSL 13/03/2023 (1st Shift)
(a) 60 kg (b) 55 kg (c) 75 kg (d) 45 kg

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.291. There are three numbers P, Q and R. 30 percent of P is equal to the 15 percent of Q . 20 percent of Q is equal to the 10 percent of R. By what percent is R more than P ?
SSC CHSL 13/03/2023 (2nd Shift)
(a) 200 % (b) 300 % (c) 150 % (d) 250 %

Q.292. In an election between two candidates, one got 60% of the total valid votes, 90% of the votes were valid. If the total number of votes was 12000, then what was the number of valid votes that the other candidate got?
SSC CHSL 13/03/2023 (4th Shift)
(a) 8840 (b) 4320 (c) 10800 (d) 6200

Q.293. Rajiv scored 20 percent marks in an exam and failed by 25 marks. If he scores 50 percent marks, then he gets 20 marks more than passing marks. What is the passing marks for the exam?
SSC CHSL 14/03/2023 (1st Shift)
(a) 40 (b) 35 (c) 55 (d) 45

Q.294. Student A got 25 marks more than the student B and the marks of A were equal to the 60 percent of the sum of their marks. What are the marks obtained by A and B respectively?
SSC CHSL 14/03/2023 (3rd Shift)
(a) 75, 100 (b) 75, 50
(c) 45, 120 (d) 55, 80

Q.295. Nakul went to the market to buy groceries. He has some money with him, 20% of which he used to buy wheat flour, 25% of the remaining money is spent on cooking oils. If he is left with Rs.900, then find out total amount of money that Nakul had.
SSC CHSL 15/03/2023 (1st Shift)
(a) Rs.1,500 (b) Rs.1,200
(c) Rs.1,350 (d) Rs.1,800

Q.296. If the price of an apple is reduced by 30 Percent, it enables the customer to buy 5 more apples for Rs.140. Find the reduced rate of apples.
SSC CHSL 15/03/2023 (3rd Shift)
(a) Rs.14 (b) Rs.12 (c) Rs.7 (d) Rs.8.4

Q.297. Price of 15 chairs is 20 percent more than the price of 8 tables. If price of 2 tables is Rs. 2400, then what is the price of 15 chairs?
SSC CHSL 16/03/2023 (1st Shift)
(a) Rs. 10,320 (b) Rs. 12,380
(c) Rs. 11,520 (d) Rs. 10,780

Q.298. If the numerator of a fraction is increased by 140% and the denominator of the fraction is decreased by 20%, the resultant fraction is $\frac{12}{7}$. Find the original fraction.
SSC CHSL 17/03/2023 (1st Shift)
(a) $\frac{4}{9}$ (b) $\frac{4}{7}$ (c) $\frac{7}{6}$ (d) $\frac{8}{9}$

Q.299. In an examination, 45 percent students passed in history and 60 percent students passed in hindi. If 8 percent students failed in both the subjects, then what percentage students passed in both the subjects?
SSC CHSL 17/03/2023 (4th Shift)
(a) 15 % (b) 10 % (c) 13 % (d) 12 %

Q.300. P's income is 150 percent of Q's income and P's expenditure is 60 percent of Q's expenditure. If Q saves 20 percent of his income, then how much percentage does P save of his own income?
SSC CHSL 20/03/2023 (2nd Shift)
(a) 68 % (b) 60 % (c) 72 % (d) 75 %

Q.301. Tilak's salary increases by 15% in the first year, decreases by 20% in the second year and increases by 25% in the third year. If Tilak's salary after these three years is Rs.23,000, then find the salary of Tilak in the beginning of these 3 years.
SSC CHSL 21/03/2023 (1st Shift)
(a) Rs.20,000 (b) Rs.18,000
(c) Rs.15,000 (d) Rs.25,000

SSC CGL 2022 Tier - 2

Q.302. A basket contains 350 eggs. If 12% of the eggs are rotten, how many eggs are good enough to be sold?
SSC CGL Tier II (02/03/2023)
(a) 408 (b) 310 (c) 308 (d) 410

Q.303. If radius of a sphere is decreased by 48%, then by what percent does its surface area decrease?
SSC CGL Tier II (02/03/2023)
(a) 82.91% (b) 72.96%
(c) 78.98% (d) 86.26%

Q.304. Two candidates contested an election. One of them got 64% of the votes and won by 434 votes. What was the total number of votes polled?
SSC CGL Tier II (03/03/2023)
(a) 1550 (b) 1345 (c) 1680 (d) 1684

Q.305. Mrs. Deepa Devi saves 30% of her salary. If she receives Rs.42,000 per month as her salary, what is her monthly expenditure?
SSC CGL Tier II (06/03/2023)
(a) Rs.29,200 (b) Rs.29,400
(c) Rs.29,300 (d) Rs.29,100

SSC CGL 2022 Tier - 1

Q.306. The price of a scooter increases successively by 10%, 5% and 15%. What is the total percentage increase in price of scooter ?
SSC CGL 01/12/2022 (2nd Shift)
(a) $32\frac{33}{40}$ % (b) $34\frac{21}{40}$ %
(c) $30\frac{11}{40}$ % (d) $36\frac{31}{40}$ %

Q.307. The ratio of expenditure to savings of a woman is 5 : 1. If her income and expenditure are increased by 10% and 20%, respectively, then find the percentage change in her savings.
SSC CGL 01/12/2022 (3rd Shift)
(a) 55% (b) 60% (c) 50% (d) 40%

Q.308. Raju, Ravi and Ashok contested an election. 5% votes polled were invalid. Raju got 30% of the total votes. Ravi got 32% of the total votes. The winner got 5136 more votes than the person who received the least number of votes. Find the total number of votes polled.
SSC CGL 01/12/2022 (4th Shift)
(a) 171200 (b) 64200
(c) 171220 (d) 172100

Q.309. In the election, 8% of the voters did not cast their votes. Two candidates contested the election in which the winning candidate got 48% of the total votes and won election by 1100 votes. Find the total number of voters in the election, given that all the votes cast were valid?
SSC CGL 02/12/2022 (1st Shift)
(a) 25500 (b) 26500 (c) 27500 (d) 28500

Q.310. In an election between two candidates, 12% of voters did not cast their votes. The winner by obtaining 68% of the total votes defeated his contestant by 2880 votes. What was the total number of voters who cast their votes in the election?
SSC CGL 02/12/2022 (3rd Shift)
(a) 5280 (b) 8000 (c) 4000 (d) 6000

Q.311. The number of books on Mathematics, Physics and Chemistry in a University library is in the ratio 8 : 5 : 9. There is a proposal to increase these books by 10%, 5% and 5% respectively. What will be the ratio of the number of books after increment?
SSC CGL 02/12/2022 (4th Shift)
(a) 212 : 117 : 47 (b) 37 : 47 : 83
(c) 176 : 105 : 189 (d) 189 : 115 : 117

Q.312. Ram loses $12\frac{1}{2}$% of his money and after spending 75% of the remainder,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

is left with ₹630. How much money did Ram have initially ?
SSC CGL 03/12/2022 (1st Shift)
(a) ₹2,080 (b) ₹2,880 (c) ₹2,205 (d) ₹2,808

Q.313. Mr. X has a monthly income of $26,500 and his monthly expenditure is $20,500. The next year, his salary is increased by 12% and expenditure is increased by 6%. His savings increase by how much percent?
SSC CGL 05/12/2022 (3rd Shift)
(a) 32.5% (b) 27.3% (c) 32.0% (d) 34.7%

Q.314. During the first year, the population of a town increased by 12%. The next year, due to some contagious disease, it decreased by 8%. At the end of the second year, the population was 64,400. Find the population of the town at beginning of the first year.
SSC CGL 05/12/2022 (4th Shift)
(a) 50,000 (b) 54,750
(c) 62,500 (d) 50,500

Q.315. Two candidates P and Q contested in an election. 70% of the registered voters are P supporters. If 60% of the P supporters and 30% of the Q supporters are expected to vote for candidate P, then what percentage of the registered voters are expected to vote for candidate P ?
SSC CGL 06/12/2022 (1st Shift)
(a) 30% (b) 51% (c) 26% (d) 47%

Q.316. If the price of petrol is increased by 28%, by what percentage should the consumption be decreased by the consumer, if the expenditure on petrol remains unchanged? (Correct to 2 decimal places)
SSC CGL 06/12/2022 (3rd Shift)
(a) 12.35% (b) 21.88%
(c) 20.25% (d) 25.75%

Q.317. 20% of the inhabitants of a village having died of malaria, a panic set in, during which 30% of the remaining inhabitants left the village. The population was then reduced to 12,000. What was the number of inhabitants initially (Consider integral part only)
SSC CGL 07/12/2022 (2nd Shift)
(a) 21000 (b) 21428 (c) 21500 (d) 30428

Q.318. Three candidates were participating in an election. The person at third place got 20% of the total votes while the difference between the votes of the winner and the first runner up was 20% of the total votes. If the difference between the votes of the first runner up and the second runner up was 37,000, how many votes did the winner receive?
SSC CGL 07/12/2022 (4th Shift)
(a) 1,80,000 (b) 1,85,000
(c) 1,75,000 (d) 1,95,000

Q.319. In the first year the population of a town decreased by 5% due to the Corona virus first wave. In the next year it decreased again by 5% due to the second wave and in the third year it increased by 5%. At the end of the third year the population was 9,47,625. What was the population at the beginning of the first year?
SSC CGL 08/12/2022 (3rd Shift)
(a) 7,00,000 (b) 10,00,000
(c) 8,97,993 (d) 9,92,519

Q.320. Three candidates P, Q and R participated in an election. P got 35% more votes than Q, and R got 15% more votes than Q, P overtook R by 2,412 votes. If 90% of voters voted and no invalid or illegal votes were cast, then what was the number of voters in the voting list?
SSC CGL 09/12/2022 (1st Shift)
(a) 46,900 (b) 42,800
(c) 42,210 (d) 48,500

Q.321. In an election contested between two candidates, 15% of the total voters did not cast their votes and 100 votes got disqualified. The candidate who won the election won it by securing 45% of the total votes and won by a margin of 400 votes. Find the total number of voters?
SSC CGL 09/12/2022 (2nd Shift)
(a) 6,000 (b) 3,600 (c) 10,000 (d) 3,500

Q.322. A number is decreased by 20% to get another number. The number so obtained is increased by 200% to get a third number. The difference of the third number and the original number is what percentage more or less than the difference of second and the third number?
SSC CGL 12/12/2022 (2nd Shift)
(a) More, 15.7 % (b) Less, 15.7 %
(c) More, 12.5 % (d) Less, 12.5 %

SSC CPO 2022 Tier - 1

Q.323. The monthly income of Ramesh was Rs.16,500 and his monthly expenditure was Rs.10,500. Next year his income increased by 25% and his expenditure increased by 19%. Find the percentage increase in his saving.
SSC CPO 09/11/2022 (Afternoon)
(a) 33.5% (b) 34.5% (c) 32.5% (d) 35.5%

Q.324. In a two-candidate election, 10% of the voters did not cast their ballots. 10% of the votes cast were found invalid. The winning candidate received 54% of the valid votes and a 1620-vote majority. Find the number of people on the voter list who have registered to vote.
SSC CPO 09/11/2022 (Evening)
(a) 25000 (b) 26000 (c) 24500 (d) 25500

Q.325. The production of AB Co. increased by 10% after one year, and in the next year it increased by 22%. In the third year, it increased by 5%. What overall change (in %) has been there in the production in three years from the original production?
SSC CPO 10/11/2022 (Afternoon)
(a) 41.5% (b) 40.9% (c) 41.2% (d) 42.8%

Q.326. In an assembly election, a candidate got 60% of the total valid votes. 2% of the total votes were declared invalid. If the total number of voters is 1,50,000, then find the number of valid votes polled in favour of that candidate.
SSC CPO 11/11/2022 (Afternoon)
(a) 90,000 (b) 78,000
(c) 86,400 (d) 88,200

Q.327. In an election between two candidates, 85% of the voters cast their votes, out of which 4% of the votes were declared invalid. A candidate got 6936 votes which were 85% of the valid votes. Find the total number of voters enrolled in that election.
SSC CPO 11/11/2022 (Evening)
(a) 10,500 (b) 10,800 (c) 10,000 (d) 10,700

SSC CGL 2021 Tier - 2

Q.328. Raju spends 10 percent and 20 percent of his income on transport and food respectively. He spends 30 percent of the remaining income on clothing. He saves the rest of his income. If his saving is ₹26460, then what will be the total expenditure on food and clothing together?
SSC CGL Tier II (08/08/2022)
(a) ₹26420 (b) ₹24480
(c) ₹22140 (d) ₹23440

SSC Selection Post (Phase - X)

Q.329. In an election , 35% of the voters for candidate P whereas 50% of the remaining voted for candidate Q The remaining voters did not vote. If the different between those who voted for candidate P and those who did not vote was 1000, the number of individuals eligible for casting a vote in that election was:
Graduate Level 01/08/2022 (Shift - 4)
(a) 55000 (b) 60000 (c) 40000 (d) 75000

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.330. 28% of the people eligible to vote are between 20 to 25 years .In an election 75% of those eligible to vote who were between 20 to 25 years actually voted. In that election the number of persons between 20 to 25 who actually voted was what percentage of those eligible to vote?
Graduate Level 01/08/2022 (Shift - 4)
(a) 22% (b) 25% (c) 28% (d) 21%

Q.331. A family saves 30% of the total income and the savings amount to ₹600 less than half of the expenditure. If the total expenditure is spent on health, food and education in the ratio of 3 : 5 : 6, then what amount of expenditure is spent on education?
Graduate Level 02/08/2022 (Shift - 3)
(a) ₹3,600 (b) ₹1,800 (c) ₹8,400 (d) ₹7,200

Q.332. The income of an employee is 30% more than his expenditure. If his income decreases by 10% and his expenditure increases by 3%, then by what percent does his savings decrease or increase?
Graduate Level 04/08/2022 (Shift - 2)
(a) $48\frac{1}{3}$% increase (b) $52\frac{1}{4}$% decrease
(c) $53\frac{1}{3}$% decrease (d) $50\frac{1}{4}$% increase

Q.333. Ranjeet spends 30% of his monthly salary on food, 15% of the remaining salary on clothes, 25% of the remaining salary on rent, and 20% of the remaining salary on fuel and still saves an amount of ₹5,355. What is Ranjeet's monthly salary ?
Graduate Level 04/08/2022 (Shift - 4)
(a) ₹12,000 (b) ₹15,000
(c) ₹20,000 (d) ₹17,000

Q.334. In an election there were two candidates Ram Singh and Sohan Lal. The total no. of voters in the constituency was 80000 and 80% of the total votes were polled. If 60% of the polled votes were cast in favour of Ram Singh, how many votes were received by Sohan Lal ?
Higher Secondary 01/08/2022 (Shift - 3)
(a) 28000 (b) 38400 (c) 25600 (d) 26700

SSC MTS 2021 Tier - 1

Q.335. In a competitive exam, the minimum qualifying percentages for Category A and Category B jobs are 25% and 45% respectively. A candidate scored 83 marks and failed to get a Category B job by 25 marks. What is the minimum qualifying marks to secure a Category A job ?
SSC MTS 06/07/2022 (Morning)
(a) 55 (b) 60 (c) 50 (d) 65

Q.336. In a city 60% of the population are males and the rest are females. If the ratio of married males to non-married males is 5 : 7, and the ratio of married females to non-married females is 2 : 3, then what percentage of the total population is married?
SSC MTS 08/07/2022 (Afternoon)
(a) 41% (b) 59% (c) 51% (d) 49%

Q.337. A batsman scored 120 runs, which included 4 sixes and 6 fours. What percentage of his total score did he make by running between the wickets (runs that were scored only by running between the wickets and not by hitting fours and sixes) ?
SSC MTS 11/07/2022 (Afternoon)
(a) 30% (b) 50% (c) 60% (d) 40%

Q.338. In an office of 900 employees, on a particular day, except for 10% of the female employees, all employees were present. On the next day, except for 8% of the male employees, all employees were present. The number of employees present on each of these two days was the same. Find the total number of male employees on the payrolls of this office.
SSC MTS 12/07/2022 (Morning)
(a) 550 (b) 450 (c) 800 (d) 500

Q.339. There are 45 students in a hostel. If the number of students increases by 5, the total expenses of the mess increase by ₹30 per day while the average daily expenditure per head diminishes by ₹2. Find the original total daily expenditure of the mess.
SSC MTS 13/07/2022 (Evening)
(a) ₹1,170 (b) ₹1,710 (c) ₹1,200 (d) ₹1,250

Q.340. In university exams where the total maximum marks were 500, Mohit gets 20% more than Surendra, Surendra gets 20% more than Lalit, and Lalit gets 15% less than Darshan. If Mohit gets 366 marks, what percentage of the full marks does Darshan get? [Give your answer correct to 2 decimal places]
SSC MTS 14/07/2022 (Afternoon)
(a) 82.50% (b) 59.80%
(c) 58.02% (d) 80.50%

Q.341. The number of adults who come only to walk in a park every day is 140. 18% of the adults come only to accompany their children in the park. 54% of the adults come only to run in the park. What is the total number of adults who come to the park every day (if the adults come for no other activity other than for the given reasons) ?
SSC MTS 14/07/2022 (Evening)
(a) 400 (b) 700 (c) 500 (d) 560

Q.342. In a class of 50 students and 6 teachers, each student got a number of chocolates that is equal to 16% of the total number of students , and each teacher got a number of chocolates that is equal to 12% of the total number of students. How many chocolates were there in total ?
SSC MTS 19/07/2022 (Morning)
(a) 436 (b) 420 (c) 360 (d) 450

Q.343. The male population of a city has increased by 20% from the previous year, while the female population has increased by 42.5%. If the total population of the city has increased by 30%. Then the female population of the city was what percentage of male population in the previous year?
SSC MTS 19/07/2022 (Evening)
(a) 60% (b) 80% (c) 90% (d) 70%

Q.344. 15 kg of grapes, in which 90% of the content was water, were kept in sunlight. In presence of sunlight, the water content reduced to such an extent that now only 85% of the total weight of the grapes was water. Find the total reduced weight of the grapes.
SSC MTS 19/07/2022 (Evening)
(a) 10 kg (b) 14 kg (c) 13 kg (d) 12 kg

Q.345. Mr. Stark gave 30% of the money he had to Bruce. He also gave 30% of the remaining amount to each of Natasha ,Captain and Vision. Half of the remaining amount he spent on miscellaneous items. And the remaining amount of ₹14,000 he deposited in Marvel's Fund. How much money did Mr. Stark Initially have?
SSC MTS 20/07/2022 (Afternoon)
(a) ₹ 390000 (b) ₹ 400000
(c) ₹ 370000 (d) ₹ 300000

Q.346. The total salary of two employees, A and B, in an organization was Rs 40,000. After increasing the salary of A by 9% and of B by 11%, the total salary of A and B becomes Rs 44,100. What was the initial salary of A?
SSC MTS 22/07/2022 (Morning)
(a) 15000 (b) 22500 (c) 25000 (d) 18000

Q.347. Aman gave 30% of his monthly income to his father and of the remaining income he gave 30% to his daughter and 25% to his wife. Aman invested the amount of money still remaining from his monthly income equally in three schemes. If he invested ₹42,000 in each scheme, what is Aman's monthly income (in ₹thousand) ?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC MTS 25/07/2022 (Evening)
(a) 300 (b) 400 (c) 200 (d) 500

SSC CHSL 2021 Tier - 1

Q.348. 70% of students in a class are girls and 70% of the girls have chosen soccer as their favourite sport. If 98 girls have chosen soccer as their favourite sport, what is the total number of students in the class?
SSC CHSL 24/05/2022 (Morning)
(a) 180 (b) 225 (c) 175 (d) 200

Q.349. In an election between two candidates, 80% of the eligible voters cast their votes, 5% of the votes cast were declared invalid. A candidate got 10545 votes, which were 75% of the total valid votes. Find the total number of eligible voters.
SSC CHSL 24/05/2022 (Evening)
(a) 17800 (b) 18500 (c) 18250 (d) 18000

Q.350. In Class 8 of a school, the ratio of students playing cricket to those playing football is 27 : 13, while the ratio of those playing football to those playing hockey is 26 : 14. If the total number of students in Class 8 is 470, and each student plays exactly one game, find the percentage of students of the class playing cricket. [Give your answer correct to two decimal places.]
SSC CHSL 25/05/2022 (Afternoon)
(a) 55.47% (b) 54.75%
(c) 57.45% (d) 56.35%

Q.351. In a Panchayat election, three candidates were there in the fray. The losing candidates got an equal number of votes and the winning candidate got as many votes as the rest of the two got collectively. If the total votes polled were 1500, find the number of votes that the winning candidate got assume all votes polled were valid.
SSC CHSL 25/05/2022 (Afternoon)
(a) 750 (b) 625 (c) 575 (d) 800

Q.352. A software company has only 3 divisions that have 20, 30 and 40 employees, respectively. If the working percentage of this during a weekend were 20%, 30% and 40%, respectively, then the working percentage of the entire company during that weekend was approximately:
SSC CHSL 25/05/2022 (Evening)
(a) 0.0032 (b) 3.2 (c) 0.032 (d) 32

Q.353. In an engineering institution, a student's grade is assessed based on Internal tests (30%), assignments (30%) and external exams (40%). If a student scored 90% in internal tests, 95% in assignments and 75% in the external exams, then the overall grade of the student is:
SSC CHSL 27/05/2022 (Afternoon)
(a) 86.25% (b) 85.25% (c) 86% (d) 85.50%

Q.354. The salaries of P and Q together amount to ₹1,20,000. P spends 95% of his salary and Q 85% of his. If their savings are the same, then what is P's salary?
SSC CHSL 31/05/2022 (Evening)
(a) ₹80,000 (b) ₹72,000
(c) ₹90,000 (d) ₹60,000

Q.355. 64% of the students of a class are girls and 81.25% of the girls have chosen soccer as their favourite sport. If 143 girls have chosen soccer as their favourite sport, what is the total number of students in the class?
SSC CHSL 03/06/2022 (Morning)
(a) 270 (b) 280 (c) 300 (d) 275

Q.356. In an election between two candidates, 15% of the voter did not cast their votes and 10% of the votes polled found invalid. The successful candidate got 55% of the valid votes and won by a majority of 6120 votes. The number of voters enrolled on the voters list was:
SSC CHSL 03/06/2022 (Morning)
(a) 70000 (b) 80000 (c) 72000 (d) 75000

Q.357. In a school, the final grades of a subject for an academic year are calculated, based on the grades that a student gets in his assignments, tests and a final exam. Assignments have the weightage of 28%, tests of 22%, and the final exam of 50%. If a student has an assignment grade of 80, a test grade of 75, an exam grade of 86, then his overall grade for the year is _____.
SSC CHSL 08/06/2022 (Morning)
(a) 81.9 (b) 80.5 (c) 84.6 (d) 90.2

Q.358. Kumar's salary is ₹ 30,000 per month. He spends 25% of this on food and rent and 20% of the remaining on education. But he pays 5% of his total salary on paying the income tax and saves ₹ 8,000 after all these three deductions. What is the amount (in ₹.) available with him after his savings?
SSC CHSL 08/06/2022 (Evening)
(a) 8500 (b) 7500 (c) 7250 (d) 8550

Q.359. A man spends 20% of his monthly salary on food and one-fourth of the remaining salary on charity. If he saves ₹9,600 per month, which is equal to half of the balance after spending on food and charity, then his monthly salary is:
SSC CHSL 10/06/2022 (Morning)
(a) ₹28,000 (b) ₹32,000
(c) ₹26,000 (d) ₹30,000

Q.360. In a panchayat election Candidate A secured 30% of the total votes and did NOT qualify by 6 votes. Candidate B secured 40% of the total votes and got 6 votes more than the bare minimum to qualify. The total number of votes were _____.
SSC CHSL 10/06/2022 (Afternoon)
(a) 140 (b) 160 (c) 100 (d) 120

SSC CGL 2021 Tier - 1

Q.361. Some students (only boys and girls) from different schools appeared for an Olympiad exam. 20% of the boys and 15% of the girls failed in the exam. The number of boys who passed the exam was 70 more than that of the girls who passed the exam'. A total of 90 students failed. Find the numbers of students that appeared for the exam.
SSC CGL 11/04/2022 (Morning)
(a) 420 (b) 400 (c) 500 (d) 350

Q.362. In a factory with 400 employees, the ratio of the number of male employees to that of female employees is 5 : 3. There are 87.5% regular employees in the factory. If 92% of male employees are regular employees. Then what is the percentage of regular female employees?
SSC CGL 13/04/2022 (Morning)
(a) 80% (b) 78% (c) 87.5% (d) 85%

Q.363. In an election between two candidates, 5% of the registered voters did not caste their vote. 10% of the votes were found to be either invalid or of NOTA. The winning candidate received 60% of the votes in his favour and won the election by 17271 votes. FInd the number of registered voters.
SSC CGL 18/04/2022 (Evening)
(a) 90525 (b) 100000
(c) 101000 (d) 102500

Q.364. A man started off a business with a certain capital amount. In the first year, he earned 60% Profit and donated 50% of the total capital (initial amount + profit). He followed the same procedure with the remaining capital after the second and the third year. If at the end of the three years, he is left with Rs. 15,360, what was the initial amount with which the man started his business?
SSC CGL 19/04/2022 (Morning)
(a) 20,000 (b) 30,000
(c) 25,000 (d) 32,000

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 2020 Tier - 2

Q.365. The income of A is 80% of B's income and the expenditure of A is 60% of B's expenditure. If the income of A is equal to 90% of B's expenditure, then by what percentage are the savings of A more than B's savings ?
SSC CGL Tier II (29/01/2022)
(a) 100% (b) 125% (c) 150% (d) 140%

Q.366. The monthly expenses of a person are $66\frac{2}{3}$% more than her monthly savings. If her monthly income increases by 44% and her monthly expenses increases by 60%, then there is an increase of ₹1,040 in her monthly savings. What is the initial expenditure (in ₹) ?
SSC CGL Tier II (29/01/2022)
(a) 10,000 (b) 12,000 (c) 9,000 (d) 13,000

Q.367. In an examination, B obtained 20% more marks than those obtained by A, and A obtained 10% less marks than those obtained by C. D obtained 20% more marks than those obtained by C. By what percentage are the marks obtained by D more than those obtained by A ?
SSC CGL Tier II (03/02/2022)
(a) $33\frac{1}{3}$% (b) $13\frac{1}{3}$%
(c) $43\frac{1}{3}$% (d) $23\frac{1}{3}$%

SSC MTS 2020 Tier - 1

Q.368. A number was divided by 8, instead of being multiplied by 8. As a result of this, there was an error in the answer. What is the percentage difference(correct to two places of decimal) in the answer due to this miscalculation?
SSC MTS 08/10/2021 (Morning)
(a) 48.67% (b) 67.33%
(c) 98.44% (d) 72.00%

Q.369. Varun gave 60% of the money he had to his wife. He also gave 20% of the remaining amount to each of his three children. Three-fifth of the amount now left was spent on miscellaneous items, and the remaining amount of ₹9,600 was deposited in the bank. How much money did Varun have initially?
SSC MTS 13/10/2021 (Evening)
(a) ₹2,00,000 (b) ₹1,80,000
(c) ₹1,50,000 (d) ₹1,60,000

Q.370. Last year, 300 students appeared for an examination from school A, and 33 $\frac{1}{3}$% of the students failed. In the same year, 480 students appeared for the examination from school B. 60% of the total students from schools A and B passed. What is the fail percentage of students from school B ?
SSC MTS 14/10/2021 (Evening)
(a) $43\frac{3}{4}$% (b) $40\frac{2}{3}$%
(c) $42\frac{1}{3}$% (d) $44\frac{1}{6}$%

Q.371. At a recruitment test, the candidates were tested for General Awareness (GA) and Quantitative Techniques (QT). 54% and 45% failed in GA and QT, respectively, while 16% failed in both. If 136 candidates passed in both, what was the total number of candidates?
SSC MTS 18/10/2021 (Evening)
(a) 800 (b) 640 (c) 600 (d) 850

Q.372. When the price of sugar gets raised by 30%, a person increases his expenditure on sugar by 12%. By what percentage (correct up to two decimal places) should he reduce his consumption of sugar so as to be able to maintain the same level of expenditure?
SSC MTS 20/10/2021 (Afternoon)
(a) 12.75% (b) 13.85%
(c) 11.54% (d) 15.75%

Q.373. By what percentage is the percentage of the number of vowels in the word **CONSONANT** less than the percentage of consonants in it ?
SSC MTS 02/11/2021 (Evening)
(a) 33.33 (b) 200 (c) 66.67 (d) 50

SSC CGL 2020 Tier - 1

Q.374. Chamanlal, Arshad and Jagjit Singh contested an election. All the votes polled were valid. Arshad got 35% of the total votes. For every 35 votes Chamanlal got 14 votes. The winner got 4950 more votes than the person who received the least number of votes. Find the total number of votes polled.
SSC CGL 16/08/2021 (Afternoon)
(a) 13378 (b) 38000 (c) 99000 (d) 33000

Q.375. If a number is first increased by 15% then reduced by 15%, it results in 782. If the same number is first reduced by 25%, then increased by 25% and again reduced by 20%, then what will be the resulting number?
SSC CGL 16/08/2021 (Evening)
(a) 712 (b) 150 (c) 750 (d) 600

Q.376. In a class the ratio of rural to urban students is 4 : 7. In an examination the average percentage marks of the rural and the urban students are respectively 65 and 63. What is the overall average percentage marks of the class (correct to two decimal places)?
SSC CGL 17/08/2021 (Afternoon)
(a) 65.87% (b) 73.63%
(c) 63.73% (d) 64.37%

Q.377. Rajan spent 10% of his salary on rent. He spent 20% of the remaining part of the salary on transport. After which he spent 40% of the balance of the salary on food. Further, he spends 80% of the balance on various bills. He deposits Rs.5000 in the bank and kept the remaining Rs.1480 for his own petty expenditure. Find the monthly salary (in Rs).
SSC CGL 17/08/2021 (Afternoon)
(a) 75000 (b) 80000 (c) 82500 (d) 64800

Q.378. A sports-goods shop has tennis balls of 3 colours - red, green and white. The number of white balls is 60% more than the number of red balls and the number of green balls is 12.5% less than the number of white balls. If the total number of balls is 120, then how many green balls are there?.
SSC CGL 17/08/2021 (Evening)
(a) 48 (b) 40 (c) 30 (d) 42

Q.379. The present population of a village is 15280. If the number of males increases by 25% and the number of females increases by 15%, then the population will become 18428. The difference between the present population of males and females in the village is:
SSC CGL 20/08/2021 (Afternoon)
(a) 1840 (b) 1380 (c) 920 (d) 2760

Q.380. Price of a one gram gold coin decreased by 10% on its initial price on Monday and increased by 20% on Tuesday and again increased by 8% on Wednesday, and 5% increase on Thursday. If the final price on Thursday is Rs.5511.24, then the initial price (in Rs.) of one gram gold coin on Monday was?
SSC CGL 20/08/2021 (Evening)
(a) 4500 (b) 4250 (c) 4000 (d) 5000

SSC CHSL 2020 Tier - 1

Q.381. In an examination of 180 marks of subjects, 75% marks are allocated for theory and the rest for project work. Veena scored 60% in theory. What percentage of marks must she score in the project to achieve an overall 62% marks in the subject ?
SSC CHSL 13/04/2021 (Evening)
(a) 65 (b) 66 (c) 68 (d) 64

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.382. The expenditure on food is 35% of the income of a particular family. If the income is raised by 30%, then how much percentage (to the nearest whole number) of food expenditure is less than the initial percentage to keep the food expenditure unchanged ?
SSC CHSL 16/04/2021 (Morning)
(a) 2 (b) 20 (c) 23 (d) 17

Q.383. The price of an article increases by 5% every year. If the difference between its price at the end of the second and the third year is Rs.52.5, then what will be its price at the end of the first year ?
SSC CHSL 19/04/2021 (Morning)
(a) 1,000 (b) 950 (c) 840 (d) 900

SSC CPO 2020 Tier - 1

Q.384. If decreasing 110 by x % gives the same result as increasing 50 by x%, then x% of 650 is what percentage more than (x + 20) % of 180 ? (correct to nearest integer)
SSC CPO 23/11/2020 (Morning)
(a) 80% (b) 90% (c) 136% (d) 154%

Q.385. If the area of a square is decreased by 19%, then the diagonal of the square is decreased by :
SSC CPO 23/11/2020 (Evening)
(a) 15% (b) 10% (c) 5% (d) 12%

Q.386. The monthly salary of a person was 75,000. He used to spend on family expenses(E), Taxes(T), charity(C), and the rest were his savings, E was 60% of the income, T was 20% of E, and C was 15% of T. When his salary got raised by 40%, he maintained the percentage level of E, but T becomes 30% of E and C becomes 20% of T. The ratio of the saving of earlier to that of his present salary is:
SSC CPO 24/11/2020 (Morning)
(a) 337 : 325 (b) 655 : 644
(c) 644 : 655 (d) 325 : 337

Q.387. If decreasing 110 by x% gives the same result as increasing 50 by x%, then x% of 650 is what percentage (correct to the nearest integer) more than (x - 10)% of 780 ?
SSC CPO 25/11/2020 (Morning)
(a) 14% (b) 12% (c) 17% (d) 18%

Answer Key :-

1.(a)	2.(c)	3.(d)	4.(a)
5.(c)	6.(d)	7.(a)	8.(d)
9.(b)	10.(c)	11.(d)	12.(a)
13.(b)	14.(a)	15.(a)	16.(b)
17.(a)	18.(a)	19.(c)	20.(b)
21.(a)	22.(d)	23.(a)	24.(c)
25.(a)	26.(d)	27.(a)	28.(c)
29.(b)	30.(d)	31.(a)	32.(c)
33.(b)	34.(b)	35.(a)	36.(d)
37.(d)	38.(a)	39.(b)	40.(b)
41.(a)	42.(a)	43.(b)	44.(b)
45.(d)	46.(a)	47.(c)	48.(d)
49.(b)	50.(d)	51.(a)	52.(d)
53.(c)	54.(b)	55.(a)	56.(a)
57.(b)	58.(c)	59.(b)	60.(a)
61.(b)	62.(c)	63.(a)	64.(d)
65.(c)	66.(a)	67.(d)	68.(b)
69.(a)	70.(c)	71.(d)	72.(a)
73.(d)	74.(d)	75.(b)	76.(b)
77.(c)	78.(c)	79.(a)	80.(a)
81.(d)	82.(c)	83.(c)	84.(c)
85.(d)	86.(c)	87.(a)	88.(c)
89.(c)	90.(a)	91.(a)	92.(a)
93.(a)	94.(c)	95.(c)	96.(a)
97.(d)	98.(a)	99.(b)	100.(c)
101.(c)	102.(b)	103.(d)	104.(a)
105.(a)	106.(d)	107.(c)	108.(b)
109.(c)	110.(c)	111.(d)	112.(a)
113.(a)	114.(d)	115.(c)	116.(d)
117.(a)	118.(d)	119.(a)	120.(c)
121.(c)	122.(b)	123.(b)	124.(a)
125.(b)	126.(a)	127.(c)	128.(a)
129.(b)	130.(d)	131.(a)	132.(d)
133.(d)	134.(d)	135.(d)	136.(a)
137.(c)	138.(a)	139.(a)	140.(d)
141.(d)	142.(b)	143.(a)	144.(d)
145.(a)	146.(a)	147.(d)	148.(b)
149.(d)	150.(b)	151.(d)	152.(c)
153.(b)	154.(d)	155.(b)	156.(b)
157.(b)	158.(a)	159.(d)	160.(b)
161.(c)	162.(c)	163.(a)	164.(d)
165.(d)	166.(a)	167.(b)	168.(b)
169.(a)	170.(c)	171.(b)	172.(c)
173.(b)	174.(b)	175.(a)	176.(c)
177.(b)	178.(c)	179.(d)	180.(b)
181.(b)	182.(b)	183.(c)	184.(d)
185.(a)	186.(b)	187.(a)	188.(c)
189.(c)	190.(d)	191.(d)	192.(d)
193.(c)	194.(a)	195.(c)	196.(c)
197.(b)	198.(a)	199.(d)	200.(c)
201.(c)	202.(d)	203.(a)	204.(a)
205.(b)	206.(d)	207.(c)	208.(d)
209.(b)	210.(c)	211.(d)	212.(c)
213.(a)	214.(a)	215.(a)	216.(d)
217.(b)	218.(a)	219.(b)	220.(c)
221.(b)	222.(a)	223.(a)	224.(b)
225.(a)	226.(b)	227.(b)	228.(a)
229.(d)	230.(d)	231.(b)	232.(b)
233.(c)	234.(b)	235.(b)	236.(b)
237.(b)	238.(a)	239.(c)	240.(c)
241.(b)	242.(b)	243.(b)	244.(a)
245.(d)	246.(a)	247.(a)	248.(c)
249.(c)	250.(c)	251.(c)	252.(d)
253.(a)	254.(d)	255.(d)	256.(d)
257.(d)	258.(a)	259.(b)	260.(d)
261.(b)	262.(d)	263.(a)	264.(a)
265.(a)	266.(d)	267.(c)	268.(a)
269.(b)	270.(a)	271.(b)	272.(d)
273.(a)	274.(a)	275.(c)	276.(c)
277.(b)	278.(a)	279.(c)	280.(b)
281.(c)	282.(c)	283.(c)	284.(b)
285.(b)	286.(b)	287.(b)	288.(b)
289.(d)	290.(a)	291.(b)	292.(b)
293.(c)	294.(b)	295.(a)	296.(d)
297.(c)	298.(b)	299.(c)	300.(a)
301.(a)	302.(c)	303.(b)	304.(a)
305.(b)	306.(a)	307.(d)	308.(a)
309.(c)	310.(a)	311.(c)	312.(b)
313.(a)	314.(c)	315.(b)	316.(b)
317.(b)	318.(b)	319.(b)	320.(a)
321.(a)	322.(d)	323.(d)	324.(a)
325.(b)	326.(d)	327.(c)	328.(c)
329.(c)	330.(d)	331.(a)	332.(c)
333.(b)	334.(c)	335.(b)	336.(a)
337.(c)	338.(d)	339.(a)	340.(b)
341.(c)	342.(a)	343.(b)	344.(a)
345.(b)	346.(a)	347.(b)	348.(d)
349.(b)	350.(c)	351.(a)	352.(d)
353.(d)	354.(c)	355.(d)	356.(b)
357.(a)	358.(a)	359.(b)	360.(d)
361.(c)	362.(a)	363.(c)	364.(b)
365.(d)	366.(a)	367.(a)	368.(c)
369.(c)	370.(d)	371.(a)	372.(b)
373.(d)	374.(d)	375.(d)	376.(c)
377.(a)	378.(d)	379.(a)	380.(a)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

381.(c)	382.(c)	383.(a)	384.(c)
385.(b)	386.(b)	387.(a)	

Solutions :-

Sol.1.(a) Let price of rice = x
Price of wheat = 5x
Total price = 20 x + 8 × 5x = 300 ⇒ x = 5
New price of wheat = 25 × $\frac{6}{5}$ = 30
Let new price of rice = y
⇒ 20 × y + 8 × 30 = 300
⇒ 20y = 60 ⇒ y = 3
Now, Reduction percentage
= $\frac{5-3}{5}$ × 100 = 40%

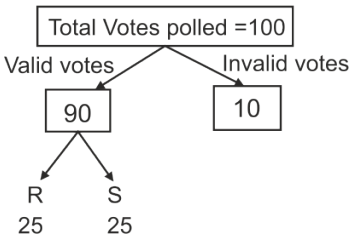
Sol.2.(c) 59.375% = $\frac{19}{32}$
Valid vote difference between two candidate = 6 unit
according to question,
16000(1 - $\frac{y}{100}$) × $\frac{9}{10}$ × $\frac{6}{32}$ = 2484
100 - y = 92 ⇒ Y = 8

Sol.3.(d) According to question,
y % = $\frac{14400-12000}{12000}$ × 100 = 20 %
x % = $\frac{12500-10000}{10000}$ × 100 = 25 %
So, ($\frac{x-y}{y}$ × 100)%
= ($\frac{25-20}{20}$ × 100)% = 25%

Sol.4.(a) Let the total valid votes be V.
The defeated candidate received 42% of the valid votes and lost by 2545800 votes.
Therefore, the winning candidate received = 100% - 42%
= 58% of the valid votes
The difference in votes between the two candidates = 58% - 42% = 16% of the valid votes.
V × 16% = 2545800 ⇒ V = 15,911,250
Total votes polled = 15,911,250 + 365500
= 16,276,750
30% of people did not cast their votes so 70% did cast their vote.
70% = 16,276,750
(people who did not cast their votes) 30% = 6,975,750
So, approximate number of people in the electorate who did not cast their votes is 7 million

Sol.5.(c) According to the question,
500 × $\frac{4}{5}$ × $\frac{(100+b)}{100}$ × $\frac{4}{5}$ × $\frac{(100+b)}{100}$ × $\frac{4}{5}$ = 1024
4 × (100 + b) × $\frac{4}{5}$ × $\frac{(100+b)}{100}$ × $\frac{4}{5}$
= 1024
$(100+b)^2$ = $\frac{1024\times5\times5\times100}{4\times4\times4}$
= 16 × 25 × 100
100 + b = 4 × 5 × 10 = 200 ⇒ b = 100

Sol.6.(d)



Due to fault → R = 25 + $\frac{S}{2}$ + $\frac{Invalid}{2}$
= 25 + 12.5 + 5 = 42.5
Overall percentage of votes secured by R
= $\frac{42.5}{100}$ × 100 = 42.5%

Sol.7.(a)
Let the total no of votes be 100 unit
No of Invalid votes = 100 × $\frac{1}{5}$ = 20 unit
No of valid votes = 100 - 20 = 80 unit
A + B = 80 ---------- (i)
A - B = 10 ---------- (ii)
Solving eqn. (i) and (ii) we get ;
A = 45 unit , B = 35 unit
Now, If 90% of invalid votes have been in favour of B. then,
No of votes would have received by B = 35 unit + 90% of 20 = 35 + 18 = 53 unit
% of votes by which B won = 53 - 45 = 8%

Sol.8.(d) Let the total no. of voters in the list be 100%
Then the no. of valid votes = 88% - 84
No. of votes received by winner = 54%
No. of votes received by loser
= (88% - 84) - 54% = 34% - 84
According to question,
54% - (34% - 84) = 1456
20% + 84 = 1456 ⇒ 20% = 1372
Then, 100% = 1372×5 = 6860

Sol.9.(b)

	A		B
Weight assigned →	2	:	1
% obtained →	x		80%

$\frac{(2x+80)\%}{2+1}$ = 70%
2x + 80 = 210 ⇒ 2x = 130 ⇒ x = 65%
So, the marks obtained by Riddhi in paper A = 10 × 65% = 6.5

Sol.10.(c)
Total valid votes = $\frac{12288}{64}$ × 100 = 19200
∴ Total casted votes = $\frac{19200}{96}$ × 100
= 20000
Now, Number of voters in election list
= $\frac{20000}{64}$ × 100 = 31250

Sol.11.(d) Let total money = 100 %
Total Money spend
= (25 + 26 + 23 + 19)% = 93%
Money deposited in bank
= (100 - 93)% = 7% ⇒ 7% = 26,600
Money spends on food and recreation
= $\frac{26,600}{7}$ × 45 = 1,71,000

Sol.12.(a)

Ratio →	CP	:	SP
Cost →	22	:	25
Faulty weight →	x	:	1000
Final →	4	:	5

The amount of weight that he gives in exchange for 1kg
= $\frac{25\times1000\times4}{22\times5}$ = 909.09 g
Required % = $\frac{1000-909.09}{909.09}$ × 100
= 10.00011% (10% approx)

Sol.13.(b) According to the question,
Let the total income of Swastik
= 100 units
80% = 15% + 12800 + 32000 + 7200
65% = 52000
(amount spent on food) 15%
= $\frac{52000}{65}$ × 15 = 12000 Rs

Sol.14.(a)

Ratio - initial	:	final
25	:	29
5	:	6
5	:	3
625	:	522

Decreased % = $\frac{625-522}{625}$ × 100
= 16$\frac{12}{25}$ %

Sol.15.(a) Let the number be x , then
According to question,
x × $\frac{108}{100}$ × $\frac{97}{100}$ = 2619
x = 2619 × $\frac{100}{108}$ × $\frac{100}{97}$
5% of x = 2619 × $\frac{100}{108}$ × $\frac{100}{97}$ × $\frac{5}{100}$
= 2619 × $\frac{100}{108}$ × $\frac{5}{97}$ = 125

Sol.16.(b)

	= Expenditure	+ Savings
Income		
Initial :- 100 =	68	+ 32
Final :- 125 =	88.2	+ 36.8

Required % increase
= $\frac{88.2-68}{68}$ × 100 = $\frac{2020}{68}$ = 29$\frac{12}{17}$%

Sol.17.(a)

Income	= Expenditure	+ Savings
Initial :- 100 =	45	+ 55

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Final :- 115 = 60 + 55

Required % increase = $\frac{60-45}{45} \times 100$

= 33.33%

Sol.18.(a)

Original price × $(\frac{100+r}{100}) \times (\frac{100-r}{100}) = 1$

⇒ Original price = $\frac{10000}{(100+r)(100-r)}$

= $\frac{10000}{10000-r^2}$

Sol.19.(c)

Let the number of rotten mangoes be a.

According to question,

(300 – a) × 5 = 1100 + 150 ⇒ a = 50

Required % = $\frac{50}{300} \times 100 = 16\frac{2}{3}\%$

Sol.20.(b) Valid votes

= (85% – 100 votes)

Winner (Ram) got votes = 69%

Loser (Shyam) will get

= (85% –100 votes) – 69%

= (16% –100 votes)

Difference in their votes

= (53% + 100 votes) = 630

53% of total votes = 530

Total votes (100 %) = 1000 votes

Sol.21.(a) As we know ,

Expenditure = price × consumption

According to the question,

Ratio →	Initial :	final
Price →	4 :	5
Consumption →	x :	y

Expenditure → 5 : 3

x : y = 5 × 5 : 3 × 4 = 25 : 12

%Decrement in the Consumption

⇒ $\frac{25-12}{25} \times 100 = 52\%$

Sol.22.(d) Total amount spent by Shiva

= 12,000 +14,000 +15,000 + 10,000

= ₹51,000

Remaining amount = 75,000 - 51,000

= ₹24,000

Total money donated to an orphanage

= 24,000 - 21,000 = ₹3,000

Required percentage

= $\frac{3,000}{75,000} \times 100 = 4\%$

Sol.23.(a)

Let the salary of a man be ₹100

New salary of man after getting two increment = $100 \times \frac{13}{10} \times \frac{8}{5}$ = ₹208

New saving of a man = (100 - 60) × $\frac{7}{2}$

= 40 × $\frac{7}{2}$ = ₹140

So, the new cost of living expenditure

= 208 - 140 = ₹68

Required percentage

= $\frac{68}{208} \times 100 = 32.7\%$

Sol.24.(c) In 2019, increased manufacturing capacity = $x \times \frac{13}{10}$

In 2020, increased manufacturing capacity = $x \times \frac{13}{10} \times \frac{23}{20}$

In 2021 , manufacturing capacity

= $x \times \frac{13}{10} \times \frac{23}{20} \times \frac{3}{5}$ = 179400

⇒ x = 200000

Sol.25.(a) Let population of country A and B be A and B respectively

x = $\frac{A}{B}$

According to question , Population of Country A decreased by p% and B decreased by q% respectively

⇒ A - $\frac{Ap}{100}$ and B - $\frac{Bq}{100}$

So percentage decrease in x

$$= \frac{\{\frac{A}{B} - \frac{A-\frac{Ap}{100}}{B-\frac{Bq}{100}}\} \times 100}{\frac{A}{B}}$$

$$= \frac{\{\frac{A}{B} - \frac{100A-AP}{100B-Bq}\} \times 100}{\frac{A}{B}}$$

$$= \frac{\frac{100AB-ABq-100AB+ABp}{B(100B-Bq)} \times 100}{\frac{A}{B}}$$

$$= \frac{\frac{100(ABp-ABq)}{B(100B-Bq)}}{\frac{A}{B}}$$

$$= \frac{100AB(p-q)}{B \times B\,(100-q)} \times \frac{B}{A} = \frac{100(p-q)}{(100-q)}$$

Sol.26.(d) Let total no of votes = 100x

According to the question,

Not casted their votes = 20%

$100x \times \frac{80}{100} \times \frac{(58-42)}{100}$ = 768400

⇒ $100x \times \frac{4}{5} \times \frac{(16)}{100}$ = 768400

⇒ x = 60031.25

Total votes 100x = 6003125

No of people who didn't cast their votes

(20%) = 6003125 × $\frac{1}{5}$ = 1200625

Total invalid vote = 82,560

Required percentage

= $\frac{82560}{1200625} \times 100 = 6.8\ \%$

Sol.27.(a) According to the question,

40% of Ranita's income = 56% of Bhaskar's income

So, $\frac{Ranita's\ income}{Bhaskar's\ income} = \frac{56}{40} = \frac{7}{5}$

Let Ranita's income = 7a and Bhaskar's income = 5a

Now, $\frac{7a+800}{5a+2000} = \frac{4}{3}$

21a + 2400 = 20a + 8000 ⇒ a = 5600

So, combined income of Ranita and Bhaskar → 7a + 5a = 12a

= 12 × 5600 = ₹67,200

Sol.28.(c)

Ratio of distance travelled By Sonam

Monday	:	Tuesday	:	Wednesday
8	:	7) × 5		
		5	:	6) × 7
40	:	**35**	:	**42**

Sonam drives cab on Wednesday

→ 42 units = 336 km ⇒ 1 unit = 8 km

Sonam drives cab on Monday

→ 40 unit = (40 × 8) km = 320 km

Sol.29.(b) Let the total no. of polled votes be 100 units.

No. of valid votes for A

→ 100 × 45% × 70% = 31.5

No of valid votes for B

→ 100 × 35% × 80% = 28

No of valid votes for C → 20%

ATQ,

(31.5 - 28) = 3.5 unit → 882

100 unit → $\frac{882}{3.5} \times 100$ = 25200

Now, the no of valid votes for C

= 25200 × 20% = 5040

Short trick :-

Total polled votes = 200

	A	B	C
Total votes →	90	70	40
	↓ 70%	↓ 80%	↓ 100%
Valid votes →	63	56	40

Difference b/w valid votes of A and B

→ (63 - 56) units = 882 votes

1 unit = 126 votes

Valid Votes gained by C (40 units)

→ 40 × 126 = 5040 votes

Sol.30.(d)

Let initially fruit seller have x oranges

In first case orange left with fruit seller

= N = [((100 - 45)% of x) – 1]

In second case orange left with fruit seller = M = [((100 - 20)% of N) – 2]

Finally orange left with fruit seller, 5

= (100 - 90)% of M

So combining all three conditions =

$[\{(x \times \frac{55}{100} - 1) \times \frac{80}{100} - 2\}\frac{10}{100}] = 5$

⇒ $\{(x \times \frac{11}{20} - 1) \times \frac{4}{5} - 2\} = 50$

⇒ $\{(x \times \frac{11}{20} - 1) \times \frac{4}{5}\} = 50 + 2$

⇒ $\{(x \times \frac{11}{20} - 1) \times 4 = 52 \times 5$

⇒ $x \times \frac{11}{20} = 65 + 1$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\Rightarrow x \times \frac{11}{20} = 66 \Rightarrow x = 120$

Short trick :

Start from Third customer → After selling oranges to third customer , he left with 10% = 5 oranges.

100% = 50 oranges

Now,

Before selling oranges to 2nd customer he has oranges,

80% → 50 + 2 free oranges

100% → 65 oranges.

Now,

Before selling oranges to 1st customer he has oranges,

55 % → 65 + 1 oranges

100% → 120 oranges

Total no. of oranges initially he has is equal to 120 oranges.

Sol.31.(a)

New price of petrol = $82 \times \frac{105}{100}$ = ₹86.1

Quantity of petrol used by a man in one month = $\frac{Distance\ travelled}{Car\ mileage}$

= $\frac{3045}{15}$ = 203 litres

Required increase in monthly expenditure

= (86.1 - 82) × 203

= 4.1× 203 = 832.3 ≈ ₹832

Sol.32.(c)

Total cost = Raw mate. cost + labour cost

Ratio →	Earlier	:	New
Raw mat. Cost →	4	:	5
Labour cost →	1.2	:	1.9
Total cost →	5.2	:	6.9

Required reduction

= $\frac{6.9 - 5.2}{6.9} \times 100$ = 24.6%

Sol.33.(b)

Take the approx . value → 19.96% ≈ 20%

Fractional value of 20% = $\frac{1}{5}$

Let , Initial population of B = 5 units

Population of B increased by 20% .

Then , total population of B = 6 units

Required % decrease when increased population returned to State A

→ $\frac{1}{6}$ × 100 = 16.66% ≈16.64%

Sol.34.(b) Let the fraction be x

It's reciprocal be $\frac{1}{x}$

ATQ, $\frac{x - \frac{1}{x}}{x} \times 100 = \frac{7}{16} \times 100$

$\frac{x^2 - 1}{x^2} = \frac{7}{16} \Rightarrow 7x^2 = 16x^2 - 16$

$9x^2 = 16 \rightarrow x = \frac{4}{3}$

Short-trick : As the number is reducing when it is reversed which means that its numerator must be greater than its denominator, which is only in option B

Sol.35.(a) Let income of B = 200 units

Ratio of their Income →

A	:	B	:	C	:	D
160	:	200	:	$360 \times \frac{70}{100}$		$252 \times \frac{125}{100}$
				252	:	315

ATQ, Difference b/w income of D and B

→ (315 - 200) units = 115 units

115 units → 23000 Rs.

160 units → 32000 Rs.

Sol.36.(d) Let , the total number of students in school x → 100

Failed students in x = 20

Number of students in school y = 230

Number of total students = 330

10% of total students (Who failed)

= 10% of 330 = 33

Now students of school Y who failed

= $\frac{13}{230}$ × 100 % = 5.65 % ≈ 5.7 %

Sol.37.(d) Amount spent on each student

→ 30% of 80 = 24

Amount spent on each resource person

→ 40% of 80 = 32

Total amount spent for sweets distribution

→ (80 × 24) + (10 × 32) = 2240 Rs.

Sol.38. (a)

Let the total number of voters = 1000

55% of total voter are male

→ 55% of 1000 = 550

Then , female voters = 1000 - 550 = 450

No. of illiterate male voters

→ 40% of 550 = 220

No. of illiterate female voters

→ 60% of 450= 270

Difference = 270 - 220 = 50

Required % = $\frac{50}{220}$ ×100 = 22.7%

Sol.39.(b)

Expenditure = Price × Consumption

Ratio →	Original	:	Final
Price →	5	:	4
Consumption →	4	:	5
Expenditure	20	:	20

Increase in quantity (1 unit) = 4 kg.

Original consumption (4 units) = 16 kg.

The original price of sugar per kg

= $\frac{160}{16}$ = 10 Rs.

Sol.40.(b) Let , a number i.e. 12

when multiplied by $\frac{3}{4}$ = 9

when multiplied by $\frac{4}{3}$ = 16

Difference = 16 - 9 = 7

Percentage error = $\frac{7}{16} \times 100$ = 43.75%

Sol.41. (a) 60% of spoiled fruits → 48

Total spoiled fruits(100%) = 80

A crate of fruits contains one spoiled fruit for every 25 fruits, so

The number of fruits in the crate

⇒ 80 × 25 = 2000 Fruits

Sol.42.(a)

Surface area of Cube = $6 \times (side)^2$

Net % increase = a + b + $\frac{a \times b}{100}$

Net % increase = 10 + 10 + $\frac{10 \times 10}{100}$

= 21%

Sol.43.(b)

Let the total number of students = x

⇒ according to the question, students who passed but did not get distinction can be represented as,

⇒ $x \times \frac{96}{100} \times \frac{90}{100} \times \frac{50}{100}$ = 432

⇒ x = 1000

Sol.44.(b) Let salaries of A and B → ₹ x

Difference between their donation

→ 8% of x – 7% of x = ₹ 259

100% of x = ₹ 25900

Salary of each of A and B = ₹ 25900

Total donation of A and B

→ 15% of ₹ 25900 = ₹ 3885

C's donation = ₹ (3885 - 1185) = ₹ 2700

Here, 9% → 2700 , then 100% → 30000

C's salary = ₹ 30000

A's donation = ₹ 2072

B's donation = ₹ 1813

Total salary of A,B and C = ₹ 81,800

Donation of A and C = ₹ 4772

Required % = $\frac{4772}{81800} \times 100$ = 5.8%

Sol.45.(d) Let the population of A = 100

Population of B = 400

population of A after two years

= $100 \times (\frac{100 + x}{100}) \times (\frac{100 + x}{100})$

population of B after two years

= $400 \times (\frac{100 - x}{100}) \times (\frac{100 - x}{100})$

ATQ, $100 \times (\frac{100 + x}{100}) \times (\frac{100 + x}{100})$

= $400 \times (\frac{100 - x}{100}) \times (\frac{100 - x}{100})$

$\Rightarrow (100 + x)^2 = [2(100 - x)]^2$

$\Rightarrow 100 + x = 2(100 - x)$

$\Rightarrow 100 + x = 200 - 2x$

$\Rightarrow 3x = 100 \Rightarrow x = 33\frac{1}{3}\%$

Sol.46.(a)

Let total income of person be 100 units

E = 50 units

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

T = 50 × 20% = 10 units
P = 10 × 15% = 1.5 units
Savings =100 - (50 +10 +1.5) = 38.5 units
His new salary = 100 × 140% = 140 units
E = 140 × 50% = 70 units
T = 70 × 30% = 21 units
P = 21 × 20% = 4.2 units
New savings = 140 - (70 + 21 + 4.2)
= 44.8 units

Increased Saving% = $\frac{44.8-38.5}{38.5}$ × 100

Increased Saving% = $\frac{6.3}{38.5}$ × 100
= 16.4% more

Sol.47.(c) Fractional value → 10% = $\frac{1}{10}$, 20% = $\frac{1}{5}$ and 32% = $\frac{8}{25}$

Ratio → A : B : C : D
11 : 10
6 : 5
17 : 25

After balancing the ratio →
Ratio → A : B : C : D
11 : 10 : **10** : **10**
6 : 6 : 5 : **5**
17 : **17** : 17 : 25

Final → 1122 : 1020 : 850 : 1250
According to the question ,
Difference b/w A and C mark
→ (1122-850) unit = 272 → 1 unit = 1
Marks of B = 1020 units = 1020 × 1
= 1020 marks

Sol.48.(d)

Fractional value → 28% = $\frac{7}{25}$, 25% = $\frac{1}{4}$
Ratio → A : B = 32 : 25) × 4
Ratio → A + B : C = 4 : 3) × 57
Balancing the ratio for A + B
A : B : C : A + B
128 : 100 : 171 : 228

Desired % = $\frac{171-128}{128}$ × 100 = 33.6 %

Sol.49.(b)

Fractional value → 25% = $\frac{1}{4}$, 20% = $\frac{1}{5}$
Revenue = Price × sale
Ratio → Original : New
Revenue → 5 : 6
Price → 4 : 3

Sale ⇒ 5 × 3 : 6 × 4 = 5 : 8

% increase in sale = $\frac{8-5}{5}$ × 100 = 60%

Sol.50. (d) Fractional value → 25% = $\frac{1}{4}$

$(x-\frac{1}{x}) = \frac{1}{4}(x+\frac{1}{x})$

$\Rightarrow 4x - \frac{4}{x} = (x+\frac{1}{x}) \Rightarrow 3x = \frac{5}{x}$

$\Rightarrow x^2 = \frac{5}{3}$ and $x^4 = \frac{25}{9}$

Required % age = $\frac{\frac{25}{9}-\frac{5}{3}}{\frac{5}{3}}$ × 100 = 66.7

Sol.51.(a) Aggregate percentage

$= 100 \times [\{\frac{40}{100} \times \frac{80}{100}\} + \{\frac{30}{100} \times \frac{70}{100}\} + \{\frac{20}{100} \times \frac{60}{100}\} + \{\frac{10}{100} \times \frac{50}{100}\}]$

$= 100 \times \frac{32+21+12+5}{100} = 70\%$

Short Trick :-
Ratio of No. → 4 : 3 : 2 : 1
% secured → 80% 70% 60% 50%

Overall % = $\frac{320+210+120+50}{4+3+2+1}$ = 70%

Sol.52.(d) Let the income of sudha = A
According to the question

$A \times \frac{12}{100} \times \frac{80}{100} = 4800 \Rightarrow A = 50{,}000$

27% of A = 50,000 × $\frac{27}{100}$ = 13500

Sol.53.(c) According to the question

$120 \times \frac{100-x}{100} = 40 \times \frac{100+x}{100}$

300 - 3x = 100 + x ⇒ x = 50
50% of 210 = 105
(50 + 20)% of 180 = 126
Required percentage

$= \frac{126-105}{126} \times 100 = 16\frac{2}{3}\%$

Sol.54.(b)

Fractional value → 20% = $\frac{1}{5}$, 40% = $\frac{2}{5}$

Ratio of amount at the end of 2nd, 3rd and 4th years be a,b and c respectively.
Ratio → a : b : c
2nd : 3rd = 5 : 6
3rd : 4th = 5 : 6

2nd : 3rd : 4th = 25 : 30 : 36
According to the question ,
Difference b/w amount at end of 3rd and 4th year (36- 30) units → 259.20 Rs.
1 unit = 43.20 Rs.
Amount at the end of 2nd year (25 unit)
= 43.20 × 25 = 1080 Rs.

40% of this amount = 1080 × $\frac{2}{5}$ = 432 Rs.

Sol.55.(a) %age score of mathematics

$= \frac{84}{90} \times 100 = 93.33\ \%$

%age score of science = $\frac{45}{50} \times 100 = 90\ \%$

%age score of computer science

$= \frac{23}{25} \times 100 = 92\ \%$

%age score of English = $\frac{68}{80} \times 100 = 85\ \%$

Highest percentage secured by Shreya In Maths.

Sol.56.(a) Total commission
⇒ 200000 × 2% + 200000 × 1.5%
+ 168000 × 1% = 8680 Rs.

Sol.57.(b) Net succussive increment of 15% and 15% = 15 + 15 + $\frac{15 \times 15}{100}$
= 30 + 2.25 = 32.25%
Net succussive decrement of 12% and 12% = 12 + 12 - $\frac{12 \times 12}{100}$ = 22.56%

Required % = $\frac{32.25\% - 22.56\%}{22.56\%}$ × 100
= 42.95%

Sol.58.(c) Let one part = ₹x
Other part = ₹(2380 - x)
According to question ,

$\Rightarrow \frac{x \times 25 \times 1}{100} + \frac{(2380-x) \times 20 \times 1}{100}$
= ₹500

$\Rightarrow \frac{25x}{100} + \frac{(2380-x) \times 20}{100} = 500$

⇒ 25x - 20x = 50000 - 47600
⇒ 5x = 2400 ⇒ x = 480
∴ Money lent at 25% rate = ₹480

Sol.59.(b)
Let the equal annual percentage be x

$\Rightarrow 120 \times \frac{(100+x)}{100} \times \frac{(100+x)}{100} = 145.20$

$\Rightarrow (100+x)^2 = \frac{1452000}{120} = 12100$

$\Rightarrow 100 + x = 110 \Rightarrow x = 10\%$

Sol.60.(a) Ratio of school
→ Initial : Final
125 : 180 or 25 : 36

Required % = $\frac{36-25}{25}$ × 100 = 44%

Sol.61.(b) 15 % = $\frac{3}{20}$, 10% = $\frac{1}{10}$

Current value of Aniruddh's investment

=15,000 × $\frac{23}{20} \times \frac{9}{10}$ = ₹15525

Sol.62.(c)
Area of triangle ∝ height and base

Ratio	**- initial**	**: new**
Height -	5	: 6
Base -	25	: 28

Total - 125 : 168
Now, according to the question,
125 unit = 200 cm^2

So, old area (168) unit = $\frac{200}{125}$ × 168
= 268.8 cm^2

Sol.63.(a)

Ratio	- initial	: final
Price -	5	: 6
Price -	4	: 5

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Final - 2 : 3

For the increased price be reduced to get the initial price

Required % = $\frac{3-2}{3} \times 100 = 33\frac{1}{3}\%$

Sol.64.(d) Let no. = x

$x \times \frac{80}{100} + 80 = x$

$4x + 400 = 5x \Rightarrow x = 400$

Sol.65.(c) Net increment %

= 60 - 30 - $\frac{60 \times 30}{100}$ = 30 - 18 = 12%

Sol.66.(a) Let income = ₹100

Income → Expenditure + Saving

100 → 76 + 24

+18% +25%

118 95 23

∴ Percentage change in saving

= $\frac{24-23}{24} \times 100 \simeq 4.2$ (Decrease)

Sol.67.(d) Daily earning % increase

= 10 + 5 + $\frac{10 \times 5}{100}$ = 15.5%

Sol.68.(b) Net change in the salary

= +30 - 28.5 + $\frac{30 \times (-28.5)}{100}$

= 1.5 - 8.55 = - 7.05 %

Hence, salary of worker decrease will be 7.05 %

Sol.69.(a) Savings of Mr. Sharma = 100 - (24 + 70) = 6%

According to the question,

6% = 1200 ⇒ 1% = ₹200

Hence, monthly income (100%)= ₹20,000

Sol.70.(c)

Price α $\frac{1}{consumption}$, total expense = ₹ 250

Ratio	→ Initial	:	Final
Price	→ 10	:	9
Consumption	→ 9	:	10

---

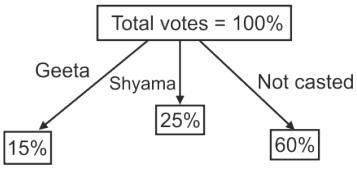
1 unit = 22 kg

Consumption before price increase (9 unit) = $\frac{22}{1} \times 9$ = 198 kg

Price of 1 kg = $\frac{total\ expense}{total\ consumption}$

= $\frac{250}{198}$ = ₹ 1.26

Sol.71.(d)



Hence, Shyama received 25% of votes.

Sol.72.(a) Money Sunaina had

= $\frac{124}{100} \times$ **1500 = 1860**

Money Sanatan had

= $\frac{90}{100} \times$ **1860 = 1674**

Sol.73.(d) Let fraction = $\frac{x}{y}$

According to question

$\frac{x \times \frac{112}{100}}{y \times \frac{92}{100}} = \frac{56}{69} \Rightarrow \frac{x \times 112}{y \times 92} = \frac{56}{69}$

$\frac{x}{y} = \frac{56 \times 23}{69 \times 28} = \frac{2}{3}$

Sol.74.(d) Take his initial income = 100

Ratio -	**initial :**	**final**
Income -	100 :	120
Expend. -	80 :	88

Saving -	**20 :**	**32**

%increase in his savings

= $\frac{12}{20} \times 100$ = 60%

Sol.75.(b) Change in number after two successive increment of 12% and 23%

= 12 + 23 + $\frac{12 \times 23}{100}$ = 35 + 2.76 = 37.76%

Now, number decreased by 34%

Hence, net change in number

= 37.76 - 34 - $\frac{37.76 \times 34}{100}$ = 3.76 - 12.83 ≈ - 9% (-ve sign denotes decrement)

Sol.76.(b) Let the total number of voters enrolled = 100x

Sunita got the votes

= 100$x \times \frac{85}{100} \times \frac{98}{100} \times \frac{78}{100}$ = 64974

⇒ x = 1000

And total votes enrolled

= 100 × 1000 = 1,00,000

Sol.77.(c) Total valid votes

= 7560000 × $\frac{9}{10}$ = 6804000

Votes that Q got

= 6804000 × $\frac{85}{100} \times \frac{22}{100}$ = 1272348

Sol.78.(c) According to the question,

(15 - 6) years = 52997 - 28400 = 24597

9 years = ₹ 24597

1 years = ₹ 2733

So, her annual increment = ₹ 2733

Sol.79.(a) % change in salary

= (25 - 12 - $\frac{25 \times 12}{100}$)%

= 13 - 3 = +10% or 10% increase

Sol.80.(a) Let the income and expenditure of the woman be 300 & 200 respectively

	Income	=	Expenditure	+	Saving
Initial	300	=	200	+	100
% increase	54	=	48	+	6

%increase in savings = $\frac{6}{100} \times 100$ = 6%

Sol.81.(d)

Income → Expenditure : Saving

4 → 3 : 1

$\times\frac{5}{4}$ ×1.1

5 3.9 1.1

Now , percentage increase in expenditure

= $\frac{3.9-3}{3} \times 100$ = 30%

Sol.82.(c) According to the question,

Ratio → R : S

110 : 100

---

11 : 10

1 units = 770 votes

11 units = 770 × 11 = 8470 units

Total number of votes polled

= 7700 + 8470 = 16170

Sol.83.(c)

Income → Expenditure Saving

100 → 80 : 20

15% ↑ 5%↑

115 84 31

percentage of increase in his savings

= $\frac{31-20}{20} \times 100$ = 55%

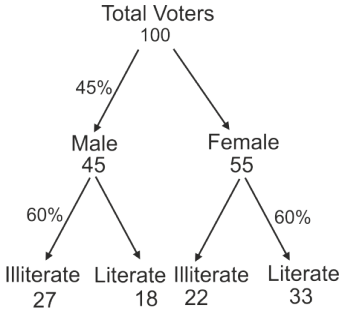
Sol.84.(c)

	Initial	:	Final
Employees	5	:	6
Wages	50	:	41
	250	:	246

Percentage decrease

= $\frac{4}{250} \times 100$ = 1.6%

Sol.85.(d) Let Total voters = 100



Now , Percentage in which number of illiterate female more than that of literate male = $\frac{22-18}{18} \times 100$ = 22.22%

Sol.86.(c) Percentage of boys chose medical = $\frac{80}{200} \times 100$ = 40%

Sol.87.(a)

Let total number of votes be 100

Elected candidate got votes = 88%

Not elected candidate got votes

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

= 100 - 88 = 12 %
According to the question,
(88 - 12)% = 76 % = 684
100 % = 684 × $\frac{100}{76}$ = 900

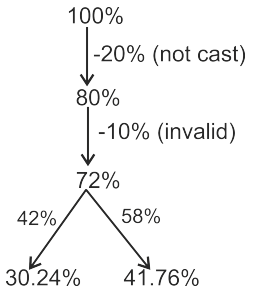
Sol.88.(c)
Net increase/decrease on 1st and 2nd day
= 18 - 15 - $\frac{18 \times 15}{100}$ = 3 - 2.7 = 0.3 %
Net increase/decrease on (1st + 2nd) day and 3rd day = 0.3 - 3 - $\frac{0.3 \times 3}{100}$
= 0.3 - 3 - 0.009 = -2.691
Hence overall decrease = 2.691% ≈ 2.7%

Sol.89.(c) As we know , percentage increment the second time was twice the percentage increment the first time
By using hit and trial method , let first increment = 35%
⇒ 1000 × $\frac{135}{100}$ × $\frac{170}{100}$ = 2295
⇒ 2295 = 2295
∴ This satisfy the condition , hence price increased in the second time = 70%

Sol.90.(a)
Let the total no. of votes be 100%
Casted votes = 71%
then,
⇒ x = y × $\frac{130}{100}$ ⇒ x : y = 13 : 10
⇒ z = y × $\frac{125}{100}$ ⇒ z : y = 5 : 4
Ratio → x : y : z
13 : 10 : 10
4 : 4 : 5
---
52 : 40 : 50 or 26 : 20 : 25
Now, (26 - 25) % = 1 % = 5000
100 % = 500000

Sol.91.(a) Let the total marks be x
According to the question,
⇒ 450 + x × 35% = x × 85%
⇒ 450 = x × 50%
⇒ x = 450 × $\frac{100}{50}$ = 900
Target score = 900 × $\frac{85}{100}$ = 765
Now, Increment percentage
= $\frac{765 - 450}{450}$ × 100 = $\frac{315}{45}$ × 10 = 70%

Sol.92.(a) Let the total votes be 100%



⇒ (41.76% - 30.24%) = 11.52% = 45360
⇒ 100% = $\frac{45360}{11.52}$ × 100 = 393750

Sol.93.(a) Ratio → Expenditure : Saving
140 : 100
7 : 5
12 units = ₹ 72000 ⇒ 5 units = ₹ 30000
Hence, the saving amount is ₹ 30000.

Sol.94.(c)
Let total number of votes = 100 unit
According to question ,
⇒ (100 × $\frac{80}{100}$ × $\frac{96}{100}$ × $\frac{80}{100}$) unit
= 15,360
⇒ ($\frac{64 \times 96}{100}$) unit = 15360
⇒ 1 unit = 250 ⇒ 100 unit = 25,000

Sol.95.(c)
Let expenditure = 40 and saving = 10
Expenditure + saving = income
Initial → 40 + 10 = 50
↓+10% = ↓ + 20%
Final → 44 + 16 = 60
% change in saving
= $\frac{16 - 10}{10}$ × 100 = 60%

Sol.96.(a) Income - expenditure = saving
Initial → 18600 - 12400 = 6200
↓+15% ↓+8%
Final → 21390 - 13392 = 7998
% increase in saving
= $\frac{7998 - 6200}{6200}$ × 100 = $\frac{1798}{62}$ = 29%

Sol.97.(d)
Expenditure + saving = Income
Initial → 30 + 10 = 40 unit
Final → x + 12 = 50 unit
x = 50 - 12 = 38
Increase in expenditure = $\frac{38 - 30}{30}$ × 100
= $\frac{8}{30}$ × 100 = 26$\frac{2}{3}$%

Sol.98.(a) 2.5% = $\frac{1}{40}$
Income → Ram : Shyam
41 : 40
Required % = $\frac{1}{41}$ × 100 = 2.43%

Sol.99.(b) Let the total salary = 100 units
Remaining amount
= 100 - [{60 + 20} + 20 × $\frac{80}{100}$)] = 4 units
4 units = ₹ 20,000
(Required salary) 100 units
= $\frac{20000}{4}$ × 100 = ₹ 5,00,000

Sol.100.(c) 12 % = $\frac{3}{25}$, 15 % = $\frac{3}{20}$
Let the sale of 2 years ago = ₹ x
x × $\frac{28}{25}$ × $\frac{23}{20}$ = 128800 ⇒ x = 100,000

Sol.101.(c) Required price of bike
= 125000 × $\frac{70}{100}$ = Rs.87,500

Sol.102.(b)
Number of toys for girls = 75 - 18 = 57
Hence, required % = $\frac{57}{75}$ × 100 = 76%

Sol.103.(d) Total votes =
1136 + 7636 + 11628 = 20400
Number of votes winning candidate got = 11628
Hence, required % = $\frac{11628}{20400}$ × 100 = 57%

Sol.104.(a)
Ratio - initial : final
20 : 27
required% = $\frac{27 - 20}{27}$ × 100 = 25$\frac{25}{27}$ %

Sol.105.(a)
Votes got by B = (100 - 33)% = 67%
Difference = (67 - 33)% = 34%
34% = 55522
(Vote got by B) 67%
= $\frac{55522}{34}$ × 67 = 109411

Sol.106.(d) 7.5% = $\frac{3}{40}$
Required population =
5000000 × $\frac{43}{40}$ × $\frac{43}{40}$ = 5778125

Sol.107.(c) Required income
= 21000 × $\frac{11}{10}$ × $\frac{11}{10}$ = ₹25,410

Sol.108.(b) According to the question,
(59 - 41)% = 97632
1% = 5424
So, votes obtained by the winning candidate(59%) = 5424 × 59 = 320016

Sol.109.(c) Let Population at the beginning of the first year be x
According to the question,
= x × $\frac{21}{20}$ × $\frac{19}{20}$ = 47880
= x = 47880 × $\frac{20}{21}$ × $\frac{20}{19}$ = 48000

Sol.110.(c) Total number of person in the group = 250
Female initially has in the group
= 250 × 60% = 150
After adding 30 female in the group
Total female in the group now
= 150 + 30 = 180
Total persons in the group now
= 250 + 30 = 280
Hence, required % = $\frac{180}{280}$ × 100 = 64.29%

Sol.111.(d) Let number be x
According to the question,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$x + 8 = \frac{6x}{5}$

$5x + 40 = 6x \Rightarrow x = 40$

Sol.112.(a)
Let salary of software engineer be Rs. x
According to the question,

$x \times \frac{85}{100} \times \frac{75}{100} \times \frac{75}{100} \times \frac{85}{100} = 10404$

$x = 10404 \times \frac{20}{17} \times \frac{4}{3} \times \frac{4}{3} \times \frac{20}{17}$

x = ₹25,600

Sol.113.(a)

%Change = $40 - 45 + \frac{40 \times (-45)}{100} = -23\%$

Sol.114.(d) Let the number be x

$460 \times \frac{20}{100} + x = 920 \times \frac{70}{100}$

$92 + x = 644$

$x = 644 - 92 = 552$

Sol.115.(c) Total number of votes = 7500
Total number of valid votes = 7500 × 80% = 6000
Required number of votes

$= 6000 \times \frac{35}{100} = 2100$

Sol.116.(d) Let the total income = $100x$
Expenditure of food = $100x \times 35\% = 35x$
Remaining amount = $100x - 35x = 65x$

Expenditure of transport = $65x \times \frac{4}{13} = 20x$

$(100x - (35x + 20x)) \times \frac{1}{5} = 6300$

$100x - 55x = 6300 \times 5$

$45x = 6300 \times 5$, $x = 700$

So,
his monthly income = 100 × 700 = 70000

Sol.117.(a)
Votes received by the candidate who lost the election = 100 - 78 = 22% vote
Difference in votes = 78 - 22 = 56%
(difference) 56% = 448

Total votes (100%) = $\frac{448}{56} \times 100 = 800$

Sol.118.(d)
Let the income of Ramana is 100 units.

Ratio -	before	:	after
Income -	100	:	125
Expenditure -	75	:	82.5

Saving -	25	:	42.5

increase % in saving

$= \frac{42.5 - 25}{25} \times 100 = 17.5 \times 4 = 70\%$

Sol.119.(a) Cost of 1 chair = $\frac{4500}{10} = 450$

Cost of 1 chair after 20% decrement
= 450 × 80% = 360
Number of chairs purchased by him
= 10 × 110% = 11
Total cost of chairs that he purchased
= 360 × 11 = ₹3960

Sol.120.(c) According to the question,

$\frac{3}{5} - \frac{2}{5} = \frac{1}{5}$

After 20% increment = $\frac{1}{5} \times \frac{6}{5} = \frac{6}{25}$

Ratio - initial : final

$\frac{3}{5} : \frac{6}{25} = 5 : 2$

decrease% = $\frac{5-2}{5} \times 100 = 60\%$

Sol.121.(c)
Let total registered voters be x
According to the question,

$x \times \frac{9}{10} \times (60 - 40)\% = 1242$

$x \times \frac{9}{10} \times \frac{1}{5} = 1242$

$x = 1242 \times \frac{10}{9} \times 5 = 138 \times 50 = 6900$

Sol.122.(b) 40% = $\frac{2}{5}$

Income - P : Q = 3 : 5

Hence, required % = $\frac{(3+5)-3}{3} \times 100$

$= \frac{500}{3} = 166\frac{2}{3}\%$

Sol.123.(b) Total students in all branches
= $(11x + 5x + 6x + 7x) = 29x$
Number of students in CS and ME branches = $(11x + 7x) = 18x$

Hence, required % = $\frac{18x}{29x} \times 100 = 62.07\%$

Sol.124.(a) Expenditure of the man
= 10% + 10% + 20% + 15% = 55%
Saving of the man = 100% - 55% = 45%
(income) 100% = 30000

(saving) 45% = $\frac{30000}{100} \times 45 = 13{,}500$

Sol.125.(b)
Total number of enrolled votes = $100x$
Number of cast votes
= $100x \times 83\% = 83x$

Total number of valid votes = $83x \times \frac{96}{100}$

Number of votes got by party A

$= 83x \times \frac{96}{100} \times \frac{83}{100}$

$83x \times \frac{96}{100} \times \frac{83}{100} = 156611$

Number of enrolled votes ($100x$)

$= \frac{156611 \times 100 \times 100}{83 \times 96 \times 83}$

= 2,36,807 (approx)

Sol.126.(a)

Ratio	-	before	:	after
Income	-	100	:	115
Expenditure	-	70	:	75.25
Saving	-	30	:	39.75

required% = $\frac{39.75 - 30}{30} \times 100 = 32.5\%$

Sol.127.(c)

Increase % = $\frac{38640 - 34500}{34500} \times 100 = 12\%$

Sol.128.(a) increase/decrease%

$= 25 - 30 + \frac{25 \times (-30)}{100} = -12.5\%$ (-ve sine denote decrease)

Decrease % = $12\frac{1}{2}\%$ Decrease

Sol.129.(b) According to the question,

Ratio -	initial	:	final
Price -	100	:	140
Consumption -	140	:	100

decrease% = $\frac{140 - 100}{140} \times 100 = 28\frac{4}{7}\%$

Sol.130.(d)
Let the income of the Ramu is 100 units
According to the question,

Ratio	-	before	:	after
Income	-	100	:	112
Expenditure	-	72	:	75.6
Saving	-	28	:	36.4

Required value = $(\frac{x-y}{y} \times 100)\%$

$= (\frac{36.4 - 28}{28} \times 100)\% = 30\%$

Sol.131.(a)

Ratio	-	Neha	:	Monica
Income	-	105	:	100

required% = $\frac{105 - 100}{105} \times 100 = 4\frac{16}{21}\%$

Sol.132.(d) According to question,
Jitvik salary in month of february 2022

$= 24800 \times \frac{21}{20} \times \frac{21}{20} =$ ₹ 27342

Sol.133.(d) According to question,
⇒ 31% - 26% = 5% = 2350

⇒ 100% = $\frac{2350}{5} \times 100 = 47000$

Now, $47000 \times \frac{7}{100} = 3290$

Sol.134.(d)
Let the population of a town = 100
According to question,
Population after two year

$= 100 \times \frac{21}{25} \times \frac{121}{100} = 101.64$

Net increase change %

$= \frac{101.64 - 100}{100} \times 100 = 1.64\%$

Sol.135.(d)
Votes got by looser candidate = 28%
Votes got by winner candidate = 72%
Difference = 72% - 28% = 44%
(total number of votes) 100% = 1000 votes
(no. of votes by which winner won the election) 44% = 440 votes

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.136.(a) According to the question,

44 - 30 + $\frac{44 \times (-30)}{100}$

= 14 - 13.2 = 0.8 (approx 1% increase)

Sol.137.(c) According to the question,
Let the income of the Raju be 100 units

Ratio	- income	: expenditure	: saving
Before -	100	: 80	: 20
After -	120	: 88	: 32

require% = $\frac{32-20}{20}$ × 100 = 60%

Sol.138.(a) Let R has x toffees

Toffees given by R to S = $\frac{3x}{8}$

Then, now R has toffees = x - $\frac{3x}{8}$ = $\frac{5x}{8}$

Hence, k% = $\frac{\frac{5x}{8}}{\frac{3x}{8}}$ × 100 = $\frac{5}{3}$ × 100 = $\frac{500}{3}$

Sol.139.(a)

Change in the fraction = $\frac{5}{6}$ - $\frac{4}{5}$ = $\frac{1}{30}$

Required change = $\frac{\frac{1}{30}}{\frac{4}{5}}$ × 100 = 4.17%

Sol.140.(d) Price of the motor cycle this year = \$750 × $\frac{6}{5}$ = \$900

Sol.141.(d)
Let the monthly salary be 100%
According to question,
Saving = 100 - (60 + 10 + 5) = 25%
Now, 25% = 4000 ⇒ 100 % = ₹ 16000

Sol.142.(b)
Expenditure = price × quantity

Ratio -	old	:	new
Price -	25	:	19
Quantity -	19	:	25

Difference = 25 - 19 = 6 units
6 units = 10 kg

(New) 25 units = $\frac{10}{6}$ × 25 kg

New price per kg = $\frac{2500 \times 6}{10 \times 25}$ = ₹ 60 per kg

Sol.143.(a) 2 hours 25 min = 145 min
2 hours 30.5 min = 150.5 min

error% = $\frac{150.5-145}{145}$ × 100 = 3$\frac{23}{29}$%

Sol.144.(d)
Ratio - sunday : monday : tuesday
Sale - 10 : 9 : 9.9
According to the question,

Sales on Sunday = $\frac{1485}{9.9}$ × 10 = ₹1,500

Sol.145.(a)

Ratio -	A	:	B
Expendi. -	100y	:	75y
Savings -	100x	:	120x

Income - 5 : 4

$\frac{100x+100y}{120x+75y}$ = $\frac{5}{4}$

400x + 400y = 600x + 375y
25y = 200x

$\frac{x}{y}$ = $\frac{25}{200}$ = $\frac{1}{8}$

B's savings = 120x = 120 × 1 = 120
B's expenditure = 75y = 75 × 8 = 600

Required % = $\frac{120}{600}$ × 100 = 20%

Sol.146.(a)
Let the total number of votes = 100x
Valid votes = 100x − 68
According to the question,

(100x − 68) × $\frac{4}{100}$ = 98

100x = (98 × 25) + 68 = 2518

Sol.147.(d) required% = -25 + 20 + $\frac{(-25) \times 20}{100}$ = - 10% (decrement)

Sol.148.(b) Difference of votes
= 53 - 47 = 6% ⇒ 6% = 276

(total votes) 100% = $\frac{276}{6}$ × 100 = 4600

Sol.149.(d)
Let total number of votes be 100
According to question
(58 - 42)% = 800 ⇒ 16% = 800

Total votes (100%) = $\frac{800}{16}$ × 100 = 5000

Sol.150.(b)

Ratio -	**initial**	**: new**
Income -	100	: 300
Expendi. -	55	: 75

Savings -	45	: 225

Desired change in expenditure

= $\frac{20}{55}$ × 100 = 36.4% (increased)

Sol.151.(d) Let number of voters that enrolled in voter list be x
According to the question,

x × $\frac{9}{10}$ × $\frac{19}{20}$ × (52.5 - 47.5)% = 1710

x × $\frac{9}{10}$ × $\frac{19}{20}$ × $\frac{1}{20}$ = 1710 ⇒ x = 40000

Sol.152.(c) Let savings of three families be 8x , 9x and 20x
and income of first ,second and third family be I_1 , I_2 and I_3 respectively,
Now, according to the question,
I_1× 20% = 8x

I_1 = $\frac{8x}{20}$ × 100 = 40x

And, I_2 × 15% = 9x

I_2 = $\frac{9x}{15}$ × 100 = 60x

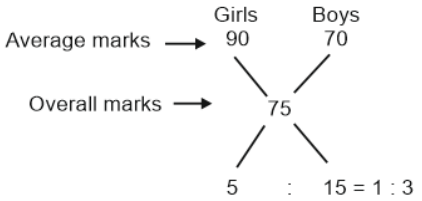
And, I_3 × 25% = 20x

I_3 = $\frac{20x}{25}$ × 100 = 80x

Now,
(I_1 + I_2 + I_3) = 40x + 60x + 80x = 180x
180x = 72000 ⇒ x = 400
So,
income of second family (60x) = ₹24,000

Sol.153.(b) % change = 25 - 18 - $\frac{25 \times 18}{100}$
= 7 - 4.5 = 2.5 (increased)

Sol.154.(d)



So the percentage of boys
= $\frac{3}{4}$ × 100 = 75%

Sol.155.(b) Difference = 65 - 35 = 30%
(Difference) 30% = 381

(Total votes) 100% = $\frac{381}{30}$ × 100 = 1270

Sol.156.(b) x × $\frac{7}{20}$ × $\frac{1}{5}$ = 240.8

x = 240.8 × $\frac{20}{7}$ × 5

Number (x) = 3440
Now,

18% of number = 3440 × $\frac{18}{100}$ = 619.2

Sol.157.(b) Let initial price = Rs. x
According to the question,

x × $\frac{3}{4}$ × $\frac{3}{2}$ = 7650

x = 7650 × $\frac{4}{3}$ × $\frac{2}{3}$ = Rs. 6800

Sol.158.(a) Let total salary = 100 %
Total expenditure = 30% + 10% + 7% + 6% = 53%
Saving = 100% - 53% = 47%
47% = 1880

100% (total salary) = $\frac{1880}{47}$ × 100% = 4,000

Sol.159.(d) Total votes polled = 8750

Valid votes = $\frac{80}{100}$ × 8750 = 7000

Valid votes get by B

= $\frac{37}{100}$ × 7000 = 2590

Sol.160.(b) Total votes (100%) = 50000
No. of vote got third candidate
= 100 - (40 + 35) = 25%
Hence, votes gote by third candidate

= $\frac{50000}{100}$ × 25 = 12500

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.161.(c) Initial salary

$= \frac{6300}{109} \times 100 =$ ₹5,779 (approx)

Sol.162.(c) Let the third no. be 100

Then, first no. = 100 × 39% = 39

and second no. = 100 × 65% = 65

Required % = $\frac{39}{65} \times 100 = 60\%$

Sol.163.(a) Number of valid votes that the other candidate got

$= 8000 \times \frac{(100-15)}{100} \times \frac{(100-52)}{100}$

$= 8000 \times \frac{85}{100} \times \frac{48}{100} = 3{,}264$

Sol.164.(d)

No. of valid votes that Aravind got

$= 30{,}000 \times \frac{(100-20)}{100} \times \frac{(100-55)}{100}$

$= 30{,}000 \times \frac{80}{100} \times \frac{45}{100} = 10800$

Sol.165.(d) Population after 2 yrs

$= 4{,}00{,}000 \times \frac{6}{5} \times \frac{13}{10} = 6{,}24{,}000$

Sol.166.(a) Let the total no of votes be x

No of valid votes = (x × 70% - 200)

$= (\frac{7}{10}x - 200)$

No of votes received by winner = 65%

Then , no of votes received by loser

= (100 - 65)% = 35%

According to the question,

$(\frac{7}{10}x - 200) \times (65 - 35)\% = 1200$

$(\frac{7}{10}x - 200) \times \frac{30}{100} = 1200$

$\frac{7}{10}x - 200 = 4000$

$\frac{7}{10}x = 4200 \Rightarrow x = 6000$

Sol.167.(b)

Let the no of votes polled be x

No. of votes received by first candidate = 44%

No. of votes received by second candidate = (100 - 44)% = 56%

According to the question,

$x \times (56 - 44)\% = 1440$

$x \times \frac{12}{100} = 1440$

$x = \frac{1440 \times 100}{12} = 12000$

Sol.168.(b)

		Initial	:	final
1st year	→	10	:	11
2nd year	→	5	:	6
Net increase →		50	:	66

% increase = $\frac{16}{50} \times 100 = 32$ %

Sol.169.(a) Percentage decrease

$= \frac{42800 - 37236}{42800} \times 100$

$= \frac{5564}{428} =$ **13 %**

Sol.170.(c) Let valid votes = 100 %

Difference between winner and loser

= (54 - 46)% of valid votes

= 8% of valid votes ⇒ 8 % = 88 votes

100 % (valid votes)

$= \frac{88}{8} \times 100 = 1100$ votes

Total votes = 1100 + 58 = 1158

Sol.171.(b) 36% = $\frac{9}{25}$

		Initial	:	Final
Price	→	25	:	34
Consumption	→	34	:	25

% decrease in consumption

$= \frac{34-25}{34} \times 100 = \frac{9}{34} \times 100 = 26.5$ %

Sol.172.(c) Let the weekly income of Ranita and Bhaskar be R and B respectively

According to question,

57% of R = 76% of B

$\frac{R}{B} = \frac{76}{57} = \frac{4}{3}$

Let R = 4x and B = 3x

Now, $\frac{4x-400}{3x} = \frac{6}{5}$

20x - 2000 = 18x

2x = 2000 ⇒ x = 1000

So, weekly Income of Bhaskar

= 3x = 3 × 1000 = ₹3000

Sol.173.(b) No. of valid votes received by other candidate = $15000 \times \frac{(100-25)}{100} \times \frac{(100-60)}{100} = 15000 \times \frac{3}{4} \times \frac{2}{5} = 4500$

Sol.174.(b) Let the population of a village initially be 'x'

According to question,

$x \times \frac{19}{20} \times \frac{4}{5} = 4655$

$x \times \frac{76}{100} = 4655$

$x = \frac{4655 \times 100}{76} = 6125$

Sol.175.(a) Required % of boys

$= \frac{3}{3+5} \times 100 = \frac{300}{8} = 37.5\%$

Sol.176.(c)

Let the no of voters on the list be 100x

No of valid votes

= 100x × 90% - 60 = (90x - 60)

Votes received by winner

= 100x × 46% = 46x

Votes received by loser

= (90x - 60) - 46x = (44x - 60)

According to question,

46x - (44x - 60) = 410

2x + 60 = 410 ⇒ 2x = 350

$x = \frac{350}{2} = 175$

So, the no of voters on the list

= 100x = 100 × 175 = 17500

Sol.177.(b)

2012 2013 2014 2015

+15 %	- 15 %	+ 15%
$\frac{23}{20}$	$\frac{17}{20}$	$\frac{23}{20}$

Let the total student increased in school in 2012 to 2015 be x

$x \times \frac{23}{20} \times \frac{17}{20} \times \frac{23}{20} = \frac{8993}{8000}$

Student increase %

$= \frac{993}{8000} \times 100 = 12.41\%$

Sol.178.(c) Population one year ago

$= 1{,}42{,}560 \times \frac{100}{108} = 1{,}32{,}000$

Sol.179.(d) Let total votes = 100x%

Voters cast their vote = 90x%

Valid votes = 90x% - 75

Votes winner got = 50x%

Votes Loser got = (90x% - 75) - 50x%

= (40x% - 75)

According to question,

50x% - (40x% - 75) = 170

(10x% + 75) = 170 votes

100% (vote cast)

$= \frac{170-75}{10} \times 100 = 950$

Sol.180.(b) Let income of Bhavani = 100

Ratio →	income	:	expenditure	:	saving
Before →	100	:	68	:	32
After →	115	:	74.8	:	40.2

Percentage change in saving

$= \frac{40.2-32}{32} \times 100 = \frac{8.2}{32} \times 100 = 25.62\%$

Sol.181.(b)

Initial	:	final
10	:	9
10	:	13
5	:	4
500	:	468

Net decrease = $\frac{500-468}{500} \times 100$

$= \frac{32}{5} = 6\frac{2}{5}\%$

Sol.182.(b) $\frac{25}{8}\% = \frac{1}{32}$, $\frac{37}{5}\% = \frac{37}{500}$

Ratio →	Initial	:	Final
	32	:	31
	500	:	537

Net change → 16000 : 16647

Required % = $\frac{647}{16000} \times 100$

= 4.04% increase

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.183.(c) 30% = 1,53,000

100% = $\frac{1,53,000}{30}$ × 100 = 5,10,000

Annual income of Shiya = 5,10,000

Monthly income of Shiya

= $\frac{5,10,000}{12}$ = 42,500

Sol.184.(d) we know that,

Surface area of sphere ∝ $radius^2$

	Initial	:	Final
Radius →	4	:	9
S.A →	16	:	81

% increase in surface area

= $\frac{81-16}{16}$ × 100 = 406.25%

Sol.185.(a) 5% = $\frac{1}{20}$

Population after 2 years

= 16000 × $\frac{21}{20}$ × $\frac{21}{20}$

= 40 × 441 = 17640

Sol.186.(b) Number of school going children at the end of 3 years = 64000 × $\frac{11}{10}$ × $\frac{11}{10}$ × $\frac{11}{10}$ = 64 × 1331 = 85184

Sol.187.(a) 65% = $\frac{13}{20}$

Ratio →	Initial	:	final
Cost →	20	:	33
Consumption →	33	:	20

Required % consumption

= $\frac{33-20}{33}$ × 100 = $\frac{13}{33}$ × 100 = 39.39 %

Sol.188.(c) Overall increase =

25 + 25 + $\frac{25 \times 25}{100}$ = 50 + 6.25 = 56.25 %

Sol.189.(c) Ratio → A : B : C : D

5 : 4 : 4 : 4

7 : 7 : 10 : 10

6 : 6 : 6 : 5

Final → 210 : 168 : 240 : 200

Required % = $\frac{210-200}{200}$ × 100

= $\frac{10}{200}$ × 100 = 5%

Sol.190.(d) 20 % = $\frac{1}{5}$

Present population = 80 lakh

Population 3 years ago

= 80 × $\frac{5}{6}$ × $\frac{5}{6}$ × $\frac{5}{6}$ lakh

Population 2 years ago

= 80 × $\frac{5}{6}$ × $\frac{5}{6}$ lakh

Difference

= 80 × $\frac{5}{6}$ × $\frac{5}{6}$ - 80 × $\frac{5}{6}$ × $\frac{5}{6}$ × $\frac{5}{6}$

= 80 × $\frac{5}{6}$ × $\frac{5}{6}$ × (1 - $\frac{5}{6}$) = $\frac{80 \times 25}{6 \times 6 \times 6}$

= $\frac{10 \times 25}{27}$ = $\frac{250}{27}$

= 9.2592593 lakh or 925925.93

Sol.191.(d) 8% = $\frac{2}{25}$, 15% = $\frac{3}{20}$

Ratio →	Initial	:	final
Breadth →	25	:	23
Length →	20	:	23

Area →	500	:	529

Percentage change in area

= $\frac{29}{500}$ × 100 = 5.8% increase

Sol.192.(d)

15% = $\frac{3}{20}$, 25% = $\frac{1}{4}$, 60% = $\frac{3}{5}$

Ratio →	Initial	:	final
Length →	20	:	17
Breadth →	4	:	3
Height →	5	:	8

Area →	400	:	408

Percentage change in Volume

= $\frac{8}{400}$ × 100 = 2% increase.

Sol.193.(c) Volume of sphere α $(Radius)^3$

	Initial	:	Final
Radius →	5	:	6
Volume →	$(5)^3$	:	$(6)^3$
	125	:	216

Percentage Increase

= $\frac{(216-125)}{125}$ × 100 = $\frac{91}{5}$ × 4 = 72.8 %

Sol.194.(a)

15% = $\frac{3}{20}$, 25% = $\frac{1}{4}$, 6% = $\frac{3}{50}$

Total population = 15000

Population after 3 years

= 15000 × $\frac{23}{20}$ × $\frac{5}{4}$ × $\frac{47}{50}$

= 15 × 23 × $\frac{5}{4}$ × 47

= $\frac{81075}{4}$ = 20268.75 ~ 20269

Sol.195.(c) 6% = $\frac{3}{50}$, 8% = $\frac{2}{25}$

Volume of cuboid α $l \times b$

	Initial	:	final
$length$ →	50	:	53
$breadth$ →	25	:	27

Change →	1250	:	1431

% increase in volume

= $\frac{(1431-1250)}{1250}$×100

= $\frac{181}{25}$ × 2 = 14.48

Sol.196.(c)

Let the original price of the sweet be x

One-third of the sweet is sugar,

so the price of sugar = $\frac{1}{3}x$

and price of other part = x - $\frac{1}{3}x$ = $\frac{2}{3}x$

New price of sugar = $\frac{7}{6}$ × $\frac{1}{3}x$ = $\frac{7}{18}x$

Total price of sweet after increase = price of other part + New price of sugar

= $\frac{2}{3}x$ + $\frac{7}{18}x$ = $\frac{19}{18}x$

Effective increase = New price - Old price

= $\frac{19}{18}x - x$ = $\frac{1}{18}x$

Percentage increase in price of sweet

= $\frac{\frac{1}{18}x}{x}$ × 100% = $\frac{100}{18}$%

Sol.197.(b) Let total amount = 100 %

Amount in cash = 40%

Amount spent = 60 %

60% = 30,000 + 45,000 = 75000

100 % = $\frac{75000}{60}$ × 100 = 1,25,000

Hence, total amount = 1,25,000

Sol.198.(a) Let the total number of votes polled be 100%

Vote received by first candidate = 30%

Vote received by second candidate

= (100 - 30)% = 70%

According to the question,

⇒ (70 - 30)% = 40% = 200

⇒ 100% = $\frac{200}{40}$ × 100 = 500

Sol.199.(d) No. of voters who cast their votes = 8000 × 75% = 6000

No. of votes received by B

= 6000 × 66% = 3960

Sol.200.(c) Let the total number of nominated votes 100x

Vote cast by the voters = 75x

Valid votes = 75 × $\frac{96}{100}$ = 72x

80% of valid votes = 9504

⇒ 72 x × $\frac{80}{100}$ = 9504 ⇒ x = 165

⇒ total number of votes

= 165 × 100 = 16500

Sol.201.(c) Let the price of bike = 100

After 21% increment = 100 × $\frac{121}{100}$ = 121

After 34% reduction

= 121 × $\frac{66}{100}$ = 79.86

net percentage change = 100 - 79.86

= 20.14 % (decrease)

Sol.202.(d) Total votes = 100%

⇒ Total casted votes = 100 × $\frac{9}{10}$ = 90%

⇒ valid votes = 90 × $\frac{95}{100}$ = 85.5%

Successful candidate votes

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= 85.5 \times \frac{55}{100} = 47.025\%$

⇒ Other candidate votes

$= 85.5 \times \frac{45}{100} = 38.475\%$

According to question,

⇒ 47.025% - 38.475% = 1710

⇒ 8.55% = 1710 ⇒ 100% = 20000

Hence, the total voters will be 20000.

Sol.203.(a) According to the question,

A's savings = $25x$ and B's savings = $20y$

Now, A's savings = B's savings

$\Rightarrow 25x = 20y \Rightarrow \frac{x}{y} = \frac{4}{5}$

⇒ 9 units = 45000 ⇒ 5 units = 25000

So, B's salary will be ₹ 25000.

Sol.204.(a)

Monthly income of Antara = ₹96,000

Monthly income of Barnali = ₹1,10,000

ATQ, 96,000 × 55% = 1,10,000 × y%

$y = \frac{96 \times 55}{110} = 48$

Sol.205.(b) Total no of valid votes cast

$= 2,75,000 \times \frac{9}{10} \times \frac{17}{20} = 2,10,375$

Sol.206.(d)

Let the total number of votes be x

Total no of valid votes

$= x \times \frac{75}{100} \times \frac{98}{100} = \frac{147x}{200}$

According to the question,

$\frac{147x}{200} \times \frac{3}{4} = 9261 \Rightarrow \frac{441}{800}x = 9261$

$x = \frac{9261 \times 800}{441} = ₹16,800$

Sol.207.(c) % increase in GST

$= \frac{750 - 600}{600} \times 100 = \frac{150}{600} \times 100 = 25\%$

Sol.208.(d)

Let the original population be x

According to question

$x \times \frac{11}{10} \times \frac{6}{5} \times \frac{11}{10} = 8,71,200$

$x \times \frac{726}{500} = 8,71,200$

$x = \frac{871200 \times 500}{726} = 6,00,000$

Sol.209.(b)

Votes received by candidate A = 48%

Votes received by candidate B

= (100 - 48)% = 52%

No. of valid votes received by candidate B over candidate A = 3,75,000 × (52 - 48)% = 3,75,000 × 4% = 15,000

Sol.210.(c) Let the monthly salary of Shweta be 100%

Saving of Shweta

= 100% - (21 + 14 + 13)% = 52%

Now, 52% ---------- ₹5408

Then, 100% -------- $\frac{5408}{52} \times 100 = ₹10,400$

Sol.211.(d) Percentage scored in paper A

$= \frac{8}{10} \times 100 = 80\%$

	A		B
Weight assigned	2	:	1
Percentage	80%		x%

$70\% = \frac{2 \times 80\% + 1 \times x\%}{2+1} = (\frac{160 + x}{3})\%$

210 = 160 + x ⇒ x = 50

Marks scored in paper B = 10 × 50% = 5

Sol.212.(c) Let total votes = $100x$

⇒ total valid votes

$= 100x \times \frac{100 - 20}{100} = 80x$

First candidate got = $80x \times \frac{75}{100} = 60x$

⇒ other candidate got = $80x - 60x = 20x$

Total vote given = 2,48,000

Other candidate votes

$= 2,48,000 \times \frac{20}{100} = 49600$ votes

Sol.213.(a) Given : $1\frac{3}{5}\% = 1.6\%$

1st , 2nd and 3rd years

→ +1.6%, -1.6% and +1.6%

According to the question,

Effective rate

$= +1.6 - 1.6 + \frac{1.6 \times (-1.6)}{100} = -0.0256\%$

Effective rate = $-0.0256 + 1.6 + \frac{-0.0256 \times 1.6}{100} \approx +1.57\%$

So, the price of the AC in 2007 increased by 1.57%

Sol.214.(a) Let number = 100 x

Given, 70 x - 70 = 70

⇒ 70 x = 140 ⇒ x = 2

⇒ required number = 200

Sol.215.(a)

Let the maximum marks = 100x

⇒ Pass percentage = 35x

Given, a student who got 210 marks, failed by 14 marks

⇒ minimum passing marks

= 210 + 14 = 224

Now, 35x → 224 ⇒ x → 6.4

⇒ maximum marks = 6.4 × 100 = 640

Sol.216.(d)

Let the amount of the bill = 100x

Reduced price = $100x \times \frac{90}{100} = 90x$

⇒ Reduction = $10x$ ⇒ $10x \rightarrow 23$

⇒ amount of his electricity bill

= 23 × 10 = 230 Rs.

Sol.217.(b) Let the income be 100

Income →	Expenditure	saving
100 →	60	40

New,

Income = $100 \times \frac{13}{10} = 130$

Expenditure = $60 \times \frac{6}{5} = 72$

Saving = 130 - 72 = 58

Required percentage

$= \frac{58 - 40}{40} \times 100 = 45\%$

Sol.218.(a) Let , total income = $100x$

Spent on salary = $22x$

⇒ remaining salary = $78x$

Household expenses

$= 78x \times \frac{75}{100} = 58.5x$

Remaining salary = $78x - 58.5x = 19.5x$

Hence, $19.5x = 3705 \Rightarrow x = 190$

⇒ Total income = 190 × 100 = 19000 ₹

Sol.219.(b)

Let the total number of votes be 100%

No of invalid votes = 12%

No of votes received by winner = 60%

No of votes received by loser

= (100 - 12 - 60)% = 28%

According to the question,

(60 - 28)% = 32% = 1200

$100\% = \frac{1200}{32} \times 100 = 3750$

Sol.220.(c)

	Income	=	Expenditure	+	Saving
Initial →	100	=	60	+	40
Final →	130	=	72	+	58

% increase in the savings of Ramesh

$= \frac{58 - 40}{40} \times 100 = \frac{18}{40} \times 100 = 45\%$

Sol.221.(b)

Let the population of a city in 2021 be x

ATQ,

$x \times \frac{27}{25} \times \frac{11}{10} = 47520 \Rightarrow \frac{297}{250}x = 47520$

$x = \frac{47520 \times 250}{297} = 40,000$

The population of the city at the end of 2021 = 40,000 × 108% = 43,200

Sol.222.(a) Marks scored by D

$= \frac{12}{19} \times 80 = \frac{960}{19} = 50.5$

Marks scored by C = 32 × 160% = 51.2

Marks scored by A = 80 × 72% = 57.6

Marks scored by B

$= \frac{7}{11} \times 80 = \frac{560}{11} = 50.9$

Clearly, we can see that D scored the minimum marks.

Sol.223.(a) No of illiterate = 300

No of students with commerce background = 300 × 2= 600

Total no students either illiterate or with a commerce background

= 600 + 300 = 900

% of students with Science and Arts background = (35 + 20)% = 55%

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

% of students either illiterate or with a commerce background = (100 - 55)%
= 45%

Now, 45% → 900

Then, 55% → $\frac{900}{45}$ × 55 = 1100

Sol.224.(b)
Let the two no's be a and b where a>b.

a × $\frac{24}{25}$ = b × $\frac{6}{5}$

$\frac{a}{b}$ = $\frac{6}{5}$ × $\frac{25}{24}$ = $\frac{5}{4}$

ATQ, 5 + 4 = 9 unit = 450

Then, 4 unit = $\frac{450}{9}$ × 4 = 200

Sol.225.(a) 20% = $\frac{1}{5}$

2018 → 5 : 6
2019 → 5 : 4
2020 → 5 : 6

125 : 144

% change = $\frac{144-125}{125}$ × 100

= $\frac{19}{125}$ × 100 = 15.2% increase

Sol.226.(b)
Let the total no of votes be 100%
No of votes received by Sanjay = 47.5%
No of votes received by Vinod
= (100 - 47.5)% = 52.5%
ATQ, (52.5 - 47.5)% = 270

5% = 270 ⇒ 1% = $\frac{270}{5}$ = 54

So, the no of votes received by Vinod
= 54 × 52.5 = 2835

Sol.227.(b) Let the monthly salary be x

ATQ, x × $\frac{60}{100}$ × $\frac{50}{100}$ × $\frac{70}{100}$ = 1260

x × $\frac{21}{100}$ = 1260

x = 1260 × $\frac{100}{21}$ = 6000

So, the monthly salary of a person is ₹6,000

Sol.228.(a)

	Stock A	:	Stock B	:	Stock C
Portfolio →	30	:	40	:	30
Return →	5%	:	10%	:	8%

Average return of the portfolio

= $\frac{30\times5\%+40\times10\%+30\times8\%}{30+40+30}$

= $\frac{(150+400+240)\%}{30+40+30}$ = $\frac{790}{100}$ = 7.9%

Sol.229.(d) No of toys manufactured in 2018 = 25,000
No of toys manufactured in 2019

= 25,000 × $\frac{6}{5}$ = 30,000

No of toys manufactured in 2020

= 30,000 × $\frac{17}{20}$ =25,500

Total no of toys manufactured in 3 yrs
= 25,000 + 30,000 + 25,500 = 80500

Sol.230.(d)
Present population in the city

= 175000 × $\frac{104}{100}$ × $\frac{105}{100}$ = 191100

Sol.231.(b) If a number increase by a% and decrease by b%
Then,

net % increase/decrease = $a - b - \frac{ab}{100}$

∴ Net % increase/decrease

= 25 − 16 − $\frac{25\times16}{100}$ = 5% increase

Sol.232.(b) Let the cost price of rice for shopkeeper = 100
∴MP = SP = 100 × 125% = 125
But his actual selling price on 10% profit
= 100 × 110% = 110
Discount = 125 - 110 = 15

% discount = $\frac{15}{125}$ × 100 = 12%

Sol.233.(c)
∵ Winner gets 90% of polled votes
∴ Loser gets 10% of polled votes
Difference between them = 80% = 800
So, (total number of polled votes)100%

= $\frac{800}{80}$ × 100 = 1000

Sol.234.(b)
Let the total votes enrolled = x
Total number of valid votes

= x × $\frac{4}{5}$ × $\frac{19}{20}$ = $\frac{19}{25}x$

According to question,

$\frac{19}{25}x$ × $\frac{4}{5}$ = 9500 ⇒ x = 15625

Sol.235.(b) $\frac{1}{5}$% = $\frac{1}{5\times100}$ = $\frac{1}{500}$

Sol.236.(b) Let total voters enrolled in the voter list = 100x
According to the question,

100x × $\frac{70}{100}$ × $\frac{80}{100}$ ($\frac{64}{100}$ − $\frac{36}{100}$)

= 3136

x × $\frac{7}{10}$ × $\frac{4}{5}$ × 28 = 3136

x = 200 ⇒ 100x = 20000

Sol.237.(b) Let total votes = 100%
According to the question,
75% - 25% = 2500
50% = 2500 ⇒ 1% = 50
Hence, total number of votes polled to losing candidate (25)% = 1250

Sol.238.(a) Let the total votes = 100x

Valid votes = $\frac{4}{5}$ × 100x - 80 = 80x - 80

Winner got = 45x
Then, loser gets votes = 80x - 80 - 45x
= 35x - 80

According to question,
$Winner - loser = 280$
$\Rightarrow 45x - (35x - 80) = 280$
$\Rightarrow 10x = 200 \Rightarrow 100x = 2000$
Hence, total number of votes in the voter list = 2000

Sol.239.(c) According to the question,
Family's total expenditure

= 75000 × $\frac{90}{100}$ = 67500

Amount after spend on education

= 67500 × $\frac{70}{100}$ = 47250

Amount after spend on health (amount spend on food) = 47250 - 30375 = 16875

Required % = $\frac{16875}{75000}$ × 100 = 22.5%

Sol.240.(c) According to the question,
Second number : third number = 7 : 10

First number = 10 × $\frac{80}{100}$ = 8 unit

Average of first number and third number

= $\frac{8+10}{2}$ = 9 unit

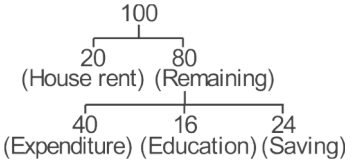
So, required % = $\frac{9-7}{7}$ × 100 = 28 $\frac{4}{7}$

Sol.241.(b) Ratio - initial : final
Time - 48 : 36
Cost - 36 : 48

Required % = $\frac{48-36}{36}$ × 100 = 33$\frac{1}{3}$%

Sol.242.(b) Let the monthly income of family be 100 unit
After family spends 20% on house rent
Remaining income = 100 × 80% = 80 unit
Income which Family spends on household expenditure
= 80 × 50% = 40 unit
And , income which family spends on children's education = 80 × 20% = 16 unit
Then, remaining income
= 80 − (40 + 16) = 24 unit
According to the question,
24 unit = ₹6,600 ⇒ 1 unit = ₹ 275
Hence, total monthly income of family (100 unit) = ₹27500

Short tricks :-



24 unit (Saving)= ₹6,600
100 unit (monthly income)

= $\frac{6600}{24}$ × 100 = ₹27,500

Sol.243.(b)
Ratio - initial : after 4 years

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Income - 100 : 140
Saving - 20 : 20
Expenditure- 80 : 120

Required % = $\frac{120-80}{80}$ × 100 = 50%

Sol.244.(a) Bhushan's savings

= 45,000 × $\frac{122}{100}$ − 33,000 × $\frac{111}{100}$

= 54,900 − 36,630 = 18,270 Rs.

Sol.245.(d)

Income = price of tickets × sales

% increase in income

= 12.5 + 8.5 + $\frac{12.5 \times 8.5}{100}$

= 21 + 1.0625 = 22.0625%

Sol.246.(a)

Total valid votes = x × $\frac{80}{100}$ × $\frac{97}{100}$

Winner got votes

= x × $\frac{80}{100}$ × $\frac{97}{100}$ × $\frac{55}{100}$

= 42,680 votes

x = 1,00,000 votes

Third one receive votes

= 1,00,000 × $\frac{80}{100}$ × $\frac{97}{100}$ × $\frac{10}{100}$

= 7760 votes

Sol.247.(a) Total valid votes

= $\frac{382500}{60}$ × 100 = 6,37,500

Required % = $\frac{750000-637500}{750000}$ × 100

= 15%

Sol.248.(c) CSA of cylinder = $2\pi rh$

Let radius increases by x% , Then

$x - 4 - \frac{4x}{100}$ = 20

$\frac{24x}{25}$ = 24 ⇒ x = 25

Volume of cylinder = $\pi r^2 h$

Net % change of 25 and 25 :-

25 + 25 + $\frac{25 \times 25}{100}$ = 56.25

Net % change of 56.25 and (− 4) :-

56.25 − 4 − $\frac{56.25 \times 4}{100}$ = 52.25 − 2.25

= 50% increase in volume.

Sol.249.(c) Let Ravi have 100 units of chocolates , then Bhanu has 80 units of chocolates.

Ravi gave chocolates to his sister

= 100 × 10% = 10 units of chocolates

Now , total chocolates Bhanu has after receiving chocolates from his uncle

= 80 + 80 × 35%= 108 units of chocolates

108 units = 54 chocolates

Then 10 units = 5 chocolates.

Sol.250.(c) Total valid votes (100%)

= 40000 × $\frac{90}{100}$ = 36000

Votes Abha got = (100 - 36 - 40)% = 24%

24% = 36000 × $\frac{24}{100}$ = 8640

Sol.251.(c)

Number of votes winning candidates get

= 10000 × $\frac{85}{100}$ × $\frac{94}{100}$ × $\frac{60}{100}$ = 4794

Sol.252.(d) According to the question,

Samita × 65% = bhairav × 91%

$\frac{samita}{bhairav} = \frac{7}{5}$

$\frac{7x+1500}{5x+500} = \frac{3}{2}$

14x + 3000 = 15x + 1500 ⇒ x = 1500

Required sum

= (12x) = 12 × 1500 = ₹ 18000

Sol.253.(a) Let total number of voters enrolled = 100x

Voters participated in elections = 98x

Valid votes = 98x − 500

Votes in favour of A = 43% of enrolled voters = 43x

Votes in favour of B = (98x − 500) − 43x

According to question,

43x − [(98x − 500) − 43x] = 200

43x − (98x − 500) + 43x = 200

86x − 98x + 500 = 200

− 12x = − 300 ⇒ x = 25

Total number of voters participated = 98x

= 98 × 25 = 2450

Sol.254.(d)

Ratio → Arjun : Saral : Bhaskar

Votes → 3 : 2

49 : 50

---

147 : 98 : 100

Difference between votes of bhaskar and saral = 100 − 98 = 2 units = 1296 votes

1 unit = 648 votes

Half of difference between votes of Arjun and Bhaskar =

($\frac{147-100}{2}$) × 648 = (23.5) × 648

= 15228 votes

Sol.255.(d) Tax paid by Suhani

= 90000 × $\frac{30}{100}$ = 27000 Rs.

According to question,

27000 + $\frac{2y}{5}$ = $\frac{37}{100}$ × (90000 + y)

135000 + 2y = (166500 + $\frac{37y}{20}$)

$\frac{3y}{20}$ = 31500 ⇒ y = 210000 Rs.

Sol.256.(d)

Let , total no. of votes in electoral roll = x

According to the question ,

x × $\frac{90}{100}$ × $\frac{85}{100}$ × $\frac{60}{100}$ = 91800

x = $\frac{91800 \times 100 \times 100}{9 \times 85 \times 6}$

x = $\frac{10200 \times 100 \times 20}{17 \times 6}$ ⇒ x = 2,00,000

Sol.257.(d) Total valid votes

= 3,00,000 × $\frac{85}{100}$ × $\frac{90}{100}$ = 2,29,500

Total valid votes secured by Dharam

= 1,37,700

So, required % = $\frac{137700}{229500}$ × 100 = 60%

Sol.258.(a) As we know,

Price × Consumption = Expenditure

According to question,

Ratio → initial : final

Price → 100 : 107

Consumption → 107 : 100

Required % = $\frac{107-100}{107}$ × 100 = 6 $\frac{58}{107}$%

Sol.259.(b)

Let , overall population increase is 5% ,

Then increase in population

= 18000 × 5% = 900

But the actual growth in population

= 19200 − 18000 = 1200

This is because , female population increase by 2% extra

So , female population × 2%

= 1200 − 900 = 300

Female population = 15000 and male population = 3000

Required ratio = male : female = 1 : 5

Sol.260.(d) Let money spent of groceries and clothes be 7x and 5x

According to question,

5x = 18200 Rs.

Total money Spent on groceries and clothes = 18200 × $\frac{12}{5}$ = 43680 Rs.

Her income in january 2022

= 43680 + (43680 × $\frac{22}{78}$) = 56000 Rs.

Her salary in february

= 56000 × $\frac{116}{100}$ = 64960 Rs.

Short tricks :-

% of salary spent on clothing

= 78 × $\frac{5}{12}$ = 32.5%

His salary = $\frac{18200}{32.5}$ × 100 = 56000 ₹

His increased salary = 56000 × $\frac{116}{100}$

= 64960 ₹

Sol.261.(b)

Let total income of a person = 1000 unit

Expenses on goods (25%)

= 1000 × $\frac{25}{100}$ = 250 unit

Remaining money = 750 unit

Furthermore expenses on house rent

(18%) = 750 × $\frac{18}{100}$ = 135 unit

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Remaining money = 750 − 135 = 615 unit
Now, expenses on travel (16%)
$= 615 \times \frac{16}{100} = 98.40$ unit
Remaining money = 615 − 98.40
= 516.60 unit
According to the question,
516.60 unit = ₹861
$\Rightarrow$ 1 unit = $\frac{861}{516.60}$ = ₹ $1.\overline{6}$
Hence, his salary (1000 units)
$= 1.\overline{6} \times 1000 = 1666\frac{2}{3}$

Short trick :-
Let his initial salary be 1000 units , then
Money left with him =
1000 units $\times \frac{3}{4} \times \frac{82}{100} \times \frac{84}{100}$ = 861 Rs.
1000 units = $\frac{861 \times 100 \times 100 \times 4}{3 \times 82 \times 84}$
$= \frac{287 \times 100 \times 100}{82 \times 21} = \frac{350 \times 100}{21}$
$= 1666\frac{2}{3}$ Rs.

Sol.262.(d) Let the total marks in paper A, B and C be 100.
Then, Marks in paper A, B and C = 75, 80 and 60 respectively
According to question,
Weighted on A, B and C = 40%, 50% and 10%
Required%
$= \frac{\left(\frac{75 \times 40}{100}\right) + \left(\frac{80 \times 50}{100}\right) + \left(\frac{60 \times 10}{100}\right)}{100}$
$\times 100 = 76$ %

Sol.263.(a)
Let total number of toffees = x
Then According to the question ,
$\frac{x}{8} = \frac{x}{10} + 10$
$\frac{x}{8} = \frac{x+100}{10} \Rightarrow x = 400$ toffees.
Toffees given to S $= 400 \times \frac{9}{10} \times \frac{7}{20}$
= 126 toffees.

Sol.264.(a)
Monthly income of the family = ₹35000
Monthly expenditure of the family
$= 35000 \times \frac{92}{100}$ = ₹32,200
According to the question,
Let expenditure on the food = 300 unit
Then, expenditure on the health
$= 300 \times \frac{3}{2} = 450$ unit
expenditure on the entertainment
$= 300 \times \frac{1}{3} = 100$ unit
Expenditure on the education
= 450 × 2 = 900 unit
Expenditure on the rent
$= \frac{300 + 450 + 900}{3} = 550$ unit
Total expenditure = 300 + 450 + 100 + 900 + 550 = 2300 unit
2300 unit = ₹ 32,200
$\Rightarrow$ 1 unit = ₹ 14
Hence, expenditure on the education (900 unit) = 900 × 14 = ₹12,600

Sol.265.(a)
Ratio of area owned by them :-
Tarun : Bssab = 11 : 10 and
Tarun : Nakul = 10 : 14
Tarun : Bssab : Nakul = 110 : 100 : 154
According to the question ,
154 units = 2695 sq . feet
Area owned by Besab (100 units)
$= \frac{2695}{154} \times 100 = 1750$ sq . feet

Sol.266.(d) Let the monthly income of the father be 100 units.
Then, Pocket money of both son = 8 units
According to question,
Elder brother savings,
$\frac{8 \times 85}{100} \times \frac{10}{100} = 17$ Rs.
$\Rightarrow$ 0.68 units = 17 Rs.
Monthly income of father
$= 17 \times \frac{100}{0.68} = 2500$ Rs.

Sol.267.(c) Let the price in the beginning be x Rs., then
$x \times \frac{11}{10} \times \frac{9}{10} = 66000$ Rs.
$x = \frac{66000 \times 10 \times 10}{11 \times 9} = \frac{600000}{9}$
= 66666.7 Rs.

Sol.268.(a) Let the fraction be $\frac{a}{b}$
According to question,
$\frac{a \times \frac{112}{100}}{b \times \frac{92}{100}} = \frac{16}{17}$
$\frac{a}{b} = \frac{16 \times 92}{17 \times 112} = \frac{1472}{1904} = \frac{92}{119}$

Sol.269.(b) According to question,
Initial saving of person = 80000 − 45000
= Rs. 35000
Saving of person after increment
$= 80000 \times \frac{116}{100} - 45000 \times \frac{108}{100}$
= Rs. 44200
Required % $= \frac{44200 - 35000}{35000} \times 100$
= 26.29 %

Sol.270.(a) Let , total money he has x Rs ,
Money left after 3rd round = 100 Rs
$x \times \frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} = 100$ Rs
$x = 64 \times 100 = 6400$ Rs.

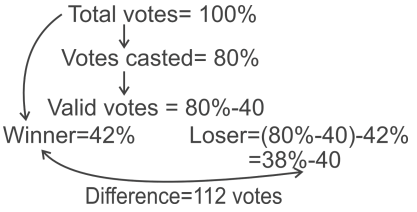
Sol.271.(b) According to question,
Total number of valid votes
$= 8850 \times \frac{90}{100} = 7965$
Required number of votes
$= 7965 \times \frac{40}{100} = 3186$

Sol.272.(d) According to question,
{62 − (100 − 62)}% = 96
24% = 96
Total number of valid votes (100%)
$= 96 \times \frac{100}{24} = 400$
The, total number of vote polled
= 400 + 84 = 484

Sol.273.(a)
Let the monthly income be 160 units.
Expenses on food = 160 × 25% = 40 units
Expenses on home loans = 120 × 35%
= 42 units
Remaining income = 160 − (40 + 42)
= 78 units
His monthly savings $= \frac{78}{2} = 39$ units
39 units $= \frac{\$46215}{12}$
His monthly income (160 units)
$= \frac{\$46215}{12 \times 39} \times 160 = \$15800$

Sol.274.(a) Population in 2023
$= 150000 \times \frac{102}{100} \times \frac{102}{100} \times \frac{102}{100}$
$\approx$ 159181

Sol.275.(c) Gita's total expenses
= (15% + 40% + 10% + 15%) of salary
= 80% of salary
Left amount for EMI = 20% of salary
$= 80000 \times \frac{20}{100} = 16000$ ₹

Sol.276.(c)


According to the question ,
42% − (38% − 40) = 112
4% of total votes = 112 − 40 = 72
Total votes (100%) $= \frac{72}{4} \times 100$
= 1800 votes.

Sol.277.(b)
The value of the mobile after 2 year,
$30000 \times \frac{22}{25} \times \frac{17}{20}$ = ₹ 22440

Sol.278.(a)
A complete the whole work in 300 days
Required % $= \frac{50}{300} \times 100 = 16.67\%$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.279.(c)
Initial amount Manisha has = ₹8000
Final amount Manisha has
$= 8000 \times \frac{11}{10} \times \frac{95}{100}$ = ₹8360
Required % = $\frac{8360 - 8000}{8000} \times 100$
$= \frac{360}{80}$ = 4.5%

Sol.280.(b) According to the question,
Ratio - 5 : 7
Required percentage = $\frac{7-5}{5} \times 100$
= 40%

Sol.281.(c) Ratio - initial : final
Length - 25 : 28
Breadth - 25 : 28
Height - x : y

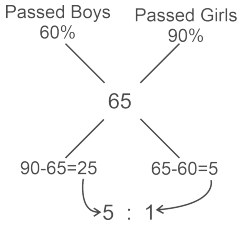
Volume - $625x$: 784y
So ratio of height = $\frac{x}{y} = \frac{784}{625}$
Require percentage = $\frac{784 - 625}{784}$
= 20.28%

Sol.282.(c)
Ratio of price → 4 : 5
Ratio of consumption → 5 : 4
So, decrement in consumption
$= \frac{(5-4)}{5} \times 100 = 20\%$

Sol.283.(c) Let the number be $40x$
Wrong multiplied = $40x \times \frac{8}{5} = 64x$
Right multiplied = $40x \times \frac{5}{8} = 25x$
%error = $\frac{64 - 25}{25} \times 100 = 156\%$

Sol.284.(b) According to the question,
$(7x + 11x + 10x) \times \frac{1}{2} = (3y + 5y + 6y)$
$28x \times \frac{1}{2} = 14y \Rightarrow \frac{x}{y} = \frac{1}{1}$
So the maximum marks will be
= 7, 11, 10
And marks scored by him = 3, 5, 6
We can see that in only one exam he got more than 50% marks.

Sol.285.(b) According to the question,
Let x be the number
$x \times \frac{3}{10} - 60 = 120$
Number $(x) = \frac{180 \times 10}{3} = 600$

Sol.286.(b)


Ratio of boys to girls = 5 : 1
Total boys = $\frac{5}{6} \times 6000 = 5000$

Sol.287.(b)
20% of P + 40% of Q = 80% of Q
$\frac{P}{5} + \frac{2Q}{5} = \frac{4Q}{5} \Rightarrow \frac{P}{Q} = \frac{2}{1}$
Required % = $\frac{2}{1} \times 100 = 200\%$

Sol.288.(b) Let x and y be the smaller and bigger numbers
According to the question,
$x \times \frac{1}{5} = y \times \frac{7}{50} \Rightarrow \frac{x}{y} = \frac{7}{10}$
Sum of the both numbers (17)unit = 8942
⇒ 1 unit = 526
therefore , larger number (10) unit = 5260

Sol.289.(d)
Total vote obtained by party C
= (100 - vote obtained by (A + B))
= (100 - 55) = 45%
According to the question,
Party C got the 9000 more votes than Party A → (45 - 30)% = 9000 ⇒ 1% = 600
Therefore, number of votes party B got (25%) = 600 × 25 = 15,000

Sol.290.(a)
Concept ⇒ consumption $\propto \frac{1}{price}$
Ratio → Initial : Final
Price → 4 : 3
Consumption → 3 : 4
According to the question ,
1 unit = 20 kg
Then, Initial consumptions (3 units) = 60 kg

Sol.291.(b) According to the question,
$P \times \frac{30}{100} = Q \times \frac{15}{100} \Rightarrow \frac{P}{Q} = \frac{1}{2}$
And $Q \times \frac{20}{100} = R \times \frac{10}{100} \Rightarrow \frac{Q}{R} = \frac{1}{2}$
Then, P : Q : R = 1 : 2 : 4
Hence,
R is more than P = $\frac{3}{1} \times 100 = 300\%$

Sol.292.(b) According to the question,
Total vote (100%) = 12000
then,Total valid vote (90%)
$= 12000 \times \frac{90}{100} = 10{,}800$
one candidates got 60% of the total valid votes
Then, second candidates got total valid votes (40%) = $10800 \times \frac{40}{100} = 4320$

Sol.293.(c) According to the question,
Passing marks = (20 % + 25)
Rajiv scored 50% of total marks and get 20 marks more
Then, 50% - 20 = (20 % + 25)
⇒ 30% = 45 → 100% = 150
So, passing marks (20 % + 25)
= (30 + 25) = 55

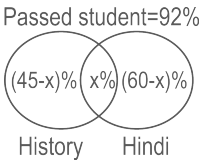
Sol.294.(b)
Student → A B
Marks → $x + 25$ x
According to question,
$\Rightarrow x + 25 = (2x + 25) \times \frac{3}{5}$
$\Rightarrow 6x + 75 = 5x + 125 \Rightarrow x = 50$
So, B = 50 & A = 50 + 25 = 75

Sol.295.(a)
Let nakul's total amount = 100 unit
Remaining money after spending
20% and 25% ⇒ $100 \times \frac{4}{5} \times \frac{3}{4}$ = 60 unit
60 unit → 900
100 unit → 15 × 100 = Rs 1500

Sol.296.(d)
Let , the initial price of apple be x ₹/pc.
No. of apples he buy in 140₹ = $\frac{140}{x}$
Now, Reduced price → $x \times \frac{70}{100} = \frac{7x}{10}$
No. of apples he buy in 140₹ now is
$\Rightarrow \frac{140 \times 10}{7x} = \frac{200}{x}$
According to the question ,
$\frac{200}{x} - \frac{140}{x} = 5 \Rightarrow x = \frac{60}{5}$ = 12 ₹/pc
Reduced price $(\frac{7x}{10}) = \frac{7 \times 12}{10}$ = 8.4 ₹/pc

Sol.297.(c) Price of 2 tables = Rs. 2400
So, price of 8 tables = Rs. 9600
Price of 15 Chairs
$= 9600 + \frac{9600 \times 20}{100}$ = Rs. 11,520

Sol.298.(b) Let numerator = x
Let Denominator = y
According to the question
$\Rightarrow \frac{x \times \frac{12}{5}}{y \times \frac{4}{5}} = \frac{12}{7} \Rightarrow \frac{x}{y} = \frac{4}{7}$

Sol.299.(c)
Student failed in both subject → 8%
So , Total students passed = 92%


Number of student passed in both the subjects →
$(45 - x) + x + (60 - x) = 92 \Rightarrow x = 13\%$

Sol.300.(a) Let the income of Q = 100
Ratio → P : Q
Income → 150 : 100
Expenditure → 48 : 80
Saving → 102 : 20
Saving of P = $\frac{102}{150} \times 100 = 68\%$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.301.(a)
Let the salary of Tilak before 3 year be x.
Therefore,
$x \times \frac{115}{100} \times \frac{80}{100} \times \frac{125}{100} = 23000$
$\Rightarrow$ x = Rs. 20000

Sol.302.(c)
Let the total number of Eggs be 100%
No. of rotten eggs = 12 %
Remaining good eggs = 88 %
According to the question ,
100% = 350 eggs
88% = $\frac{350}{100} \times 88$ = 308 eggs

Sol.303.(b)
Surface area of sphere = $4\pi r^2$
Radius decreased by 48% , then % decreased in surface area
$= 48 + 48 - \frac{48 \times 48}{100}$
$= 96 - \frac{2304}{100} = 72.96\%$

Sol.304.(a)
Votes obtained by winner = 64 %
Votes obtained by loser = 36 %
Winner win by 28 % of the total vote = 434
Total votes polled (100%) = $\frac{434}{28} \times 100$
= 1550 votes

Sol.305.(b)
Income = Expenditure + Saving
Saving = 30 % of 42,000 = 12600 Rs
42000 = Expenditure + 12600
$\Rightarrow$ Expenditure = 29400 Rs

Sol.306.(a)
Let , the Price of scooter = 100 units
Price after 10 % increase= 110 units
Price after another 5 % increase = 115.5 units
Price after another 15 % increase = 132.825 units
Total increase = 132.825 - 100 = 32.825%
= $32\frac{33}{40}\%$

Short Tricks:-
Formula:- Net increase
$= a + b + c + \frac{ab + bc + ca}{100} + \frac{abc}{10000}$
Net increase
$= 10 + 5 + 15 + \frac{50 + 75 + 150}{100} + \frac{750}{10000}$
$= 30 + 2.75 + 0.075 = 32.825\% = 32\frac{33}{40}\%$

Sol.307.(d)
Income=Expenditure + Savings
60 = 50 + 10
+10% +20%
66 = 60 + 6
% change in saving = $\frac{10 - 6}{10} \times 100$
= 40%

Sol.308.(a)
Total votes
100% -5%(invalid)
95% total valid vote
Raju Ravi Ashok
30% 32% 95-62=33%
3%=5136 votes
3% = 5136 votes $\Rightarrow$ 100% = 171200
Then , total number of votes polled = 171200

Sol.309.(c) Let, the total no. of votes = 100%
Then , total votes cast = 100% - 8% = 92%
Now winner got 48% of total votes = 48 %
Then , defeated candidates got total votes = 92% - 48% = 44%
Difference between winner and defeated candidates = 4% → 1100 votes
Total no. of voters = 100% → 27500

Sol.310.(a)
Let, the total no. votes = 100%
Then, total votes cast= 100% - 12% = 88%
Now winner got 68% of total votes
Then , defeated candidates got votes = 88% - 68% = 20%
Difference between winner and defeated candidates = 48% → 2880 votes
Total no. of voters who cast their votes = 88% → 5280 Votes

Sol.311.(c)
Subject $\Rightarrow$ Maths : physics : chemistry
No. of books $\Rightarrow$ 8 : 5 : 9
New Ratio of no. of books after increase in quantity
$\Rightarrow 8 \times \frac{110}{100} : 5 \times \frac{105}{100} : 9 \times \frac{105}{100}$
= 176 : 105 : 189

Sol.312.(b)
Let,ram has initially 32 units Rs. ,
Then money left after losing $12\frac{1}{2}\%$
$= \frac{32 \times 7}{8}$ = 28 unit
Finally , money left after spending 75% of the left money = $28 \times \frac{1}{4}$ = 7 units
According to question ,
7 units = 630 Rs.
$\Rightarrow$ 32 units = 32 × 90 = Rs 2880.

Sol.313.(a)
Income = Expenditure + Saving
26500 = 20500 + 6000
+12% +6%
29680 = 21730 + 7950

Saving increase = (7950 - 6000 = 1950)
Saving increase % = $\frac{1950}{6000} \times 100$ = 32.5%

Sol.314.(c) Let , the population at the beginning of the year = 100%
Net percentage increase
$= +12 - 8 - \frac{12 \times 8}{100} = +3.04\ \%$
Now , population at end of the second year = 103.04%
According to question ,
103.04% = 64400
Then , 100% = 62500

Sol.315.(b) Let the total number of registered voters is 100
Then , P supporters = 70
and Q supporters = 30
According to question ,
Candidates expected to votes for
P $= 70 \times \frac{60}{100} + 30 \times \frac{30}{100}$ = 51%
Hence 51% of the registered voters are expected to vote for candidate P.

Sol.316.(b) Concepts:-
Expenditure = price × consumption
When expenditure is constant , then the ratio of price is inversely proportional to the ratio of consumption.
Price $\Rightarrow$ 25 : 32
Consumption $\Rightarrow$ 32 : 25
Decreased % = $\frac{32 - 25}{32} \times 100$ = 21.88%

Sol.317.(b) Let the total number of inhabitants initially be x.
20% died, remaining inhabitants = $\frac{80}{100}x$
30% of them left the village,
$\frac{30}{100} \times \frac{80}{100}x$
Now, remaining inhabitants
$= \frac{80}{100}x - \frac{30}{100} \times \frac{80}{100}x$
$\frac{80}{100}x - \frac{30}{100} \times \frac{80}{100}x = 12000$
$\Rightarrow \frac{56}{100}x = 12000 \Rightarrow x = 21428$
So, the total number of inhabitants initially was 21,428.

Sol.318.(b) Let total votes = 100 units
2nd runner up got = 20 units
The difference between the votes of the winner and the first runner up is 20% of the total votes.
Let x be the winner , y be first runner up and z be second runner up.
According to question,
$x - y = z \Rightarrow x = y + z$
$x + y + z = 100\ units$
$2x = 100 \Rightarrow x = 50$
x = 50 , y = 30 and z = 20
10 units → $37,000$
Then, 50 units → $1,85,000$
Hence, the winner got 1,85,000 votes.

Sol.319.(b) Let the population at the beginning of the first year be x

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

According to question,

$x \times \frac{19}{20} \times \frac{19}{20} \times \frac{21}{20}$ = 9,47,625

$x \times \frac{7581}{8000}$ = 9,47,625

$x = \frac{9,47,625 \times 8000}{7581}$ = 10,00,000

Sol.320.(a) Let the no of votes got by Q be 100 unit

Then, no. of votes got by P = 100 × 135% = 135 unit

And, the no of votes got by R = 100 × 115% = 115 unit

Total no of votes got by 3 candidates = 100 + 135 + 115 = 350 unit

According to question,

(135 - 115) = 20 unit → 2,412

Then, 350 unit corresponds to

$\frac{2412}{20}$ × 350 = 42,210

Now, 90% of the voters voted. So, the required no of votes = 42,210 × $\frac{10}{9}$

= 46,900

Sol.321.(a)

Let the total no of voters be 100x

Total no of valid votes = 85x - 100

No of votes secured by winner = 45x

No of votes secured by loser = 85x - 100 - 45x = (40x - 100)

According to question,

45x - (40x - 100) = 400

5x + 100 = 400 ⇒ 5x = 300 ⇒ x = 60

So, the total no of votes = 100x = 60 × 100 = 6000

Sol.322.(d) Let original number be 100

Then, another number = 100 × $\frac{4}{5}$ = 80

and, the third number = 80 × 3 = 240

Now, the difference of the 3rd number and original number = 240 - 100 = 140

and, the difference of second and third number = 240 - 80 = 160

Required percentage = $\frac{160 - 140}{160}$ × 100

= $\frac{20}{160}$ × 100 = 12.5% less

Sol.323.(d) Let the percentage increase in his saving be x

According to question,

16,500 × 25% = 10,500 ×19% + 6,000 × x%

4125 = 1995 + 60x

2130 = 60x ⇒ x = $\frac{2130}{60}$ = 35.5%

Sol.324.(a) Let the no of people on the voter list be x

No of votes got by winner = 54%

No of votes got by loser = 46%

According to question,

$x \times \frac{9}{10} \times \frac{9}{10}$ × (54 - 46)% = 1620

$x \times \frac{81}{100} \times \frac{8}{100}$ = 1620

$x = \frac{1620 \times 100 \times 100}{648}$ = 25,000

The no of people on the voter list= 25,000

Sol.325.(b) Let the initial and final production of AB be a and b respectively

According to question,

a × $\frac{11}{10} \times \frac{61}{50} \times \frac{21}{20}$ = b ⇒ a × $\frac{14091}{10000}$ = b

⇒ $\frac{b}{a} = \frac{14091}{10,000}$

So, the overall percentage change

= $\frac{14091 - 10,000}{10,000}$ × 100

= $\frac{4091}{10,000}$ × 100 = 40.9%

Sol.326.(d)

Let the total number of votes = 100%.

2 % votes are invalid, then valid votes = 98%

And one candidate got 60% of the valid votes = $\frac{60}{100} \times 98$

Total number of votes = 1,50,000

winner candidate got

= $\frac{150000 \times 98 \times 60}{100 \times 100} = 88,200\ votes$

Sol.327.(c) Let the total number of voters enrolled in that election be x

According to the question,

$x \times \frac{85}{100} \times \frac{85}{100} \times \frac{96}{100} = 6936$

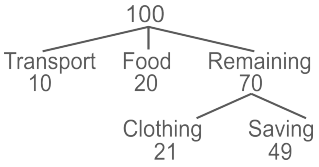
$\Rightarrow x = \frac{6936000000}{85 \times 85 \times 96} = 10,000$

Hence,

the total number of voters is 10,000

Sol.328.(c)

Let the total income of Raju be 100.



According to the question,

49 → ₹26460,

So, total expenditure on food and clothing together = $\frac{(20 + 21) \times 26460}{49}$

= $\frac{41 \times 26460}{49}$ = ₹22,140

Sol.329.(c) Let the total number of voters in an election be 100x

No of votes got by candidate P = 100x × 35% = 35x

Remaining no of votes = 100x - 35 x = 65x

No of votes got by candidate Q = 65x × 50% = 32.5x

According to question,

35x - 32.5x = 1000

2.5x = 1000 ⇒ x = $\frac{1000}{2.5}$ = 400

So, the total number of voters in an election = 400 × 100 = 40,000

Sol.330.(d)

Let the no. of people eligible to vote be x

No. of people between 20 to 25 years who were eligible to vote = $\frac{28x}{100}$

No. of people between 20 to 25 years who actually voted = $\frac{28x}{100} \times \frac{3}{4} = \frac{21x}{100}$

Required percentage = $\frac{21x}{100 \times x}$ ×100 = 21%

Sol.331.(a)

Let the total income of a family be 100x

Savings of a family = 100x × 30% = 30x

Expenditure of a family = 100x - 30x = 70x

According to question,

30x = (70x) × $\frac{1}{2}$ - 600

⇒ 30x = 35x - 600 ⇒ 5x = 600 ⇒ x = 120

So, the expenditure of a family = 120 × 70 = ₹8400

Money spent on education

= $\frac{6}{3 + 5 + 6}$ × 8400

= $\frac{6}{14}$ × 8400 = ₹3600

Sol.332.(c)

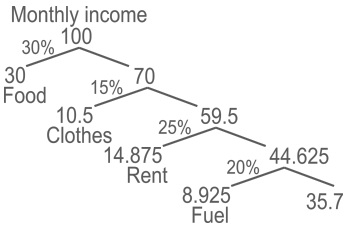
Income		=	Expenditure	+	Saving
Original	130	=	100	+	30
New	117	=	103	+	14

Percentage change in his savings

= $\frac{30 - 14}{30}$ × 100 = $\frac{16}{30}$ × 100

= $\frac{160}{3}$ = 53$\frac{1}{3}$% decrease

Sol.333.(b) Using tree method, we have :



Here, 35.7 unit ---------- ₹5,355

Then, 100 unit ---------- $\frac{5,355}{35.7}$×100

= ₹15,000

Alternate method:- Monthly salary of Ranjeet = 5355 × $\frac{100}{80} \times \frac{100}{75} \times \frac{100}{85}$ × $\frac{100}{70}$ = ₹15,000

Sol.334.(c)

Total number of voters = 80000

Votes polled = 80000 × $\frac{80}{100}$ = 64000

No of votes in the favour of Ram Singh

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= 64000 \times \frac{60}{100} = 38400$

No of votes in the favour of Sohan Lal
= 64000 - 38400 = 25600

Short Tricks:-

No of votes in the favour of Sohan Lal

$= 80000 \times \frac{4}{5} \times \frac{40}{100} = 25600$

Sol.335.(b) Minimum qualifying percentage for category A job = 25%
Minimum qualifying percentage for category B job = 45%
Passing marks for candidate to get a category B job = 83 + 25 = 108
According to question, 45% corresponds to 108
Then, 25% corresponds to $\frac{108}{45} \times 25 = 60$

Sol.336.(a)
Let the population of the city = 100 unit
Numbers of male = 60% of 100 = 60 unit
And numbers of female = 40 unit

Married Male	:	Unmarried Male	Married Female	:	Unmarried Female
5	:	7	2	:	3
12			5		

12 → 60 unit ⇒ 5 → 40 unit
Therefore,
1 → 5 unit ⇒ 1 → 8 unit
So,
Married male (5) → 5 × 5 = 25 unit
married female (2) → 8 × 2 = 16 unit
Then percentage of married population
$\Rightarrow \frac{25+16}{100} \times 100 = 41\%$

Sol.337.(c)
Batsman scored total 120 runs,
he made runs by hitting boundaries
4 sixes and 6 four
⇒ 4 × 6 + 6 × 4 = 48 runs
Runs made by running between wickets
120 - 48 = 72 runs
So,
Percentage of runs made by running between wickets $\frac{72}{120} \times 100 = 60\ \%$

Sol.338.(d) According to the question if 10% female absent and if 8% male absent in both cases remaining employees are the same it means
10% female = 8% male
$\frac{female}{male} = \frac{8}{10} = \frac{4}{5}$
Total 9 units = 900 ⇒Male = 5 units = 500

Sol.339.(a)
Let the average expenses be x
Now according to the question
45x + 30 = 50(x - 2)
45x + 30 = 50x - 100
5x = 130 ⇒ x = 26
Original expenditure = 45x = 45 × 26
= 1,170 Rs

Sol.340.(b) Let Darshan get x marks.
Then, $\frac{120}{100} \times \frac{120}{100} \times \frac{85}{100} \times x = 366$
$x = 299.01$
Darshan percentage
$= \frac{299.01}{500} \times 100 = 59.80\%$

Sol.341.(c) Given 18% people come to accompany their children the park
And 54% people come for running
$\Rightarrow 100 - (18 + 54) = 28\ \%$
people come to walk
⇒ 28 % = 140 ⇒ 1% = 5
⇒ total number of adults in the park are
5 × 100 = 500.

Sol.342.(a) According to the question,
Each student got chocolates
$= 50 \times \frac{16}{100} = 8$
Each teacher got chocolates
$= 50 \times \frac{12}{100} = 6$
Total chocolates = 8 × 50 + 6 × 6 = 436

Sol.343.(b)

Male		Female
20		42.5
	30	
12.5		10

so, actual ratio = 5 : 4
Percentage of female with respect to male $= \frac{4}{5} \times 100 = 80\%$

Sol.344.(a) According to the question
Water $= 15 \times \frac{90}{100} = 13.5$ kg
Solid material = 15-13.5 = 1.5 kg
After presence of sunlight ,
Let reduced weight = x
Solid material percentage = 100 - 85 = 15%
Therefore, $x \times \frac{15}{100} = 1.5$ kg
$\Rightarrow x = 1.5 \times \frac{100}{15} = 10$kg

Sol.345.(b) Let initial money of stark = x
After giving to Bruce remaining money
$= x \times \frac{70}{100}$
After giving to 30% per each Natasha , Captain and Vision remain money
$= x \times \frac{70}{100} \times \frac{10}{100}$
After spending on miscellaneous items remaining money $= x \times \frac{70}{100} \times \frac{10}{100} \times \frac{1}{2}$
According to the question ,
$\Rightarrow x \times \frac{70}{100} \times \frac{10}{100} \times \frac{1}{2} = 14000$
Therefore , $\Rightarrow x =$ ₹400000

Sol.346.(a) If 9% increase in salary of both $= 40{,}000 \times \frac{9}{100} = 3600$
Difference in increment = 4100 - 3600
= 500
500 extra increase due to 2% extra increase in B
2% = 500 ⇒ 100% = 25,000
Salary of A = 40,000 - 25,000 = 15,000

Sol.347.(b)
Let total monthly income is 100 units
Then remaining income after giving 30% to father is 70%
Then remaining income after giving to wife and daughter = 45% of 70%
Now according to the question = 45% of 70% of 100 units = Rs 42000 × 3
$\frac{9}{20} \times \frac{7}{10} \times 100\ units = 126000$
100 units = 4,00,000 Rs i.e (400 thousand)

Sol.348.(d)
Let the no. of student in the class = 100
No. of girls = 70 and No. of boys = 30
No. of girls chose soccer = 70 × 70% = 49
49 units = 98 ⇒ 1 unit = 2
Total Students(100 units) = 2 × 100 = 200

Sol.349.(b)
Let the total no of eligible voters be x
ATQ,
$x \times 80\% \times 95\% \times 75\% = 10545$
$x \times \frac{4}{5} \times \frac{19}{20} \times \frac{3}{4} = 10545$
$x = \frac{10545 \times 100}{19 \times 3} = \frac{55500}{3} = 18500$

Sol.350.(c)
Ratio of students →

Cricket	:	Football	:	Hockey
27	:	13		
		26	:	14
54	:	26	:	14

Total students = 54 + 26 + 14 = 94 units
94 units = 470
Students playing Cricket (54 units) = 270
Required percentage $= \frac{270}{470} \times 100$
= 57.45%

Sol.351.(a)
The total number of votes = 1500
Loser 1 + Loser 2 = winner
(750) = 750
So the votes of winning candidate = 750

Sol.352.(d)
Efficiency of div. 1 = 20 × 20% = 4
Efficiency of div. 2 = 30 × 30% = 9
Efficiency of div. 3 = 40 × 40%= 16
Required percentage
$= \frac{29}{20+30+40} \times 100 = 32.22\% \approx 32\%$

Sol.353.(d) Let the total marks in internal

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

tests , assignments and external exams be 300 , 300 and 400
Now, student scored in internal tests
= 300 × 90% = 270
Student Scored in assignments
= 300 × 95% = 285
Student Scored in external exams
= 400 × 75% = 300
So, the total marks of student
= 270 + 285 + 300 = 855
Overall grade of the student
$= (\frac{855}{300+300+400}) \times 100$
$= \frac{855}{1000} \times 100 = 85.50\%$

Short Trick :-

Ratio of No. →	3	:	3	:	4
% secured →	90%		95%		75%

Overall% = $\frac{270\%+285\%+300\%}{3+3+4}$ = 85.50%

Sol.354.(c) According to question ,
Saving of P and Q are same .
P × 5% = Q × 15%
$\frac{P}{Q} = \frac{15}{5} = \frac{3}{1}$
Salaries of P and Q = 4 units
4 units → ₹120,000
So, the salary of P → 3 unit = ₹90,000

Sol.355.(d) Fractional value → 64% = $\frac{16}{25}$
and 81.25% = $\frac{13}{16}$
Let , the total no of students = 25 units
No. of girls in a class = 16 units
No of girls who have chosen soccer
= 13 units
According to question ,
13 units → 143
Total students (25 units) = 275

Sol.356.(b)
Let the total number of voters be x.
According to question,
$x \times \frac{17}{20} \times \frac{9}{10} \times \frac{55-45}{100} = 6120$
$x \times \frac{1530}{20000} = 6120$
$x = \frac{6120 \times 20000}{1530} = 80000$

Sol.357.(a)
Assignment = 80 × $\frac{28}{100}$ = 22.4
Test = 75 × $\frac{22}{100}$ = 16.5
Exam = 86 × $\frac{50}{100}$ = 43
Total = 22.4 + 16.5 + 43 = 81.9

Sol.358.(a)
Kumar's salary is 100% = 30000 Rs.
Amount spend on food → 25%
Amount spend on education
= 75 × 20% = 15%
Tax Paid → 5%
Total spend = 45% of salary .
He left with 55% of salary = 30000 × 55%
= 16500 Rs.
His savings = 8000 Rs.
Amount available with him after his savings = 8500 Rs.

Sol.359.(b)
Let the total salary = 100 units
Expenditure on food = 100 × $\frac{1}{5}$ = 20 units
Expenditure on charity
= 80 × $\frac{1}{4}$ = 20 units
Savings = 100 - (20 + 20) = 60 units
According to question ,
Half of saving → 30 units = 9600 Rs.
Total salary (100 units) = 32000

Sol.360.(d)
Let the total number of votes be 100y.
According to the question,
40y – 6 = 30y + 6
10y = 12
Total number of votes → 100y = 120

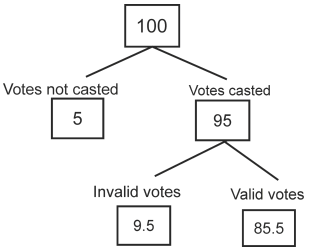
Sol.361.(c)

Ratio →	Boys	:	Girls
Total →	100x	:	100y
Failed →	20x	:	15y
Passed →	80x	:	85y

According to question ,
80x = 85y + 70
80x – 85y = 70 ..... e.q .(1)
Total students failed = 90
20x + 15y = 90 .....e.q .(2)
Solving e.q .(1) and e.q .(2), we get
x = 3 and y = 2
Total number of students who appeared in the exam →
100x + 100y = 300 + 200 = 500

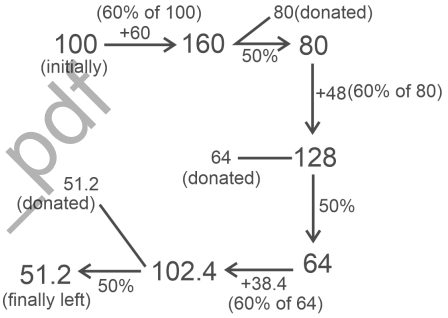
Sol.362.(a)
Fractional value → 87.5% = $\frac{7}{8}$
Total Male = 250 , Total Female = 150
Number of regular employees
⇒ 400 × $\frac{7}{8}$ = 350
Regular male = 250 × 92% = 230
Then Regular female = 350 – 230 = 120
% of regular female employees
⇒ $\frac{120}{150}$ × 100 = 80%

Sol.363.(c) Let total number of registered voters = 100



According to the question,
Winner got 60% of valid votes and the loser got 40% of valid votes.
So, 60% - 40% = 20% which corresponds to 17271 votes.
So, total number of valid votes
$= \frac{17271 \times 100}{20} = 86355$
Now, 86355 corresponds to 85.5, so total number of registered voters
$= \frac{86355 \times 100}{85.5} = 101000$

Sol.364.(b)
Let initially man have 100 units
Now according to the question
He earn 60% and then he donate 50% of his capital and this process repeat 2 more times as shown in below flowchart



He finally left with
51.2 units = 15360 Rs ⇒ 1 unit = 300 Rs
100 units = 100 × 300 = 30,000 Rs

Sol.365. (d)

	A	:	B
Income	4x	:	5x
Expenditure	3y	:	5y
Savings	(4x - 3y)	:	(5x - 5y)

According to the question,
4x = $\frac{90}{100}$ × 5y, ⇒ x : y = 9 : 8
Savings ratio = (4x - 3y) : (5x - 5y)
⇒ (4 × 9 - 3 × 8) : (5 × 9 - 5 × 8)
= 12 : 5
Required percentage
$= \frac{12-5}{5} \times 100 = 140\%$

Short Trick :-

Ratio →	A	:	B
Income →	×9(8	:	10
Expenditure →	6	:	10)×8

Saving of A = (9 × 8) - (8 × 6) = 24
Saving of B = (9 ×10) - (8 ×10) = 10
Required % = $\frac{14}{10}$ × 100 = 140%

Sol.366.(a)
Fractional value of $66\frac{2}{3}\% = \frac{2}{3}$

	Income	=	savings	+	expenditure
Old →	8	=	3	+	5
New →	11.52	=	x	+	8

New Saving → x = 11.52 - 8 = 3.52

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Increased saving → 3.52 - 3 = 0.52 units
0.52 units = 1040 Rs.
1 unit = 2000 Rs.
Initial expenditure (5 units) = 10000 Rs.

Sol.367.(a)
Let the marks of C = 100,
so marks of D = 120,
marks of A = 90 and marks of B = 108

Required answer = $\frac{120-90}{90} \times 100$

= $\frac{30}{90} \times 100 = 33\frac{1}{3}$ %

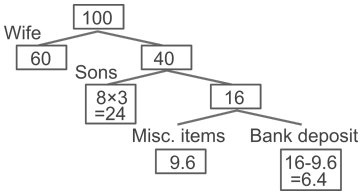
Sol.368.(c) Let the number be 8
So, correct answer = 8 × 8 = 64,

while incorrect answer = $\frac{8}{8}$ = 1

Error in %age = $\frac{64-1}{64} \times 100$

= $\frac{63}{64} \times 100 = 98.44\%$

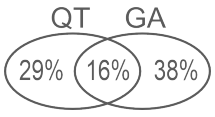
Sol.369.(c)
Let the initial amount = 100 units



Bank deposit (6.4 units) → ₹9,600
1 unit = ₹1500
So, Initial amount (100 units)= ₹1,50,000

Sol.370.(d)
For school A, failed students
→ $\frac{300}{3}$ = 100, so passed students = 200
total students From School (A + B)
= 300 + 480 = 780
Total failed Students = 780 × 40% = 312
So , failed students from school B
= 312 - 100 = 212
Required % of failed student from school B
= $\frac{212}{480} \times 100 = 44\frac{1}{6}\%$

Sol.371. (a) Let total candidates = 100x.
Failed in QT = 45x, Failed in GA = 54x,
Failed in both = 16x
Candidates who passed in both papers →
100x - [F (QT) + F (GA) - F (QT) ∩ F (GA)]
100x - [54x + 45x - 16x]
17x = 136, → x = 8
Total students = 100x = 100 × 8 = 800.
Short Trick :-



Candidates who failed either in QT or GA
= (29 + 16 + 38)% = 83%
Candidates who passed in both subjects
= 17%,
17% →136 ⇒ 100% → 800

Sol.372. (b)

	Expense	=	Consumption	×	Price
Old →	100	=	10	×	10
New →	112	=	y	×	13

So, new consumption → y = $\frac{112}{13}$
% Reduction required in consumption

= $\frac{10 - \frac{112}{13}}{10} \times 100 = \frac{18}{130} \times 100$
= 13.846% ≈ 13.85%

Sol.373.(d) Word → "CONSONANT"
Total letters = 9
Vowels = 3 and Consonants = 6
Percentage of vowels
= $\frac{3}{9} \times 100 = 33.33\%$
Percentage of consonants
= $\frac{6}{9} \times 100 = 66.66$ %

Required% = $\frac{(66.66 - 33.33)}{66.66} \times 100$
= 50%

Sol.374.(d)
Arshad got = 35% of the total votes

Chamanlal got = $\frac{14}{35} \times 100$
= 40% of the total votes
Jagjit got = 25% of the total votes
Difference between the winner and who got least votes = 15% of the total votes

Total votes = $\frac{4950}{15} \times 100 = 33000$

Sol.375.(d) Change in overall percentage
= +15 − 15 − $\frac{225}{100}$ = −2.25%

Fractional value of 2.25% = $\frac{9}{400}$
According to question ,
391 units = 782
Original no. (400 units) = 800
Required number

= 800 × $\frac{75}{100} \times \frac{125}{100} \times \frac{80}{100}$ = 600

Sol.376.(c)

Ratio →	Rural	:	Urban
Students →	4	:	7
% mark →	65	:	63

Overall percentage = $\frac{4 \times 65 + 7 \times 63}{4+7}$
= 63.73%

Sol.377.(a) Let his salary = 1000 units
Remaining amount →

1000 × $\frac{90}{100} \times \frac{80}{100} \times \frac{60}{100} \times \frac{20}{100}$
= 86.4 units
86.4 units = 6480 Rs.
1000 units = 75000 Rs.

Sol.378.(d) Let, the Red balls = 100 units
So, white balls = 160 units
Green balls = 140 units
Total = 100 + 160 + 140 = 400 units
400 units = 120
No. of green balls (140 units) = 42

Sol.379.(a) Population of male = M
Population of females = F
M + F = 15280 ------- e.q .(1)
125% of M + 115% of F = 18428
25 M + 23 F = 368560 ------e.q . (2)
Apply → e.q .(1) × 25 - e.q . (2)
2 F = 13440 ⇒ F = 6720
M = 15280 - 6720 = 8560
Difference = 8560 - 6720 = 1840
Short Trick : -
If both males and females increased by 15% then the population = 17572
But population is 18428 due to 10% extra increase in males population
Difference in population = 18428 - 17572
= 856
10% of male population = 856
Total male population (100%) = 8560
Total female population = 15280 - 8560
= 6720
Difference between males and females
→ 8560 - 6720 = 1840

Sol.380.(a)
Let price of one gram gold = 10000

Price on Monday = $\frac{90}{100}$ × 10000 = 9000

Price on Tuesday = $\frac{120}{100}$ × 9000 = 10800

Price on Wednesday = $\frac{108}{100}$ × 10800
= 11664

Price on Thursday = $\frac{105}{100}$ × 11664
= 12247.2
12247.2 units → 5511.24 Rs.
10000 units → 4500 Rs.

Sol.381.(c) Veena scored in theory
= 180 × $\frac{75}{100} \times \frac{60}{100}$ = 81
Total marks scored by Veena
= 180 × $\frac{62}{100}$ = 111.6
Project total marks in exams
= 180 × $\frac{25}{100}$ = 45
Marks needed = 111.6 - 81= 30.6

Marks % = $\frac{30.6}{45} \times 100 = 68\%$

Short Trick :-
To score overall 62% , veena has to score 62% in theory as well as in practical .
But , Veena scored only 60% in theory .
Total mark of Theory = 135
Total mark of Practical = 45
% mark needed in practical to score overall 62% = 62% + $\frac{135 \times 2\%}{45}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

= 62% + 6% = 68%

Sol.382.(c) Let, income = 100 units and
Expenditure = 35 units
New income = 130 units
New expenditure unchanged = 35 units
Percentage = $\frac{35}{130} \times 100$ = 26.92
Difference = 35 – 26.92 = 8.08
Required percentage = $\frac{8.08}{35} \times 100$ = 23%

Sol.383.(a) Fractional value → 5% = $\frac{1}{20}$
Ratio of amount at the end of →

1st	:	2nd	:	3rd
20	:	21		
		20	:	21
400	:	420	:	441

According to the question ,
Difference b/w amount at the end of 2nd and 3rd years (441- 420) units → 52.5 Rs.
1 unit = 2.5 Rs.
Amount at the end of 1st year (400 units) = 1000 Rs.

Sol.384.(c) According to the question
110 ($\frac{100-x}{100}$) = 50 ($\frac{100+x}{100}$)
Solving the equation
We get, x = 37.5%
x% of 650 = $\frac{37.5}{100} \times 650$ = 243.75
(x + 20) % of 180 = $\frac{57.5}{100} \times 180$ = 103.5
Required percentage increase
= $\frac{243.75 - 103.5}{103.5} \times 100$
= $\frac{140.25}{103.50} \times 100$ = 135.50% ≈ 136%

Sol.385.(b)
Let the area of the square = 100 units
Side = 10 units, Diagonal = $10\sqrt{2}$ units
After decrement
area = 81 units , Side = 9 units
diagonal = $9\sqrt{2}$units
Ratio of diagonals = $10\sqrt{2}$: $9\sqrt{2}$ = 10 : 9
Change in diagonal = 1 unit
Percentage change = 10%

Sol.386.(b) Total income = 75,000
E = 60% of the income = 45,000
T = 20% of E = 9,000
C = 15% of T = 1,350
Saving =
75,000 - (45,000 + 9,000 + 1,350)= 19,650
After increment
New income =1,05,000
E = 60% of the income = 63,000
T = 30% of E = 18,900
C = 20% of T = 3,780
His saving now
→ 1,05000 -(63,000 + 18,900 + 3,780)
= 19320
Ratio of saving = 19,650 : 19,320
= 655 : 644

Sol.387.(a) According to the question
110($\frac{100-x}{100}$) = 50($\frac{100+x}{100}$)
Solving the equation
We get, x = 37.5%
x% of 650 = $\frac{37.5}{100} \times 650$ = 243.75
(x - 10) % of 780 = $\frac{27.5}{100} \times 780$ = 214.5
Required percentage
= $\frac{243.75 - 214.5}{214.5} \times 100$ = 13.64 ≈ 14%

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Profit and Loss

1. Profit incurs when SP (selling price) is more than CP (cost price).
2. Profit = SP – CP
3. Loss incurs when CP is more than SP i.e. Loss = CP – SP
4. % Profit = $\frac{Profit}{CP} \times 100$
5. % Loss = $\frac{loss}{CP} \times 100$
6. Profit or Loss is always calculated on cost price.
7. $SP = CP \times \frac{100 \pm profit\ /\ loss\ \%}{100}$
8. $CP = SP \times \frac{100}{100 \pm profit/loss\ \%}$
Note: In case of profit you must add and in case of loss subtract in above two formulas.
9. When instead of amount, number of goods sold are given then,
Percentage profit
$= \frac{Remaining\ Goods}{Goods\ sold} \times 100$
10. When two products are sold at same selling price, one at a loss of x% and other at a profit of x% then net result is always loss, which is equal to :
Net result = $(\frac{x^2}{100})$%
11. When two products are sold at same selling price, one at a loss/profit of x% and other at a loss/profit of y% then net result is equal to :
Net result = $\{\frac{100(x+y)+2xy}{200+x+y}\}$%
Note :- Take +ve sign → Profit and -ve sign → Loss
12. Marked Price - Discount = Selling Price
13. Discount is always calculated on Marked price. So, Discount %
$= \frac{Discount}{Marked\ price} \times 100$
14. In case of Trade Discount and Cash Discount, first deduct the Trade Discount and then calculate the Cash Discount on the remaining amount.
15. If a trader profess to sell goods at cost price but uses false weights, then Profit percentage
$= \frac{Error}{True\ value - Error} \times 100,$
where Error = True value - False value
16. $\frac{CP}{MP} = \frac{100 - Discount\ \%}{100 \pm profit\ /\ loss\ \%}$

Variety Questions

Q.1. A refrigerator manufacturer earns a profit of 15% by selling each refrigerator for Rs. 17,250. If the cost of production increases by 18%, then What should be the selling price of the refrigerator to earn a profit of 18% ?
SSC MTS 22/10/2024 (Morning)
(a) ₹ 20,886 (b) ₹ 34,086
(c) ₹ 19,094 (d) ₹ 21,032

Q.2. A shopkeeper has a fault of 100 g in a 3 kg weight. He sold 3 kg of potatoes to Charu using the same faulty weight for ₹46. The cost price of the potatoes for the seller was ₹12 per kg. How much profit (in₹) did he earn on the potatoes ?
SSC CGL 26/09/2024 (3rd Shift)
(a) 11.6 (b) 10.2 (c) 11.2 (d) 10

Q.3. If books bought at prices ranging from ₹200 to ₹260 are sold at prices ranging from ₹250 to 300, what is the greatest possible profit that might be made in selling 25 books?
SSC CGL 26/09/2024 (1st Shift)
(a) ₹2,300 (b) ₹2,500
(c) ₹1,800 (d) ₹2,700

Q.4. A vendor started selling vegetables at ₹10 per kg, but couldn't find buyers at this rate. So he reduced the price to ₹7.2 per kg, but uses a faulty weight of 900 g instead of 1 kg. Find the percentage change in the actual price.
SSC CGL 19/09/2024 (1st Shift)
(a) 10% (b) 15% (c) 20% (d) 25%

Q.5. A seller sold 19 cookies for ₹95 instead of 20 cookies in one kg, cheating a customer. What is the gain (in ₹) if the seller bought the cookies for ₹76?
SSC CGL 18/09/2024 (3rd Shift)
(a) 28.2 (b) 26.2 (c) 22.8 (d) 25.8

Q.6. If a shopkeeper sells sugar at ₹44.8 per kg, he is able to make a 12% profit. Due to water seepage, $\frac{1}{5}$ of the sugar is damaged. What should now be the selling price per kg of the rest of the sugar to have a 5% profit?
SSC CGL 17/09/2024 (1st Shift)
(a) ₹49.5 (b) ₹52.5 (c) ₹48.5 (d) ₹51.8

Q.7. By selling 30 metres of cloth a shopkeeper makes a profit equivalent to the selling price of 10 metres of cloth. Find the selling price of 1 metre of cloth when the cost price of 1 metre of cloth is ₹480.
SSC CHSL 03/07/2024 (3rd Shift)
(a) ₹520 (b) ₹960 (c) ₹720 (d) ₹820

Q.8. A reduction of 7.5% in the cost price of a commodity enables a shopkeeper to purchase 15 kg more than what he previously purchased for a sum of ₹7,400. In order to make a profit of 32.5% on the pre-reduction cost price of the commodity, at what price (in ₹) per kg should the commodity be sold ?
SSC CPO 28/06/2024 (1st Shift)
(a) 54 (b) 53 (c) 52 (d) 51

Q.9. Ramanna purchased raw materials for a certain price to manufacture a product. However, owing to shortage of labour, 22.5% of the raw materials could not be utilised and got wasted. 80% of the cost of raw materials used was added as the cost of manufacturing. If Ramanna could sell his product at a price to earn an overall profit of 20% after offering a discount of 20%, how many times of the total cost of the raw materials purchased was the marked price of the product ?
SSC CPO 27/06/2024 (1st Shift)
(a) 2.44 times (b) 2.42 times
(c) 2.43 times (d) 2.40 times

Q.10. During the lockdown, a state government gives 4.5 kg of rice to each person of a family at a cost price of ₹40 per kg. But the distributor uses false weight of 3.75 kg instead of 4.5 kg and distributes the rice. The accumulated rice was sold in the black market at double the price. He showed the government that he distributed 2700 kg of rice. When caught, he was made to pay a fine of 125% of what he earned in the black market. What was his fine amount?
Higher Secondary 26/06/2024 (Shift - 2)
(a) ₹45,000 (b) ₹54,000
(c) ₹28,000 (d) ₹36,000

Q.11. A shopkeeper claims to sell 450 kg rice at a cost price of ₹40 per kg but uses a weight of 900 grams instead of a one kilogram weight. He makes a profit of ₹2,520 by selling the remaining rice in the black market. The ratio of the black-market price to the original price per kg of rice is:
Higher Secondary 25/06/2024 (Shift - 2)
(a) 7 : 5 (b) 10 : 7 (c) 9 : 4 (d) 4 : 3

Q.12. A person bought bananas at 6 for ₹12 and sold them at 8 for ₹10. Find his gain or loss percentage ?
Matriculation Level 25/06/2024 (Shift - 1)
(a) 3.75% gain (b) 37.5% loss
(c) 375% gain (d) 0.375% loss

Q.13. A sells a watch to B at a profit of 33% and B sells it to C at a loss of 20%. If C pays ₹532, then what was the cost price for A?
SSC CHSL Tier II 10/01/2024
(a) ₹500 (b) ₹800 (c) ₹400 (d) ₹600

Q.14. B purchased 15 kg apples at the rate of ₹180 per kg from a wholesaler

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

who uses a weight of 950 grams for the kg weight. B sold all these apples at ₹180 per kg but used a weight of 750 grams for the kg weight. Find the percentage profit earned by B in the transaction (correct to 2 places of decimal).
SSC CGL Tier II (26/10/2023)
(a) 22.55% (b) 25.75%
(c) 33.33% (d) 26.67%

Q.15. Aditya sold article X at a profit of 23% and article Y at a loss of 13%. He earned a profit of ₹180 in the entire transaction. If article X costs ₹90 less than article Y, then what is the price of article Y (in ₹)?
SSC CPO 03/10/2023 (3rd Shift)
(a) 2,007 (b) 2,050 (c) 2,100 (d) 2,020

Q.16. A company buys raw materials for ₹10,000 and manufactures a product that costs an additional ₹5,000 in labour and overhead. The product is sold to a distributor for ₹25,000, who marks it up by 20% and sells it to a retailer. The retailer then marks it up by another 25% and sells it to the end customer. What is the overall percentage profit made by the company, distributor, and retailer combined ?
SSC MTS 11/09/2023 (3rd Shift)
(a) 100% (b) 150% (c) 125% (d) 135%

Q.17. By selling a TV set for ₹16,800, a salesman gains a profit of 20%. If the production cost is increased by 20%, find the new selling price of the set so as to gain 20%.
SSC MTS 04/09/2023 (1st Shift)
(a) ₹18,160 (b) ₹18,480
(c) ₹20,160 (d) ₹20,480

Q.18. Arun brought 50 kg of rice at a discount of 15% on the marked price. For purchasing bulk quantity, he was given 5 kg of wheat (the marked price of which was 60% the marked price of rice) free of cost. Had the retailer sold both items at their marked price to his other customers, then approximately what would be the profit percentage that the shopkeeper could earn ?
SSC CHSL 14/08/2023 (1st Shift)
(a) 24.7% (b) 25.2% (c) 22.8% (d) 23.5%

Q.19. A fruit seller buys 480 bananas for ₹1,200. Some of these bananas are rotten and hence, they are thrown away. He sells the remaining bananas at ₹3.5 each and makes a profit of ₹396. What is the percentage of bananas thrown away?
SSC CHSL 11/08/2023 (4th Shift)
(a) 6% (b) 4.5 % (c) 5 % (d) 4 %

Q.20. A tailor buys lining clothes from a wholesale merchant and cheats him by using a measurement tape which is 5 cm longer than the normal tape. The tailor offers the customers at cost price while stitching different garments and uses measurements tape which is 5 cm shorter than the normal tape. The gain percent is:
SSC CHSL 03/08/2023 (3rd Shift)
(a) 15% (b) $10\frac{10}{25}$% (c) 10% (d) $10\frac{10}{19}$%

Q.21. Rini has mixed two colours 'C_1' and 'C_2' in the ratio 2 : 3. If the rate of the colour 'C_1' is ₹500 per unit and she is selling the mixture of the two colours at ₹650 per unit at breakeven price, then what is the rate (in ₹) per unit of the second colour, that is, 'C_2'?
SSC CGL 27/07/2023 (1st shift)
(a) 750 (b) 725 (c) 760 (d) 765

Q.22. A shopkeeper purchased 1600 mangos at the rate of ₹120 per dozen. Out of these, he sold 900 mangoes at ₹15 per mango and the remaining mangoes at ₹14 per mango. His gain percentage is:
SSC CGL 25/07/2023 (4th shift)
(a) 45.625% (b) 38.265%
(c) 35.625% (d) 48.765%

Q.23. A shopkeeper bought a certain number of apples for Rs.3,600. He sold one - fifth of them at a loss of 10%, one-fourth of the remaining apples at a loss of 5%, and two-third of the rest at a profit of 15%. At what price (in Rs.) should he sell the remaining apples to earn a profit of 27% overall?
SSC CGL 25/07/2023 (1st shift)
(a) 1,548 (b) 1,584 (c) 1,845 (d) 1,864

Q.24. A retailer announces a discount of 30% for selling an air-conditioner marked at ₹92,000. The cost price of the air-conditioner is 70% below the marked price. He offers a further discount of 20% if the buyer presents his membership card of the retailer's store. The profit of the retailer with the membership card scheme is what percentage of the profit of the retailer without the membership card scheme?
SSC CGL 20/07/2023 (3rd shift)
(a) 62% (b) 65% (c) 70% (d) 74%

Q.25. A shopkeeper is incurring a loss of cost price of 4 pens while selling 20 pens to Ajay. If the shopkeeper had purchased 20 pens at 10% less price and had sold 20 pens to Ajay at 25% more than the selling price, then how much percentage would he have gained (rounded off to 1 decimal place)?
Graduate Level 28/06/2023 (Shift - 3)
(a) 8.0 (b) 11.1 (c) 10.0 (d) 12.5

Q.26. Ten refrigerators and four mobile phones together cost ₹2,10,000 while six refrigerators and two mobile phones together cost ₹1,22,000. The cost (in ₹) of one refrigerator and two mobile phones is:
SSC CHSL Tier II (26/06/2023)
(a) 37000 (b) 35200
(c) 34500 (d) 36000

Q.27. Mukesh sells two shirts. The cost price of the first shirt is equal to the selling price of the second shirt. The first shirt is sold at a profit of 20% and the second shirt is sold at a loss of 20%. What is the ratio of the selling price of the first shirt to the cost price of the second shirt?
SSC MTS 19/06/2023 (Afternoon)
(a) 18 : 25 (b) 97 : 100
(c) 24 : 25 (d) 27 : 50

Q.28. Kapil bought 100 frocks at the rate of ₹320 per frock. Transport expenditure was ₹ 1000. He paid a tax of ₹1.50 per frock and the labor fee was ₹500. What should be the selling price per frock if she wants to make a profit of 10%?
SSC MTS 18/07/2022 (Morning)
(a) ₹385.45 (b) ₹370.15
(c) ₹390.80 (d) ₹336.50

Q.29. Akshay has 30 articles, each having the same cost price. He marked the price of each article at 30% above its cost price. He sold 15 of the articles at a discount of 20% each and the remaining 15 articles at a discount of 10% each, thereby gaining a total profit of ₹630. What was the cost price of each article?
SSC MTS 12/07/2022 (Morning)
(a) ₹ 240 (b) ₹ 180 (c) ₹ 280 (d) ₹ 200

Q.30. A dishonest dealer is selling sugar at Rs. 40 per kg and pretending that he is selling it at a loss of Rs. 5 per kg but he actually gives 800g instead of 1 kg, using a faulty weight. What is his actual profit or loss percent?
SSC CHSL 06/06/2022 (Afternoon)
(a) Gain, 11% (b) Gain, $11\frac{1}{9}$%
(c) Loss. $10\frac{1}{9}$% (d) Loss, $9\frac{1}{9}$%

Q.31. A woman sold her earphone for Rs. 2,000 and got a percentage profit equal to the numerical value of cost price. The cost price of the earphone is:
SSC CHSL 03/06/2022 (Morning)
(a) Rs. 500 (b) Rs. 200
(c) Rs. 600 (d) Rs. 400

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.32. A manufacturer sells an item to a wholesale dealer at a profit of 11%. The wholesaler sells the same to a retailer at a profit of 15%. The retailer in turn sells it to a customer for ₹17,045, thereby earning a profit of 19%. The cost price of the manufacturer is (consider integral part only) :
SSC CHSL 26/05/2022 (Evening)
(a) ₹13,520 (b) ₹15,020
(c) ₹10,200 (d) ₹11,220

Q.33. Aditya sells two wrist watches from his personal collection for ₹12,600 each. On the first watch he gains 26% and on the second he loses 10%. Find the overall loss or profit percentage?
SSC CGL 12/04/2022 (Evening)
(a) Gain of 16% (b) Gain of 5%
(c) Loss of 5% (d) Gain of 12%

Q.34. Sushant buys goods worth Rs.8000. He gets a discount of 10% on that article. After getting the exemption, he pays tax at the rate of 7.5%. Find the amount he will have to pay for this goods received at his residence, if the shopkeeper charges Rs.200 for home delivery.
SSC MTS 02/11/2021 (Morning)
(a) Rs.7940 (b) Rs.8155
(c) Rs.9660 (d) Rs.6851

Q.35. The difference between the selling prices of some apples, if sold for ₹12 per apple instead of ₹9 per apple, is ₹870. If total cost price of all the apples is ₹2,320, then find the selling price of one apple if the profit earned is 25%
SSC MTS 22/10/2021 (Afternoon)
(a) ₹15 (b) ₹10 (c) ₹12 (d) ₹8

Q.36. Joseph bought two woollen jackets for Rs. 2100 and Rs. 3150 respectively. By selling the first at a gain of k% and the second at a loss of k%, he found the selling price of both is the same. What is the value of k?
SSC CHSL 06/08/2021 (Morning)
(a) 20 (b) 22.64 (c) 15 (d) 25

Q.37. When an article is sold for Rs.720, there is a profit of x%. When the same article is sold for Rs.750, profit is (x + 5) %. What is the value of x ?
SSC CHSL 21/10/2020 (Morning)
(a) 20 (b) 18 (c) 25 (d) 1

Q.38. 35% of goods were sold at a profit of 65%, while the remaining were sold at x% loss. If the overall loss is 12%, then what is the value of x? (correct to one decimal place)
SSC CGL Tier II (13/09/2019)
(a) 51.8 (b) 50.6 (c) 53.5 (d) 52.4

Q.39. How many kg of salt costing Rs. 28 per kg must be mixed with 6.6 kg of salt costing Rs. 16 per kg, so that selling the mixture at Rs. 29.90, there is a gain of 15%?
SSC CGL Tier II (13/09/2019)
(a) 33 (b) 31 (c) 35 (d) 32

Q.40. By selling two articles for Rs 800, a person gains the cost price of three articles. The profit percent is:
SSC CGL Tier II (12/09/2019)
(a) 125 (b) 140 (c) 120 (d) 150

Q.41. An article is sold at a certain price. If it is sold at $33\frac{1}{3}$% of this price, there is a loss of $33\frac{1}{3}$%. What is the percentage profit when it is sold at 60% of the original selling price?
SSC CGL Tier II (11/09/2019)
(a) 20 (b) 30 (c) $33\frac{1}{3}$ (d) $17\frac{1}{3}$

Q.42. Sujata sold 25 articles for Rs. 1250 and she incurred a loss of 10%. How many articles should she sell for Rs. 2600 so that she can get a profit of 17% ?
SSC MTS 20/08/2019 (Morning)
(a) 26 (b) 40 (c) 25 (d)42

Q.43. The sum of cost prices of A and B is Rs. 1200. The sum of the selling prices of A and B is Rs. 1390. If the profit of 10% and 20% is obtained on A and B respectively, then find the ratio between the cost prices of A and B.
SSC MTS 19/08/2019 (Afternoon)
(a) 5 : 7 (b) 5 : 9 (c) 7 : 13 (d) 6 : 11

Q.44. A shopkeeper earns the same percent of profit as well as loss by selling two similar pieces of furniture for Rs 18000 and Rs 10000, respectively. At what price should he sell it to earn a profit of 50%?
SSC MTS 14/08/2019 (Afternoon)
(a) Rs 21,000 (b) Rs 20,250
(c) Rs 21,750 (d) Rs 19,500

Q.45. A shopkeeper gains 400% on a transaction. If the cost increases by 100% and there is no change in the selling price, then find the ratio between new profit and selling price.
SSC MTS 14/08/2019 (Morning)
(a) 1 : 3 (b) 2 : 5 (c) 3 : 5 (d) 1 : 2

Q.46. Parikh sold his pen at a profit of Rs 11. He calculated the profit percentage on selling price and found it to be 25%. the cost price (in Rs) of the pen is:
SSC MTS 13/08/2019 (Afternoon)
(a) 33 (b) 24 (c) 36 (d) 44

Q.47. If 20% of the goods are sold at 50% profit, 40% of the goods at 20% loss, 20% of the goods at 5% loss and the remaining at no loss or no profit, then the overall profit percentage is:
SSC MTS 09/08/2019 (Afternoon)
(a) 5% (b) 8% (c) 4% (d) 1%

Q.48. Two articles were sold for Rs 2400 each by a shopkeeper. The shopkeeper incurred no profit and no loss on the whole transaction. If one of the two articles sold at a profit of 20%, then what was the loss incurred on the other article?
SSC MTS 07/08/2019 (Afternoon)
(a) 600 (b) 400 (c) 380 (d) 240

Q.49. P sold an article to Q at a profit of 20%. Q sold the same article to R at a loss of 25%. R sold the same article to T at a profit of 50%. If P bought the article at Rs 100, then at what price did T buy that article?
SSC MTS 06/08/2019 (Evening)
(a) 145 (b) 125 (c)115 (d) 135

Q.50. A sold an article on 15% profit for Rs. 1495. He purchased another article whose cost price was equal to that of the first article. He sold this new article at 10% profit. What is the total profit of A ?
SSC MTS 05/08/2019 (Afternoon)
(a) 325 (b) 450 (c) 375 (d) 425

Q.51. The cost prices of article A and article B are Rs. 1200 and Rs. 1600 respectively. The selling price of article A is Rs. 1380 and the total profit after selling both the articles is 25%. What is the profit percentage on the article B ?
SSC MTS 05/08/2019 (Afternoon)
(a) 27.5 (b) 32.5 (c) 29.5 (d) 35.5

Q.52. An article is sold for Rs 6500 so as to earn a profit of 4%. A second article whose cost price is Rs 3750, is sold at a loss of 4%. What is the overall gain or loss percent in the whole transaction?
SSC MTS 05/08/2019 (Morning)
(a) Gain 45% (b) Loss 1%
(c) Loss 4% (d) Gain 1%

Q.53. A man bought three articles for Rs 3,000 each. He sold the articles respectively at 10% profit, 5% profit and 15% loss. The total percentage profit/loss he earned is:
SSC CHSL 08/07/2019 (Evening)
(a) 10% loss (b) 5% loss
(c) 5% profit (d) No profit no loss

Q.54. A person sells an article at a profit of 12%. If he had purchased it for 12% less and sold it for Rs.9 less, he would have gained 27%. What is the original cost price of the article?

Search on TG @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 07/06/2019 (Evening)
(a) 4,250 (b) 4,000 (c) 4,500 (d) 3,750

Q.55. Sushma bought 6 tables and 12 chairs for Rs.12000. She sold the tables at a profit of 15% and the chairs at a loss of 10%. If her total gain was 300, then the total cost of the tables was:
SSC CGL 07/06/2019 (Morning)
(a) 6000 (b) 5000 (c) 5400 (d) 4800

Q.56. Abhi bought two articles for Rs.624. He sold one at a loss of 14% and the other at a profit of 14%. If the selling price of both the articles is equal, then the difference between their cost prices (in Rs) is:
SSC CGL 06/06/2019 (Afternoon)
(a) 89.64 (b) 87.36 (c) 89.68 (d) 88.84

Q.57. The marked price of an article is Rs. 315. It is sold for Rs. 288. If there is a loss of 4%, then by what percent above the cost is the article marked?
SSC CGL 04/06/2019 (Afternoon)
(a) 5 (b) 8 (c) $6\frac{1}{2}$ (d) $5\frac{1}{2}$

Q.58. A person sold an article at a loss of 15%. Had he sold it for Rs. 30.60 more, he would have gained 9%. To gain 10%, he should have sold it for:
SSC CGL 04/06/2019 (Morning)
(a) Rs. 140.25 (b) Rs. 132
(c) Rs. 130 (d) Rs. 128.40

Q.59. A bought 38 kg. Rice at Rs. 54.50/kg, 45 Kg rice at Rs. 62/kg, and 55 kg rice at Rs. 48/kg . He sold the mixture at Rs. 65/kg. His loss or profit percentage is:
SSC CPO 16/03/2019 (Morning)
(a) Loss 1.04 (b) Loss 1.7
(c) Profit 19.6 (d) Profit 16.8

Q.60. Three partners A, B and C share profit and losses in the ratio 3 : 4 : 7 If the profit for the year before charging 30% tax is Rs. 1,10,166 What is B's share of profit after tax?
SSC CPO 16/03/2019 (Morning)
(a) Rs.9442.80 (b) Rs.31476
(c) Rs.22033.20 (d) Rs.24673.10

Q.61. A cyclist sells 3 cycles at the loss of Rs. 129 per bicycle and 12 cycles on the profit of 516 per cycle. If the total profit on all the bicycles sold is 15%, then what will be the cost per cycle?
SSC CPO 14/03/2019 (Evening)
(a) 2960 (b) 3870 (c) 2580 (d) 4440

Q.62. A manufacturer sells the product to a wholesaler at 6% profit, the wholesaler sells the product to a retailer at 8% profit and the retailer sells the product to his customer at 10% profit. The price paid by the customer is Rs 31,482. The cost of the product to the manufacturer is:
SSC CPO 14/03/2019 (Morning)
(a) 28,306 (b) 26,524
(c) 25,000 (d) 26,980

Practice Questions

SSC CHSL 2024 Tier - 2

Q.63. Sandeep made a profit of 22% when he sold an overcoat for 8,540. Find the cost price of the overcoat.
SSC CHSL Tier II (18/11/2024)
(a) ₹ 7,500 (b) ₹ 7,000
(c) ₹ 6,000 (d) ₹ 6,500

SSC MTS 2024 Tier - 1

Q.64. Atul sold two sacks of rice for ₹19,200 each. On one, he gained 20% and on the other, he lost 20%. Find his gain or loss percentage in the whole transaction.
SSC MTS 30/09/2024 (Morning)
(a) 8% profit (b) 7% profit
(c) 4% loss (d) 5% loss

Q.65. Two mixers and one TV cost ₹7,000, while two TVs and one mixer cost ₹9,800. The value of one TV is:
SSC MTS 01/10/2024 (Morning)
(a) ₹3,600 (b) ₹4,600
(c) ₹3,200 (d) ₹4,200

Q.66. A shopkeeper makes a 15% profit on a sale. He would have made 18%, if he had sold it for Rs.18 more. The cost price of the article is:
SSC MTS 01/10/2024 (Afternoon)
(a) Rs.650 (b) Rs.550
(c) Rs.600 (d) Rs.500

Q.67. By selling an article for ₹19, a dealer makes a profit of 20%. By how much should he increase his selling price (in ₹, rounded off to two decimal place) so as to make a profit of 40% ?
SSC MTS 01/10/2024 (Afternoon)
(a) 6.17 (b) 3.17 (c) 4.17 (d) 5.17

Q.68. A vendor wants to gain 25% by adding water to milk and selling the mixture at the cost price. Find the ratio of water and milk in the mixture.
SSC MTS 07/10/2024 (Morning)
(a) 2 : 5 (b) 1 : 4 (c) 2 : 7 (d) 1 : 5

Q.69. A flat worth ₹9,50,000 is sold by Lakshman to Bharath at 8% profit. If Bharath sells it back to Lakshman at 3% loss, then find the gain/loss (in ₹) of Lakshman in the entire transaction ?
SSC MTS 08/10/2024 (Morning)
(a) Lakshman gains ₹30,780
(b) Lakshman gains ₹50,200
(c) Lakshman gains ₹45,220
(d) Lakshman loses ₹45,220

Q.70. Two vendors calculate their profit percentage on the cost price and selling price, respectively. What will be the difference between the profits (in ₹) if both the vendors declare a profit of 28% on the goods sold for ₹3,200 ?
SSC MTS 09/10/2024 (Morning)
(a) 196 (b) 700 (c) 548 (d) 896

Q.71. Each of the two merchants sell an article for ₹1,000. If Merchant A computes his profit on the cost price, while Merchant B computes his profit on the selling price, then they both end up making profits of 25%. By how much is the profit made by Merchant B more than that of Merchant A ?
SSC MTS 09/10/2024 (Evening)
(a) ₹45 (b) ₹40 (c) ₹35 (d) ₹50

Q.72. A trader sells his goods at 25% profit. Had he bought it at 10% more and sold it for ₹75 more, he would have earned a profit of 25%. The cost price of the goods is:
SSC MTS 14/10/2024 (Evening)
(a) ₹ 400 (b) ₹ 1000 (c) ₹ 600 (d) ₹ 800

Q.73. The cost price of some table lamps is ₹25,000. The shopkeeper will get ₹15,000 more If he sells these table lamps for ₹1,200 per lamp instead of ₹900 per lamp. Find the selling price of 23 table lamps if he earned 21% profit.
SSC MTS 22/10/2024 (Evening)
(a) ₹14,917 (b) ₹13,915
(c) ₹12,919 (d) ₹12,585

Q.74. A vendor bought a certain number of bananas at 6 for ₹5 and sold them at 4 for ₹3. Find his loss percentage.
SSC MTS 30/10/2024 (Afternoon)
(a) 12% (b) 10% (c) 8% (d) 15%

Q.75. Pankaj bought a watch at a price range from₹1,500 to₹3,000 which are sold at prices ranging from₹2,500 to₹3,500. If Pankaj sells such 10 watches, then the greatest possible profit (in ₹) he made with the transaction is:
SSC MTS 13/11/2024 (Morning)
(a) 19,000 (b) 23,854
(c) 21,765 (d) 20,000

Q.76. Vasudha claimed to sell her items at 18% above the cost of production, but used a weight that had 1 kg written on it, though it actually weighed y grams. If the actual profit percentage earned by

Search on TG @apna_pdf

Search on Telegram @apna_pdf

Vasudha was $33\frac{1}{3}$%, what is the value of y ?
SSC MTS 13/11/2024 (Morning)
(a) 885 (b) 890 (c) 895 (d) 880

Q.77. A shopkeeper sells one-fourth of his items at a loss of 12%, one-third of the remaining items at a profit of 44%, and the rest at a loss of 7%. What is his overall profit/loss percentage ?
SSC MTS 13/11/2024 (Afternoon)
(a) 2% loss (b) 4.5% gain
(c) 4.5% loss (d) 2% gain

Q.78. Find the gain percentage, given that Komal sold her scooter for ₹ 1980 gaining $\frac{1}{5}$th of the selling price.
SSC MTS 13/11/2024 (Evening)
(a) 20% (b) 45% (c) 40% (d) 25%

Q.79. The amount of profit and loss will be the same if an article is sold at ₹19,125 and ₹14,625. Find the percentage of profit if an article is sold at ₹19,125.
SSC MTS 14/11/2024 (Afternoon)
(a) $12\frac{1}{4}$ % (b) $13\frac{1}{3}$ %
(c) 12 % (d) $11\frac{3}{4}$%

Q.80. Which of the following equations is correct ?
SSC MTS 14/11/2024 (Evening)
(a) Gain % = CP / (gain × 100)
(b) SP = (100 - gain%) × $\frac{CP}{100}$
(c) SP = (100 - loss%) × $\frac{CP}{100}$
(d) Loss = SP - CP

SSC CGL 2024 Tier - 1

Q.81. A grocer professes to sell rice at the cost price, but uses a fake weight of 870 g for 1 kg. Find his profit percentage (correct to two decimal places).
SSC CGL 09/09/2024 (1st Shift)
(a) 15.11% (b) 14.94%
(c) 18.21% (d) 11.11%

Q.82. Madhav purchased an item for ₹42,000 and sold it at a loss of 20%. With that amount, he purchased another item and sold it at a gain of 30%. What is the overall gain (in ₹)?
SSC CGL 09/09/2024 (2nd Shift)
(a) 6720 (b) 4200 (c) 1680 (d) 2520

Q.83. The marked price of an article is 26% more than its cost price. If a discount of 32% is given, what will be the loss percentage?
SSC CGL 09/09/2024 (2nd Shift)
(a) 18.64% (b) 15.25%
(c) 12.26% (d) 14.32%

Q.84. A dishonest shopkeeper claims to sell salt at a rate of ₹25/kg. The cost price of the salt is ₹25/kg. Not satisfied with this, he tries to make profit by removing 200 gm from each kg. What is the shopkeeper's gain percentage?
SSC CGL 09/09/2024 (3rd Shift)
(a) 15% (b) 25% (c) 30% (d) 20%

Q.85 A merchant has 1000 kg of sugar, part of which he sells at a 10% profit and the rest at a 40% profit. He gains 20% on the whole. The quantity sold at 40% profit is:
SSC CGL 10/09/2024 (2nd Shift)
(a) $543\frac{1}{3}$ kg (b) $383\frac{1}{3}$ kg
(c) $333\frac{1}{3}$ kg (d) $443\frac{1}{3}$ kg

Q.86. Ravi's salary was increased by 50%. After some time, his new salary was also increased by 50%. Find his gain percentage of salary.
SSC CGL 10/09/2024 (2nd Shift)
(a) 125% (b) 100% (c) 200% (d) 150%

Q.87. A dishonest merchant sells his grocery using weights that are 12% less than the true weights and makes a profit of 10%. Find his total gain percentage.
SSC CGL 11/09/2024 (1st Shift)
(a) 10% (b) 20% (c) 15% (d) 25%

Q.88. S borrowed some amount from R and promised to pay him 8% interest. Then S invested the borrowed amount in a scheme, upon which he earned a profit of 5% after paying R, the principal amount with interest. How much percentage R would have gained, if he would have invested in the scheme directly?
SSC CGL 11/09/2024 (2nd Shift)
(a) 13.4% (b) 13% (c) 14.4% (d) 14%

Q.89. The cost price of a bat is 75% of the marked price. Calculate the gain percentage after allowing a discount of 15%.
SSC CGL 11/09/2024 (2nd Shift)
(a) 25.6% (b) 13.33%
(c) 18.16% (d) 21.33%

Q.90. Find the gain percentage, given that Siddhi sold her scooter for ₹ 24318 gaining $\frac{1}{6}$th of the selling price.
SSC CGL 12/09/2024 (2nd Shift)
(a) 20% (b) 35% (c) 25% (d) 5%

Q.91. The profit gained on selling a certain product is 320% of the cost. If the cost increases by 10% but the selling price remains constant, then what percentage of the selling price is the profit (correct to one decimal place)?
SSC CGL 12/09/2024 (3rd Shift)
(a) 70.2% (b) 73.8% (c) 75.7% (d) 63.8%

Q.92. An article is sold at a profit of 250%. What is the ratio of its cost price to selling price?
SSC CGL 13/09/2024 (1st Shift)
(a) 2 : 5 (b) 5 : 2 (c) 2 : 7 (d) 7 : 2

Q.93. Ramesh sells rice at ₹36 per kg, which he purchased for ₹30 per kg. Moreover, he gives only 800 g of rice instead of 1 kg while selling. Find the actual profit percentage of Ramesh.
SSC CGL 13/09/2024 (2nd Shift)
(a) 46% (b) 50% (c) 48% (d) 52%

Q.94. A shopkeeper marked the price 20% more than its cost price. If he allows a discount of 30%, then find his loss percent.
SSC CGL 17/09/2024 (1st Shift)
(a) 20% (b) 16% (c) 25% (d) 15%

Q.95. In a bank, 6% interest is given on the deposited amount. The bank then invests the money in the stock market and is able to earn ₹30,000 for every ₹3,00,000. How much money is the bank earning finally if the total amount deposited in the bank is ₹60,00,000?
SSC CGL 17/09/2024 (3rd Shift)
(a) ₹3,00,000 (b) ₹6,40,000
(c) ₹2,40,000 (d) ₹3,60,000

Q.96. Ajay spends $66\frac{2}{3}$% of his income on different household items. If his income increases by 25% and expenditure increase by 20%, then the effect on his savings will be:
SSC CGL 17/09/2024 (3rd Shift)
(a) 28% (b) 61% (c) 49% (d) 35%

Q.97. A shopkeeper sold $\frac{5}{8}$ of his articles at a gain of 20% and the remaining at the cost price. What is his gain percentage in the whole transaction?
SSC CGL 18/09/2024 (1st Shift)
(a) $16\frac{1}{2}$ % (b) $14\frac{1}{2}$ %
(c) $13\frac{1}{2}$ % (d) $12\frac{1}{2}$ %

Q.98. From the given data, find the ratio of the cost prices of a shirt and a trouser.

Item	Selling Price	Profit
Shirt	₹1,200	20%
Trouser	₹660	10%

SSC CGL 18/09/2024 (2nd Shift)
(a) 2 : 1 (b) 1 : 3 (c) 3 : 4 (d) 5 : 3

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.99. A shopkeeper sells rice at the rate of ₹44 per kg whose cost price is ₹40 per kg. Not satisfied with this, he tries to increase his profit by removing 200 grams of rice from each packet. What is the shopkeeper's overall gain percentage?
SSC CGL 19/09/2024 (2nd Shift)
(a) 35% (b) 37.5% (c) 37% (d) 35.5%

Q.100. The marked price of 55 items was equal to the cost price of 99 items. The selling price of 56 items was equal to the marked price of 35 items. Calculate the profit or loss percentage from the sale of each item.
SSC CGL 23/09/2024 (2nd Shift)
(a) 15% profit (b) 12.25% profit
(c) 12.5% profit (d) 12.5% loss

Q.101. A customer pays ₹975 in instalments. The payment is done each month ₹5 less than the previous month. If the first instalment is ₹100, how much time will be taken to pay the entire amount?
SSC CGL 23/09/2024 (3rd Shift)
(a) 14 months (b) 15 months
(c) 27 months (d) 26 months

Q.102. Samreen sells a keyboard for ₹1,260 at a profit of 25%, and another keyboard for ₹1,440 at a loss of 10%. What is her total gain or loss percentage?
SSC CGL 24/09/2024 (1st Shift)
(a) $3\frac{86}{163}$% Loss (b) $3\frac{11}{27}$ % Gain
(c) $3\frac{11}{27}$ %Loss (d) $3\frac{86}{163}$% Gain

Q.103. A person purchased a table and a sofa for ₹28,000. He sold the sofa at a profit of 10% and the table at a profit 15.25%. If his total profit was 13%, then the difference between the cost price of the sofa and the table (in ₹) is:
SSC CGL 24/09/2024 (2nd Shift)
(a) 1500 (b) 4000 (c) 5000 (d) 2500

Q.104. If the market price of a bag is 25% above the cost price, and a discount of 18% is declared on it, then find the gain percentage.
SSC CGL 24/09/2024 (3rd Shift)
(a) 1.5% (b) 2.0% (c) 3.0% (d) 2.5%

Q.105. Rohini buys a Bluetooth headphone set for ₹1,700 from a wholesale shop and marks it at ₹2,000. Later on, she allows a discount of 40% on its sale. What is her loss or gain percentage (correct up to two decimal places)?
SSC CGL 25/09/2024 (1st Shift)
(a) 25.19% loss (b) 29.41% gain
(c) 29.41% loss (d) 25.19% gain

Q.106. Ramesh purchased 130 books at the rate of ₹200 each and sold half of them at the rate of ₹300 each, one-fifth of them at the rate of ₹350 each and the rest at the cost price. Find his profit percentage.
SSC CGL 25/09/2024 (1st Shift)
(a) 35% (b) 40% (c) 38% (d) 44%

Q.107. A man loses 28% by selling an article for ₹144. If he sells it for ₹288, what will be his gain/loss percentage?
SSC CGL 25/09/2024 (2nd Shift)
(a) Gain, 41% (b) Loss, 43%
(c) Gain, 44% (d) Loss, 46%

Q.108. An article passing through two hands is sold at a total profit of 40% of the original cost price. If the first dealer makes a profit of 30%, then the profit percentage made by the second dealer is:
SSC CGL 26/09/2024 (2nd Shift)
(a) $8\frac{6}{13}$% (b) $6\frac{3}{13}$%
(c) $7\frac{1}{13}$% (d) $7\frac{9}{13}$%

Q.109. An article costs ₹1,000 for a salesman. He fixes its marked price as ₹ 1,500. He sells it to a customer at a discount of 20%, He gives a further discount of 10% for each cash payment. Find the percentage of loss or gain that the salesman makes on sale.
SSC CGL 26/09/2024 (3rd Shift)
(a) gain 8% (b) gain 10%
(c) loss 8% (d) loss 10%

SSC CHSL 2024 Tier - 1

Q.110. A shopkeeper marks up the price of the oil by 40% and uses a faulty machine which measures 15% less. If the shopkeeper gives a discount of 32%, the profit/loss percentage is:
SSC CHSL 01/07/2024 (1st Shift)
(a) 12% Profit (b) 25% Profit
(c) 15% Loss (d) 18% Loss

Q.111. Ravi sells his goods at a 25% loss on cost price but uses 45% less weight. What is his percentage profit or loss?
SSC CHSL 01/07/2024 (2nd Shift)
(a) Loss, $47\frac{9}{10}$% (b) Loss, $36\frac{4}{11}$%
(c) Profit, $36\frac{4}{11}$% (d) Profit, $47\frac{9}{10}$%

Q.112. A shopkeeper gives a 10% discount and still earns 10% profit. The marked price of the item is how many times (correct to 2 decimal places) the cost price?
SSC CHSL 01/07/2024 (3rd Shift)
(a) 1.28 (b) 1.20 (c) 1.22 (d) 1.24

Q.113. If the selling price of 100 pens is equal to the cost price of 140 pens, find the profit percentage.
SSC CHSL 01/07/2024 (3rd Shift)
(a) 30% (b) 40% (c) 45% (d) 36%

Q.114. A merchant sold two refrigerators for ₹10,000 each. On one refrigerator, he incurred a 20% loss, and on the other, he gained 20%. What was his profit/loss percentage on the whole transaction?
SSC CHSL 02/07/2024 (1st Shift)
(a) Profit of 2% (b) Loss of 2%
(c) Loss of 4% (d) Profit of 4%

Q.115. A shopkeeper marks an article at ₹150 and sells it at a discount of 25%. He also gives a gift worth ₹2.5. If he still makes a 10% profit, then the cost price (in ₹) of the article is:
SSC CHSL 02/07/2024 (3rd Shift)
(a) 175 (b) 100 (c) 125 (d) 112

Q.116. A shopkeeper bought 288 oranges for ₹115.20. He sold 50 of them at 70 paise each and the remaining at ₹46.20. Find his profit or loss.
SSC CHSL 02/07/2024 (3rd Shift)
(a) Loss, ₹36 (b) Loss, ₹34
(c) Profit, ₹37 (d) Profit, ₹25

Q.117. The difference between the cost price and the selling price of an article is ₹1,800. If there is a profit of 20%, then the cost price of the article is:
SSC CHSL 02/07/2024 (4th Shift)
(a) ₹7,000 (b) ₹11,000
(c) ₹8,000 (d) ₹9,000

Q.118. A retail fruit vendor buys a score of apples for ₹400 and retails them for ₹264 at a dozen. What was his loss/gain per cent? (a score = 20 no's)
SSC CHSL 03/07/2024 (1st Shift)
(a) 20% profit (b) 5% loss
(c) 10% loss (d) 10% profit

Q.119. The marked price of an article is ₹600. A shopkeeper purchased it on two successive discounts of 10% and 20%. He spent ₹68 on transportation and sold the article for ₹600. Find his gain or loss percentage.
SSC CHSL 03/07/2024 (1st Shift)
(a) 15% Profit (b) 20% Profit
(c) 18% LosS (d) 25% Loss

Q.120. A sells a bike to B at 45% profit. Then B sells it to C at 30% profit. If C pays ₹43,355, then what is the cost price of the bike for A ?
SSC CHSL 03/07/2024 (2nd Shift)
(a) ₹21,000 (b) ₹23,000
(c) ₹27,000 (d) ₹29,000

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.121. By selling an article at 66% of its marked price, a merchant makes a profit of 10%. If he sells the article at 80% of its marked price, then the profit percentage will be:
SSC CHSL 03/07/2024 (2nd Shift)
(a) $33\frac{1}{3}$% (b) 25% (c) $33\frac{2}{3}$% (d) 20%

Q.122. A dealer buys an article listed at ₹100 and get successive discounts of 10% and 20%. He spends 10% of the cost price on transportation. At what price should he sell the article to earn a profit of 15% ?
SSC CHSL 03/07/2024 (3rd Shift)
(a) ₹76.07 (b) ₹89.08
(c) ₹91.08 (d) ₹81.07

Q.123. A seller decreased the selling price of each item from ₹5,000 to ₹4,680, by which his loss percentage increased by 4%. If he has to get 4% profit, then the selling price of the item should be:
SSC CHSL 03/07/2024 (4th Shift)
(a) ₹8,840 (b) ₹8,320
(c) ₹7,800 (d) ₹7,280

Q.124. Gaurav marks his goods 50% above the cost price and offers a discount of 30% on the marked price to his customers. What is his percentage gain?
SSC CHSL 04/07/2024 (1st Shift)
(a) 4% (b) 3% (c) 2% (d) 5%

Q.125. A retailer purchased a batch of goods for ₹5,000. Due to a manufacturing defect, 5% of the goods were damaged. If the retailer wants to make a profit of 20% on the remaining goods, at what price should the undamaged goods be sold?
SSC CHSL 04/07/2024 (3rd Shift)
(a) ₹5,800 (b) ₹5,700
(c) ₹5,900 (d) ₹6,000

Q.126. A 35% profit is made when a discount of 35% is given on the marked price of an item. When the discount is 45%, then the profit percentage will be:
SSC CHSL 04/07/2024 (4th Shift)
(a) $11\frac{3}{13}$% (b) $13\frac{3}{17}$%
(c) $17\frac{1}{13}$% (d) $14\frac{3}{13}$%

Q.127. A shopkeeper buys 1800 kg wheat for ₹32,400. If 20% of this wheat is spoiled due to rain, at what rate (₹/kg) should he sell the rest to earn 20% ?
SSC CHSL 04/07/2024 (4th Shift)
(a) 26 (b) 29 (c) 27 (d) 25

Q.128. Ravath had to sell vegetables worth ₹4,960 for ₹4,712 due to weather conditions. What is the loss percentage that he has incurred?
SSC CHSL 05/07/2024 (1st Shift)
(a) 15% (b) 20% (c) 10% (d) 5%

Q.129. A shopkeeper marks up his goods 32% above the cost price and gives a discount of 21% on the marked price. Find his gain percentage on the goods.
SSC CHSL 05/07/2024 (2nd Shift)
(a) 8.24% (b) 8.42% (c) 4.28% (d) 4.82

Q.130. Ramendra purchased some watermelons for ₹1,500. He sold one-fourth of them at a loss of 12%. At what gain percentage should the remaining watermelons be sold so as to gain 25% on the whole transaction (correct to two decimal places)?
SSC CHSL 05/07/2024 (2nd Shift)
(a) 37.65% (b) 33.73%
(c) 33.43% (d) 37.33%

Q.131. A retailer gets a discount of 40% on the printed price of an article. If the retailer sells it at the printed price, then his gain percentage is:
SSC CHSL 05/07/2024 (3rd Shift)
(a) $33\frac{1}{3}$ % (b) $37\frac{2}{3}$ %
(c) $66\frac{1}{3}$ % (d) $66\frac{2}{3}$ %

Q.132. A mobile phone dealer buys a phone for ₹10,000 and sells it for ₹12,000. Later, he realizes that he could have sold it for ₹13,000. What is the percentage loss that he incurs?
SSC CHSL 05/07/2024 (3rd Shift)
(a) 10% (b) 20% (c) 15% (d) 25%

Q.133. A shopkeeper cheats 25% in weight while buying rice and cheats 25% while selling it. If he sells the rice at $12\frac{1}{2}$ % profit, then find his net profit percentage.
SSC CHSL 05/07/2024 (4th Shift)
(a) 92.5% (b) 82.5% (c) 87.5% (d) 62.5%

Q.134. The profit obtained by selling an article for ₹86 is twice the loss obtained by selling the same article for ₹53. Find the cost price.
SSC CHSL 08/07/2024 (2nd Shift)
(a) ₹22 (b) ₹33 (c) ₹75 (d) ₹64

Q.135 Pradeep sells two fans at ₹480 each and by doing so he gains 20% on one fan and loses 20% on the other. His loss on the whole (in ₹) is:
SSC CHSL 08/07/2024 (3rd Shift)
(a) 10 (b) 40 (c) 20 (d) 30

Q.136. A sells an object to B at 10% profit, B sells it to C at 60% profit and C sells it to D at $12\frac{1}{2}$% profit. If D paid ₹59.40, then at what price did A buy it ?
SSC CHSL 08/07/2024 (4th Shift)
(a) ₹30 (b) ₹32 (c) ₹34 (d) ₹28

Q.137. A trader buys 500 kg cotton for ₹8,000. If 10% of this cotton is spoiled due to rain, at what rate (₹/kg) should he sell the rest to earn a 20% profit?
SSC CHSL 09/07/2024 (1st Shift)
(a) $21\frac{1}{3}$ (b) $23\frac{1}{3}$ (c) $22\frac{1}{3}$ (d) $25\frac{1}{3}$

Q.138. A shopkeeper allows a discount of 22% to his customers and still gains 36%. Find the marked price (in₹) of an article which costs ₹1,092 to the shopkeeper.
SSC CHSL 09/07/2024 (2nd Shift)
(a) 1,792 (b) 2,024 (c) 1,904 (d) 1,872

Q.139. A dishonest dealer professes to sell his goods at the cost price, but he uses a false weight of 850 grams per 1 kg weight. Find the percentage of his gain. (Correct up to two decimal places)
SSC CHSL 09/07/2024 (2nd Shift)
(a) 17.56% (b) 17.65%
(c) 17.45% (d) 17.54%

Q.140. Ramesh sells an article for ₹34,440, after allowing an 18% discount on the marked price and still manages to gain 40% profit. If Ramesh sold the article at a 12% discount on the marked price, then what will be his profit, correct to two places of decimals?
SSC CHSL 09/07/2024 (3rd Shift)
(a) 50.42% (b) 48.24%
(c) 50.24% (d) 48.42%

Q.141. By selling 22 items, Rohit gains the selling price of 6 items. His gain percent is:
SSC CHSL 09/07/2024 (4th Shift)
(a) $37\frac{1}{2}$% (b) $37\frac{1}{3}$% (c) $33\frac{1}{2}$% (d) $33\frac{1}{3}$%

Q.142. A shopkeeper sells an item at 20% discount on the marked price and earns a profit of 90%. If he sells the same item at 40% discount, then his new profit percentage will be:
SSC CHSL 09/07/2024 (4th Shift)
(a) 48.2% (b) 45.8% (c) 42.5% (d) 41.8%

Q.143. A vendor sells his goods using weights 19% less than true weights and makes a profit of 35%. His net gain percentage (rounded off to 2 decimal places) is:
SSC CHSL 10/07/2024 (1st Shift)
(a) 81.33% (b) 66.33%
(c) 81.67% (d) 66.67%

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.144. Shopkeeper A marks up his price for an item at 25% and offers a discount of 15%. The same item is marked at 20% by another shopkeeper B and sold at a discount of 12%. Who gets a better deal in terms of % profit and by what profit percentage he sells that item?
SSC CHSL 10/07/2024 (2nd Shift)
(a) A by 0.55% (b) B by 0.65%
(c) B by 5.6% (d) A by 6.25%

Q.145. A vendor buys 20 dozen bananas for ₹1,200 and sells 5 dozen for ₹350, then his gain percentage is:
SSC CHSL 10/07/2024 (2nd Shift)
(a) $15\frac{1}{3}$ % (b) $16\frac{2}{3}$ %
(c) $13\frac{2}{3}$ % (d) $21\frac{1}{3}$ %

Q.146. A merchant sells 195 kg of wheat for ₹10,260 at a profit of ₹4.50 per kg of wheat. What is the cost price (in ₹, to the nearest integer) of 15 kg of wheat?
SSC CHSL 10/07/2024 (3rd Shift)
(a) 682 (b) 750 (c) 722 (d) 595

Q.147. A costs thrice as much as B. A is sold at a loss of 10%, and B is sold at $\frac{5}{4}$ of its own price. If the selling price of A is ₹5,800 more than the selling price of B, then the cost price of A is :
SSC CHSL 10/07/2024 (4th Shift)
(a) ₹12,000 (b) ₹9,600
(c) ₹15,000 (d) ₹4,000

Q.148. By selling an article for ₹2,160, Prashant allows a 20% discount and earns 28% profit. If the article is sold without any discount, the profit will be:
SSC CHSL 11/07/2024 (1st Shift)
(a) 50% (b) 55% (c) 65% (d) 60%

Q.149. A shopkeeper sells goods at 40% loss on cost price but uses 25% less weight. What is his percentage profit or loss ?
SSC CHSL 11/07/2024 (1st Shift)
(a) Loss, 10% (b) Profit, 10%
(c) Loss, 20% (d) Profit, 20%

Q.150. The cost price of a fan is ₹4,400. A merchant wants to make a 24% profit by selling it. At the time of sale, merchant declares a discount of 12% on the marked price. Find the marked price.
SSC CHSL 11/07/2024 (3rd Shift)
(a) ₹6,020 (b) ₹2,060 (c) ₹2,600 (d) ₹6,200

Q.151. A shopkeeper sold an article at a 26% profit. On selling it for ₹2,250 more, he would get a profit of 41%. If this article is sold at 12% profit, then the selling price would be:
SSC CHSL 11/07/2024 (3rd Shift)
(a) ₹16,120 (b) ₹15,000
(c) ₹16,800 (d) ₹15,800

SSC CPO 2024 Tier - 1

Q.152. The cost price of 36 articles is the same as the selling price of N articles. If the profit is 20%, then the value of N is:
SSC CPO 27/06/2024 (1st Shift)
(a) 25 (b) 42 (c) 40 (d) 30

Q.153. The marked price of an article is 35% more than its cost price. If a discount of 15% is given, what will be the profit percentage ?
SSC CPO 27/06/2024 (2nd Shift)
(a) $10\frac{1}{4}$ % (b) $12\frac{3}{4}$ %
(c) $13\frac{2}{3}$ % (d) $14\frac{3}{4}$ %

Q.154. Aarav owns a watch worth ₹10,000. He sells it to Bhavin at a profit of 15%. After some days, Bhavin sells it back to Aarav at 15% loss. Find the percentage profit or loss faced by Aarav.
SSC CPO 27/06/2024 (2nd Shift)
(a) 17.25% loss (b) 17.25% profit
(c) 18.25% profit (d) 18.75% loss

Q.155. A merchant bought two watches for ₹9,000 each. He sold one watch at a loss of 10%. At what price (in ₹) should he sell the other watch to earn a profit of 18% overall?
SSC CPO 27/06/2024 (2nd Shift)
(a) 14,130 (b) 14,310
(c) 13,140 (d) 13,410

Q.156. A dishonest dealer sells his goods at 20% loss on the cost price but uses a faulty weight that weighs 25% less. His profit or loss percentage (rounded off to 2 decimal places) is:
SSC CPO 27/06/2024 (3rd Shift)
(a) 6.67%, loss (b) 3. 33%, profit
(c) 3.33%, loss (d) 6.67%, profit

Q.157. A grocer purchased 10 kg rice for ₹700. He spends some amount on transportation and then sells it for ₹1,400. If the percentage of profit made by the grocer is 30%, then what is the amount (in₹)he spends on transportation? (Round off to the nearest integer)
SSC CPO 27/06/2024 (3rd Shift)
(a) 350 (b) 380 (c) 300 (d) 377

Q.158. A shopkeeper buys oranges at the rate of 10 oranges for ₹50 and sells them at the rate of 12 oranges for ₹74. Find his gain or loss percentage.
SSC CPO 28/06/2024 (1st Shift)
(a) $23\frac{1}{3}$% gain (b) 25% gain
(c) 30% loss (d) $25\frac{1}{3}$% loss

Q.159. A retailer marks up his goods by 130% and offers 25% discount. What will be the selling price (in ₹) if the cost price is ₹1600 ?
SSC CPO 28/06/2024 (1st Shift)
(a) 3680 (b) 2760 (c) 1765 (d) 1980

Q.160. On the tag price, a seller offers a 10% discount and a cashback of ₹250. He still earns 10% profit. If the cost price is ₹1,200, then the tag price (rounded off to 2 decimal places) is ₹_____.
SSC CPO 28/06/2024 (2nd Shift)
(a) 1447.44 (b) 1777.44
(c) 1744.44 (d) 1774.44

Q.161. A shopkeeper gives a discount of 12% on the purchase of 10 kg of sugar. The cost price of the sugar is ₹30/kg, and the marked price is ₹38/kg. The weighing machine of the shopkeeper is faulty, and it shows weight of 1 kg when the actual weight is 900 grams. Find the percentage profit of the shop keeper (rounded off to two decimal places).
SSC CPO 28/06/2024 (2nd Shift)
(a) 30.18% (b) 12.5%
(c) 22.25% (d) 23.85%

Q.162. A dishonest dealer professes to sell his goods at cost price but uses a false weight of 950 grams instead of 1 kilogram. His gain percentage is:
SSC CPO 28/06/2024 (2nd Shift)
(a) $4\frac{5}{19}$% (b) $6\frac{5}{19}$%
(c) $5\frac{5}{19}$% (d) $7\frac{5}{19}$%

Q.163. A vegetable vendor bought 100 kg of potatoes at the rate of ₹19 per kg and spent ₹100 as cartage. He sold 60 kg of potatoes with a 50% profit and half of the remaining stock with a 40% profit. He sold half of the still remaining potatoes with a 25% profit. What profit percentage should he aim for when selling the ultimate remaining potatoes to achieve an overall profit of 42%?
SSC CPO 28/06/2024 (3rd Shift)
(a) 0.16 (b) 0.1 (c) 0.12 (d) 0.15

Q.164. A shopkeeper offers a discount of 24 % on the marked price. On a special sale day, he offers an extra 30% off coupon after the first discount. If the article was sold for ₹ 7,700.70. What is the marked price of the article ?
SSC CPO 29/06/2024 (1st Shift)
(a) 14475 (b) 17475
(c) 14745 (d) 17745

Q.165. A trader sells an article at 16%

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

below its cost price. Had he sold it for ₹192.20 more, he would have gained 15%. The new selling price (in ₹) of the article is:
SSC CPO 29/06/2024 (1st Shift)
(a) 742 (b) 731 (c) 713 (d) 724

Q.166. The cost price of two articles is equal. One article is sold at a profit of 12% and the other article for ₹3,600 more than the first. If the net profit is $15\frac{27}{51}\%$, then what is the cost price of each article
SSC CPO 29/06/2024 (1st Shift)
(a) ₹50,000 (b) ₹51,000
(c) ₹50,990 (d) ₹52,150

Q.167. A person bought two buffaloes for ₹11,520. One is sold at a loss of 15% and the other is sold at a gain of 19%. If the selling price of both buffaloes is equal, find the cost price of the first one.
SSC CPO 29/06/2024 (2nd Shift)
(a) ₹6,700 (b) ₹6,715
(c) ₹6,720 (d) ₹6,710

Q.168. A shopkeeper sold 3 wristwatches for ₹2,800 each. If he has sold the watches with 40%, 25% and 12% profit, respectively, then find his overall profit percentage (correct to 2 decimal places).
SSC CPO 29/06/2024 (3rd Shift)
(a) 0.2419 (b) 0.2463
(c) 0.2455 (d) 0.2475

Q.169. A seller marks an item for ₹500 and sells it at a discount of 25%. He also gives a gift worth ₹65. If he still makes 24% profit, then the cost price of the item (in ₹) is:
SSC CPO 29/06/2024 (3rd Shift)
(a) 280 (b) 270 (c) 250 (d) 320

SSC Selection Post (Phase - XII)

Q.170. Rashid sells a book at a gain of 20%. If he had sold it at ₹34.51 more, he would have gained 37%. The cost price (in ₹) of the book is:
Matriculation Level 20/06/2024 (Shift - 1)
(a) 210 (b) 207 (c) 203 (d) 220

Q.171. An iron costing ₹758 was sold by Ramesh at a gain of 15%, and it was again sold by Reena, who bought it from Ramesh, at a loss of 8%. Find the selling price of the iron for Reena (correct to two places of decimals).
Matriculation Level 20/06/2024 (Shift - 1)
(a) ₹810.96 (b) ₹808.69
(c) ₹820.69 (d) ₹801.96

Q.172. If the cost price of a table is ₹400 and the selling price is ₹600, then find the profit percentage.
Matriculation Level 20/06/2024 (Shift - 4)
(a) 55% (b) 45% (c) 33% (d) 50%

Q.173. A shopkeeper expects a gain of 36% on his cost price. If in a month, his sale was ₹6,14,856, then what was his profit (in ₹)?
Matriculation Level 20/06/2024 (Shift - 4)
(a) 1,61,235 (b) 1,63,900
(c) 1,62,756 (d) 1,62,800

Q.174. A salesman purchases goods at ₹1,250 and is forced to sell it at ₹1,000. Find his loss percentage.
Matriculation Level 20/06/2024 (Shift - 4)
(a) 25% (b) 20% (c) 30% (d) 15%

Q.175. A shopkeeper marks the price of his goods at 20% higher than the cost price and allows a discount of 10%. What is his profit percentage?
Matriculation Level 21/06/2024 (Shift - 1)
(a) 10% (b) 6% (c) 8% (d) 4%

Q.176. The percentage profit earned by selling an article for Rs.2,100 is equal to the percentage loss incurred by selling the same article for Rs.1,460. At what price should the article be sold to make 20% profit?
Matriculation Level 21/06/2024 (Shift - 1)
(a) Rs.2,156 (b) Rs.2,056
(c) Rs.2,136 (d) Rs.2,256

Q.177. By selling a mobile phone for ₹23,856, Ramesh gains 20%. If he sells it for ₹20,580, find his gain or loss percentage (correct to two places of decimals).
Matriculation Level 21/06/2024 (Shift - 1)
(a) Loss 3.52% (b) Gain 5.32%
(c) Gain 3.52% (d) Loss 5.32%

Q.178. The profit earned after selling a bucket for ₹680 is the same as the loss incurred after selling the bucket for ₹532. The cost price (in ₹) of the bucket is:
Matriculation Level 21/06/2024 (Shift - 4)
(a) 606 (b) 612 (c) 618 (d) 610

Q.179. In a business, R invests ₹65,000 and he gets a total ₹80,000 back. Out of profit, ₹2,000 are spent as expenses of the business. What is his profit from the business in percentage?
Matriculation Level 21/06/2024 (Shift - 4)
(a) 18% (b) 25% (c) 22% (d) 20%

Q.180. A shopkeeper purchased an article for ₹7,200 and spent 9% of its cost on repairs. He sold it to Rajan for ₹8,100. What was the profit percentage on selling the article? (Rounded off to 2 decimal places)
Matriculation Level 21/06/2024 (Shift - 4)
(a) 2.91% (b) 3.12% (c) 3.21% (d) 12.5%

Q.181. The ratio of the cost price of an article to its selling price is 432 : 612. The profit percentage (rounded off to 2 decimal places) on it is:
Matriculation Level 24/06/2024 (Shift - 1)
(a) 41.66% (b) 40.25%
(c) 42.33% (d) 38.26%

Q.182. A and B invested money in a business in the ratio of 2 : 3. If 10% of the total profit goes to charity and A's share in the profit is ₹4,500, then what is the total profit?
Matriculation Level 24/06/2024 (Shift - 1)
(a) ₹13,000 (b) ₹12,500
(c) ₹12,000 (d) ₹13,500

Q.183. Shyam bought a chair for ₹1,563 and spent ₹350 on its repairing. He sold it for ₹2,398. Find his profit percentage (correct to two places of decimals).
Matriculation Level 24/06/2024 (Shift - 4)
(a) 42.35% (b) 52.55%
(c) 25.35% (d) 35.55%

Q.184. A chair is bought for ₹600 and sold for ₹750. Find the profit percentage.
Matriculation Level 24/06/2024 (Shift - 4)
(a) 20% (b) 30% (c) 25% (d) 35%

Q.185. The difference between the cost price and the selling price of a table lamp is ₹540. If the profit is 30%, then the selling price (in ₹) is :
Matriculation Level 24/06/2024 (Shift - 4)
(a) 2,800 (b) 2,340 (c) 2,280 (d) 2,150

Q.186. A tradesman marked his goods at 26% above its cost price and then allowed a discount of 13%. His gain (in %) is:
Matriculation Level 25/06/2024 (Shift - 1)
(a) 9.62 (b) 9.26 (c) 6.92 (d) 6.29

Q.187. The cost price of 10 apples is equal to the selling price of 20 apples. Find the loss or gain percentage.
Matriculation Level 25/06/2024 (Shift - 1)
(a) Loss 50% (b) Gain 10%
(c) Gain 20% (d) Loss 40%

Q.188. Reena makes a profit of 20% by selling pens at a certain price. If she charges ₹5 more on each pen, she will gain 40%. The initial selling price of one pen was:
Matriculation Level 26/06/2024 (Shift - 1)
(a) ₹30 (b) ₹20 (c) ₹35 (d) ₹25

Q.189. The percentage profit earned by selling an article for ₹1,910 is equal to the percentage loss incurred by selling the same article for ₹1,690. At what price (in ₹) should the article be sold to make a

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

12% profit?
Matriculation Level 26/06/2024 (Shift - 1)
(a) 2,016 (b) 2,106 (c) 2,610 (d) 2,160

Q.190. A retailer buys 220 chocolates from a wholesaler for the marked price of 198 items. He then sells each chocolate at a discount of 3.7%. What is his profit percentage ?
Higher Secondary 20/06/2024 (Shift - 2)
(a) 6.3% (b) 7% (c) 6% (d) 7.2%

Q.191. A person, while trading the shares of a particular company, observes that its price has gone down by 10% from the previous day. In anticipation of increment on the next day, he holds it for the next day. But the share price further falls down by another 8% of the previous day. Then he sells his shares and gets ₹12,420. How much could he have saved had he sold it the previous day?
Higher Secondary 21/06/2024 (Shift - 2)
(a) ₹1,080 (b) ₹1,220
(c) ₹1,140 (d) ₹1,260

Q.192. The selling price of 84 items is equal to the cost price of 105 items. What is the percentage of profit gained in the transaction?
Higher Secondary 21/06/2024 (Shift - 2)
(a) 28% (b) 25% (c) 21% (d) 20%

Q.193. Two articles were sold for Rs.3,000 each, with no loss and profit in the entire transaction. If one was sold at a profit of 25%, then the loss incurred on the second article is _____.
Higher Secondary 21/06/2024 (Shift - 2)
(a) $16\frac{2}{3}$% (b) 10% (c) $15\frac{2}{3}$% (d) $18\frac{2}{3}$%

Q.194. A shopkeeper normally makes a profit of 20% in a certain transaction; he weighed 900 gm instead of 1 kg due to an error in the weighing machine. If he charges 15% less than what he normally charges, then what is his actual profit or loss percentage ?
Higher Secondary 25/06/2024 (Shift - 4)
(a) 13.33% profit (b) 13.33% loss
(c) 18.00% loss (d) 18.33% profit

Q.195. A dealer buys an article listed at ₹250 and gets successive discounts of 12% and 16%. He spends 10% of the cost price on transportation. At what price should he sell the article to earn a profit of 25%? (Correct to two places of decimal)
Higher Secondary 26/06/2024 (Shift - 2)
(a) ₹244.10 (b) ₹274.10
(c) ₹264.10 (d) ₹254.10

Q.196. A dealer sells an article at ₹850 after offering a cash discount of 15% on its marked price. Without discount, he would have earned a profit of 25%. What is the cost price of the article (in ₹)?
Graduate Level 24/06/2024 (Shift - 3)
(a) 800 (b) 950 (c) 900 (d) 1000

Q.197. A shopkeeper purchased groundnuts at ₹64/kg and sells at ₹80/kg. While selling, he uses faulty weights and gives 800 gm instead of 1 kg. Find his actual profit percentage.
Graduate Level 24/06/2024 (Shift - 3)
(a) 32.25% (b) 36.65%
(c) 28.75% (d) 56.25%

Q.198. A vendor buys 20 laptop bags for ₹13,000 and sells them at 15 for ₹10,125. How many laptop bags should be bought and sold to earn a profit of ₹3,225?
Graduate Level 25/06/2024 (Shift - 3)
(a) 127 (b) 123 (c) 120 (d) 129

Q.199. A dishonest dealer professes to sell grains at cost price, but he uses a weight of 925 g for 1 kg weight. Find his gain percentage. (Approximate to two decimals.)
Graduate Level 26/06/2024 (Shift - 3)
(a) 0.0811 (b) 0.085
(c) 0.0775 (d) 0.075

Q.200. P sells a Laptop to Q at a loss of 25% and Q sells the laptop to R at a profit of 20%. If R purchased the laptop for ₹22,500, then what was the cost (in ₹) of the laptop for P?
Graduate Level 26/06/2024 (Shift - 4)
(a) 23800 (b) 24800
(c) 25000 (d) 23200

SSC CHSL 2023 Tier - 2

Q.201. The cost of 4 chairs and 3 tables is ₹2,100 and the cost of 5 chairs and 2 tables is ₹1,750. Find the cost (in ₹) of a chair.
SSC CHSL Tier II 02/11/2023
(a) 150 (b) 130 (c) 140 (d) 125

Q.202. A shopkeeper sold his goods at half the list price and thus lost 17%. If he had sold on the listed price, then his gain percentage would be:
SSC CHSL Tier II 02/11/2023
(a) 17% (b) 41% (c) 83% (d) 66%

Q.203. Sohan sells sugar at the cost price but uses false weights thus gaining 28% profit. How many grams of sugar is he giving for 3.2 kg sugar?
SSC CHSL Tier II 10/01/2024
(a) 1500 (b) 1900 (c) 2200 (d) 2500

SSC CGL 2023 Tier - 2

Q.204. Two friends A and B started a business by investing ₹1,50,000 and ₹2,50,000, respectively. They agreed to distribute their earnings in the same ratio of their investments. After an year, the profit earned was ₹6,00,000. Each of them added ₹50,000 to their respective profits and invested in a different project. If this project gave an yield of ₹4,20,000, then A's share in the profit is:
SSC CGL Tier II (26/10/2023)
(a) ₹2,35,000 (b) ₹1,65,000
(c) ₹1,97,000 (d) ₹1,84,000

SSC CPO 2023 Tier - 1

Q.205. The first shirt is sold at twice the selling price of the second shirt. The first shirt is sold at 8% profit and the second shirt is sold at a 3% loss. What is the overall percentage profit on the shirts (Rounded off to two decimal places)?
SSC CPO 03/10/2023 (1st Shift)
(a) 4.60% (b) 4.07% (c) 3.86% (d) 4.86%

Q.206. Sukhvir purchased some perishable items for sale but 30% of those items could not be sold and went bad. However, Sukhvir managed to sell the rest of the items at a price that helped him earn an overall profit of 19%. At what percentage above the cost price of each item purchased by Sukhvir did he sell each of the items that did not go bad?
SSC CPO 03/10/2023 (2nd Shift)
(a) 49% (b) 70% (c) 75% (d) 63%

Q.207. If the difference between the selling prices of an article at profits of 10% and 7% is ₹6, then the cost price (in ₹) of the article is:
SSC CPO 03/10/2023 (2nd Shift)
(a) 175 (b) 150 (c) 200 (d) 100

Q.208. Mayur sold a watch at a profit of 7%. If he had sold it for ₹1,329 more, he would have gained 57%. Find the cost price (in ₹) of the watch.
SSC CPO 03/10/2023 (3rd Shift)
(a) 2856 (b) 2658 (c) 2580 (d) 2420

Q.209. After deducing a commission of 20%, a DVD set costs ₹9,080. Its marked price is:
SSC CPO 04/10/2023 (1st Shift)
(a) ₹11,350 (b) ₹10,100
(c) ₹10,000 (d) ₹11,200

Q.210. A dealer sells his goods at 10% loss on the cost price but uses 25% less weight. What is his profit percentage ?
SSC CPO 04/10/2023 (1st Shift)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) 20% (b) 35% (c) 25% (d) 15%

Q.211. A vendor marked the selling price of a table at ₹5,670 after adding 35% profit to its cost price. Since the sale was very low at this price level, he decided to sell the table with 12% profit. Find the new selling price (in ₹).
SSC CPO 04/10/2023 (2nd Shift)
(a) 4,750 (b) 4,608 (c) 4,810 (d) 4,704

Q.212. The price of a land passing through three hands rises on the whole by 65%. The first and second sellers earned 20% and 25% profit, respectively. Find the profit percentage earned by the third seller.
SSC CPO 04/10/2023 (2nd Shift)
(a) 15% (b) 20% (c) 10% (d) 25%

Q.213. By selling 42 m of cloth, Vijay gains the selling price of 7 m of cloth. Find the profit percentage.
SSC CPO 04/10/2023 (3rd Shift)
(a) 20% (b) 30% (c) 25% (d) 15%

Q.214. Mahesh agreed to sell rice with 24% loss, as the rice got rotten. However, he cheated customers and gave only 19 gm of rice in place of 50 gm of rice. What is the percentage of his profit or loss ?
SSC CPO 05/10/2023 (1st Shift)
(a) 100 % loss (b) $\frac{100}{3}$% profit
(c) 100 % profit (d) $\frac{100}{3}$% loss

Q.215. Arbind has 650 kg of wheat. A part of which he sells at 9% profit and the rest at 19% profit to get 15% profit on the whole. What is the quantity (in kg) of wheat sold by Arbind at 9% profit?
SSC CPO 05/10/2023 (2nd Shift)
(a) 260 (b) 390 (c) 195 (d) 455

Q.216. A shopkeeper sells sugar at ₹40 per kg, which he purchased at ₹36 per kg. His weighing machine is faulty and it weighs only 800 gm while selling. His percentage profit (correct to 2 decimal places) is:
SSC CPO 05/10/2023 (3rd Shift)
(a) 40% (b) 37.58% (c) 38.89% (d) 39.28%

Q.217. Ankita sold three toys. The first toy was sold for ₹1,500 at a profit of 25%; the second toy was sold for ₹2,800 at a loss of 50% and the third toy was sold for ₹3,500 at a profit of 25%. Find her total profit or loss percentage.
SSC CPO 05/10/2023 (3rd Shift)
(a) 15.25% profit (b) 18.75% loss
(c) 18.75% profit (d) 15.25% loss

SSC MTS 2023 Tier - 1

Q.218. Samridhi sold a gold ring at a loss of 26%. If the cost price of the gold ring is ₹38,500, what is the selling price of the gold ring?
SSC MTS 01/09/2023 (2nd Shift)
(a) ₹28,490 (b) ₹30,500
(c) ₹29,590 (d) ₹38,600

Q.219. The cost price of an article is ₹1,120. After allowing a discount of ₹205 a gain of 15% was made, then the marked price of the article is:
SSC MTS 01/09/2023 (3rd Shift)
(a) ₹1,760 (b) ₹1,493 (c) ₹1,350 (d) ₹1,580

Q.220. A manufacturer earns a profit of 10% on selling his products to a wholesale dealer. The wholesale dealer earns a profit of 15% by selling it to a retailer. The retailer, in turn, earns a profit of 25% from the customer. What is the actual cost of production of an article for which the customer pays ₹12,650 ?
SSC MTS 04/09/2023 (1st Shift)
(a) ₹8,000 (b) ₹8,500 (c) ₹9,000 (d) ₹7,000

Q.221. A grocer purchased 50 kg of sugar at ₹40 per kg and mixed with 70 kg of sugar at ₹30 per kg. At what rate should he sell the mixture (per kg) to gain 20%?
SSC MTS 04/09/2023 (2nd Shift)
(a) ₹60 (b) ₹20 (c) ₹35 (d) ₹41

Q.222. A store sells an item for ₹500, making a profit of 25%. Later, the store reduces the price of the item by 20% to clear out old inventory. What is the new percentage profit or loss for the store?
SSC MTS 04/09/2023 (3rd Shift)
(a) 2% profit (b) 5% profit
(c) 5% loss (d) No profit, no loss

Q.223. Vaishali booked a bus ticket for ₹1,260. Because of her ill health, she had to cancel the ticket. She got a refund of ₹945 in this process. What is the percentage loss that Vaishali had to face?
SSC MTS 05/09/2023 (1st Shift)
(a) 23% (b) 15% (c) 25% (d) 33%

Q.224. By selling 8 items, a shopkeeper gains the selling price of 2 items. The gain percentage of the shopkeeper is:
SSC MTS 05/09/2023 (3rd Shift)
(a) 25% (b) 16 $\frac{2}{3}$% (c) 33$\frac{1}{3}$ % (d) 30%

Q.225. Zeenat earns 20% on an investment, but she loses 10% on other investments. If the two investments are respectively in the ratio of 3 : 5, then what is the percentage gain or loss for Zeenat on the two investments taken together ?
SSC MTS 05/09/2023 (3rd Shift)
(a) 1.25 % Gain (b) 2.25 % Loss
(c) 1.25 % Loss (d) 2.25% Gain

Q.226. The profit obtained by a vendor on selling goods at ₹3,200 is equal to $\frac{7}{5}$ th of the profit obtained by selling the same goods at ₹3,000. What is the cost price (in ₹) of the goods?
SSC MTS 06/09/2023 (1st Shift)
(a) 2,500 (b) 2,700 (c) 2,400 (d) 2,900

Q.227. Kavita bought a table at 30% discount on its original price. She sold it with 48% increase on the price she bought it. What is the percentage difference between the new sale price and original price ? If the original price is ₹8,000, then how much extra money did Kavita get as profit ?
SSC MTS 06/09/2023 (3rd Shift)
(a) 5.6%; ₹280 (b) 3.6%; ₹288
(c) 6%; ₹360 (d) 4.5%; ₹308

Q.228. A man sold his cycle at 17% loss. If he had sold it for ₹1,056 more, he would have made 5% profit. The cost price of the cycle is:
SSC MTS 08/09/2023 (2nd Shift)
(a) ₹4,700 (b) ₹3,800 (c) ₹5,100 (d) ₹4,800

Q.229. The percentage profit earned by selling an article for ₹955 is equal to the percentage loss incurred by selling the same article for ₹845. At what price should the article be sold to make a 6% profit?
SSC MTS 08/09/2023 (3rd Shift)
(a) ₹955 (b) ₹954 (c) ₹925 (d) ₹1,014

Q.230. Ravi sells a laptop bag to Reeta for ₹1,920 and he sells another similar laptop bag to Vinay for ₹1,280. The percentage profit earned in selling the laptop bag to Reeta is equal to the percentage loss in selling the laptop bag to Vinay At what price (in ₹) should Ravi sell the laptop bag to make a profit of 25%?
SSC MTS 08/09/2023 (3rd Shift)
(a) 1,650 (b) 1,600 (c) 1,800 (d) 2,000

Q.231. A milk vendor mixes water with milk and by selling the mixture at the cost price be gains, 16$\frac{1}{4}$%. Find the ratio of milk to water in the mixture.
SSC MTS 11/09/2023 (2nd Shift)
(a) 7 : 40 (b) 80 : 13 (c) 13 : 80 (d) 40 : 7

Q.232. A seller marked the price of a sofa 25% more than its cost price. If he allows 12% discount on the marked price to the customer, then what is his gain

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

percentage? If the cost price of the sofa is ₹15,000, then what is his gain money?
SSC MTS 12/09/2023 (3rd Shift)
(a) 9%, ₹1,480 (b) 8%, ₹1,350
(c) 10%, ₹1,500 (d) 9.5%, ₹1,600

Q.233. Some oranges were purchased at ₹150 per hundred and sold at ₹24 per dozen. It gave a gain of ₹1,000. How many oranges were purchased ?
SSC MTS 13/09/2023 (1st Shift)
(a) 3000 (b) 2500 (c) 1500 (d) 2000

Q.234. A medical store owner purchased medicines worth ₹18,000 from a company. He sold 2/5 part of the medicine at a 35% loss. On which gain, he should sell the rest of the medicines so that he has neither gain nor loss ?
SSC MTS 13/09/2023 (2nd Shift)
(a) $23\frac{2}{3}\%$ (b) $20\frac{2}{3}\%$
(c) $20\frac{1}{3}\%$ (d) $23\frac{1}{3}\%$

Q.235. A microwave and a dish washing machine were sold for ₹27,000 each. If the microwave was sold at a gain of 25% and the dish washing machine at a loss of 25%. What is the overall profit % or loss% on the entire transaction?
SSC MTS 13/09/2023 (3rd Shift)
(a) 5.50% loss (b) 7.75% profit
(c) 6.25% loss (d) 8.25% profit

Q.236. A jewel was sold passing through 3 hands and on the whole, its price is raised by 80%. The first seller earns 20% profit and the second seller earns 25% profit, respectively. Find the percentage of profit earned by the third seller.
SSC MTS 14/09/2023 (1st Shift)
(a) 20% (b) 10% (c) 15% (d) 5%

Q.237. Praveen sells a study table to Zoya at a loss of 10%, and Zoya sells the study table to Aadarsh at a profit of 25%. If Aadarsh purchased the study table for ₹2,250, then what was the cost (in ₹) of the study table for Praveen?
SSC MTS 14/09/2023 (2nd Shift)
(a) 2,000 (b) 2,100 (c) 1,800 (d) 1,900

Q.238. A factory owner earns 12% on the product manufactured by him. The shopkeeper earns 10% profit on the same item. If shopkeeper sells the product for ₹98.56, then the cost price of the product for the factory owner is ₹_____.
SSC MTS 14/09/2023 (3rd Shift)
(a) 88 (b) 90 (c) 84 (d) 80

SSC CHSL 2023 Tier - 1

Q.239. A shopkeeper marks his goods at 80% more than their cost price and allows a discount of 48% on the marked price. His loss percentage is:
SSC CHSL 02/08/2023 (1st Shift)
(a) $2\frac{1}{5}\%$ (b) $7\frac{3}{5}\%$ (c) $6\frac{2}{5}\%$ (d) $3\frac{1}{5}\%$

Q.240. A publisher supplies books to a book-seller at 20% discount on the list price of ₹1,574.80. If the book-seller sells books at the list price and if his expenses for freight etc. are ₹45.40. Determine his profit.
SSC CHSL 02/08/2023 (2nd Shift)
(a) ₹285.34 (b) ₹269.56
(c) ₹273.50 (d) ₹282.22

Q.241. S sells an item costing ₹37,800 to P with 8% profit. P sells it to Q with a 4% loss. At what price (in ₹) does P sell the item? (Correct to a nearest rupee)
SSC CHSL 02/08/2023 (3rd Shift)
(a) 39,919 (b) 39,119
(c) 39,191 (d) 39,911

Q.242. If a man purchases kismis at ₹320 per kg and sells it at ₹6 per 25 grams, then his profit / loss percentage is:
SSC CHSL 02/08/2023 (4th Shift)
(a) 20% loss (b) 25% loss
(c) 25% profit (d) 20% profit

Q.243. The ratio of cost price (CP) and marked price (MP) of an article is 4 : 7. A discount of 20% is given on MP and the shopkeeper made a profit of ₹80. Find the CP of the article.
SSC CHSL 02/08/2023 (4th Shift)
(a) ₹190 (b) ₹170 (c) ₹200 (d) ₹180

Q.244. In April 2019, Dinesh purchased a new car for ₹7,00,000 and sold it in April 2022 at its depreciated cost. If the rate of depreciation in the first year is 20%, 15% in the second year and 10% every year thereafter, what amount of money will Dinesh get as the selling price ?
SSC CHSL 03/08/2023 (1st Shift)
(a) ₹4,28,400 (b) ₹4,28,600
(c) ₹4,68,400 (d) ₹5,28,400

Q.245. A profit earned by selling an article for ₹1,032 is equal to the loss incurred when the same article is sold for ₹648. What should be the selling price of the article if the profit is 30% ?
SSC CHSL 03/08/2023 (2nd Shift)
(a) ₹2,520 (b) ₹1,050 (c) ₹1,092 (d) ₹998

Q.246. A trader allows a 40% discount on his goods, but he loses 30% on them. Find the percentage of the marked price above the cost price.
SSC CHSL 03/08/2023 (2nd Shift)
(a) $15\frac{2}{3}\%$ (b) $15\frac{1}{3}\%$
(c) $16\frac{2}{3}\%$ (d) $16\frac{1}{3}\%$

Q.247. The marked price of the cupboard is ₹15,750, which is 50% above its cost price. It is sold at a discount of 40%.What is the profit/loss percentage?
SSC CHSL 03/08/2023 (3rd Shift)
(a) Profit, 10% (b) Loss, 10%
(c) Loss, 20% (d) Profit, 20%

Q.248. A vendor earns 10% on an investment but loses 10% on another investment. What will be the combined loss or gain if the two investments are in the ratio 1: 3 ?
SSC CHSL 03/08/2023 (4th Shift)
(a) 4% loss (b) 5% gain
(c) 4% gain (d) 5% loss

Q.249. A retailer buys 50 pens at the marked price of 44 pens. If he sells these pens at a discount of 1% on the marked price, what is the profit per cent?
SSC CHSL 04/08/2023 (2nd Shift)
(a) 10% (b) 12.5% (c) 12% (d) 15%

Q.250. A dealer gives a 7% discount on the marked price and gives 1 article free for buying every 25 articles and thus gains 25%. Find the percentage increase in the marked price above the cost price (round up to two decimal places).
SSC CHSL 04/08/2023 (3rd Shift)
(a) 39.78% (b) 37.88%
(c) 1.4% (d) 38.87%

Q.251. Sukhen purchased some perishable items for sale but 15% of those items could not be sold and went bad. However, Sukhen managed to sell the rest of the items at a price that helped him eam an overall profit of 19%. At what percentage above the cost price of each item did Sukthen sell each of the items that did NOT go bad?
SSC CHSL 04/08/2023 (4th Shift)
(a) 40% (b) 42% (c) 34% (d) 36%

Q.252. The marked price of a toy car is ₹600. The shopkeeper gives a discount of 4% and still makes a profit of 28%. Find the cost price of a toy car.
SSC CHSL 04/08/2023 (4th Shift)
(a) ₹460 (b) ₹420 (c) ₹480 (d) ₹450

Q.253. A renowned brand marked its goods at 40% above the cost price but allows a discount of 7.5% for UPI payments to the customers. What actual profit is made on a shirt, if a customer

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

pays ₹1,813 to buy it using UPI ?
SSC CHSL 07/08/2023 (3rd Shift)
(a) ₹413 (b) ₹348 (c) ₹378 (d) ₹393

Q.254. The marked price of a T-shirt is ₹560. The shopkeeper Krishna allows a discount of 16% and gains 12%. What would be the gain of Krishna if no discount is allowed ?
SSC CHSL 07/08/2023 (3rd Shift)
(a) $16\frac{2}{3}$ % (b) $31\frac{1}{9}$ %
(c) $33\frac{1}{3}$ % (d) $11\frac{1}{9}$ %

Q.255. A person purchased ten boxes of grapes at a cost of ₹2,000 per box. Each box contained 20 kgs of grapes. He sold each box at the rate of ₹ 2,500 per box. But on the whole 10 kgs of grapes were damaged. Further he paid ₹1,000 as transport charges. Find his gain or loss.
SSC CHSL 07/08/2023 (4th Shift)
(a) Gain ₹ 2,050 (b) Loss ₹ 1,000
(c) Gain ₹ 2,750 (d) Loss ₹ 1,500

Q.256. Pawan purchases 70 articles for ₹16,875 and sells them at a loss equal to the selling price of 5 articles. What will be the selling price of one article?
SSC CHSL 08/08/2023 (1st Shift)
(a) ₹220 (b) ₹230 (c) ₹235 (d) ₹225

Q.257. At how much per cent above the cost price should a trader mark his goods so that after allowing a discount of 25%, he still gains 5%?
SSC CHSL 08/08/2023 (1st Shift)
(a) 35% (b) 32% (c) 50% (d) 40%

Q.258. Shyam purchased a packet of 16 pens and got 4 pens free with it. He marked the price 20% more than the CP. If he did not allow any discount and sold all the 20 pens at this price, then what was his profit percentage?
SSC CHSL 08/08/2023 (2nd Shift)
(a) $37\frac{1}{2}$ % (b) 50% (c) 36% (d) 48%

Q.259. A shopkeeper sells a table at a discount of 25% on the marked price and earns a profit of 80%. If he sells the same table at a 40% discount, then his new profit is:
SSC CHSL 08/08/2023 (3rd Shift)
(a) 31% (b) 44% (c) 33% (d) 41%

Q.260. The cost price of 240 articles is the same as the selling price of x articles. If profit is 20%, find the value of x.
SSC CHSL 09/08/2023 (2nd Shift)
(a) 200 (b) 21 (c) 180 (d) 240

Q.261. The marked price of 85 items was equal to the cost price of 153 items. The selling price of 104 items was equal to the marked price of 65 items. Calculate the percentage profit or loss from the sale of each item.
SSC CHSL 09/08/2023 (3rd Shift)
(a) 12.5% loss (b) 12.5% profit
(c) 15% profit (d) 12.25% profit

Q.262. A man sells rice at 8% profit and uses weight 25% less than the actual measure. What is his percentage profit?
SSC CHSL 09/08/2023 (4th Shift)
(a) 44% (b) 41% (c) 23% (d) 36%

Q.263. A 45% profit is made when a discount of 45% is given on the marked price of an item. If the discount on the marked price of the same item is 50%, then the profit will be:
SSC CHSL 10/08/2023 (1st Shift)
(a) $31\frac{9}{11}$% (b) $33\frac{2}{11}$%
(c) $30\frac{7}{11}$% (d) $31\frac{7}{11}$%

Q.264. A trader allows a discount of 5% for cash payment. What percentage above the cost price must he mark his goods to make a profit of 14% ?
SSC CHSL 10/08/2023 (2nd Shift)
(a) 30% (b) 40% (c) 50% (d) 20%

Q.265. Deepak starts a business with a capital of ₹1,60,000. He incurs a loss of 10% during the first year. But he makes a profit of 5% during the second year on his remaining investment. Finally, he makes a profit of 25% on his new capital during the third year. Find his total profit at the end of three years.
SSC CHSL 10/08/2023 (2nd Shift)
(a) ₹29,500 (b) ₹29,000
(c) ₹28,000 (d) ₹28,500

Q.266. The cost price of an article is 72% of the marked price. The profit percentage after allowing a discount of 6% on the marked price is (rounded off to 2 decimal places):
SSC CHSL 11/08/2023 (1st Shift)
(a) 32.50% (b) 28.23%
(c) 30.56% (d) 35.65%

Q.267. A shopkeeper does a faulty weighing of an item of 930 gram instead of 1 kg and sells it at its cost price. Find his profit percentage on selling 15 kg of the item.
SSC CHSL 11/08/2023 (1st Shift)
(a) $8\frac{79}{93}$% (b) $5\frac{21}{93}$%
(c) $7\frac{49}{93}$% (d) $6\frac{19}{93}$%

Q.268. Upon selling an article at $\frac{3}{7}$ of the marked price, a loss of 30% is incurred. What is the ratio between the marked price and the cost price of the article?
SSC CHSL 11/08/2023 (2nd Shift)
(a) 48 : 60 (b) 49 : 30
(c) 25 : 37 (d) 50 : 80

Q.269. A discount of 20% is given on the marked price of a cycle, and still there is a profit of 20%. If the profit is ₹800, find the marked price of the cycle.
SSC CHSL 14/08/2023 (3rd Shift)
(a) ₹4,000 (b) ₹5,800
(c) ₹4,800 (d) ₹6,000

SSC CGL 2023 Tier - 1

Q.270. A shopkeeper uses 940 gm weight in place of one kg weight. He sells it at 4% profit. What will be the actual profit percentage? (rounded off to two decimal places)
SSC CGL 14/07/2023 (2nd shift)
(a) 9.25% (b) 10.32%
(c) 10.64% (d) 10.96%

Q.271. If the selling price of an article is doubled, then the profit becomes four times. What was the original profit percentage?
SSC CGL 17/07/2023 (4th shift)
(a) 75% (b) 100% (c) 50% (d) 25%

Q.272. R lends some money to S on which S pays ₹17,000 more to R. S lends the same money to T, on which T pays 8.5% more to S. What should be the minimum amount (in ₹) that S must borrow so that he does not incur any loss in the process?
SSC CGL 19/07/2023 (3rd shift)
(a) 2,00,000 (b) 2,25,000
(c) 1,80,000 (d) 1,70,000

Q.273. A seller professes to sell his fruits at cost price but still gains $5\frac{5}{19}$%. How much does he give for 1 kg?
SSC CGL 20/07/2023 (2nd shift)
(a) 905 gm (b) 5 gm
(c) 900 gm (d) 950 gm

Q.274. The cost price and selling price of rice are the same. Due to a faulty weighing machine, the seller earns a 15% profit. If Rs. x is the cost price of 1000 gm rice and the machine is changed which shows 1000 gm instead of 950 gm, what should be the selling price (in ₹) now to get the same percentage of profit?
SSC CGL 20/07/2023 (4th shift)
(a) 1.0295x (b) 1.0259x
(c) 1.0925x (d) 1.0950x

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.275. A dishonest shopkeeper sells millet at ₹20 per kg which he has bought at ₹16 per kg and he is giving 800 gm instead of 1000 gm. Find his actual profit percentage.
SSC CGL 24/07/2023 (2nd shift)
(a) 52.12% (b) 58.36%
(c) 54.25% (d) 56.25%

Q.276. A person marks his goods x% above the cost price and allows a discount of 12% on the marked price. If his profit is 10%, then the difference between x% and the profit percentage is:
SSC CGL 24/07/2023 (4th shift)
(a) 15% (b) 18% (c) 13% (d) 10%

Q.277. R's weighing machine shows 400 gm when the actual weight is 350 gm. The cost price of almonds is ₹880 per kg and packets of 200 gm are made using the faulty machine. What should be the selling price (in ₹) of each packet to get a profit of 25%?
SSC CGL 26/07/2023 (1st shift)
(a) 197.50 (b) 175.50
(c) 182.50 (d) 192.50

Q.278. Ram bought a cell phone and paid 30% less than its original price. He sold it at 50% profit on the price he had paid. The percentage of profit earned by Ram on the original price was:
SSC CGL 26/07/2023 (4th shift)
(a) 25% (b) 50% (c) 15% (d) 5%

Q.279. On selling a painting at Rs.1,498, the gain is 25% more than the loss incurred on selling it at Rs.1,300. In order to gain 25%, the selling price will be:
SSC CGL 27/07/2023 (1st shift)
(a) Rs.1,735 (b) Rs.1,335
(c) Rs.1,755 (d) Rs.1,388

SSC Selection Post (Phase - XI)

Q.280. The cost price of milk has increased to ₹62 from ₹60. The milkman sold milk at 10% profit earlier. What is his profit% now if he sells milk at the same rate?
Graduate Level 27/06/2023 (Shift - 4)
(a) 5.46% (b) 6.54% (c) 6.45% (d) 5.64%

Q.281. A piece of land was sold to a person through two middlemen, each gaining 25%. If the person purchased the land for ₹6,25,000, the original cost (in) of the land was:
Graduate Level 28/06/2023 (Shift - 3)
(a) 4,25,000 (b) 4,00,000
(c) 3,50,000 (d) 3,75,000

Q.282. A shopkeeper bought articles A and B for a total ₹2,540. He sold A at a gain of 15% and sold B at a loss of 25%. The selling price of A was ₹109 more than that of B. His profit or loss percentage in the entire transaction was (rounded off to one decimal place):
Graduate Level 30/06/2023 (Shift - 1)
(a) Loss, 8.3% (b) Profit, 8.3%
(c) Profit, 9.5% (d) Loss, 9.5%

Q.283. Muskan buys two kg of pulses for ₹400 and sells it for ₹440. She also uses the weight of 850 gm instead of 1 kg. What is Muskan's actual profit percentage?
Higher Secondary 30/06/2023 (Shift - 2)
(a) 30% (b) 27% (c) $25\frac{15}{17}$ % (d) $29\frac{7}{17}$ %

Q.284. A shopkeeper is purchasing goods from a wholesaler. The wholesaler is selling 1265 units of goods to the shopkeeper after gaining the sale price of 165 units of goods. What is the gain percentage of the wholesaler?
Matriculation Level 27/06/2023 (Shift - 2)
(a) 15% (b) 20% (c) 25% (d) 18%

Q.285. Mukesh sells almonds at the cost price but uses a false weight and thus gains a 23% profit. How many grams of almonds is he giving for 3.075 kg?
Matriculation Level 28/06/2023 (Shift - 1)
(a) 2500 (b) 2700 (c) 2400 (d) 2600

Q.286. In a grocery shop, Samarth sold 950 g of sugar to a customer in place of 1 kg for ₹54. The cost price of 1 kg sugar was ₹36. How much profit (in ₹) did he earn on selling the sugar?
Matriculation Level 30/06/2023 (Shift - 4)
(a) 16.2 (b) 18.7 (c) 20.2 (d) 19.8

SSC CHSL 2022 Tier - 2

Q.287. The marked price of a television set is ₹18,000. A shopkeeper allows a discount of 40% and gets a profit of 10%. What is the cost price of the television set?
SSC CHSL Tier II (26/06/2023)
(a) ₹$9,531\frac{5}{11}$ (b) ₹$8,181\frac{1}{11}$
(c) ₹$7,821\frac{3}{11}$ (d) ₹$9,818\frac{2}{11}$

SSC MTS 2022 Tier - 1

Q.288. A man earns a profit of 45 percent by selling a bike for a certain price. If he sells that bike at double the price, then what will be the profit percentage?
SSC MTS 02/05/2023 (Morning)
(a) 80 % (b) 180 % (c) 90 % (d) 190 %

Q.289. A person sold an article at a loss of 4%. Had he sold it at a gain of 1%, he would have received Rs.42.5 more. To gain 18%, what must be his selling price?
SSC MTS 03/05/2023 (Morning)
(a) Rs.756 (b) Rs.900
(c) Rs.1003 (d) Rs.850

Q.290. A man buys 21 mangoes for a rupee. How many mangoes had he sold for a rupee so that there is a loss of 30 percent ?
SSC MTS 03/05/2023 (Morning)
(a) 30 (b) 40 (c) 35 (d) 25

Q.291. A dishonest shopkeeper sells sugar at a rate of Rs.45 per kg. The cost price of the sugar is Rs.40 per kg. Even after doing this, he tries to increase his profit by removing 100 gm from each packet of 1 kg. What is the gain percent of the shopkeeper ?
SSC MTS 08/05/2023 (Afternoon)
(a) 30% (b) 35% (c) 20% (d) 25%

Q.292. A dishonest shopkeeper pretends to sell his goods at cost price but uses false weights and gain 10%. How much false weight he is using instead 1 kg weight ?
SSC MTS 09/05/2023 (Afternoon)
(a) 909.09 gm (b) 900 gm
(c) 920.30 gm (d) 911.12 gm

Q.293. If the selling price of 9 boxes is equal to the cost price of 15 boxes. The gain percent is (Selling price of all boxes is same. Cost price of all boxes is same):
SSC MTS 11/05/2023 (Evening)
(a) $(\frac{50}{3})$% (b) $(\frac{200}{3})$%
(c) $(\frac{100}{3})$% (d) $(\frac{140}{3})$%

Q.294. Vijay sells bananas at the rate of Rs. 13 per dozen and earns a profit of 30 percent. The cost price of the bananas increases by 10 percent. If the selling price remains the same, then what is his new profit percent?
SSC MTS 12/05/2023 (Afternoon)
(a) 16.66% (b) 18.18% (c) 14.28% (d) 12.5%

Q.295. The difference between cost price and selling price is Rs. 143. If profit percentage is 26 percent, then what is the selling price?
SSC MTS 15/05/2023 (Morning)
(a) Rs. 603 (b) Rs. 676
(c) Rs. 693 (d) Rs. 713

Q.296. The cost price of 50 articles is same as the selling price of x articles. If there is a profit of 25 percent, then what is the value of x? (Selling price of all articles is same. Cost price of all articles

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

is same)
SSC MTS 16/05/2023 (Morning)
(a) 20 (b) 40 (c) 30 (d) 25

Q.297. A person loses 20 percent on selling 80 pens for Rs. 40. What should be the selling price of 80 pens to earn a profit of 10 percent?
SSC MTS 17/05/2023 (Morning)
(a) Rs.80 (b) Rs.60 (c) Rs.55 (d) Rs.65

Q.298. Shivam purchased two watches, first for Rs. 12000 and the second for Rs. 10000. He sold both the watches, first one at the profit of 10 percent and the second at a loss of 10 percent. What is the overall profit or loss?
SSC MTS 19/05/2023 (Morning)
(a) 2.25 percent profit
(b) 2.25 percent loss
(c) 0.909 percent profit
(d) 0.909 percent loss

Q.299. A fruit seller sells $\frac{2}{5}$th part of fruits at a profit of 10% and remaining at a loss of 5%. If the total profit is Rs.1850, then what is the total cost price of fruits?
SSC MTS 19/05/2023 (Afternoon)
(a) Rs.198000 (b) Rs.205000
(c) Rs.185000 (d) Rs.176000

Q.300. A person earns a profit of 30 percent by selling an article for Rs. 325. How much percent should he increase his selling price to earn a profit of 40 percent?
SSC MTS 19/05/2023 (Evening)
(a) 6.66% (b) 8.25% (c) 7.69% (d) 5.25%

Q.301. A shopkeeper sells a book at a loss of 60 percent. Had he sold the book for Rs. 150 more, then he would have suffered a loss of 30 percent. To earn a profit of 20 percent, what should be the selling price of the book?
SSC MTS 13/06/2023 (Morning)
(a) Rs. 650 (b) Rs. 600
(c) Rs. 700 (d) Rs. 550

Q.302. If 80 percent of total articles are sold at a loss of 25 percent and remaining articles are sold at a profit of 20 percent, then what will be the overall loss percentage?
SSC MTS 13/06/2023 (Evening)
(a) 20% (b) 18% (c) 16% (d) 22%

Q.303. An article is sold at 5 percent loss. If its cost price is decreased by Rs. 20 and selling price is increased by Rs. 13, then profit of 10 percent is earned on it. What is the original selling price of the article?
SSC MTS 16/06/2023 (Morning)
(a) Rs. 266.66 (b) Rs. 221.66
(c) Rs. 283.33 (d) Rs. 250

Q.304. The profit earned by selling a jacket for Rs. 3860 is equal to the loss incurred by selling the same jacket for Rs. 1900. What should be the selling price of the jacket to earn 10 percent profit?
SSC MTS 16/06/2023 (Afternoon)
(a) Rs.3450 (b) Rs.3168
(c) Rs.3360 (d) Rs.3250

Q.305. Profit obtained on selling an article for Rs. 600 is equal to the loss incurred on selling the same article for Rs. 400. If selling price is Rs. 750, then what is the profit percentage?
SSC MTS 20/06/2023 (Afternoon)
(a) 80 % (b) 50 % (c) 70 % (d) 60 %

Q.306. Shivam purchased two watches, first for Rs. 12000 and the second for Rs. 16000. He sold both the watches, first one at the profit of 10 percent and the second at a loss of 10 percent. What is the overall profit or loss?
SSC MTS 20/06/2023 (Evening)
(a) Profit = Rs. 600 (b) Profit = Rs. 200
(c) Loss = Rs. 800 (d) Loss = Rs. 400

SSC CHSL 2022 Tier - 1

Q.307. A person sells wheat at a profit of 25 percent. If he reduces its selling price by Rs. 40, then he suffers a loss of 25 percent. What was the initial selling price of the wheat ?
SSC CHSL 09/03/2023 (1st Shift)
(a) Rs.80 (b) Rs.120 (c) Rs.60 (d) Rs.100

Q.308. Vijay sells bananas at the rate of Rs. 14 per dozen and earns a profit of 40 percent. The cost price of bananas increases by 30 percent. If the selling price remains the same, then what is his new profit percent?
SSC CHSL 10/03/2023 (1st Shift)
(a) 7.69 % (b) 9.09 % (c) 7.14 % (d) 8.33 %

Q.309. The marked price of an article is 20 percent more than its cost price. What maximum discount percentage can be offered by the shopkeeper to sell his article so that there is no loss?
SSC CHSL 10/03/2023 (3rd Shift)
(a) 16.66 percentage (b) 12.56 percentage
(c) 15.33 percentage (d) 13.33 percentage

Q.310. A milk merchant buys 30 litres of milk at the rate of Rs. 50 per litre and mixes 20 litres of water in it (water is free of cost). If he sells this mixture at the rate of Rs. 48 per litre, then what is the profit percentage ?
SSC CHSL 13/03/2023 (2nd Shift)
(a) 40 % (b) 50 % (c) 66.66 % (d) 60 %

Q.311. A trader sells an article at 20 percent profit. If he buys it at half of the cost price and sells at the same selling price as before, then what will be the profit percentage?
SSC CHSL 13/03/2023 (3rd Shift)
(a) 240 % (b) 40 % (c) 140 % (d) 60 %

Q.312. Ritika purchased x kg wheat at Rs.30/kg and sold 8 kg of this at Rs. 'x' per kg and remaining at Rs.45/kg. Overall profit percent earned is 10%, then what quantity of wheat Ritika sold at Rs.45/kg?
SSC CHSL 14/03/2023 (2nd Shift)
(a) 18 kg (b) 16 kg (c) 10 kg (d) 14 kg

Q.313. A shopkeeper sells a table at a discount of 20 percent and earns a profit of 30 percent. If he sells the same table at 10 percent discount. then what will be his new profit or loss percent?
SSC CHSL 14/03/2023 (3rd Shift)
(a) 32.5 percent profit
(b) 40.5 percent loss
(c) 46.25 percent profit
(d) 50.5 percent loss

Q.314. If an article is sold at 9/10th of its usual selling price. 20% profit would be made on it. Find the profit percentage which would have been made on it on selling it at its usual selling price.
SSC CHSL 15/03/2023 (1st Shift)
(a) 33.33% (b) 25% (c) 30% (d) 20%

Q.315. If 60 chairs are bought for Rs.24,560, then how many chairs must be sold for Rs.24,560 to earn a profit of 20 percent?
SSC CHSL 15/03/2023 (3rd Shift)
(a) 50 (b) 40 (c) 30 (d) 60

Q.316. Manoj bought two T.V. for Rs.2,280. He sold one at a loss of 20 percent and other at a profit of 10 percent. If each T.V was sold for the same price, then what is the cost price of the TV which was sold at loss?
SSC CHSL 16/03/2023 (1st Shift)
(a) Rs.1,380 (b) Rs.1,320
(c) Rs.1,050 (d) Rs.1,440

Q.317. A person buys three spectacles at the rate of Rs.4,000 per spectacles. He sells first spectacles at a profit of 30 percent, sells second spectacles at a loss of 10 percent and sells third spectacles at a loss of 10 percent. What is the total percentage of profit earned in the whole transaction?
SSC CHSL 16/03/2023 (4th Shift)
(a) 7.14 percent (b) 2.18 percent
(c) 3.33 percent (d) 5.41 percent

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.318. On selling a table for Rs. 210 and Rs. 420 there will be loss of L_1% and L_2 % respectively. If L_1 - L_2 = 7, then what is the cost price of table ?
SSC CHSL 17/03/2023 (2nd Shift)
(a) Rs. 5,000 (b) Rs. 3,000
(c) Rs. 7,000 (d) Rs. 4,000

Q.319. In what ratio tea of Rs.60 per kg should be mixed with tea of Rs.70 per kg so that on selling the mixture at Rs.80 per kg there is a profit of 25 percent?
SSC CHSL 20/03/2023 (2nd Shift)
(a) 3 : 2 (b) 2 : 3 (c) 5 : 2 (d) 4 : 1

Q.320. Shivam purchased two watches, first for Rs. 12000 and the second for Rs. 20,000. He sold both the watches, first one at the profit of 10 percent and the second at a loss of 20 percent. What is the overall profit or loss?
SSC CHSL 20/03/2023 (3rd Shift)
(a) Profit = Rs. 2600 (b) Loss = Rs. 2800
(c) Loss = Rs. 2400 (d) Profit = Rs. 2200

Q.321. A faulty weighing machine reads 1 kg when 900 gm is actually weighted on it. The shopkeeper marked the price of his goods by 10%, but unfortunately he was caught by the metrology department and then they ordered him to repair his weighing machine and gave punishment to sell the goods at a 10% discount on cost price for a month. If each customer is now paying ₹20 for 1 kg, then before the raid _____ amount they have paid for the same quantity. (Rounded off to two places of decimal)
SSC CHSL 21/03/2023 (3rd Shift)
(a) ₹27.16 (b) ₹27.04
(c) ₹28.05 (d) ₹28.15

SSC CGL 2022 Tier - 1

Q.322. A dishonest merchant sells goods at a 12.5% loss on the cost price, but uses 28 g weight instead of 36 g. What is his percentage profit or loss?
SSC CGL 01/12/2022 (1st Shift)
(a) 6.25% loss (b)12.5% gain
(c)18.75% gain (d)10.5% loss

Q.323. The price of some wooden furniture increases by 65% when it passes through three hands. If the first and second sellers made a profit of 20% and 25%, respectively, then find the profit percentage of the third seller.
SSC CGL 02/12/2022 (3rd Shift)
(a) 10% (b) 12.5% (c) 16% (d) 8%

Q.324. The cost of a piece of diamond varies with the square of its weight. A diamond of Rs.6,084 value is cut into 3 pieces whose weights are in the ratio 3 : 2 : 1. Find the loss involved in the cutting.
SSC CGL 03/12/2022 (2nd Shift)
(a) Rs.3,768 (b) Rs.3,718
(c) Rs.3,168 (d) Rs.3,518

Q.325. A dishonest trader says to customers that he sells his goods at a cost price, but he uses a false weight and gains 12.5% as profit. How many grams does he use to weigh 1 kg?
SSC CGL 03/12/2022 (4th Shift)
(a) 900 g (b) 880.5 g (c) 850 g (d) 888.8 g

Q.326. Apples were purchased at 100 for Rs.350 and sold at Rs.48 a dozen. What is the profit or loss percentage?
SSC CGL 05/12/2022 (4th Shift)
(a) Profit $14\frac{2}{7}$% (b) Loss $18\frac{3}{5}$%
(c) Loss 10% (d) Profit 12%

Q.327. Ramesh claims that he is selling onions at Rs.36 per kg, which costs him Rs.40 per kg, but he gives 800 grams instead of 1 kg. Find Ramesh's percentage gain or loss.
SSC CGL 07/12/2022 (4th Shift)
(a) Gain 13.5% (b) Loss 13.5%
(c) Loss 12.5% (d) Gain 12.5%

Q.328. A shopkeeper advertises for selling clothes at a 7% loss. However, by using a false scale of length 1 metre he actually gains 24%. What will be the actual length he uses instead of 1 metre ?
SSC CGL 08/12/2022 (1st Shift)
(a) 75cm (b) 31cm (c) 76cm (d) 93cm

Q.329. A dishonest dealer professes to sell his goods at cost price but uses a false weight and thus gains 15%. For a kilogram, he uses a weight of _____ (rounded off to one digit after decimal).
SSC CGL 12/12/2022 (2nd Shift)
(a) 833.3 gm (b) 876.7 gm
(c) 869.6 gm (d) 898.33 gm

Q.330. Ramesh purchases a table and a chair for Rs.3,900. He sells the table at a profit of 8% and the chair at a profit of 16%. He earns a profit of Rs.540. What is the difference between the original price of the table and the chair?
SSC CGL 13/12/2022 (1st Shift)
(a) Rs.2,000 (b) Rs.1,800
(c) Rs.1,900 (d) Rs.1,700

SSC CPO 2022 Tier - 1

Q.331. A seller uses faulty weight in place of a 2 kg weight and earns a 25% profit. He claims that he is selling on the cost price in front of the customers but uses a faulty weight. How much error is there in the 2 kg weight to gain 25%?
SSC CPO 09/11/2022 (Morning)
(a) 250 g (b) 400 g (c) 500 g (d) 300 g

Q.332. What will be the actual profit percentage (rounded off to nearest integer) after selling an article at a certain price, while there occurs a loss of 45% on selling the article at $\frac{3}{8}$ of the selling price ?
SSC CPO 09/11/2022 (Evening)
(a) 17 % (b) 37 % (c) 47 % (d) 27 %

Q.333. A shopkeeper sells his items using a faulty balance which measures 25% less. He then marks up his items 15% above the cost price. If he also gives a discount of 10%, then find his net profit percentage on 1 kg items.
SSC CPO 10/11/2022 (Afternoon)
(a) 32% (b) 41% (c) 44% (d) 38%

Q.334. The cost price of an article is ₹1,200. On buying four such articles, the customer gets one for free. If the selling price of each article is ₹1,800, then determine the net percentage profit earned by the shopkeeper on selling four articles.
SSC CPO 10/11/2022 (Evening)
(a) 12% (b) 20% (c) 18% (d) 15%

Q.335. A shopkeeper gives 20% commission on the retail price of one article and earns 5% profit. If his commission is reduced by 10%, then what is his approximate profit percentage? (Nearest integral value)
SSC CPO 10/11/2022 (Evening)
(a) 18% (b) 10% (c) 15% (d) 8%

Q.336. A shopkeeper claims to sell his articles at ₹20 per kg which cost him ₹23 per kg. But while selling, he uses a false weight and gives only 800 gm instead of 1 kg. What is his profit percentage?
SSC CPO 11/11/2022 (Morning)
(a) $8\frac{17}{23}$% (b) $8\frac{16}{23}$%
(c) $8\frac{14}{23}$% (d) $8\frac{15}{23}$%

Q.337. A merchant marks up the price of his goods by 40% more than the cost price. He then sells $\frac{1}{5}$th of his goods at a discount of 10%, half of the goods at the marked price and the rest of the goods at a discount of 20%. Find his profit percentage.
SSC CPO 11/11/2022 (Evening)
(a) 20.4 % (b) 30.2 % (c) 28.8 % (d) 14.6 %

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 2021 Tier - 2

Q.338. A person sells an article for a loss of 18 percent. If he increases the selling price by ₹144 and decreases the cost price by 30 percent, then there is profit of 20 percent. What is the original selling price?
SSC CGL Tier II (08/08/2022)
(a) ₹ 5068 (b) ₹ 6036
(c) ₹ 5904 (d) ₹ 6124

Q.339. The selling prices of articles A and B are the same. A is sold at a profit of 28 percent and B is sold at a loss of 24 percent. If the total selling price of the both articles is ₹48640, then what is the cost price of A and B, respectively?
SSC CGL Tier II (08/08/2022)
(a)₹ 26000, ₹ 40000 (b) ₹ 24000, ₹ 38000
(c)₹ 17000, ₹ 28000 (d) ₹ 19000, ₹ 32000

SSC Selection Post (Phase - X)

Q.340. Raheem sold a crockery set for ₹1,092 at a profit of 20%. What would have been the actual percentage profit or loss on it, if he sold it for ₹950 (rounded to two decimal places)?
Graduate Level 03/08/2022 (Shift - 3)
(a) 5.40% loss (b) 4.40% loss
(c) 5.40% profit (d) 4.40% profit

Q.341. P buys an article for Rs.280 and sells it to Q at a profit of 25%. Q sells it to R at some profit. R sells it to S for Rs.560 making a profit of 40%. What percentage profit (rounded off to the nearest integer) did Q make?
Graduate Level 05/08/2022 (Shift - 3)
(a) 26 % (b) 14 % (c) 32 % (d) 20 %

Q.342. A multi-store outlet sold 1375 items in a week earning 25% gain. The gain is also equal to the selling price of 'Q' number of items. What is the value of Q ?
Higher Secondary 02/08/2022 (Shift - 2)
(a) 250 (b) 325 (c) 225 (d) 275

Q.343. A shopkeeper purchases supplies from a supplier. The supplier sells 750 units of bags to the shopkeeper after gaining the sale price of 125 units of bags. What is the gain percentage of the supplier?
Higher Secondary 04/08/2022 (Shift - 3)
(a) 16% (b) 20% (c) 22% (d) 15%

SSC MTS 2021 Tier - 1

Q.344. A shopkeeper buys three products a, b, c and sells them at 20%, 30%, 40% profit, respectively. What is the ratio of the selling price of these products, if the ratio of their cost prices is 4 : 3 : 2?
SSC MTS 05/07/2022 (Morning)
(a) 34 : 54 : 12 (b) 48 : 39 : 28
(c) 56 : 26 : 21 (d) 24 : 39 : 14

Q.345. Ranveer bought a computer paying 25% less than the list price and sold it to his neighbour at a 40% profit on his purchase cost. The profit percentage earned by Rnaveer on the list price of the computer is :
SSC MTS 05/07/2022 (Evening)
(a) 10% (b) 7.5% (c) 6.67% (d) 5%

Q.346. A bought a bag and a bottle for a total of ₹900. He sold the bottle at a profit of 12% and the bag at a profit of 20%. If he earned a total profit of ₹160.80, then calculate the cost price of the bottle.
SSC MTS 07/07/2022 (Morning)
(a) ₹320 (b) ₹300 (c) ₹200 (d) ₹240

Q.347. If 25% discount is given on an article, then there will be a loss of 15%. if the article is sold at its marked price, Then what will the profit percentage be? [Give your answer correct to 2 decimal places]
SSC MTS 11/07/2022 (Morning)
(a) 15.66% (b) 12.66%
(c) 13.33% (d) 10.22%

Q.348. A person buys some bananas at ₹Y per dozen and sells them at ₹$\frac{Y}{4}$ per banana. What is his gain percentage?
SSC MTS 11/07/2022 (Evening)
(a) 200% (b) 50% (c) 80% (d) 100%

Q.349. $\frac{2}{5}$ of the marked price of an item is equal to $\frac{4}{7}$ of its cost price. If a discount of 15% is given on its sale, then what is the approximate profit percentage earned?
SSC MTS 11/07/2022 (Evening)
(a) 19.84% (b) 23.63%
(c) 21.43% (d) 14.28%

Q.350. A retailer bought 50 kg of Arhar Dal at a discount of 20%. Another 2 kg of Arhar dal was offered to him for free by the wholesaler on the purchase of 50 kg of the dal. If the retailer sells the entire quantity of the dal at the marked price to a customer, what is the profit percentage gained by the retailer?
SSC MTS 13/07/2022 (Morning)
(a) 30% (b) 22% (c) 12% (d) 15%

Q.351. A shopkeeper earns a profit of 16% if he allows a discount of 20% on the marked price of an article. What will be the profit % earned by the shopkeeper if he sold the article at its marked price?
SSC MTS 14/07/2022 (Afternoon)
(a) 45% (b) 35% (c) 36% (d) 55%

Q.352. Nalini purchased 20 dozen apples at ₹48 per dozen. She sold 8 dozen of them at 10% profit and the remaining 12 dozen at 20% profit. What is the overall profit percentage gained in this transaction?
SSC MTS 15/07/2022 (Afternoon)
(a) 10% (b) 45% (c) 16% (d) 22%

Q.353. The selling prices of an apple and an orange are Rs 90 and Rs 40, respectively. If the profit percentage gained on the sales of an apple and an orange are 50% and 100%, respectively, then what is the total cost price of an apple and an orange.
SSC MTS 18/07/2022 (Evening)
(a) 65 (b) 100 (c) 85 (d) 80

Q.354. A milkman purchases milk at ₹ 'a' per litre and sells it at ₹ 1.5a per litre. Still he mixes 2 litres water with every 9 litres of pure milk. What is his profit percentage?
SSC MTS 19/07/2022 (Afternoon)
(a) $\frac{250}{3}$ % (b) $\frac{328}{9}$ %
(c) $\frac{789}{5}$ % (d) $\frac{1000}{3}$ %

Q.355. Vishal and Param each sold their article at ₹1,818 but Vishal incurred a loss of 10%, while Param gained by 1%. What is the ratio of the cost price of Vishal's article to that of Param's article?
SSC MTS 20/07/2022 (Morning)
(a) 101 : 90 (b) 3 : 4
(c) 85 : 89 (d) 81 : 75

Q.356. Kisna buys a cow for ₹15,000. After one year, he sells it for ₹18,500. After one year, again he buys the same cow at ₹19,000 and sells it for ₹22,300. What is the overall profit percentage of Kisna?
SSC MTS 20/07/2022 (Afternoon)
(a) 18 % (b) 10% (c) 20% (d) 15%

Q.357. A mobile phone is sold at a profit of 80%. The nominal profit is approximately what percentage of the selling price of the mobile phone?
SSC MTS 21/07/2022 (Morning)
(a) 33.33% (b) 28.56%
(c) 44.44% (d) 36.66%

Q.358. What is the profit percentage of a dishonest cloth merchant who uses a scale which measures $16\frac{2}{3}$% less than

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

what is marked on it, and also sells a price of 10% higher than the cost price?
SSC MTS 25/07/2022 (Afternoon)
(a) 20% (b) 32% (c) 26% (d) 30%

Q.359. When a watch is sold at $\frac{7}{8}$th of the marked price, there is profit of 25%. At what percentage more than the cost price has the marked price of the watch been fixed?. [Give your answer correct to 2 decimal places]
SSC MTS 25/07/2022 (Evening)
(a) 34.46% (b) 42.86% (c) 37.15% (d) 30%

Q.360. A shopkeeper sold 24 shirts, each at a profit of 20% and 16 shirts, each at a profit of 10%. If he had sold all the 40 shirts, each at a profit of 15% , then his overall profit would have been reduced by ₹36. What is the cost price of each shirt?
SSC MTS 26/07/2022 (Evening)
(a) ₹100 (b) ₹220 (c) ₹90 (d) ₹150

SSC CHSL 2021 Tier - 1

Q.361. A man P purchased a land for ₹4,32,000 on the outskirts of a city. Due to some reason, its value depreciated at 25% per annum and he sold it to Q after 2 years. At this time, the city expanded and new projects of infrastructures started coming up. As a result of the expansion, there was an appreciation of real estate prices at the rate of 50%. What would be the value (in ₹) of the land after 2 years, from the time Q bought the land from P ?
SSC CHSL 24/05/2022 (Afternoon)
(a) ₹5,46,750 (b) ₹5,57,450
(c) ₹5,76,450 (d) ₹6,05,070

Q.362. Kamal purchases 80 articles for ₹11,180 and sells them at a loss equal to the selling price of 6 articles. What will be the selling price of 1 article?
SSC CHSL 25/05/2022 (Morning)
(a) ₹130 (b) ₹120 (c) ₹135 (d) ₹125

Q.363. A shopkeeper normally makes a profit of 20% in a certain transaction; he weighs 900 g instead of 1 kg, due to an issue with the weighing machine. If he charges 10% less than what he normally charges, what is his actual profit or loss percentage?
SSC CHSL 27/05/2022 (Morning)
(a) 20% (b) 28% (c) 25% (d) 30%

Q.364. A fruit seller purchased 300 bananas at the rate of ₹18 per dozen and sold 200 bananas at the rate of ₹24 per dozen and the remaining bananas at the rate of ₹21 per dozen. What is his net profit percentage?
SSC CHSL 31/05/2022 (Evening)
(a) 28% (b) 26% (c) 27% (d) $27\frac{7}{9}$%

Q.365. The marked price of 42 items was equal to the cost price of 70 items. The selling price of 25 items was equal to the marked price of 21 items. Calculate the percentage profit or loss from the sale of each item.
SSC CHSL 01/06/2022 (Afternoon)
(a) 42% profit (b) 29% profit
(c) 29% loss (d) 40% profit

Q.366. A merchant gives an additional discount of 10% on the product after an initial discount of 20% on the listed price. He managed to make a 10% profit by selling the product for ₹54,000. What was the listed price of the product?
SSC CHSL 06/06/2022 (Evening)
(a) ₹77,500 (b) ₹77,000
(c) ₹75,000 (d) ₹72,500

Q.367. If half of the quantity of sugar in a bag was sold at a profit of 20%, a quarter of the quantity of sugar in the bag was sold at a profit of 16% and the remaining sugar in the bag was sold at a profit of 24%, and the total profit obtained by selling all the sugar in the bag was ₹90, what was the cost price of the entire quantity of sugar in the bag?
SSC CHSL 08/06/2022 (Evening)
(a) ₹450 (b) ₹750 (c) ₹500 (d) ₹400

Q.368 A table fan, passing through two hands, is finally sold at a profit of 30% of the original cost price. If the first dealer makes a profit of 25%, then the profit made by the second dealer is:
SSC CHSL 09/06/2022 (Evening)
(a) 5% (b) 10% (c) 15% (d) 4%

SSC CGL 2021 Tier - 1

Q.369. The marked price of an article is ₹10,927. Due to the festive season, a certain percentage of discount is declared. Raju buys an article at a reduced price and sells it at ₹10,927, and makes a profit of 11.5%. What was the percentage discount offered?
SSC CGL 11/04/2022 (Morning)
(a) 10.3% (b) 11.3% (c) 11.5% (d) 10.9%

Q.370. The cost price of two articles A and B are in the ratio 4 : 5 . While selling these articles ,the shopkeepers gains 10% on article A and 20% on article B and the difference in their selling price is ₹480. The difference in the cost price (in ₹) of article B and A is ;
SSC CGL 12/04/2022 (Afternoon)
(a) 250 (b) 300 (c) 400 (d) 350

Q.371. Manjeet bought a second hand motorbike for ₹22,000 and spent ₹3,000 on its overhauling and maintenance . He then sold it with 12% profit.If he had sold it for ₹500 less, then what would have been his profit percentage ?
SSC CGL 20/04/2022 (Morning)
(a) 10.5% (b) 10% (c) 5% (d) 8%

Q.372. An article is sold at a certain price. If it is sold at 70% of this price, then there is a loss of 10%. What is the percentage profit, when it is sold at the original selling price ?
SSC CGL 20/04/2022 (Evening)
(a) $\frac{50}{7}$% (b) $\frac{200}{7}$% (c) $\frac{300}{7}$% (d) $\frac{100}{7}$%

Q.373. A vegetable vendor sold 1 kg of potatoes for Rs. 25 and earned 25% profit. In the evening, he started selling potatoes with only 10% profit. At what cost (in ₹) per kg did he sell the potatoes in the evening?
SSC CGL 21/04/2022 (Evening)
(a) 21 (b) 20 (c) 24 (d) 22

SSC CGL 2020 Tier - 2

Q.374. An article is sold at a certain price. If it is sold at $33\frac{1}{3}$% of this price, there is a loss of $33\frac{1}{3}$%. What is the percentage profit if the article is sold at 80% of its original selling price?
SSC CGL Tier II (29/01/2022)
(a) 70% (b) 60% (c) 40% (d) 50%

SSC MTS 2020 Tier - 1

Q.375. The cost prices of two articles are in the ratio 4 : 5. While selling these articles, the shopkeeper gains 10% on one article and 20% profit on the other article, and the difference in the selling price is ₹480. Find the total cost price of both the articles.
SSC MTS 06/10/2021 (Morning)
(a) ₹3,000 (b) ₹2,700 (c) ₹2,500 (d) ₹2,800

Q.376. When an article is sold for ₹768, the profit percentage is x%. When the same article is sold for ₹896, the profit percentage is (x + 20)%. What is the value of x?
SSC MTS 06/10/2021 (Evening)
(a) 30 (b) 25 (c) 15 (d) 20

Q.377. A man sold a radio and a TV set together for ₹30,400, thereby making a profit of 25% on the radio and 10% on the TV set. By selling them together for ₹30,700, he would have made a 10% profit on the radio and 25% on the TV set.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

The cost price of the radio is:
SSC MTS 12/10/2021 (Evening)
(a) ₹10,000 (b) ₹12,000
(c) ₹8,000 (d) ₹9,000

Q.378. A shopkeeper bought 500 notebooks. He sold 300 of them for the price he paid for all 500 notebooks. He sold 140 notebooks at a 20% higher rate than that at which he sold 300 notebooks and the remaining at the cost price.What is the profit percentage in the whole transaction?
SSC MTS 14/10/2021 (Afternoon)
(a) 60% (b) 56% (c) 68% (d) 64%

Q.379. A trader purchased 500 kg of sugar at ₹40 per kg. He sold 200 kg of it at a profit of 10% and 120 kg at a loss of 5%. At what rate per kg (in ₹, correct to 2 decimal places) should he sell the remaining sugar to gain 12% on his initial investment?
SSC MTS 18/10/2021 (Afternoon)
(a) 48.67 (b) 52.33 (c) 50.22 (d) 44.80

Q.380. A shopkeeper buys 60 oranges at 10 for ₹72, and an equal number at 12 for ₹90. He spends ₹118 on the transaction and sells all the oranges that he buys. If there is a profit of 26% in the entire transaction, then what is the selling price of 32 oranges?
SSC MTS 27/10/2021 (Afternoon)
(a) ₹336 (b) ₹313.60
(c) ₹316.80 (d) ₹320

Q.381. If a shopkeeper purchases a certain number of items for a certain sum and sells a fraction of the said number for the same amount, then his profit is 300%. What is the fraction?
SSC MTS 02/11/2021 (Evening)
(a) $\frac{1}{4}$ (b) $\frac{1}{3}$ (c) $\frac{1}{6}$ (d) $\frac{1}{2}$

SSC CGL 2020 Tier - 1

Q.382. A shopkeeper bought 20 kg of sugar at Rs.45 per kg, 25 kg of sugar at Rs.50 per kg and 35 kg of sugar at Rs.40 per kg. He spent a sum of Rs.450 on transportation and other expenses. He mixed all the three types of sugar and sold all the stock at Rs.52.50 per kg. His profit percent in the entire transaction is:
SSC CGL 17/08/2021 (Afternoon)
(a) 5% (b) 7.25% (c) 4.25% (d) 6.5%

Q.383. A shopkeeper sold two items. The selling price of the first item equals the cost price of the second item. He sold the first item at a profit of 20%, and the second item at a loss of 10%. What is the overall profit/loss percent?
SSC CGL 20/08/2021 (Afternoon)
(a) Loss, $4\frac{6}{11}$% (b) Profit, $3\frac{7}{11}$%
(c) Profit, $4\frac{7}{11}$% (d) Loss, $8\frac{1}{3}$%

Q.384. A shopkeeper sold an article at four-fifth of the marked price and suffered a loss of $3\frac{1}{3}$%. Find the profit percent, if he sold the article at the marked price. (correct to nearest integer)
SSC CGL 24/08/2021 (Afternoon)
(a) 20 (b) 22 (c) 18 (d) 21

SSC CHSL 2020 Tier - 1

Q.385. A shopkeeper bought 40 dozen eggs at Rs. 1.40 each. 80 eggs were broken in transportation. He sold the remaining eggs at Rs. 1.60 each. What is his profit or loss per cent?
SSC CHSL 13/04/2021 (Afternoon)
(a) Loss, $3\frac{19}{27}$ (b) Profit, $3\frac{19}{27}$
(c) Profit, $4\frac{16}{21}$ (d) Loss, $4\frac{16}{21}$

Q.386. A man buys goods for Rs.8000. He sells 30% of those goods at a profit of 12% and 40% of the remaining goods at a profit of 25%. At what profit percentage should he sell the remaining goods to gain 30% in the entire transaction. (correct to one decimal place)?
SSC CHSL 19/04/2021 (Morning)
(a) 42.6% (b) 46.2% (c) 48.4% (d) 31.6%

Q.387. By selling a car for Rs.6,32,500, a showroom owner makes a profit of 15%. If he sold the car at Rs. 8,10,000, then what would be the profit percentage (correct to one decimal place)
SSC CHSL 10/08/2021 (Evening)
(a) 47.3% (b) 44.8% (c) 41.5% (d) 51.4%

SSC CPO 2020 Tier - 1

Q.388. A person sold an article at a loss of 16%. Had he sold it for Rs. 660 more, he would have gained 8%. If the article is sold at Rs. 3,080, then how much profit percentage is gained?
SSC CPO 25/11/2020 (Morning)
(a) 10% (b) 15% (c) 20% (d) 12%

Answer Key :-

1.(a)	2.(c)	3.(b)	4.(c)
5.(c)	6.(b)	7.(c)	8.(b)
9.(c)	10.(a)	11.(a)	12.(b)
13.(a)	14.(d)	15.(a)	16.(b)
17.(c)	18.(a)	19.(c)	20.(d)
21.(a)	22.(a)	23.(b)	24.(b)
25.(b)	26.(a)	27.(c)	28.(b)
29.(d)	30.(b)	31.(d)	32.(d)
33.(b)	34.(a)	35.(b)	36.(a)
37.(a)	38.(c)	39.(a)	40.(d)
41.(a)	42.(b)	43.(a)	44.(a)
45.(c)	46.(a)	47.(d)	48.(b)
49.(d)	50.(a)	51.(b)	52.(d)
53.(d)	54.(d)	55.(a)	56.(b)
57.(a)	58.(a)	59.(c)	60.(c)
61.(c)	62.(c)	63.(b)	64.(c)
65.(d)	66.(c)	67.(b)	68.(b)
69.(a)	70.(a)	71.(d)	72.(c)
73.(b)	74.(b)	75.(d)	76.(a)
77.(b)	78.(d)	79.(b)	80.(c)
81.(b)	82.(c)	83.(d)	84.(b)
85.(c)	86.(a)	87.(d)	88.(b)
89.(b)	90.(a)	91.(b)	92.(c)
93.(b)	94.(b)	95.(c)	96.(d)
97.(d)	98.(d)	99.(b)	100.(c)
101.(b)	102.(d)	103.(b)	104.(d)
105.(c)	106.(b)	107.(c)	108.(d)
109.(a)	110.(a)	111.(c)	112.(c)
113.(b)	114.(c)	115.(b)	116.(b)
117.(d)	118.(d)	119.(b)	120.(b)
121.(a)	122.(c)	123.(b)	124.(d)
125.(b)	126.(d)	127.(c)	128.(d)
129.(c)	130.(d)	131.(d)	132.(a)
133.(c)	134.(d)	135.(b)	136.(a)
137.(a)	138.(c)	139.(b)	140.(c)
141.(a)	142.(c)	143.(d)	144.(d)
145.(b)	146.(c)	147.(a)	148.(d)
149.(c)	150.(d)	151.(c)	152.(d)
153.(d)	154.(b)	155.(c)	156.(d)
157.(d)	158.(a)	159.(b)	160.(c)
161.(d)	162.(c)	163.(d)	164.(a)
165.(c)	166.(b)	167.(c)	168.(b)
169.(c)	170.(c)	171.(d)	172.(d)
173.(c)	174.(b)	175.(c)	176.(c)
177.(c)	178.(a)	179.(d)	180.(c)
181.(a)	182.(b)	183.(c)	184.(c)
185.(b)	186.(a)	187.(a)	188.(a)
189.(a)	190.(b)	191.(a)	192.(b)
193.(a)	194.(a)	195.(d)	196.(a)
197.(d)	198.(d)	199.(a)	200.(c)
201.(a)	202.(d)	203.(d)	204.(b)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

205.(b)	206.(b)	207.(c)	208.(b)
209.(a)	210.(a)	211.(d)	212.(c)
213.(a)	214.(c)	215.(a)	216.(c)
217.(b)	218.(a)	219.(b)	220.(a)
221.(d)	222.(d)	223.(c)	224.(c)
225.(a)	226.(a)	227.(b)	228.(d)
229.(b)	230.(d)	231.(b)	232.(c)
233.(d)	234.(d)	235.(c)	236.(a)
237.(a)	238.(d)	239.(c)	240.(b)
241.(c)	242.(b)	243.(c)	244.(a)
245.(c)	246.(c)	247.(b)	248.(d)
249.(b)	250.(a)	251.(a)	252.(d)
253.(a)	254.(c)	255.(c)	256.(d)
257.(d)	258.(b)	259.(b)	260.(a)
261.(b)	262.(a)	263.(a)	264.(d)
265.(b)	266.(c)	267.(c)	268.(b)
269.(d)	270.(c)	271.(c)	272.(a)
273.(d)	274.(c)	275.(d)	276.(a)
277.(d)	278.(d)	279.(a)	280.(c)
281.(b)	282.(a)	283.(d)	284.(a)
285.(a)	286.(d)	287.(d)	288.(d)
289.(c)	290.(a)	291.(d)	292.(a)
293.(b)	294.(b)	295.(c)	296.(b)
297.(c)	298.(c)	299.(c)	300.(c)
301.(b)	302.(c)	303.(b)	304.(b)
305.(b)	306.(d)	307.(d)	308.(a)
309.(a)	310.(d)	311.(c)	312.(c)
313.(c)	314.(a)	315.(a)	316.(b)
317.(c)	318.(b)	319.(a)	320.(b)
321.(a)	322.(b)	323.(a)	324.(b)
325.(d)	326.(a)	327.(d)	328.(a)
329.(c)	330.(b)	331.(b)	332.(c)
333.(d)	334.(b)	335.(a)	336.(b)
337.(c)	338.(c)	339.(d)	340.(d)
341.(b)	342.(d)	343.(b)	344.(b)
345.(d)	346.(d)	347.(c)	348.(a)
349.(c)	350.(a)	351.(a)	352.(c)
353.(d)	354.(a)	355.(a)	356.(c)
357.(c)	358.(b)	359.(b)	360.(c)
361.(a)	362.(a)	363.(a)	364.(d)
365.(d)	366.(c)	367.(a)	368.(d)
369.(a)	370.(b)	371.(b)	372.(b)
373.(d)	374.(b)	375.(b)	376.(d)
377.(b)	378.(c)	379.(c)	380.(a)
381.(a)	382.(a)	383.(b)	384.(d)
385.(d)	386.(b)	387.(a)	388.(d)

Solutions :-

Sol.1.(a) Cost price of each refrigerator

$= 17250 \times \frac{20}{23} = ₹15000$

Cost of production increases by 18% then,

New cost price $= 15000 \times \frac{118}{100} = ₹17700$

Now, for the profit of 18 %

Selling price $= 17700 \times \frac{118}{100} = ₹20886$

Sol.2.(c)

Ratio → initial : final

Price → 36 : 46

Weight → 2900 : 3000

Final → 6 × 29 : 46 × 5 = 174 : 230

230 unit = ₹ 46

Profit (56 unit) $= \frac{46}{230} \times 56 = ₹\ 11.2$

Sol.3.(b) For greatest profit, cost price must be minimum and selling price must be maximum.

Hence, C.P. = ₹200 and S.P. = ₹300

Profit = 300 - 200 = ₹100

Profit for 25 books = 25 × 100 = ₹2500

Sol.4.(c)

$\frac{SP}{Actual\ Price} = \frac{7.2}{10} \times \frac{1000}{900} = \frac{72}{90}$

Percentage change in the actual price

$= \frac{90-72}{90} \times 100 = 20\%$

Sol.5.(c)

CP of 20 cookies for seller = ₹ 76

CP of 1 cookies for seller = ₹ 3.8

SP of 19 cookies for seller = ₹95

Profit = 95 - 76 = ₹19

Total profit = 19 + 3.8 (remaining 1 cookies price) = ₹ 22.8

Sol.6.(b) SP of 1 kg sugar = ₹44.8

CP of 1 kg sugar $= ₹44.8 \times \frac{100}{112} = ₹40$

According to the question,

C.P.Remaining sugar $= ₹40 \times \frac{5}{4} = ₹50$

New SP of 1 kg sugar after profit of 5%

$= ₹\ 50 \times \frac{105}{100} = ₹52.5$

Sol.7.(c) According to the question,

(30 S.P. - 30 C.P.) = 10 S.P.

C.P. : S.P. = 2 : 3

Now, C.P. (2 unit) = ₹480

1 unit = ₹240

So, S.P. (3 unit) = 3 × 240 = ₹720

Sol.8.(b)

Expenditure = Price × Consumption

Ratio → Original : Final

Price → 40 : 37

Consumption → 37 : 40

Expenditure → 1480 : 1480

Increase in quantity (3 units) = 15 kg.

Original consumption (37 units)

$= \frac{15}{3} \times 37 = 185$ kg.

The original price of sugar per kg

$= \frac{7400}{185} = 40$ Rs.

Selling price after 32.5% profit

$= 40 \times \frac{132.5}{100} = 53$

Sol.9.(c) Let Ramanna purchase 100kg of raw material at a cost of ₹100

$22.5\% = \frac{9}{40}$

Quantity of raw material used

$= 100 \times \frac{31}{40} = 77.5$ kg

Cost of raw material used = ₹77.5

Now, Ramanna added 80% of the cost of raw materials to the manufacturing cost

Then, total manufacturing cost

= 100 + 62 = ₹162

According to question,

$MP \times \frac{4}{5} = 162 \times \frac{6}{5}$

$\frac{4}{5} MP = 194.4$

$MP = \frac{194.4 \times 5}{4} = 243$

∴ Marked price is 2.43 times the cost of the raw material purchased.

Sol.10.(a) By using the false weight , the ratio between no of rice distribute to each person by distributor

Ratio → Initial : Final

By weight → 4.5 : 3.75

Or

6 : 5

Sold in black market = 6 - 5 = 1 unit

Total rice (6 unit) = 2700kg

Sold in black market (1 unit)

$= \frac{2700}{6} \times 1 = 450$ kg

The accumulated rice was sold in the black market at double the price

After caught, Fine amount

$= \frac{450 \times 80 \times 125}{100} = 45 \times 8 \times 125 = ₹45000$

Sol.11.(a)

Ratio → Initial : Final

By weight → 1000 : 900

Or

10 : 9

Sold in black market = 10 - 9 = 1 unit

Total rice (10 unit) = 450 kg

Sold in black market (1 unit)

$= \frac{450}{10} \times 1 = 45$ kg

Price per kg sold in black market $= \frac{2520}{45}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

= ₹ 56
ratio of the black-market price to the original price per kg = 56 : 40 = 7 : 5

Sol.12.(b)
CP of banana = $\frac{12}{6}$ = ₹2
SP of banana = $\frac{10}{8}$ = ₹$\frac{5}{4}$
CP : SP = 2 : $\frac{5}{4}$ = 8 : 5
Loss% = $\frac{8-5}{8}$ × 100 = $\frac{3}{8}$ × 100 = 37.5%

Sol.13.(a) Cost price of watch for A
= $532 \times \frac{100}{80} \times \frac{100}{133}$ = ₹500

Sol.14.(d) ATQ,

CP	:	SP
1000	:	950
750	:	1000
750	:	950 = 15 : 19

Required profit% = $\frac{19-15}{15}$ × 100
= $\frac{4}{15}$ × 100 ≈ 26.67%

Sol.15.(a) Let price of article Y = ₹ a
Price of article X = ₹ (a - 90)
According to question,
Profit on X - loss on Y = overall profit
(a - 90) × $\frac{23}{100}$ - a × $\frac{13}{100}$ = 180
23a - 2070 - 13a = 18,000
10a = 20070 ⇒ a = 2007
Therefore, price of article Y is ₹2007

Sol.16.(b) CP of product
= 10,000 + 5,000 = 15,000 = 15k
SP of product for retailer
= $25k \times \frac{6}{5} \times \frac{5}{4}$ = 37.5k
Required profit % = $\frac{37.5k - 15k}{15k}$ × 100
⇒ $\frac{22.5k}{15k}$ × 100 = 150 %

Sol.17.(c) C.P. = 16,800 × $\frac{5}{6}$ = ₹ 14000
C.P. when cost of production increases
= 14000 × $\frac{6}{5}$ = 16,800
Required S. P. = 16,800 × $\frac{6}{5}$ = ₹20,160

Sol.18.(a)
Ratio - Marked Price : Cost Price
Cost - 20 × 50 : 17 × 50
= 1000 : 850
M.P of 5 kg wheat
= (20 × 60 %) × 5 kg = ₹ 60
Here, Total marked price
= total selling price = 1060 ₹
Required profit %
= $\frac{1060-850}{850}$ × 100 = 24.7%

Sol.19.(c) Let x bananas be rotten
Total C.P of 480 bananas = Rs. 1200
After getting a profit of 396 , Total S.P
= 1200 + 396 = 1596
According to question,
$3.5(480 - x) = 1596$
$\Rightarrow 1680 - 3.5x = 1596$
$\Rightarrow 1680 - 1596 = 3.5x$
$\Rightarrow 3.5x = 84 \Rightarrow x = 24$
So, required percentage of bananas thrown away = $\frac{24}{480} \times 100 = 5\%$

Sol.20.(d)

Ratio	= Cost price	: Selling price
While buying =	100	: 105
While selling =	95	: 100

Required profit % = $\frac{105-95}{95} \times 100$
= $\frac{1000}{95}$ = 10 $\frac{10}{19}$%

Sol.21.(a)
Let the rate of the colour 'C_2' be ₹x/unit
ATQ, $\frac{2 \times 500 + 3 \times x}{2+3}$ = 650
⇒ $\frac{1000 + 3x}{5}$ = 650 ⇒1000 + 3x = 3250
⇒ 3x = 2250 ⇒ x = ₹750
Short Trick :- Rate of second colour 'C_2'
= 650 + $\frac{(650-500) \times 2}{3}$ = 750 ₹ / unit

Sol.22.(a) Total Cost price = $\frac{1600}{12}$ × 120
= 16000 Rs.
Total Selling price = 900 × 15 + 700 × 14
= 13500 + 9800 = 23300 Rs.
Profit % = $\frac{23300-16000}{16000} \times 100$
= $\frac{7300}{160}$ = 45.625%

Sol.23.(b) Total CP = 3600 Rs. and let , Quantity = 100 unit
Price of 100 unit = 3600 Rs
So , the price of 1 unit = 36 Rs.
For SP
$\frac{1}{5}$th of 100 unit = 20 unit ⇒ (price of 20 units - 10 % loss) = 720 - 72 = 648
$\frac{1}{4}$th of remaining = 20 unit ⇒ (price of 20 units - 5 % loss) = 720 - 36 = 684
$\frac{2}{3}$th of remaining = 40 unit ⇒ (price of 40 units + 15 % profit)
= 1440 + 216 = 1656
According to question, total profit = 27%
Total SP = 3600 + $\frac{3600 \times 27}{100}$
= 3600 + 972 = 4572 Rs.
Then ,
648 + 684 + 1656 + x = 4572
⇒ x = 4572 - 2988 ⇒ x = 1584
Short Trick :-
Let the total no. of apple = 60
Ratio of apple :- 12 : 12 : 24 : 12
Profit/Loss %= (-10%) : (-5%) : (+15%) : (x%)
Using weighted method = 60 × 27%
= 12 × (-10%) + 12 × (- 5%) + 24 × (+15%) + 12(x%)
⇒ 1620 + 120 + 60 - 360 = 12x
⇒ x = $\frac{1440}{12}$ = 120% profit
Selling price for 12 apple
= $\frac{3600}{60} \times 12 \times \frac{220}{100}$ = 1584 ₹

Sol.24.(b) Let the marked price = 100 units
According to the question
Selling price = 70 units and, cost price = 100 × 30% = 30 unit
Now, new selling price for the buyer having membership card
= 70 × $\frac{80}{100}$ = 56 unit
So, profit of retailer with membership card = 56 − 30 = 26 unit
Profit of retailer without membership card = 70 − 30 = 40 unit
Hence, required % = $\frac{26}{40}$ ×100 = 65%

Sol.25.(b) Loss% = $\frac{4}{20}$ × 100 = 20%
Let , Cost price of 1 pen = 10 Rs.
Then Selling price = 10 × 80% = 8 Rs.
New cost price = 10 × 90% = 9 Rs.
C.P. of 20 pen = 180 Rs.
New selling price = 8 × 125% = 10 Rs.
S.P. of 20 pen = 200 Rs.
Required profit %
= $\frac{200-180}{180} \times 100$ = 11.11%

Sol.26.(a) 10R + 4M = 210000 ₹....e.q .(1)
6R + 2M = 122000 ₹ ....e.q .(2)
or 12R + 4M = 244000 ₹ ....e.q .(3)
Subtracting e.q .(3) from e.q .(1) , we get
2R = 34000 ₹ ⇒ R = 17000 ₹
Putting the value of R in e.q . (2) , we get
2M = 122000 − 6 × 17000 = 20000 ₹
Required price = R + 2M
= 17000 + 20000 = 37000 ₹

Sol.27.(c) Let the C.P of 1st shirt and S.P of 2nd shirt = 100x
S.P of 1st shirt = 100x × $\frac{6}{5}$ = 120x
C.P of 2nd shirt = 100x × $\frac{5}{4}$ = 125x
Required ratio = 120x : 125x = 24 : 25

Sol.28.(b) Total cost of 100 frocks
= 320 × 100 = 32000
Expenditure cost = 1000
Total tax paid = 1.5 × 100 = 150
Labour fee = 500
Her total expenditure

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

= 32000 + 1000 + 150 + 500 = 33650
Her total expenditure per frock
$= \frac{33650}{100} = 336.5$
In order to get 10% profit,
She should sell the frock at
$= \frac{336.5 \times 110}{100} = 370.15$

Sol.29.(d)
Let the price of each article is 100 unit
So, total cost price = 30 × 100 = 3000 unit
Now according to question
Mark up is 30%
Mark price of 15 article = 15 × 130
= 1950 unit
Discounted selling price at 20%
$= 1950 \times \frac{80}{100} = 1560$ unit
Discounted selling price at 10%
$= 1950 \times \frac{90}{100} = 1755$ unit
Total selling price = 3315 unit
Now profit = SP - CP = 3315 - 3000
= 315 unit
315 unit = 630 Rs ⇒ 1 unit = 2 Rs
Cost price = 100 unit = 100 × 2 = 200 Rs

Sol.30.(b)

Ratio	→	CP	:	SP
Loss	→	45	:	40
weight	→	800	:	1000
Final	→	9	:	10

Profit % = $\frac{10-9}{9} \times 100 = 11\frac{1}{9}\%$

Sol.31.(d) Let the CP of earphone = ₹x
Then profit % = x
ATQ,
$\frac{2000-x}{x} \times 100 = x$
(2000 - x) × 100 = x^2
Now, putting the different value of x in the given options to satisfy the result we get x = 400
(2000 - 400) × 100 = 400^2
160000 = 160000
LHS = RHS
So, CP of earphone = ₹400
Short Trick:-
In this type of question , go through option :-
Option (d) ⇒ Let C.P. = 400 Rs. and
Profit % = 400%
Then , S.P. = 400 + 400 × 400% = 2000 Rs.

Sol.32.(d) Let the cost price of the article for the manufacturer = ₹x
ATQ,
$x \times \frac{111}{100} \times \frac{23}{20} \times \frac{119}{100} = ₹17045$
$x = \frac{17045 \times 200000}{111 \times 23 \times 119} \approx ₹11220$

Sol.33.(b) CP of first watch
$= \frac{12600 \times 100}{126} = ₹10,000$
CP of second watch $= \frac{12600 \times 100}{90}$
= ₹14,000
Total CP = 10000 + 14000 = ₹24,000
Total SP = 12600 × 2 = ₹25,200
Percentage gain
$= \frac{25200 - 24000}{24000} \times 100 = 5\%$
Short Trick :-
Concept → If two articles sold for the same selling price but one at x% profit /Loss and other at y% profit / Loss .
Overall profit % = $\frac{100(x+y)+2xy}{200+x+y}$
$= \frac{100\{(26+(-10)\}+2(26)(-10)}{200+(26)+(-10)}$
P% $= \frac{100(16)-520}{216} = \frac{1080}{216} = 5\%$

Sol.34.(a)
Cost price $8000 \times \frac{90}{100} = 7200.$
Tax paid by Sushant = 7.5 % × 7200 = ₹540
Delivery charges = ₹200
Total price paid by Sushant
= 7200 + 540 + 200 = ₹7940.

Sol.35.(b)
Let n be the total number of apples.
According to question,
(12 – 9) n = 870
3n = 870 ⇒ n = 290
C.P. per apple $= \frac{2320}{290} = ₹8$
So, S.P. per apple $= \frac{125}{100} \times 8 = ₹10$

Sol.36.(a)
$2100 \times \frac{100+k}{100} = 3150 \times \frac{100-k}{100}$
2100 + 21k = 3150 - 31.5k
52.5k = 1050 ⇒ k = 20

Sol.37.(a) (x + 5)% - x% = 750 - 720
5% = Rs30
CP(100%) = Rs.600
Profit % on article when it is sold at 720 ₹
$= \frac{120}{600} \times 100 = 20\%$

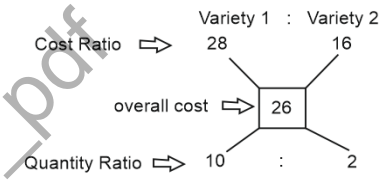
Sol.38.(c) 35% = $\frac{7}{20}$
Let the total number of goods = 20 and CP of a good = 100 unit
Total CP = 20 × 100 = 2000 unit
Total SP = 2000 $\times \frac{100-12}{100} = 1760$
SP of 35% (7 unit) goods
$= 7 \times 100 \times \frac{165}{100} = 1155$
SP of remaining 13 goods
= 1760 - 1155 = 605
SP of 1 good = $\frac{605}{13} \approx 46.5$
Value of x = 100 - 46.5 = 53.5

Short Trick :-
Weighted average :-

Ratio of goods	⟶	7	:	13
Profit/loss %	⟶	+65%	:	x%
For overall 12% loss	⟶	-12%+77%	:	$-12\% - \frac{77\times7}{13}\%$

Required loss % = $-12\% - \frac{539}{13}\%$
= - 12% - 41.4615% ≈ - 53.46%

Sol.39.(a) Fractional value of 15% = $\frac{3}{20}$
Let C.P. = 20 units and S.P. = 23 units
According to the question ,
23 units = 29.90 Rs.
1 unit = 1.3 Rs. ⇒ 20 units = 26 Rs.



According to the question
2 units = 6.6 kg
10 units = 6.6 × 5 = 33 kg

Sol.40.(d) Let , CP of the article = x Rs.
Total CP of the 2 articles = 2x Rs.
Profit earned = 3x Rs.
Sale price of two articles = 800 Rs.
2x + 3x = 800 ⇒ x = 160 Rs.
Total C.P. (2x) = 2 × 160 = 320 Rs.
Profit earned = 3 × 160 = 480 Rs.
Desired %age $= \frac{480}{320} \times 100 = 150\%$
Short Trick :-
Let , the CP of 2 article = 2 units
⇒ Profit earned = 3 units
Desired % $= \frac{3}{2} \times 100 = 150\%$

Sol.41.(a) $33\frac{1}{3}\% \Rightarrow \frac{1}{3}$

Case 1 →	Initial SP	:	New SP	
	3	:	1	
Case 2 →	New SP	:	C.P.	
	2	:	3	

Equating the above ratio , we get

Initial SP	:	New SP	:	CP
6	:	2	:	3

Let , the initial SP = 6 units
60% of the initial SP = $6 \times \frac{60}{100} = 3.6$
CP = 3 unit
Desired profit % $= \frac{3.6-3}{3} \times 100 = 20\%$

Sol.42.(b) Sale Price of one article
$= \frac{1250}{25} =$ Rs. 50
Cost price of one article

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= 50 \times \frac{100}{90} = \frac{500}{9}$

Sale Price of the article at 17% profit

$= \frac{500}{9} \times \frac{117}{100} = 65$

⇒ Number of articles sold in 2600

$= \frac{2600}{65} = 40$

Short Trick :-

Desired Number of Articles

$= \frac{S_N \times N_O \times (100 \pm K)}{S_O \times (100 \pm M)}$

$= \frac{2600 \times 25 \times (100 - 10)}{1250 \times (100 + 17)} = 40$

S_N = New Sale price

S_O = Old Sale price

N_O = number of article

k = Old profit/Loss

M = New profit/Loss

Sol.43.(a) Let the CP of A = a and B = b

According to the question

a + b = 1200 .....(1)

And, $a \times \frac{110}{100} + b \times \frac{120}{100} = 1390$

11a + 12b = 13900 .....(2)

Multiply equation 1 by 11 and subtract it from (2)

11a + 12b = 13900

11a + 11b = 13200

b = 700

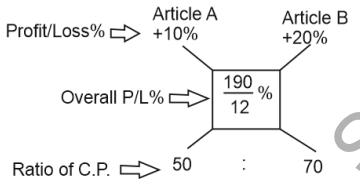
a = 1200 - 700 = 500

Desired ratio = 500 : 700 = 5 : 7

Short Trick :-

Overall profit% = $\frac{1390 - 1200}{1200} \times 100$

$= \frac{190}{12}\%$



Desired Ratio → 5 : 7

Sol.44.(a) Since both pieces are similar, their CP must be the same.

Since profit and loss % are the same, profit and loss amount will also be the same.

Let the profit amount = loss amount = k

According to the question

18000 - k = 10000 + k ⇒ k = 4000

CP of the article = 18000 - 4000 = 14000

Selling Price (at 50% profit)

$= 14000 \times \frac{150}{100} = 21000$ Rs.

Short Trick :-

C.P. = $\frac{18000 + 10000}{2} = 14000$ Rs.

For 50% Profit

Selling price = 14000 × 1.5 = 21000 Rs.

Sol.45.(c) Let the CP = 100 units

Profit earned = 400%

⇒ S.P. = 500 units

New C.P. = $100 + (100 \times \frac{100}{100}) = 200$ units

Profit earned = 500 - 200 = 300 unit

Desired ratio = 300 : 500 ⇒ 3 : 5

Sol.46.(a) Fractional value of 25% = $\frac{1}{4}$

Profit (1 unit) = 11 Rs.

the SP = 4 units and

CP = (4 − 1)units = 3 units = 3 × 11 = 33₹

Sol.47.(d) Let the total number of goods are 5 unit and Price of each good = 100

Total CP = 5 × 100 = 500

20% of 5 = 1

40% of 5 = 2

Sale Price of 20% of goods sold at 50% profit = $1 \times 100 \times \frac{150}{100} = 150$

Sale Price of 40% of goods

$= 2 \times 100 \times \frac{80}{100} = 160$

Sale Price of 20% of goods sold at 5% loss = $1 \times 100 \times \frac{95}{100} = 95$

Sale of remaining goods = 1 × 100 = 100

Total Sale Price = 150 + 160 + 95 + 100 = 505

Profit earned = 505 - 500 = 5

%age profit = $\frac{5}{500} \times 100 = 1\%$

Short Trick :-

Fractional value of 20% = $\frac{1}{5}$, 40% = $\frac{2}{5}$

and 20% = $\frac{1}{5}$.

Let, the total article is 5 units.

Ratio of Article ⇨ 1 : 2 : 1 : 1

Profit / Loss % ⇨ +50% -20% -5% 0%

Overall P/L% = $\left\{\frac{(+50x1) + (-20x2) + (-5x1) + 0}{1+2+1+1}\right\}\%$

Overall P/L% = $\{\frac{50 - 40 - 5}{5}\}\% = 1\%$

Sol.48.(b) Here Selling price is same .

No profit and no loss condition

Profit earned on 1st item will be equal to loss occurred on 2nd item.

Fractional value of 20% = $\frac{1}{5}$

For 1st item ⇒ 6 units = 2400 Rs.

Profit (1 unit) = 400 Rs.

Therefore , Loss occurred on the second item will also be equal to 400 Rs.

Sol.49.(d) Fractional value of 20% = $\frac{1}{5}$,

25% = $\frac{1}{4}$ and 50% = $\frac{1}{2}$

Ratio ⇒ CP : SP

P : Q → 5 : 6

Q : R → 4 : 3

R : T → 2 : 3

Final Ratio ⇒ P : T = 20 : 27

According to the question ,

Cost Price of P (20 units) = 100 Rs.

1 unit ⇒ 5 Rs.

Cost Price of T (27 units) = 135 Rs.

Sol.50.(a) Fractional value of 15% = $\frac{3}{20}$

SP = 23 units = 1495 Rs.

Profit (3 units) = 195 Rs.

Then , C.P. (20 units) = 1300 Rs.

Now, Fractional value of 10% = $\frac{1}{10}$

CP of 2nd article (10 units) = 1300 Rs.

Profit (1 unit) = 130 Rs.

Total profit earned = 195 + 130 = 325 Rs.

Sol.51.(b)

Total C.P. = 1200 + 1600 = 2800 Rs.

Overall Profit (25%) = $\frac{1}{4}$

According to the question ,

Total C.P. (4 units) = 2800 Rs.

Total Profit (1 unit) = 700 Rs.

Total S.P. (5 units) = 5 × 700 = 3500

S.P. of 2nd article = 3500 - 1380 = 2120

C.P. of 2nd article = 1600 Rs.

Required Profit %age

$= \frac{2120 - 1600}{1600} \times 100 = 32.5\%$

Sol.52.(d) Fractional value of 4% = $\frac{1}{25}$

S.P. of 1st article = 26 units = 6500 Rs.

Profit (1 unit) = 250 Rs.

C.P. of 1st article = 25 units = 6250 Rs.

Similarly ,

C.P. of 2nd article = 25 units = 3750 Rs.

Loss(1 unit) = 150 Rs.

S.P. of 2nd article = 24 units = 3600 Rs.

Overall profit = 250 − 150 = 100 Rs.

Desired Profit % = $\frac{100}{10000} \times 100 = 1\%$

Sol.53.(d)

Profit on 1st article = $3000 \times \frac{10}{100} = 300$

Profit on 2nd article = $3000 \times \frac{5}{100} = 150$

Loss on 3rd article = $3000 \times \frac{15}{100} = 450$

Total Profit or loss = 300 + 150 - 450 = 0

Clearly there is no profit and no loss.

Short Trick :-

Here , C.P. is same for all three articles.

So , overall Profit / loss % totally depends on the average of all Profit / Loss %.

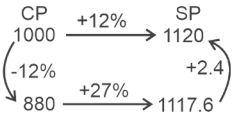
Overall P/L % = $\frac{+10\% + 5\% - 15\%}{3} = 0\%$

No profit , no loss.

Sol.54.(d) Let the CP = 1000 units

Search on TG: @apna_pdf

Search on Telegram @apna_pdf



According to the question
2.4 units = 9 Rs.

1 unit = $\frac{90}{24}$ Rs.

1000 units = $\frac{90}{24}$ × 1000 = 3750

Sol.55.(a) Let the CP of a table = T , and CP of a chair = C
According to the question
6T + 12C = 12000 .....e.q .(1)
Also
6T × 15% – 12C × 10% = 300
9T – 12C = 3000 .....e.q .(2)
Adding e.q .(1) and e.q .(2) , we get
15T = 15000 ⇒ T = 1000
Total CP of 6 tables = 6 × 1000 = 6000

Sol.56.(b) Fractional value of 14% = $\frac{7}{50}$

Ratio →	CP	:	SP	
At 14% loss →	50	:	43	) × 57
At 14% profit →	50	:	57	) × 43

C.P. of 1st Article = 50 × 57 = 2850 units
C.P. of 2nd Article = 50 × 43 = 2150 units
5000 units = 624 Rs.
Difference b/w C.P. of article = 700 units

700 units = $\frac{624}{5000}$ × 700 = 87.36 Rs.

Sol.57.(a) Fractional value of 4% = $\frac{1}{25}$

S.P. (24 units) = 288 Rs.
1 unit ⇒ 12 Rs.
C.P. (25 units) = 300 Rs.

Required % = $\frac{315-300}{300}$ × 100 = 5%

Sol.58.(a) Let the CP = 100 unit
Old SP = 85 unit
New SP = 109 unit
According to the question
109-85 unit = 30.60

1 unit = $\frac{30.60}{24}$, 100 unit = $\frac{3060}{24}$

Desired Sale Price

= $\frac{3060}{24}$ × $\frac{110}{100}$ = Rs. 140.25

Short Trick :-
Difference b/w Profit% and Loss%

(15 + 9)% = 30.60 Rs. ⇒ 1% = $\frac{30.60}{24}$

C.P. (100%) = $\frac{3060}{24}$

For Profit at 10% = $\frac{3060}{24}$ × $\frac{110}{100}$ = 140.25

Sol.59.(c) Average price of rice

= $\frac{38 \times 54.50 + 45 \times 62 + 55 \times 48}{38+45+55}$

= $\frac{7501}{138}$ = 54.35

Profit earned = 65 - 54.35 = 10.65

%age profit = $\frac{10.65}{54.35}$ × 100

= 19.59 or 19.6

Sol.60.(c) Profit after Tax deduction

= 110166 × $\frac{70}{100}$

B's share of the profit

= $\frac{4}{14}$ × 110166 × $\frac{70}{100}$

⇒ 20 × 1101.66 = Rs. 22033.20

Sol.61.(c)

No.of article →	3	12
Profit /Loss →	- 129	+ 516

Total Profit = $\frac{3 \times (-129) + 12 \times (516)}{3+12}$

= $\frac{-387+6192}{15}$ = $\frac{5805}{15}$

C.P. = $\frac{5805}{15}$ × $\frac{100}{15}$ = 2580 Rs.

Short Trick :-
Net profit on one cycles = 516 - 129
= Rs. 387
Now, 15% of CP = 387
Therefore, C.P per cycle

= $\frac{387}{15}$ × 100 = $Rs.\ 2580$

Sol.62.(c) Let the manufacturer's cost = M
According to the question

$M \times \frac{106}{100} \times \frac{108}{100} \times \frac{110}{100}$ = 31482

Therefore, Manufacturer's cost
= Rs. 25,000

Short Trick :-

Fractional value 6% = $\frac{3}{50}$, and 8% = $\frac{2}{25}$

Ratio →	Initial	:	Final
At 6% gain	50	:	53
At 8% gain	25	:	27
At 10% gain	10	:	11

Final →	12500	:	15741

According to question ,
Customer Price (15741)units = 31482 Rs.
1 unit → 2 Rs.
Price for manufacturer (12500) units
= 25000 Rs.

Sol.63.(b) 22% = $\frac{11}{50}$

C.P. = 8540 × $\frac{50}{61}$ = ₹7000

Sol.64.(c) For SP same

Overall gain/loss % = $\frac{100\,(x+y) + 2xy}{200+x+y}$

According to the question,
Overall gain/loss %

= $\frac{100\,(20-20) + 2 \times 20 \times -20}{200+20-20}$

= $\frac{-800}{200}$ = - 4% (-ve sign denotes loss)

Sol.65.(d)
Let cost of mixers be ₹x and T.V. be ₹y
According to the question,
$2x + y$ = 7000 **-------(i)**
$x + 2y$ = 9800**-------(ii)**
By equation (ii) × 2 - (i) we get;
$3y$ = 19600 - 7000 = 12600
y = ₹4200
Hence, cost of one T.V. (y) = ₹4200

Sol.66.(c) Let the cost price of the article be 100
According to question,
⇒ 18% - 15% = 3% = 18

⇒ 100% = $\frac{18}{3}$ × 100 = Rs. 600

Sol.67.(b) SP of an article = ₹ 19

CP of an article = ₹ 19 × $\frac{100}{120}$ ≈ ₹ 15.84

New SP of an article = ₹ 15.84 × $\frac{140}{100}$

= ₹ 22.17
Required difference = 22.17 - 19 = ₹ 3.17

Sol.68.(b) Vendor sell the mixture at cost price and still make 25% profit as he adding water on milk

So, gain % = $\frac{volume\ of\ water}{volume\ of\ milk}$ × 100

25 = $\frac{W}{M}$ × 100 ⇒ $\frac{W}{M}$ = $\frac{1}{4}$

Hence, required ratio = 1 : 4

Sol.69.(a) A flat sold by Lakshman to Bharath = 9,50,000 × $\frac{108}{100}$ = 10,26,000

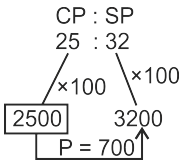
After selling back to Lakshman by Bharath ,

Selling price = 10,26,000 × $\frac{97}{100}$

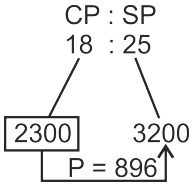
= 9,95,220
Gain/Loss of Lakshman in entire transaction = 10,26,000 - 9,95,220
= 30,780 (Gain)

Sol.70.(a) 28% gain = + $\frac{7}{25}$

For vendor who calculate his profit on cost price :-



For vendor who calculate his profit on selling price price :-



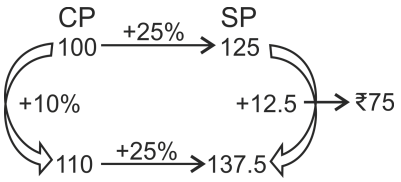
Hence, required difference = 896 - 700
= ₹196

Search on TG @apna_pdf

Search on Telegram @apna_pdf

Sol.71.(d)
By A sold the article of the SP = 1000
CP of the article = 1000 × $\frac{4}{5}$ = 800
Profit = 200
By B sold the article of the SP = 1000
According to question,
CP = 1000 and SP = 1000 × $\frac{5}{4}$ = 1250
Profit = 1250 - 1000 = 250
Hence, Required difference = 250 - 200
= ₹ 50

Sol.72.(c) Let initial CP = 100



According to the question,
12.5 unit = ₹ 75
initial cost price of good(100 unit)
= $\frac{75}{12.5}$ × 100 = ₹600

Sol.73.(b) According to the question,
If shopkeeper sells table lamp for ₹1200 instead of ₹900 he get ₹15000 more
Then, gain per lamp = 1200 - 900 = ₹300
So, total lamp = $\frac{15000}{300}$ = 50
Now, cost price per lamp = $\frac{25000}{50}$
= ₹500
For the profit of 21%
Selling price per lamp = 500 × $\frac{121}{100}$
= ₹605
Therefore, selling price of 23 table lamps
= 23 × 605 = ₹13915

Sol.74.(b)

Ratio →	Bananas	:	Rupees
CP →	6	:	5) × 2
SP →	4	:	3) × 3

Now,
Loss % = $\frac{CP - SP}{CP}$ × 100
= $\frac{10-9}{10}$ × 100 = 10 %

Sol.75.(d)
For greatest possible profit Cost Price should be minimum and Selling Price should be maximum.
Hence, C.P. = 1500 and S.P. = ₹ 3500
Profit of 1 watch = 3500 - 1500 = ₹ 2000
Profit for 10 watches = ₹ 20,000

Sol.76.(a)

Ratio →	Initial	:	Final
By Price →	50	:	59
By Weight →	y	:	1000
Final →	50y	:	59000

According to question
Profit % = $\frac{59000 - 50y}{50y}$ × 100
33.33 × y = 118000 - 100y
133.33 y = 118000
y = $\frac{118000}{133.33}$ = 885 gm

Sol.77.(b) Let total items = 12x
Overall gain/ loss
= $\frac{3x \times (-12) + 3x \times 44\% - 6x \times 7\%}{12x}$
= $\frac{54\%}{12}$ = 4.5 % gain

Sol.78.(d) Gain = $\frac{1}{5}$ of S.P.
Let S.P. = 5 unit then C.P. = 5 - 1 = 4 unit
Gain % = $\frac{1}{4}$ × 100 = 25 %

Sol.79.(b) Profit = loss
$S.P._1$ - C.P. = C.P. - $S.P._2$
2 × C.P. = $S.P._1$ + $S.P._2$
2 × C.P. = 19125 + 14625
C.P. = $\frac{33750}{2}$ = 16875
Profit on $S.P._1$ = 19125 - 16875 = 2250
Required Profit % = $\frac{2250}{16875}$ × 100
= 13$\frac{1}{3}$%

Sol.80.(c) Loss % = $\frac{C.P. - S.P.}{C.P.}$ × 100
S.P. = (100 - loss%) × $\frac{C.P.}{100}$

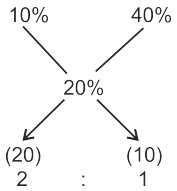
Sol.81.(b) As per question,
original weight = 1000 g
New weight = 870 g
Required Profit % = $\frac{1000 - 870}{870}$ × 100
= 14.94 %

Sol.82.(c)
Overall gain% = 30 - 20 - $\frac{30 \times 20}{100}$
= 10 - 6 = 4%
Hence, overall gain = 42000 × 4%
= Rs.1680

Sol.83.(d) $\frac{MP}{CP}$ = $\frac{126}{100}$
After giving discount of 32%
Selling price = 126 × $\frac{68}{100}$ = 85.68
Hence, loss % = $\frac{100 - 85.68}{100}$ × 100
= 14.32%

Sol.84.(b)
After removing 200 gm salt per kg
Shopkeeper give 800 gm for 1 kg
Hence, his gain % = $\frac{200}{800}$ × 100 = 25%

Sol.85.(c)
Total quantity of sugar = 1000 kg



Sugar sold at 40 % = $\frac{1}{3}$ × 1000
= 333$\frac{1}{3}$ kg

Sol.86.(a) Let the Ravi's salary be ₹100
According to the question,
Ravi's new salary = 100 × $\frac{3}{2}$ × $\frac{3}{2}$ = ₹225
Gain percentage
= $\frac{225 - 100}{100}$ × 100 = 125 %

Sol.87.(d)

Ratio	-	CP	:	SP
Less weight	-	22	:	25
Due to Profit	-	10	:	11
Final	-	20	:	25

Hence, gain % = $\frac{5}{20}$ × 100 = 25%

Sol.88.(b) Profit earned by R from S = 8%
Overall profit earned by S = 5%
Then, profit earned by S = (8 + 5)% = 13%
Hence, we can say that R would have gained 13% ,

Sol.89.(b)
Let marked price of bat be ₹100
Then, CP of bat = ₹75
and SP of bat = 100 × 85% = ₹85
CP : SP = 75 : 85 = 15 : 17
gain% = $\frac{17 - 15}{15}$ × 100 = $\frac{200}{15}$ = 13.33%

Sol.90.(a) Profit = $\frac{24318}{6}$ = 4053.
SP = 24318
⇒ CP = 24318 - 4053 = 20265
Now,
Gain % = $\frac{Profit}{CP}$ × 100
⇒ P% = $\frac{4053}{20265}$ × 100 = 20%

Sol.91.(b) Let cost price = 100
Then selling price = 420
After increasing 10 % , cost price = 110
But selling price remain same
Then , profit = 310
Profit percent on selling price
= $\frac{310}{420}$ × 100 = 73.8%

Sol.92.(c) Let the cost price of article = 100
Selling price of the article = 100 × $\frac{350}{100}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

= 350

Required ratio = CP : SP

100 : 350

2 : 7

Sol.93.(b)

Ratio → Initial : final

Weight → 800 : 1000

Price → 30 : 36

Final → 20 : 30

Profit % = $\frac{30-20}{20}$ × 100 = 50%

Sol.94.(b) Let the CP of the article be 100

MP of the article = 100 × $\frac{120}{100}$ = 120

SP of the article = 120 × $\frac{70}{100}$ = 84

Loss % = $\frac{100-84}{100}$ × 100 = 16 %

Sol.95.(c) Interest gained by bank on deposited amount = $\frac{30000}{300000}$ × 100 = 10%

Bank give by bank on deposited amount = 6%

Required profit to earn by Bank

= 6000000 × (10 - 6)% = ₹240000

Sol.96.(d) $66\frac{2}{3}\% = \frac{2}{3}$

Let the initial income of Ajay be 300

Ratio -	initial	:	final
Income -	300	:	375
Expendi. -	200	:	240

Savings -	100	:	135

Effect on saving (increased)

= $\frac{135-100}{100}$ × 100 = 35%

Sol.97.(d) Let the total no. of article be 8

According to question,

$\frac{5}{8}$ article sold At the profit of 20%

= (8 × $\frac{5}{8}$) × $\frac{6}{5}$ = 6 units

SP of 5 articles = 6 units

Remaining article sold at the cost price = 3 units

SP of 3 articles = 3 units

Total SP of the article = 9 units

Required profit = $\frac{9-8}{8}$ × 100 = $12\frac{1}{2}$%

Sol.98.(d) According to the question,

CP of the shirt = 1200 × $\frac{100}{120}$ = ₹1000

CP of the trouser = 660 × $\frac{100}{110}$ = ₹600

Required ratio = 1000 : 600 = 5 : 3

Sol.99.(b) $\frac{SP}{CP} = \frac{44}{40} \times \frac{1000}{800} = \frac{44}{32}$

overall gain percentage = $\frac{44-32}{32}$ × 100

= 37.5%

Sol.100.(c)

MP of 55 items = CP of 99 items

⇒ $\frac{MP}{CP} = \frac{99}{55} = \frac{9}{5}$

SP of 56 items = MP of 35 items

⇒ $\frac{SP}{MP} = \frac{35}{56} = \frac{5}{8}$

Ratio →	CP	:	MP	:	SP
	5	:	9	:	9
	8	:	8	:	5
	40	:	72	:	45

Required profit % = $\frac{45-40}{40}$ × 100

= 12.5%

Sol.101.(b) According to the question,

100, 95, 90, 85, ...nth term

s_n = 975, a = 100 and d = -5

⇒ $s_n = \frac{n}{2}$[2a + (n -1)d]

⇒ 975 = $\frac{n}{2}$[2 × 100 + (n -1)-5]

⇒ 1950 = 200n - $5n^2$ + 5n

⇒ $5n^2$- 205n + 1950 = 0

⇒ n^2- 41n + 390 = 0

On solving above equation, we get

⇒ n = 15 and 26

Now, if n = 26, the number of installments will become negative (after 20 installments), hence it is not possible.

Total installments = 15 months

Sol.102.(d)

Selling price of first keyboard = ₹1,260

Cost price of first keyboard = 1,260 × $\frac{4}{5}$

= ₹1008

Selling price of second keyboard = ₹1,440

Cost price of Second keyboard

= 1,440 × $\frac{10}{9}$ = ₹1600

Total CP and SP respectively

= ₹2608 and ₹2700

Gain percentage = $\frac{2700-2608}{2608}$ × 100

= $\frac{92}{2608}$ × 100 = $3\frac{86}{163}$%

Sol.103.(b) By using Alligation method

Profit% → 10% 15.25%

13%

CP → 2.25 : 3

3 : 4

According to question,

7 unit = ₹28,000

1 unit = $\frac{28000}{7}$ = ₹4000

Then required difference,

1 unit = ₹4000

Sol.104.(d)

Ratio → C.P. : M.P. : S.P.

4 : 5

50 : 41

Final → 40 : 50 : 41

Gain % = $\frac{41-40}{40}$ × 100 = 2.5%

Sol.105.(c) Selling price of headphone

= 2000 × $\frac{3}{5}$ = 1200

Cost price = 1700

loss% = $\frac{1700-1200}{1700}$ × 100 = $\frac{500}{17}$ %

= 29.41%

Sol.106.(b) Cost price of 130 books

= 130 × 200 = 26000

Selling price of half books = 65 × 300

= 19500

Selling price of $\frac{1}{5}^{th}$ books = 26 × 350

= 9100

Remaining books = 130 - 65 - 26 = 39

Selling price of 39 books = 39 × 200

= 7800

Total selling price = 19500 + 9100 + 7800

= 36400

Profit % = $\frac{36400-26000}{26000}$ × 100 = $\frac{1040}{26}$ %

= 40%

Sol.107.(c) 28% = $\frac{7}{25}$

C.P. = $\frac{144}{18}$ × 25 = 200

New S.P. = 288

New gain % = $\frac{288-200}{200}$ × 100 = 44%

Sol.108.(d)

Let the initial cost price = 100 Rs

Final selling price = 140 Rs

Selling price of first dealer (30%↑) = 130 Rs

Cost price for second dealer = 130 Rs

Profit percentage made by the second dealer = $\frac{140-130}{130}$ × 100 = $\frac{100}{13}$ = $7\frac{9}{13}$%

Sol.109.(a) Cost price = ₹ 1000

Selling price = 1500 × $\frac{4}{5}$ × $\frac{9}{10}$ = ₹ 1080

Gain % = $\frac{80}{1000}$ × 100 = 8%

Sol.110.(a)

Ratio - CP : SP

100 : 140

850 : 1000

100 : 68

Final - 850 : 14 × 68 = 50 : 56

profit% = $\frac{56-50}{50}$ × 100 = 12

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.111.(c)
Ratio → **CP : SP**
at (25% loss) 4 : 3
(45% less wt.) 11 : 20

Overall ratio → 11 : 15
Hence, required % = $\frac{4}{11}$ × 100 = 36$\frac{4}{11}$% (Profit)

Sol.112.(c) $\frac{CP}{MP} = \frac{100 - D\%}{100 + Profit\ \%}$
$\frac{CP}{MP} = \frac{90}{110}$
CP : MP = 9 : 11
Required value = $\frac{11}{9}$ = 1.22 times

Sol.113.(b) According to the question,
100 × SP = 140 × CP
$\frac{SP}{CP} = \frac{14}{10} = \frac{7}{5}$
profit = $\frac{2}{5}$ × 100 = 40%

Sol.114.(c)
Required % = 20% - 20% - $\frac{20 \times 20}{100}$%
= - 4% (- sign denotes loss)

Sol.115.(b) According to the question,
SP of the article = 150 × $\frac{3}{4}$ - 2.5 = ₹ 110
CP of the article = 110 × $\frac{10}{11}$ = ₹ 100

Sol.116.(b)
SP of 50 oranges = 50 × 0.7 = ₹ 35
SP of remaining oranges = 46.20
Total SP = 35 + 46.20 = 81.2
Loss = 115.20 - 81.2 = ₹ 34

Sol.117.(d)
Ratio - CP : SP
5 : 6
Difference = 6 - 5 = 1 unit
1 unit = 1800
(CP) 5 units = 1800 × 5 = ₹ 9000

Sol.118.(d) Given:- 1 score = 20
CP of 20 apples = ₹ 400
CP of 1 apple = ₹ 20
SP of 12 apple = ₹ 264
SP of 1 apple = ₹ 22
Profit% = $\frac{22 - 20}{20}$ × 100 = 10%

Sol.119.(b) CP for shopkeeper
= 600 × $\frac{9}{10}$ × $\frac{4}{5}$ + 68 = 500
profit% = $\frac{600 - 500}{500}$ × 100 = 20%

Sol.120.(b) CP of the bike for A = x
x × $\frac{145}{100}$ × $\frac{130}{100}$ = 43355
x = $\frac{43355 \times 10000}{145 \times 130}$ = 23,000

Sol.121.(a) According to the question,
MP × 66% = CP × 110%
$\frac{MP}{CP} = \frac{5}{3}$
New SP = 5 × $\frac{80}{100}$ = 4 units
Profit% = $\frac{4 - 3}{3}$ × 100 = 33$\frac{1}{3}$%

Sol.122.(c)
Marked price of the article = ₹100
After two successive discount of 10% and 20%
Cost price for dealer
= 100 × $\frac{9}{10}$ × $\frac{4}{5}$ = ₹ 72
Now, he spends 10% of CP on transportation = 72 × 10% = ₹ 7.2
Then, actual cost price = ₹72 + ₹7.2
= ₹79.2
Selling price of article after 15% profit
= 79.2 × $\frac{23}{20}$ = ₹91.08

Sol.123.(b)
According to the question,
($\frac{CP - 5000}{CP}$) ×100 +4 = ($\frac{CP - 4680}{CP}$) × 100
$\frac{100CP - 500000 + 4CP}{CP} = \frac{100CP - 468000}{CP}$
100CP - 500000 +4CP = 100 CP - 468000
4CP = 32000
CP = ₹8000
Now, if he get 4% profit ,then SP =
8000 × $\frac{104}{100}$ = ₹8320

Short trick :- 4% = (5000 - 4680) = ₹320
100% = ₹8000
Then, required SP = 8000 × $\frac{104}{100}$ = ₹8320

Sol.124.(d)
profit% = 50 - 30 + $\frac{50 \times (-30)}{100}$ = 5%

Sol.125.(b)
Required price = 5000 × $\frac{19}{20}$ × $\frac{6}{5}$
= ₹5,700

Sol.126.(d)
Formula :- $\frac{MP}{CP} = \frac{100 + Profit\%}{100 - Discount\%}$
According to the question,
$\frac{MP}{CP} = \frac{135}{65} = \frac{27}{13}$
Now, new selling price after giving the discount of 45% = 27 × $\frac{55}{100}$ = 14.85
Hence, profit % = $\frac{14.85 - 13}{13}$ × 100
= $\frac{185}{13}$ = 14$\frac{3}{13}$%

Sol.127.(c)
Remaining wheats = 1800 × $\frac{4}{5}$ = 1440 kg
Required rate = $\frac{32400 \times 120\%}{1440}$ = 27 ₹/kg

Sol.128.(d) Loss percentage =
$\frac{4960 - 4712}{4960}$ × 100 = $\frac{24800}{4960}$ = 5%

Sol.129.(c) According to the question,
Let the CP of the goods is 100 units
MP of the goods = 100 × 132%
= 132 units
SP of the goods = 132 × 79%
= 104.28 units
profit% = $\frac{104.28 - 100}{100}$ × 100 = 4.28%

Sol.130.(d)
When profit is 25% on whole transaction then amount = 1500 × 125% = ₹ 1875
SP of one-fourth watermelons
= 1500 × $\frac{1}{4}$ × $\frac{22}{25}$ = ₹ 330
According to the question,
1500 × $\frac{3}{4}$ × $\frac{(x + 100)}{100}$ = 1875 - 330
45 × $(x + 100)$ = 1545 × 4
$(x + 100)$ = 137.33
x = 37.33%
So, we can say that the remaining watermelons sell at a 37.33% profit.

Sol.131.(d) Let MP = 100
Then, SP = 100 × 60% = 60
Now, if retailer sells it at the printed price
CP for retailer = 60
SP for the retailer = 100
Hence gain% = $\frac{100 - 60}{60}$ × 100 = 66$\frac{2}{3}$ %

Sol.132.(a) Cost price = 10,000
SP_1 = 12,000
SP_2 = 13,000
Loss = SP_2 - SP_1 = 1000
Loss % = $\frac{1000}{10000}$ × 100 = 10%

Sol.133.(c) According to question,
Ratio → C.P : S.P
Case 1 3 : 4
Case 2 4 : 5
Case 3 8 : 9
—----------
Final ratio → 8 : 15
Required profit % = $\frac{15 - 8}{8}$ × 100 = $\frac{700}{8}$
= 87.5 %

Sol.134.(d)
Profit = SP - CP , Loss = CP - SP
According to the question,
(SP - CP) = 2(CP - SP)
(86 - CP) = 2(CP - 53)
86 + 106 = 3CP
192 = 3CP

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

CP = 64 Rs.

Sol.135.(b)
Ratio - CP : SP
1st fan - 5 : 6) × 2
2nd fan - 5 : 4) × 3

Final - (10 + 15) : (12 + 12) = 25 : 24
Loss = 25 - 24 = 1 units
SP of each fan = 12 units
12 units = ₹ 480
(loss) 1 units = ₹ 40

Sol.136.(a) Let 'A' buy the object at Rs. x
According to the question,
$x \times \frac{11}{10} \times \frac{8}{5} \times \frac{9}{8} = 59.40$
$x = 59.40 \times \frac{10}{11} \times \frac{5}{8} \times \frac{8}{9}$ = Rs. 30

Sol.137.(a) According to the question,
10% of cotton spoiled due to rain so,
Remaining cotton to sell = $500 \times \frac{9}{10}$
= 450 kg
For profit of 20%
Selling price of cotton = 8000 × 120%
= Rs. 9600
Selling price per kg = $\frac{9600}{450}$ = Rs. $21\frac{1}{3}$ /kg

Sol.138.(c)
Marked price = $1092 \times \frac{136}{78}$ = ₹1904

Sol.139.(b) Gain % = $\frac{1000-850}{850} \times 100$
$= \frac{300}{17} = 17.65\%$

Sol.140.(c) According to the question,
$MP \times \frac{82}{100} = CP \times \frac{140}{100}$
$\frac{MP}{CP} = \frac{140}{82} = \frac{70}{41}$
New SP = $70 \times \frac{88}{100}$ = 61.6 units
profit% = $\frac{61.6-41}{41} \times 100 = 50.24\%$

Sol.141.(a) According to the question,
6 × S.P. = 22 × S.P. - 22 × C.P.
22 × C.P. = 16 × S.P.
C.P. : S.P. = 8 : 11
profit% = $\frac{3}{8} \times 100 = 37\frac{1}{2}\%$

Sol.142.(c)
$\frac{MP}{CP} = \frac{100+profit\%}{100-discount\ \%}$
$\frac{MP}{CP} = \frac{190}{80}$
Now, after selling the same item at 40% discount
New selling price = 190 × 60% = 114
So, new profit % = $\frac{114-80}{80} \times 100$
$= \frac{34}{4} \times 5 = 42.5\%$

Sol.143.(d) 35 % = $\frac{7}{20}$
Ratio → Initial : Final
By weight → 81 : 100
By price → 20 : 27

Final → 1620 : 2700
Profit% = $\frac{(2700-1620)}{1620} \times 100$
$= \frac{1080}{1620} \times 100 = 66.67\%$

Sol.144.(d) For shopkeeper A :-
C.P. : M.P. = 4 : 5
After giving 15% discount
S.P. = 5 - 5 × 15% = 5 - 0.75 = 4.25
Profit % = $\frac{4.25-4}{4} = \frac{0.25}{4} \times 100 = 6.25\%$
For shopkeeper B :-
C.P. : M.P. = 5 : 6
After giving 12% discount
S.P. = 6 - 6 × 12% = 6 - 0.72 = 5.28
Profit % = $\frac{5.28-5}{5} = \frac{0.28}{5} \times 100 = 5.60\%$
Clearly, A gets the better deal with 6.25% profit.

Sol.145.(b) Cost price of 5 dozen bananas = $\frac{1200}{20} \times 5$ = ₹300
Selling price of 5 dozen bananas = ₹350
Profit % = $\frac{50}{300} \times 100 = 16\frac{2}{3}\%$

Sol.146.(c)
SP of 1 kg wheat = $\frac{10260}{195}$ = ₹52.6
Then, CP of 1 kg wheat = 52.6 - 4.5
= ₹48.1
So, CP of 15 kg wheat = 15 × 48.1
= 721.5 ≈ ₹722

Sol.147.(a) Let the CP of A and B be 300 and 100 respectively
SP of A = 300 × 90% = 270 unit
SP of B = $100 \times \frac{5}{4}$ = 125 unit
According to the question,
(270 - 125) unit = 145 unit = ₹5800
Then, 300 unit = $\frac{5800}{145} \times 300$ = ₹12,000
Then, CP of A = ₹12000

Sol.148.(d) ATQ,
$\frac{CP}{MP} = \frac{(100-D)\%}{100+P)\%}$
$\frac{CP}{MP} = \frac{80}{128} = \frac{5}{8}$
Since, there is no discount given , then MP = SP
Hence, profit% = $\frac{8-5}{5} \times 100 = \frac{3}{5} \times 100$
= 60%

Sol.149.(c) 40% = $\frac{2}{5}$, 25% = $\frac{1}{4}$
According to the question,
we have given ratio
CP : SP
5 : 3
3 : 4
---
15 : 12 = 5 : 4
Required loss% = $\frac{5-4}{5} \times 100$
$= \frac{100}{5} = 20\%$

Sol.150.(d) C.P. of fan = 4,400
$\frac{C.P.}{M.P.} = \frac{100-discount\%}{100+Profit\%}$
$\frac{C.P.}{M.P.} = \frac{100-12}{100+24}$
$\frac{C.P.}{M.P.} = \frac{88}{124} = \frac{22}{31}$
C.P. (22 unit) = 4400
M.P. (31 unit) = $\frac{4400}{22} \times 31 = 6200$
Short trick:
24% = $\frac{6}{25}$, 12% = $\frac{3}{25}$
C.P. : M.P. : S.P.
25 : 31
25 : 22
---
550 : 775 : 682
C.P. (550 unit) = 4400
M.P. (775 unit) = $\frac{4400}{550} \times 775 = 8 \times 775$
= 6200

Sol.151.(c)
Difference between profit = 2250
(41 - 26) % = 2250
15 % = 2250
C.P. (100 %) = $\frac{2250}{15} \times 100 = 15000$
Required Selling Price = $15000 \times \frac{112}{100}$
= 16,800

Sol.152.(d) According to question,
36 × CP = N × SP
$\frac{CP}{SP} = \frac{N}{36}$
Also, $\frac{CP}{SP} = \frac{5}{6}$ (as, profit = 20%)
$\Rightarrow \frac{N}{36} = \frac{5}{6}$
N = $\frac{36 \times 5}{6} = 30$

Sol.153.(d)
Required profit% = $(35 - 15 - \frac{35 \times 15}{100})\%$
$= (20 - \frac{21}{4})\% = \frac{59}{4} = 14\frac{3}{4}\%$

Sol.154.(b)
Let the price of watch be ₹100

Search on Telegram @apna_pdf

Buying price of watch for Bhavin
= 100 × 115% = ₹115
Price at which Aarav gets his watch back
= 115 × 85% = ₹97.75
Total profit of Aarav
= (15 + 2.25) = ₹17.25
So, the profit% of Aarav = 17.25%

Sol.155.(c) According to question,

Overall profit% = $\frac{(-10+x)\%}{2}$

18 = $\frac{x-10}{2}$

36 = x - 10 ⇒ x = 46%

So, the price at which merchant sell the other watch = 9000×146% = ₹13,140

Sol.156.(d)

Ratio →	Initial	:	Final
price →	5	:	4
Weight →	3	:	4
Final →	15	:	16

Profit % = $\frac{1}{15}$ × 100 = 6.67%

Sol.157.(d) Selling price = 1400
Cost price after transportation

= 1400 × $\frac{10}{13}$

= $\frac{14000}{13}$ = 1076.92 ~ 1077

Amount spend on transportation
= 1077 - 700 = 377

Sol.158.(a) C.P. of one orange = $\frac{50}{10}$ = 5

S.P. of one orange = $\frac{74}{12}$

Profit % = $\frac{\frac{74}{12}-5}{5}$ × 100

= $\frac{14}{60}$ × 100 = $\frac{70}{3}$% = 23 $\frac{1}{3}$ %

Sol.159.(b)

Selling price = 1600 × $\frac{23}{10}$ × $\frac{3}{4}$ = 2760

Sol.160.(c) Cost price = 1,200

Selling price = 1200 × $\frac{11}{10}$ = 1320

Also,

marked price × $\frac{9}{10}$ - 250 = Selling price

marked price × $\frac{9}{10}$ = 1320 + 250

marked price = 1570 × $\frac{10}{9}$

marked price = 1744.44

Sol.161.(d)
Marked price of 1 kg sugar = 38
Cost price of 1 kg sugar = 30
Selling price of 10 kg sugar

= 38 × $\frac{22}{25}$ = 33.44

Ratio →	Initial	:	Final
By price →	30	:	33.44
By weight →	900	:	1000
Overall →	27000	:	33440

Profit = $\frac{6440}{27000}$ × 100 = 23.85%

Sol.162.(c)

Required gain % = $\frac{50}{950}$ × 100 = 5$\frac{5}{19}$%

Sol.163.(d)
Total cost of 100 kg of vegetable
= 100 × 19 + 100 = ₹ 2000
Then, 1 kg vegetable cost = ₹ 20
Now,
SP of 60 kg vegetable after profit of 50%

= 60 × 20 × $\frac{3}{2}$ = ₹ 1800

SP of 20 kg vegetable after profit of 40%

= 20 × 20 × $\frac{7}{5}$ = ₹ 560

SP of 10 kg vegetable after profit of 25%

= 10 × 20 × $\frac{5}{4}$ = ₹ 250

Total SP of 90 kg vegetable = 1800 + 560 + 250 = ₹ 2610
According to the question,
SP of 100 kg vegetable after overall profit

= 2000 × $\frac{142}{100}$ = ₹ 2840

SP of 10 kg vegetable = 2840 - 2610 = ₹ 230
CP of 10 kg vegetable = 10 × 20 = ₹ 200
So, required percentage

= $\frac{230-200}{200}$ × 100 = 15% = 0.15

Sol.164.(a)

Net discount = 24 + 30 - $\frac{24\times30}{100}$

= 54 - 7.2 = 46.8 %

Marked price = 7700.70 × $\frac{100}{(100-46.8)}$

= 7700.70 × $\frac{100}{53.2}$ = 14475

Sol.165.(c)
Difference in selling price = 192.20
16 % + 15 % = 192.20
31 % = 192.20

Cost price (100 %) = $\frac{192.20}{31}$ × 100 = 620

Final selling price = 620 × $\frac{23}{20}$

= 31× 23 = 713

Sol.166.(b) let profit of 1st article = x% and profit of 2nd article = y%

Net profit% = $\frac{x+y}{2}$

15$\frac{27}{51}$% = $\frac{12+y}{2}$

$\frac{792}{51}$ = $\frac{12+y}{2}$

12 + y = $\frac{1584}{51}$

y = $\frac{1584-612}{51}$ = $\frac{972}{51}$ = $\frac{324}{17}$

Difference in profit = $\frac{324}{17}$ - 12 = $\frac{120}{17}$%

$\frac{120}{17}$% = 3600

CP of article (100%)

= $\frac{3600}{120}$× 17 × 100 = 51,000

Sol.167.(c)
Selling price of both the buffaloes equal

Ratio -	CP	:	SP
1st -	20	:	17 { × 7 = 140 : 119
2nd -	100	:	119

CP of 1st buffalo to 2nd = 140 : 100 = 7 : 5
Hence, CP of 1st buffalo

= $\frac{11520}{7+5}$ × 7 = ₹6720

Sol.168.(b)

40% = $\frac{2}{5}$, 25% = $\frac{1}{4}$, 12% = $\frac{3}{25}$

Total S.P. of 3 watches
= 2800 × 3 = 8400
Total C.P. of 3 watches

= 2800 × $\frac{5}{7}$ + 2800 × $\frac{4}{5}$ + 2800 × $\frac{25}{28}$

= 2000 + 2240 + 2500 = 6740

Profit % = $\frac{(8400-6740)}{6740}$ × 100

= $\frac{1660}{6740}$× 100 = 24.62 %

Sol.169.(c)
Marked price = 500

selling price = 500 × $\frac{3}{4}$ - 65

= 375 - 65 = 310

According to question,
124% (selling price) = 310

100% (cost price) = $\frac{310}{124}$ × 100 = 250

Sol.170.(c) Let CP of book be 100%
(37- 20)% = 17% = ₹34.51

100% = $\frac{34.51}{17}$ × 100 = ₹203

Sol.171.(d) SP of the iron for Reena

= 758 × $\frac{23}{20}$ × $\frac{23}{25}$ = $\frac{4,00,982}{500}$ = ₹ 801.96

Sol.172.(d) We know

Profit% = $\frac{SP-CP}{CP}$ × 100

Given,
CP = 400 , SP = 600

Profit% = $\frac{600-400}{400}$ × 100

= $\frac{200}{400}$ × 100 = 50%.

Sol.173.(c)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Gain % = 36 %
If CP = 100 unit ⇒ SP = 136 unit
Given, SP = ₹ 6,14,856
⇒ 136 unit = ₹ 6,14,856
⇒ 1 unit = ₹ 4521
CP = 100 × 4521 = ₹ 452100
Hence, Profit = SP - CP
= 614856 - 452100 = ₹ 1,62,756

Sol.174.(b) Given :
CP = 1,250, SP = 1,000
Hence, loss = CP - SP
= 1250 - 1000 = 250
Loss % = $\frac{loss}{CP} \times 100$
= $\frac{250}{1250} \times 100$ = 20 %

Sol.175.(c) Let CP = 100
MP = 120
SP = 120 × $\frac{9}{10}$ = 108
⇒ Profit % = $\frac{SP - CP}{CP} \times 100$
⇒ Profit % = $\frac{108 - 100}{100} \times 100$
⇒ Profit % = 8 %.

Sol.176.(c) According to question,
⇒ Profit% = Loss %
⇒ $\frac{2100 - CP}{CP} \times 100 = \frac{CP - 1460}{CP} \times 100$
⇒ 2 CP = 2100 + 1460 ⇒ 2 CP = 3560
⇒ CP = 1780
Now,
SP = 1780 × $\frac{120}{100}$ = ₹ 2136

Sol.177.(c) First Selling Price = ₹ 23856
Profit % = 20 %
⇒ CP = $\frac{23856 \times 100}{120}$ = ₹ 19880
New Selling Price = ₹ 20,580
New Profit % = $\frac{SP - CP}{CP} \times 100$
⇒ Profit% = $\frac{20580 - 19880}{19880} \times 100$
⇒ Profit% = $\frac{700}{19880} \times 100$
⇒ Profit% = 3.52 %

Sol.178.(a) Cost price of the bucket
= $\frac{680 + 532}{2} = \frac{1212}{2}$ = ₹606

Sol.179.(d)
Total amount invested by R = ₹65,000
Remaining amount
= 80,000 - (65,000 + 2,000) = ₹13,000
Required profit% = $\frac{13,000}{65,000} \times 100$ = 20%

Sol.180.(c) Total CP of an article
= ₹7200 + 7200 × 9%
= 7200 + 648 = ₹7848
SP = ₹8100
CP : SP = 7848 : 8100 = 218 : 225
Required profit% = $\frac{225-218}{218} \times 100$
= $\frac{700}{218}$ = 3.21%

Sol.181.(a) CP : SP = 432 : 612 = 12 : 17
Required profit% = $\frac{17-12}{12} \times 100$
= $\frac{500}{12}$ = 41.66%

Sol.182.(b)
Total profit = 2 + 3 = 5 unit
Share of A = 2 × 90% =1.8 unit = ₹4500
Then, 5 unit = $\frac{4500}{1.8}$ × 5 = ₹12500

Sol.183.(c) Total CP = 1563 + 350
= ₹1913
SP = ₹2,398
profit% = $\frac{2398 - 1913}{1913} \times 100$
= $\frac{485}{1913} \times 100 = \frac{48500}{1913}$ = 25.35%

Sol.184.(c) CP : SP = 600 : 750 = 4 : 5
Profit% = $\frac{5 - 4}{4} \times 100 = \frac{100}{4}$ = 25%

Sol.185.(b) Let CP be 100%
⇒ Profit = 30% = ₹540
⇒ 100% = $\frac{540}{30}$ × 100 = ₹1800
Then, SP of table lamp = 1800 + 540
= ₹2340

Sol.186.(a) gain% = (26 - 13 - $\frac{26 \times 13}{100}$)%
= (13 - $\frac{338}{100}$)% = 13 - 3.38 = 9.62%

Sol.187.(a) According to question
10CP = 20SP
$\frac{CP}{SP} = \frac{20}{10} = \frac{2}{1}$
loss% = $\frac{2-1}{2} \times 100$ = 50%

Sol.188.(a) Let the CP be 100%
(40 - 20)% = 20% ---------- ₹5
100% ---------- $\frac{5}{20} \times 100$ = ₹25
Then the initial selling price of one pen
= 25 × 120% = ₹30

Sol.189.(a) CP of article = $\frac{1910 + 1690}{2}$
= $\frac{3600}{2}$ = ₹1800
SP of article = 1800 × $\frac{28}{25}$ = ₹2,016

Sol.190.(b)
Number of chocolates purchased = 220
Marked price of 198 chocolates = 220 chocolates purchase price
then
⇒ SP = 220 × $\frac{100 - 3.7}{100}$ = 211.86
P % = $\frac{SP - CP}{CP} \times 100$
⇒ P % = $\frac{211.86 - 198}{198} \times 100$
= $\frac{13.86}{198} \times 100$ = 7 %

Sol.191.(a)
Let original price of the share = 100 units
Next day price = 100 × $\frac{90}{100}$ = 90 units
Final price = 90 × $\frac{92}{100}$ = 82.8 units
Given final price = ₹ 12,420
82.8 units = ₹ 12,420
1 units = ₹ 150
So, (90 - 82.8) = 7.2 units
= 150 × 7.2 = ₹ 1080
Hence, required money = ₹ 1080

Sol.192.(b) Given,
84 × SP = 105 × CP ⇒ SP = 15 unit
And CP = 12 unit
Now,
Profit % = $\frac{SP - CP}{CP} \times 100$
= $\frac{15 - 12}{12} \times 100$
= $\frac{15 - 12}{12} \times 100$ = 25%

Sol.193.(a)
First article was sold at 25 % profit
SP = ₹ 3000
⇒ CP = 3000 × $\frac{100}{125}$ = ₹ 2400
Total SP = 3000 + 3000 = ₹ 6000
⇒ CP of second article = 6000 - 2400
= ₹ 3600
Hence,
Loss % = $\frac{CP - SP}{CP} \times 100$
⇒ L% = $\frac{3600 - 3000}{3600} \times 100$
= $\frac{600}{3600} \times 100 = 16\frac{2}{3}$%

Sol.194.(a) Since 20% = $\frac{1}{5}$
Let CP of 1000 gm = $5x$
SP of 900 gm = $6x$
If SP of 900 gm = $6x \times \frac{85}{100} = 5.1x$
After equating the weight
CP of 9000 gm = $45x$
SP of 9000 gm = $51x$
⇒ Profit % = $\frac{SP - CP}{CP} \times 100$
= $\frac{51x - 45x}{45x} \times 100$
= $\frac{6x}{45x} \times 100$ = 13.33%

Alternate method :-

Ratio →	CP	:	SP
	100	:	120
	900	:	1000

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

100 : 85

15 : 17

Profit % = $\frac{17-15}{15}$ × 100 = 13.33 %

Sol.195.(d) MP = 250 ₹
Now according to question ,
12% = $\frac{3}{25}$, 16% = $\frac{4}{25}$, 10% = $\frac{1}{10}$
Selling price of article to earn a profit of 25% = 250 × $\frac{22}{25}$ × $\frac{21}{25}$ × $\frac{11}{10}$ × $\frac{125}{100}$
= $\frac{11 \times 21 \times 11}{10}$ = ₹254.10

Sol.196.(a)
MP of an article = 850 × $\frac{100}{85}$ = ₹1000
If Discount is not given on an article. then MP = SP
Now, CP × 125% = 1000
CP = $\frac{1000}{125}$ × 100 = ₹800

Sol.197.(d)
CP : SP
At the time of purchasing
64 : 80 = 4 : 5
At the time of Seling
800 : 1000 = 4 : 5

16 : 25

Required profit% = $\frac{25-16}{16}$ × 100
= $\frac{9}{16}$ × 100 = 56.25%

Sol.198.(d)
Let the total laptop (LCM of 15, 20) = 60
CP of 60 laptop bags
= 13,000 × 3 = ₹39,000
SP of 60 laptop bags
= 10,125 × 4 = ₹40,500
Profit on 60 laptop bags
= 40,500 - 39,000 = ₹1500
Required no. of laptop bags to earn a profit of ₹3,225 = $\frac{60}{1500}$ × 3225 = 129

Sol.199.(a)
CP : SP = 925 : 1000 = 37 : 40
Profit% = $\frac{40-37}{37}$ × 100 = $\frac{300}{37}$
= 8.11% = 0.0811

Sol.200.(c)
Let the CP of the laptop for P be x
According to Question,
x × $\frac{3}{4}$ × $\frac{6}{5}$ = 22500
x × $\frac{18}{20}$ = 22500
x = $\frac{22500 \times 20}{18}$ = 25,000

Sol.201.(a) According to question,
4C + 3T = 2100 .....(i)
5C + 2T = 1750 .....(ii)
From equation (ii) × 3 - (i) × 2, we get,
7C = 1050
∴ C = 150
So price of a chair = 150

Sol.202.(d)
Let the cost price of goods = 100
Selling price = 100×83% = 83
Mark price is double of selling price i.e. 83 × 2 = 166
∴ if he had sold at mark price then
% profit = $\frac{166-100}{100}$ × 100 = 66%

Sol.203.(d) 28% = $\frac{7}{25}$
Here 25 + 7 = 32 units = 3.2 kg
i.e. 3200 grams
∴ Actual weight of sugar = 25 units
= 2500 grams

Sol.204.(b) Profit = investment × time
Ratio of the share of A and B = 1,50,000 : 2,50,000 = 3 : 5
Then, the share of A = $\frac{3}{3+5}$ × 6,00,000
= 2,25,000
Share of B = 6,00,000 - 2,25,000
= ₹3,75,000
New share of A = 2,25,000 + 50,000
= ₹2,75,000
New share of B = ₹4,25,000
⇒ A : B = 2,75,000 : 4,25,000 = 11 : 17
A's share in the profit
= $\frac{11}{11+17}$ × 4,20,000 = ₹1,65,000

Sol.205.(b)
Let the C.P of first shirt be Rs. 100
Then, S.P of the first shirt = Rs. 108
So, S.P of the second shirt = $\frac{108}{2}$ = Rs. 54
Now, S.P = Rs. 54 and loss % = 3%
Then, C.P of the 2nd shirt
= $\frac{100}{97} \times 54 = Rs.\ 55.67$
Total C.P = 100 + 55.67 = Rs. 155.67
Total S.P = 108 + 54 = Rs. 162
Overall profit % = $\frac{162-155.67}{155.67} \times 100$
$= 4.07\%$

Sol.206.(b) According to the question,
Let the C.P of 100 items = 100 units
C.P of Remaining items = 100 × 70%
= 70 units
S.P of items when he earns overall 19% profit = 100 × 119% = 119 units
Required % = $\frac{119-70}{70}$ × 100 = 70%

Sol.207.(c) According to the question,
(10% - 7%) = ₹ 6
C.P (100%) = $\frac{6}{3}$ × 100 = ₹ 200

Sol.208.(b)
Let the cost price of the watch = Rs. 100x
According to question,
$157x - 107x = 1329$
$\Rightarrow 50x = 1329 \Rightarrow x = 26.58$
Hence, the cost price of watch
= 100x = ₹ 2658

Sol.209.(a) Marked price of the DVD
= $\frac{100}{80} \times 9080$ = Rs. 11, 350

Sol.210.(a)

	C.P		S.P
10% loss	10	:	9
25% less weight	750	:	1000
Overall	5	:	6

Profit percent = $\frac{1}{5} \times 100 = 20\%$

Sol.211.(d) According to the question,
C.P of the table = 5670 × $\frac{20}{27}$ = 4200 Rs
New S.P of table = 4200 × $\frac{28}{25}$ = 4704 Rs

Sol.212.(c)
Let the initial price of the land = 100 units
Let the profit earned by 3rd seller = x%
According to the question,
100 × $\frac{6}{5}$ × $\frac{5}{4}$ × $\frac{(100+x)}{100}$ = 165
x = 10%

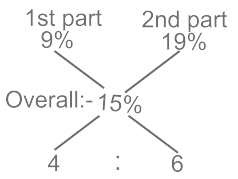
Sol.213.(a) According to the question,
42SP = (42 - 7)CP
$\frac{CP}{SP} = \frac{5}{6}$
Hence, profit percentage = $\frac{1}{5} \times 100$ = 20%

Sol.214.(c) Fractional value of $24\% = \frac{6}{25}$

	C.P	:	S.P
24% loss	25	:	19
19 gm instead of 50 gm	19	:	50
Overall	1	:	2

Now, profit % = $\frac{2-1}{1} \times 100 = 100\%$

Sol.215.(a)



Wheat sold at 9% profit = 650 × $\frac{4}{4+6}$
= 260 kg

Sol.216.(c) Given that,
cost price of an article = 36 ₹/kg
and selling price of an article = 40 ₹/kg
But he uses faulty weight ,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

He is giving 800 gm Instead of 1000 gm .

Ratio → C.P. : S.P.

$36 \times 800 : 40 \times 1000$

$18 : 25$

Profit % = $\frac{25-18}{18} \times 100$

= $\frac{7}{18} \times 100$ = 38.89%

Sol.217.(b) According to the question,

C.P of 1st toy = $1500 \times \frac{4}{5}$ = 1200

C.P of 2st toy = $2800 \times \frac{2}{1}$ = 5600

C.P of 3st toy = $3500 \times \frac{4}{5}$ = 2800

Total C.P = 1200 + 5600 + 2800 = 9600

Total S.P = 1500 + 2800 + 3500 = 7800

loss% = $\frac{9600-7800}{9600} \times 100$ = 18.75%

Sol.218.(a) Selling price of the gold ring

= $38500 \times \frac{37}{50}$ = ₹28,490

Sol.219.(b)

M.P. = $1120 \times \frac{23}{20} + 205$ = ₹1493

Sol.220.(a) Actual C.P.

= $12650 \times \frac{10}{11} \times \frac{20}{23} \times \frac{4}{5}$ = ₹8000

Sol.221.(d) Rate of mixture

= $\frac{(50 \times 40) + (70 \times 30)}{(50 + 70)} \times \frac{6}{5}$

$\Rightarrow \frac{4100}{120} \times \frac{6}{5}$ = ₹41/kg

Sol.222.(d) Ratio → $C.P. : S.P._1 : S.P._2$

Initial	→	4 :	5 :	
Final	→		5 :	4
		4 :	5 :	4

Initial $C.P.$ and final $S.P._2$ are same

Therefore , there is no profit/loss.

Sol.223.(c) Percentage loss of Vaishali

= $\frac{1260-945}{1260} \times 100 = \frac{315 \times 10}{126}$ = 25%

Sol.224.(c) According to the question

8 SP – 8 CP = 2 SP

$\frac{CP}{SP} = \frac{3}{4}$

So, profit % = $\frac{1}{3} \times 100 = 33\frac{1}{3}$ %

Sol.225.(a) According to the question,

Let the 1st and 2nd investment is 300 and 500 units

Ratio - 1st : 2nd

Initial - 300 : 500

Final - 360 : 450

Total initial investment = 300 + 500

= 800 units

Total final investment = 360 + 450

= 810 units

Profit % = $\frac{810-800}{800} \times 100$ = 1.25%

Sol.226.(a) Let profit = x

According to the question,

$3200 - \frac{7x}{5} = 3000 - x$

$\frac{7x}{5} - x = 200 \Rightarrow x$ = ₹ 500

Cost price = $(3000 - x)$ = ₹ 2500

Sol.227.(b)

Let original price of table = 100 unit

Price of the table for the Kavita

= 100 × 70% = 70 unit

Kavya sell the table at 48% profit

So, New selling price of the table

= $70 \times \frac{148}{100}$ = 103.6 unit

Now, difference between the new selling price and original price

= $\frac{103.6-100}{100} \times 100$ = 3.6%

Again, according to the question,

100 unit = ₹8,000

Then, extra money did Kavita get as profit

(3.6%) = $\frac{8000}{100} \times 3.6$ = ₹288

Sol.228.(d) According to the question,

(17% + 5%) = ₹1056

(C.P of the cycle) 100% = $\frac{1056}{22} \times 100$

= ₹4800

Sol.229.(b)

CP of article = $\frac{955+845}{2}$ = ₹900

Required selling price = $900 \times \frac{106}{100}$

= ₹954

Sol.230.(d) CP = $\frac{1920+1280}{2}$ = 1600

Required selling price = $1600 \times \frac{5}{4}$

= ₹2,000

Sol.231.(b) According to the question,

$16\frac{1}{4}\% = \frac{13}{80}$

So the ratio of milk and water will be

= 80 : 13

Sol.232.(c) CP = ₹15,000

SP = $15{,}000 \times \frac{5}{4} \times \frac{22}{25}$ = ₹16500

Gain money = 16500 – 15000 = ₹1500

Required gain % = $\frac{1500}{15000} \times 100$ = 10 %

Sol.233.(d)

Cost price of an orange = $\frac{150}{100}$ = ₹1.5

Selling price of an orange = $\frac{24}{12}$ = ₹2

Profit on 1 orange = ₹0.5

So, total number of orange purchased

= $\frac{1000}{0.5}$ = 2000

Sol.234.(d) According to the question,

Worth of $\frac{2}{5}$ parts = $18000 \times \frac{2}{5}$ = ₹ 7200

S.P of $\frac{2}{5}$ parts = $7200 \times \frac{13}{20}$ = ₹ 4680

Loss on $\frac{2}{5}$ parts = 7200 - 4680 = ₹ 2520

Worth of $\frac{3}{5}$ parts = $18000 \times \frac{3}{5}$

= ₹ 10800

S.P of $\frac{3}{5}$ parts when there is no profit/loss = 10800 + 2520 = ₹ 13320

Required % = $\frac{13320-10800}{10800} \times 100$

= $23\frac{1}{3}$%

Sol.235.(c)

Required loss % = $\frac{(25)^2}{100} = \frac{625}{100}$ = 6.25%

Sol.236.(a) Net profit of 20% and 25%

= $20 + 25 + \frac{20 \times 25}{100}$ = 50%

Now , according to the question,

80% = $50 + x + \frac{50 \times x}{100}$

80% = $\frac{100+3x}{2}$

Profit earned by third seller (x)

= $\frac{160-100}{3}$ = 20%

Sol.237.(a)

Let the C.P for the praveen = ₹ x

$x \times \frac{9}{10} \times \frac{5}{4} = 2250 \Rightarrow x$ = ₹ 2000

Sol.238.(d) Required cost price

= $98.56 \times \frac{25}{28} \times \frac{10}{11} \Rightarrow 3.2 \times 25$ = ₹80

Sol.239.(c) Let the cost price be 100 Rs.

Then marked price = 180 Rs.

And Selling price = $180 \times \frac{52}{100}$ = 93.6 Rs.

Required Loss % = $\frac{100-93.6}{100} \times 100$

= 6.4 % or $6\frac{2}{5}$%

Short Trick :-

Required % = $80 - 48 - \frac{80 \times 48}{100}$

= 32 – 38.4 = –6.4 % or $-6\frac{2}{5}$%

–ve show Loss happens.

Sol.240.(b) Cost price for book-seller

= 1574.80 × 80 % = 1259.84 Rs.

Selling price of book = 1574.80 – 45.40

= 1529.40 Rs.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Required profit = 1529.40 − 1259.84
= 269.56 Rs.

Sol.241.(c) Required selling price
$= 37{,}800 \times \frac{27}{25} \times \frac{24}{25}$ = 39191Rs.(approx.)

Short Trick :- Net % change
$= 8 - 4 - \frac{8 \times 4}{100} = 3.68\%$

Required selling price
$= 37{,}800 \times \frac{103.68}{100}$ = 39191 Rs.(approx.)

Sol.242.(b) Selling price of kismis per kg.
= 6 × 40 = 240 Rs. / kg
Required loss% = $\frac{320 - 240}{320} \times 100 = 25\%$

Sol.243.(c)
Selling price = 7 × 80% = 5.6 units
Profit = 5.6 − 4 = 1.6 units = 80 Rs.
Cost price (4 units) = $\frac{80}{1.6} \times 4$ = 200 Rs.

Sol.244.(a) Required selling price =
$7{,}00{,}000 \times \frac{4}{5} \times \frac{17}{20} \times \frac{9}{10} = 700 \times 36 \times 17$
= 700 × 612 = ₹ 4,28,400

Sol.245.(c)
Equating the value of cost price :-
$648 + x = 1032 - x$
$\Rightarrow x = \frac{1032 - 648}{2} = 192$
Cost price = 648 + 192 = 840
Required Selling price
= 840 × 130 % = ₹ 1092

Sol.246.(c) Let the marked price = 100 Rs.
Then Selling price = 60 Rs.
and cost price $= 60 \times \frac{10}{7} = \frac{600}{7}$ Rs.
Markup % = $\frac{100 - \frac{600}{7}}{\frac{600}{7}} \times 100 = 16\frac{2}{3}\%$

Sol.247.(b) Let cost price = 100 units
Then marked price = 150 units
and selling price = 150 × 60% = 90 units
Required loss% = 10%

Sol.248.(d) His combined loss/gain%
$= \frac{10\% \times 1 + (-10\%) \times 3}{1 + 3} = -5\%$
−ve sign indicates loss.

Sol.249.(b)
Let the marked price of one pen = 1 Rs.
C.P. of 50 pen = 1 × 44 = 44 Rs.
S.P. of 50 pen = 1 × 50 × 99% = 49.5 Rs.
Required profit = $\frac{49.5 - 44}{44} \times 100 = \frac{550}{44}$
= 12.5%

Sol.250.(a)
C.P. × $\frac{5}{4}$ = M.P. × $\frac{93}{100} \times \frac{25}{26}$
$\frac{C.P.}{M.P.} = \frac{93}{130}$
Required markup % = $\frac{130 - 93}{93} \times 100$
= 39.78%

Sol.251.(a)
Ratio = good article : bad article = 17 : 3
Let, cost price of one article = 10
total cost price = (17 + 3) × 10 = 200 Rs.
total Selling price = 200 × 119% = 238 Rs.
S.P. of each good article = $\frac{238}{17}$ = 14
Required markup % = $\frac{14 - 10}{10} \times 100$ = 40%

Sol.252.(d) $\frac{C.P.}{M.P.} = \frac{96}{128}$
Cost price = $600 \times \frac{96}{128}$ = 450 ₹

Sol.253.(a) Required profit %
$= 40 - 7.5 - \frac{40 \times 7.5}{100} = 29.5\%$
Profit = $\frac{1813}{129.5} \times 29.5$ = 413 ₹

Sol.254.(c) Cost price
$= 560 \times \frac{100 - 16}{100 + 12}$ = 420 ₹
Required profit
$= \frac{560 - 420}{420} \times 100 = 33\frac{1}{3}\%$

Sol.255.(c) Total Cost price
= 2000 × 10 box + 1000 = 21000 ₹
Total Selling price
= 2500× 9 box + 1250 for 10 kg = 23750 ₹
Total profit = 23750 − 21000 = 2750 ₹

Sol.256.(d) Loss = C.P. - S.P.
70 × C.P. = 70 × S.P. + 5 × S.P.
70 × C.P. = 75 × S.P.
Selling price of 1 article
$= \frac{16875}{75}$ = 225 Rs.

Sol.257.(d) $\frac{Cost\ price}{Marked\ price} = \frac{100 - D\%}{100 + P\%}$
$\frac{Cost\ price}{Marked\ price} = \frac{75}{105}$
Required markup %
$= \frac{105 - 75}{75} \times 100 = 40\%$

Sol.258.(b) Discount %
$= \frac{4}{16 + 4} \times 100 = 20\%$
Let selling price = 100 ₹
Price at which shyam purchased
= 100 × 80 % = 80 ₹
Marked price of pens = 100 × 120% = 120 ₹
Required profit % = $\frac{120 - 80}{80} \times 100 = 50\%$

Sol.259.(b) $\frac{Cost\ price}{Marked\ price} = \frac{100 - D\%}{100 + P\%}$
$\frac{Cost\ price}{Marked\ price} = \frac{75}{180}$
New Selling price = 180 × 60% = 108
Profit % = $\frac{108 - 75}{75} \times 100 = 44\%$

Sol.260.(a) C.P. × 240 = S.P. (x)
$\frac{C.P.}{S.P.} = \frac{x}{240} = \frac{100}{120} \Rightarrow x = 200$ articles

Sol.261.(b)
$\frac{C.P.}{M.P.} = \frac{85}{153} = \frac{5}{9} = \frac{40}{72}$
$\frac{S.P.}{M.P.} = \frac{65}{104} = \frac{5}{8} = \frac{45}{72}$
Required profit % = $\frac{5}{40} \times 100 = 12.5\%$

Sol.262.(a)
Ratio ⇒ C.P. : S.P.
Profit = 25 : 27
Weight = 750 : 1000

Overall = 25 : 36
Required profit = $\frac{36 - 25}{25} \times 100 = 44\%$

Sol.263.(a)
$\frac{C.P.}{M.P.} = \frac{100 - 45}{100 + 45} = \frac{55}{145} = \frac{11}{29}$
New selling price = 29 × 50% = 14.5
Required profit
$= \frac{14.5 - 11}{11} \times 100 = 31\frac{9}{11}\%$

Sol.264.(d) $\frac{C.P.}{M.P.} = \frac{95}{114}$
Required markup %
$= \frac{114 - 95}{95} \times 100 = \frac{19}{95} \times 100 = 20\%$

Sol.265.(b) In 1st year :-
$160000 \times \frac{10}{100}$ = 16000 loss
Remaining amount = 160000 − 16000
= 144000
In 2nd year :- $144000 \times \frac{5}{100}$ = 7200 profit
New amount = 144000 + 7200 = 151200
In 3rd year :-
$151200 \times \frac{25}{100}$ = 37800 profit
Total profit = 37800 + 7200 − 16000
= 29000 Rs.

Sol.266.(c) Let marked price = 100 ₹ ,
Then cost price = 72 ₹
and selling price = 100 × 94% = 94 ₹
Required profit % = $\frac{94 - 72}{72} \times 100$
= 30.56%

Sol.267.(c) Required profit %
$= \frac{1000 - 930}{930} \times 100 = \frac{700}{93} = 7\frac{49}{93}\%$

Sol.268.(b) Let marked price = 49 ₹
Then Selling price = 21 ₹

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Cost price $= 21 \times \frac{100}{70} = 30$ ₹

Required ratio :- M.P. : C.P. = 49 : 30

Sol.269.(d) Let marked price = x

Selling price = $x \times \frac{4}{5}$

Cost price = $x \times \frac{4}{5} \times \frac{100}{120} = \frac{2x}{3}$

Profit = selling price − cost price

$= \frac{4x}{5} - \frac{2x}{3} = \frac{2x}{15}$

According to the question,

$\frac{2x}{15} = 800 \Rightarrow$ marked price (x) = ₹ 6,000

Sol.270.(c) C.P. : S.P.

Article → 25 : 26

Weight → 940 : 1000

Total → 47 : 52

Required profit $= \frac{52-47}{47} \times 100 = 10.64$ %

Sol.271.(c) Let Initial :- Cost price = 10 ₹ and Selling price = 15 ₹

Initial Profit = 5 ₹

Final :- Cost price = 10 ₹ and

Selling price = 30 ₹

Initial Profit = 20 ₹ = 4 times initial profit

Initial profit% $= \frac{5}{10} \times 100 = 50\%$

Sol.272.(a) For no loss : -

We can say that 8.5% of principal = 17000

Total principal $= \frac{17000 \times 100}{8.5} = 200000$ Rs.

Sol.273.(d) Let error = x grams

Then, $\frac{x}{1000-x} \times 100 = \frac{100}{19}$

$\frac{x}{1000-x} = \frac{1}{19}$

$19x = 1000 - x \Rightarrow x = 50$ grams

Required quantity = 1000 − 50 = 950 grams

Sol.274.(c) C.P of 1000 gm rice = x Rs.

Since, He gives only 950 gm of rice

$= \frac{x}{1000} \times 950 = \frac{19}{20}x$

Selling price after making a profit of 15%

$= \frac{115}{100} \times \frac{19x}{20} = 1.0925\,x$

Sol.275.(d)

Ratio = C.P. : S.P.

Price = 16 : 20

Weight = 800 : 1000

Total = 16 : 25

Required profit % $= \frac{25-16}{16} \times 100$

= 56.25%

Sol.276.(a) Let the Cost price of goods be 100 Rs.

Then, Selling price = Rs. 110

According to question,

$(100 + x) \times \frac{88}{100} = 110$

$8800 + 88x = 11000 \Rightarrow x = 25\%$

Required Difference = 25 % − 10 % = 15%

Sol.277.(d) C.P of 200 gm almonds

$= \frac{880}{1000} \times 200 =$ Rs.176

Now, S.P of 200 gm almonds after a profit of 25% $= \frac{125}{100} \times 176 =$ Rs. 220

But, due to faulty weighing machine, it shows 400 gm instead of 350gm.

Actual Selling price of 200 gm almonds

$= \frac{350}{400} \times 220 =$ Rs. 192.50

Sol.278.(d) Original price = 100 ₹ ,

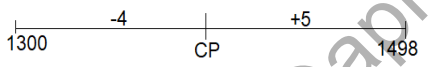
C.P. for Ram = 70 ₹

Selling price = 70 × 150% = 105 ₹

Required profit % on original price

$= \frac{105-100}{100} \times 100 = 5\%$

Sol.279.(a) 25% $= \frac{1}{4}$



ATQ,

5 - (-4) = 9 unit --------- 1498 - 1300 = ₹198

4 unit ---------- $\frac{198}{9} \times 4 =$ ₹88

CP of a painting = 1300 + 88 = ₹1388

SP of the painting to get 25% profit

$= 1388 \times \frac{5}{4} =$ ₹1735

Sol.280.(c)

Earlier Selling price = 60 × 110% = 66 Rs.

New profit % $= \frac{66-62}{62} \times 100 \approx 6.45\%$

Sol.281.(b)

Let original cost of land be x Rs. , then

$x \times \frac{5}{4} \times \frac{5}{4} = 625000$ Rs.

$x = \frac{625000 \times 16}{25} = 400000$ Rs.

Sol.282.(a) According to the question ,

$x \times \frac{23}{20} - (2540 - x) \times \frac{3}{4} = 109$

$\frac{38x}{20} = 1905 + 109 = 2014 \Rightarrow x = 1060$ Rs.

and amount = 2540 −1060 = 1480 Rs.

Total S.P. $= 1060 \times \frac{23}{20} + (1480) \times \frac{3}{4}$

= 1219 + 1110 = 2329 Rs.

Required loss% $= \frac{2540-2329}{2540} \times 100$

= 8.3% loss

Sol.283.(d)

	C.P.	:	S.P.
Price →	400	:	440
Weight →	850	:	1000

Final ratio → 17 : 22

Required profit % $= \frac{22-17}{17} \times 100$

$= 29\frac{7}{17}$%

Sol.284.(a) Required gain %

$= \frac{165}{1265-165} \times 100 = \frac{165}{11} = 15\%$

Sol.285.(a) Let the false weight be x.

According to question,

$x \times \frac{123}{100} = 3075$ gm

$x = \frac{3075 \times 100}{123} = 2500$ gm

Sol.286.(d)

Cost price of 1000 g of sugar = Rs. 36

Then, Cost price 950 g of sugar

$= \frac{36 \times 950}{1000} = 34.2$ Rs.

Selling price of 950 g of sugar = 54 Rs.

Required profit = 54 − 34.2 = 19.8 Rs.

Sol.287.(d)

$\frac{C.P.}{M.P.} = \frac{100 - D\%}{100 + P\%} \Rightarrow \frac{C.P.}{18000} = \frac{6}{11}$

$\Rightarrow$ C.P. $= 9818\frac{2}{11}$ ₹

Sol.288.(d)

Let C.P. = 100 Then, Initial SP = 145

New SP = 2 × 145 = 290

Hence, required profit %

$= \frac{290-100}{100} \times 100 = 190\%$

Sol.289.(c) According to the question,

4% + 1% = ₹ 42.5

(C.P) 100% $= \frac{42.5}{5} \times 100 =$ ₹ 850

S.P $= 850 \times \frac{118}{100} =$ ₹ 1003

Sol.290.(a) C.P of 21 mangoes = 1₹

S.P of 21 mangoes on 30% loss = 0.7 ₹

0.7 ₹ = 21 mangoes

1 ₹ $= \frac{21}{0.7} \times 1 = 30$ mangoes

Sol.291.(d)

Ratio	→	CP	: SP
Inc. in price	→	40	: 45
Change in weight	→	900	: 1000

Final ratio → 36 : 45

Gain % $= \frac{45-36}{36} \times 100 = 25\%$

Sol.292.(a)

Ratio	→	C.P	: S.P
Faulty weight	→	x	: 1000

Profit → 10 : 11

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$x = \frac{10000}{11}$ = 909.09 kg

Sol.293.(b) According to the question,
S.P × 9 = C.P × 15
$\frac{C.P}{S.P} = \frac{9}{15} = \frac{3}{5}$
Required % = $\frac{5-3}{3} \times 100 = \frac{200}{3}\%$

Sol.294.(b) According to question,
Initial Cost Price of one dozen Bananas
= 13 × $\frac{100}{130}$ = Rs. 10
New Cost Price = 10 × $\frac{110}{100}$ = Rs. 11
Then, new Profit %
= $\frac{13-11}{11} \times 100$ = 18.18 %

Sol.295.(c) According to the question,
Let the C.P = 100x
S.P = 126x
Difference = 26x
26x = ₹ 143 ⇒ x = 5.5
S.P (126x) = 126 × 5.5 = ₹ 693

Sol.296.(b) According to question,
(C.P of 1 article) × 50 = (S.P of 1 article) × x
$\frac{C.P.}{S.P.} = \frac{x}{50}$
Profit % = $\frac{(50-x)}{x} \times 100$ = 25
$\frac{(50-x)}{x} = \frac{1}{4}$
200 − 4x = x ⇒ x = 40

Sol.297.(c) According to question,
Cost Price of pens = $\frac{40 \times 100}{80}$ = Rs. 50
Now, profit = 10%
Selling price = $\frac{50 \times 110}{100}$ = Rs. 55

Sol.298.(c) Total Cost price of the watches = 12000 + 10000 = Rs. 22000
Total selling price of the watches
= 12000 × $\frac{110}{100}$ + 10000 × $\frac{90}{100}$
= 13200 + 9000 = Rs. 22200
Required profit %
= $\frac{22200-22000}{22000} \times 100$ = 0.909 %

Sol.299.(c)
Ratio → quantity A : quantity B
Quantity → 2 : 3
P/L % → + 10% : − 5%
Overall profit/ loss
= $\frac{(2 \times 10\%) + (3 \times -5\%)}{2+3}$
= 1% (profit) ⇒1% = ₹ 1850
(Total C.P of fruits) 100% = 1850 × 100
= ₹ 185000

Sol.300.(c) Selling price = Rs. 325
Cost price of the article
= 325 × $\frac{100}{130}$ = Rs. 250
For the profit of 40%
New Selling price = 250 × $\frac{140}{100}$ = Rs.350
Required % = $\frac{350-325}{325} \times 100$ = 7.69%

Sol.301.(b) Cost price of book is 100%
According to question,
(60 − 30)% = 150
Cost Price of book = 150 × $\frac{100}{30}$
= Rs. 500 ⇒ Profit = 20%
Selling price = 500 × $\frac{120}{100}$ = Rs.600

Sol.302.(c)
Ratio → 80% : 20%
Quantity → 4 : 1
Profit / loss → −25% : + 20%

Overall loss% = $\frac{-25\% \times 4 + 20\% \times 1}{5}$ = 16%

Sol.303.(b) Let original cost price = 100x
Selling price = 95x
According to the question,
$\frac{11}{10}(100x - 20) = (95x + 13)$
15x = 35
Original selling price (95x)
= 95 × $\frac{35}{15}$ = Rs. 221.66

Sol.304.(b) C.P. of the jacket
= $\frac{3860+1900}{2}$ = ₹ 2880
Required S.P. = 2880 × $\frac{11}{10}$ = ₹ 3168

Sol.305.(b) According to the question,
2x = 600 − 400 ⇒ x = 100
Cost price of the article = 400 + 100
= 500
Profit % = $\frac{750-500}{500} \times 100$ = 50%

Sol.306.(d) first watch's selling price
= 12000 × $\frac{11}{10}$ = ₹ 13200
Second watch's selling price
= 16000 × $\frac{9}{10}$ = ₹ 14400
C.P of both watches = 12000 + 16000
= ₹ 28000
S.P of both watches = 13200 + 14400
= ₹ 27600
Loss = 28000 − 27600 = ₹ 400

Sol.307.(d)
Ratio → C.P. : S.P.
Initial → 4 : 5
Final → 4 : 3

Decrease in selling price (2 units) = 40 Rs.
Initial S.P. (5 units) = 100 Rs.

Sol.308.(a) According to the question,
Ratio → CP : SP
Initial → 5 : 7
Final → 6.5 : 7

Therefore, the new profit of the vijay
= $\frac{0.5}{6.5} \times 100$ = 7.69 %

Sol.309.(a) According to the question,
$\frac{CP}{MP} = \frac{100}{120}$
discount % offered by the shopkeeper to sell his article so that there is no loss
= $\frac{120-100}{120} \times 100 = \frac{1}{6} \times 100$ = 16.66%

Sol.310.(d) Cost price of 30 litre milk
= 50 × 30 = 1500 Rs
After adding 20 litre water
Selling price of the milk = 48 × 50
= 2400 Rs
Therefore, profit % = $\frac{900}{1500} \times 100$ = 60%

Sol.311.(c) Let the CP of the article= 100
After 20% profit SP of the article = 120
If he buys it at half of the cost price and sells at the same selling price as before
Then, new CP = 50 and SP = 120
Therefore, % profit = $\frac{120-50}{50} \times 100$
= 140%

Sol.312.(c)
Total Cost Price of x kg. wheat = 30x
Total Selling price = 30x × $\frac{110}{100}$ = 33x
Now, equating total selling price ,
$(8 \times x) + \{(x-8) \times 45\}$ = 33x
$x = \frac{360}{20}$ = 18 k.g.
Quantity of wheat , Ritika sold at Rs.45/kg (x − 8) = 10 k.g.

Sol.313.(c) Let M.P = 100
S.P = 100 × $\frac{4}{5}$ = 80
Let C.P = x ⇒ x × $\frac{13}{10}$ = 80 ⇒ $x = \frac{800}{13}$
Selling price after giving 10% discount
100 × $\frac{9}{10}$ = 90
Profit percentage = $\frac{90 - \frac{800}{13}}{\frac{800}{13}}$
= $\frac{370}{800}$ × 100 → 46.25%

Short Trick :-
$\frac{C.P.}{M.P.} = \frac{100 - discount\%}{100 + Profit\%}$
$\frac{C.P.}{M.P.} = \frac{100-20\%}{100+30\%} = \frac{8}{13}$
Now ,If the discount become10% then
= $\frac{8}{13} = \frac{100 - discount\%}{100 + Profit\%}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{100 - 10\%}{100 + Profit\%}$

$100 + Profit\% = \frac{13 \times 90}{8}$ = 146.25%

So profit % = 46.25%

Sol.314.(a) Let original S.P = ₹100

New S.P = 100 × $\frac{9}{10}$ ⇒ ₹90

If he sell the Article $\frac{9}{10}$ of the S.P then he gain 20% profit

Ratio → C.P : S.P

5 : 6

(S.P)6 unit = ₹90

(C.P)5 unit = ₹75

Profit percentage when he sell the article on the original price

Profit percentage = $\frac{100 - 75}{75}$ × 100

= 33.33%

Short Trick :-

Let , the original selling Price be 120 units .

Ratio → C.P. : S.P.

Initially → x : 120

Finally → x : 120 × $\frac{9}{10}$ = 108

According to the questions ,

$x \times \frac{120}{100}$ = 108 ⇒ x = 90 units.

Required initial profit

= $\frac{120 - 90}{90}$ × 100 = 33.33%

Sol.315.(a)

C.P. of 60 chairs = Rs. 24,560

C.P. of 1 chair = Rs. $\frac{24560}{60}$

According to question;

S.P. of 1 chair = $\frac{24560}{60} \times \frac{6}{5}$ = Rs. $\frac{2456}{5}$

So, number of chairs sold for Rs. 24,560

= $\frac{24560}{\frac{2456}{5}}$ = 50

Sol.316.(b)

Ratio → C.P. : S.P.

1st TV → 5 : 4 **) × 11**

2nd → 10 : 11 **) × 4**

Total cost price → (5 × 11) + (10 × 4)

= 95 units

95 units = 2280 Rs ⇒ 1 unit = 24 Rs

Cost price of TV sold at loss (55 units)

= 55 × 24 = 1320 Rs

Sol.317.(c) C.P. of all 3 Spectacles

= 3 × 4000 = Rs. 12000

S.P. of first Spectacle = 4000 × $\frac{130}{100}$

= Rs. 5200

S.P. of second Spectacle = 4000 × $\frac{90}{100}$

= Rs. 3600

S.P. of third Spectacle = 4000 × $\frac{90}{100}$

= Rs. 3600

Total S.P. = Rs. 12400

Total profit% = $\frac{(12400 - 12000)}{12000} \times 100$

= 3.33%

Short trick :-

Ratio	→ Cost Price :	Selling Price
At 30% profit →	10 :	13
At 10% loss →	10 :	9
At 10% loss →	10 :	9
Total →	30 :	31

Required profit % = $\frac{(31 - 30)}{30}$ × 100

= 3.33%

Sol.318.(b) According to the question,

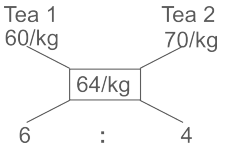
Cost price of the table

= $\frac{420 - 210}{7}$ × 100 = 3000 Rs.

Sol.319.(a) 25% profit = $\frac{5}{4} = \frac{selling\ price}{cost\ price}$

(selling price) 5 units = ₹80

(cost price) 4 units = 64



Ratio = 6 : 4 ⇒ 3 : 2

Sol.320.(b) Profit on first watch

= $\frac{12000 \times 10}{100}$ = Rs. 1200

Loss on second watch = $\frac{20000 \times 20}{100}$

= Rs. 4000

Overall loss = 4000 – 1200 = Rs. 2800

Sol.321.(a)

Ratio ⇒	C.P. :	S.P.
Profit (+10%) ⇒	9 :	10
Markup (+10%) ⇒	10 :	11

Final Ratio ⇒	9 :	11

Now, According to question ,

After getting punished , S.P.

⇒ C.P. × 90% = 8.1 units

Now, 8.1 units = Rs. 20

Then , 11 units = $\frac{20 \times 11}{8.1}$ = Rs. 27.16

Sol.322.(b)

Fractional value of 12.5% = $\frac{1}{8}$

	C.P	S.P.
-12.5% ⇒	8 :	7
less weight →	28 :	36
Final ratio →	8 :	9

Profit % = $\frac{selling\ price - cost\ price}{cost\ price}$ × 100

= $\frac{9 - 8}{8}$ × 100 = 12.5%

Sol.323.(a) Let the price of wooden furniture be Rs.100

Price after first sell

= 100 × $\frac{120}{100}$ = Rs.120

Price after Second sell

= 120 × $\frac{125}{100}$ = Rs.150

Let the profit percentage of third seller be x , then

According to question ,

150 × $\frac{100 + x}{100}$ = 165

$\frac{100 + x}{100} = \frac{11}{10}$ ⇒ x = 10%

Sol.324.(b) Given ,

the weight of diamond after cutting into 3 pieces is

3x : 2x : x

Total weight before cutting be 6x.

According to question ,

Price varies with the square of its weight,

Then , Price of diamond before cutting

= $36x^2$

Total price after cutting = $9x^2 + 4x^2 + x^2$

= $14x^2$

Loss incurred = $36x^2 - 14x^2 = 22x^2$

Now, $36x^2$ = Rs. 6084 ⇒ x = 13

Loss = 22 × 13 × 13 = Rs 3718

Sol.325.(d) Dishonest trader says that he sells his goods at the cost price then the ratio of profit is directly proportional to false weight .

		C.P. :	S.P.
Profit	→	8 :	9
Weight	→	8 :	9

Here , 9 units = 1000 gm

Then , 8 units = 888.8 gm

Sol.326.(a)

Cost price per apple = $\frac{350}{100}$ = 3.5 Rs.

S.P. per apple = $\frac{48}{12}$ = 4 Rs.

Profit % = $\frac{4 - 3.5}{3.5}$ × 100 = $14\frac{2}{7}$%

Sol.327.(d) S.P of 1 kg onion = Rs.36

C.P of 1 kg onion = Rs.40

Loss% = $\frac{4}{40} \times 100 = 10\%$

But he gives 800 grams instead of 1 kg,

gain% = $\frac{200}{800} \times 100 = 25\%$

His overall gain %

= 25 - 10 - $\frac{25 \times 10}{100} = 15 - 2.5 = 12.5\%$

Sol.328.(a) Let he gains y% by selling a false scale and the length he uses be x cm.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$24 = y - 7 - \frac{7y}{100} \Rightarrow \frac{93y}{100} = 31$

$\Rightarrow y = 33.33\%$

Now, $\frac{100-x}{x} \times 100 = \frac{100}{3}$

$\Rightarrow 300 - 3x = x$

$\Rightarrow 4x = 300 \Rightarrow x = 75$

He uses only 75 cm instead of 1 m.

Short Trick :-

	Initial	:	Final
Discount ⇨	100	:	93
False scale ⇨	100	:	x
C.P. : S.P. ⇨	100	:	124
C.P. : S.P. ⇨	100x		100×93

According to question ,

$\frac{C.P.}{S.P.} = \frac{100}{124} = \frac{100x}{100 \times 93} \Rightarrow$ x = 75 cm

Sol.329.(c) 15% = $\frac{3}{20}$

Ratio of CP and SP for dealer = 20 : 23

23 unit = 1000 gm

20 unit = $\frac{1000}{23}$ × 20 = 869.6 gm

Sol.330.(b) Let the price of table and chair be 100x and 100y respectively.

ATQ,

100x + 100y = 3900

x + y = 39 -------- (1)

and, 8x + 16y = 540

2x + 4y = 135

x + 3y + x + y = 135

x + 3y + 39 = 135

x + 3y = 96-------- (2)

Subtracting eqn(1) from (2) we have,

y = $\frac{57}{2}$ and x = $\frac{21}{2}$

So, the difference between the original price of the table and the chair

= 100 ($\frac{57}{2}$ - $\frac{21}{2}$) = 100 × 18 = ₹1800

Sol.331.(b)

Let the price of 1 gram items = ₹1

25% = $\frac{1}{4}$

Then, SP of item for seller = 5 unit which corresponds to 2000g

And CP of an item for seller = 4 unit which corresponds to $\frac{2000}{5}$ × 4 = 1600g

So, the required error in the 2 kg weight = 2000 - 1600 = 400g

Sol.332.(c)

Let the SP of an article be 8 unit

So, 3 unit corresponds to 55%

Then, 8 unit corresponds to $\frac{55}{3}$ ×8 ≈147%

So, the actual profit% = 147 - 100 = 47%

Sol.333.(d) We have following ratio :

CP	:	SP
3	:	4
20	:	23
10	:	9
600	:	828 = 50 : 69

Required profit% = $\frac{69-50}{50}$ × 100

= $\frac{19}{50}$ × 100 = 38%

Sol.334.(b) Cost Price of 5 articles = 1200 × 5 = 6000 Rs.

Selling Price of 4 articles = 1800 × 4 = 7200 Rs.

Ratio of C.P. and S.P. ⇒ 5 : 6

Required profit% = $\frac{1}{5}$ × 100 = 20%

Sol.335.(a)

Let the retail price be 100 unit

Then, CP of an article for shopkeeper

= 80 × $\frac{20}{21}$ = $\frac{1600}{21}$

SP of an article when commission is reduced by 10% = 100 × $\frac{9}{10}$ = 90 unit

The ratio of CP and SP of an article

= $\frac{1600}{21}$: 90 = 160 : 189

Required profit% = $\frac{189-160}{160}$ × 100

= $\frac{29}{160}$ × 100 ≈ 18%

Sol.336.(b) CP of article for shopkeeper = 23 × 0.8 = ₹18.4

SP of article for shopkeeper = 20 × 1 = ₹20

Required percentage = $\frac{20-18.4}{18.4}$ × 100

= $\frac{1.6}{18.4}$ × 100 = $\frac{200}{23}$ = 8$\frac{16}{23}$%

Sol.337.(c) Let the cost price of goods = 100 unit

Marked price of goods = 140 unit

Remaining goods = 1 - $\frac{1}{5}$ - $\frac{1}{2}$ = $\frac{3}{10}$

10% discount = $\frac{9}{10}$

Selling price = $\frac{140}{100}$ × [$\frac{1}{5}$ × $\frac{9}{10}$ + $\frac{1}{2}$ + $\frac{3}{10}$ × $\frac{4}{5}$] × 100

= $\frac{7}{5}$[$\frac{9}{50}$ + $\frac{1}{2}$ + $\frac{12}{50}$] × 100

= $\frac{7}{5}$ × $\frac{46}{50}$ × 100 = 128.8%

Profit percentage = 128.8 - 100 = 28.8%

Sol.338.(c) Let the original CP be y.

According to the question,

$\frac{100-18}{100}$ × y + 144

= $\frac{100-30}{100}$ × y × $\frac{100+20}{100}$

$\Rightarrow \frac{82y}{100} + 144 = \frac{70y}{100} \times \frac{120}{100}$

$\Rightarrow \frac{82y}{100} + 144 = \frac{84y}{100} \Rightarrow \frac{2y}{100} = 144$

$\Rightarrow y = 7200$

So, original SP = $\frac{100-18}{100}$ × y

= $\frac{82}{100}$ × 7200 = ₹5,904

Sol.339.(d) Let the CP of article A and B be x and y respectively.

According to the question,

$x \times \frac{128}{100} = y \times \frac{76}{100} \Rightarrow \frac{x}{y} = \frac{19}{32}$

Let $x = 19p$ and $y = 32p$

Now,

$19p \times \frac{128}{100} + 32p \times \frac{76}{100} = 48640$

$\frac{2432p}{100} + \frac{2432p}{100} = 48640$

$\frac{4864p}{100} = 48640 \Rightarrow p = 1000$

So, CP of A = x = $19p$ = 19(1000) = ₹19,000

And CP of B = y = $32p$ = 32(1000) = ₹32,000

Sol.340.(d)

S.P of the crockery = Rs. 1092

Profit % = 20%

C.P = $\frac{100}{120} \times 1092 = Rs.910$

New S.P = Rs. 950

Then, profit percentage

= $\frac{950-910}{910} \times 100$

= $\frac{40}{910} \times 100 = 4.40\%$

Sol.341.(b)

SP of an article for P = CP of the article for Q = 280 × $\frac{5}{4}$ = ₹350

SP of the article for Q = CP of the article for R = 560 × $\frac{5}{7}$ = ₹400

Required profit % for Q = $\frac{400-350}{350}$ × 100

= $\frac{50}{350}$ × 100 = 14%

Sol.342.(d) selling Price of 1 item = Rs.1

Selling Price of 1375 items = Rs.1375

Profit = 25%

CP of 1375 items = $\frac{1375}{125}$ × 100

= Rs. 1100

Profit = 1375 - 1100 = Rs. 275,

Gain is equal to selling price of Q no. of items.

So, 275 is the gain and selling price of 1 item is Rs.1 so ,Q = 275 items.

Sol.343.(b)

SP of bags for supplier = 750 units

CP of bags for supplier = 750 - 125 = 625 units

Required gain% = $\frac{125}{625}$ × 100 = 20%

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.344.(b)

	a	:	b	:	c
CP →	40	:	30	:	20
Profit% →	120%		130%		140%
SP	48	:	39	:	28

So, the required ratio = 48 : 39 : 28

Sol.345.(d)
Let the MP of a computer = ₹100
Then, CP of a computer
= 100 × 75% = ₹75
SP of a computer at profit of 40%
= 75 × $\frac{140}{100}$ = ₹105
So, the required profit %
= $\frac{105-100}{100}$ × 100 = $\frac{5}{100}$ × 100 = 5%

Sol.346.(d) Let the CP of bag and bottle be a and b respectively
ATQ,
⇒ 20a + 12b = 16080
⇒ 5a + 3b = 4020 — (1)
a + b = 900 ⇒ 5a + 5b = 4500 — (2)
Subtracting eqn (1) from (2) we get ,
b = $\frac{4500-4020}{2}$ = $\frac{480}{2}$ = ₹240
So, the CP of bottle = ₹240

Sol.347.(c) Let the cost price = 100 units
Therefore , Selling price = 85 units
Marked price = 85 × $\frac{100}{75}$ = 113.33 unit
If we sell it on mark price
Then the profit = 113.33 -100 = 13.33
Percentage of profit
= $\frac{13.33}{100}$ × 100 = 13.33%

Sol.348.(a) Let the rate of banana of 1 dozen = 48 unit
Rate of one banana = $\frac{48}{12}$ = 4 unit
According to the question
Selling price = $\frac{48}{4}$ = 12 unit
Profit percentage ,
⇒ $\frac{12-4}{4}$ × 100 ⇒ $\frac{8}{4}$ × 100 = 200%

Sol.349.(c) According to the question
⇒ M. P × $\frac{2}{5}$ = C.P × $\frac{4}{7}$
⇒ $\frac{M.P}{C.P}$ = $\frac{20}{14}$
discount given on mark price by 15%
⇒ S.P = 20 × $\frac{17}{20}$ = 17 unit
percentage Of Profit
⇒ $\frac{3}{14}$ × 100 = 21.43 %

Sol.350.(a)
Let price of arhar dal = 1 Rs/kg
According to the question shopkeeper purchased 50 kg at 20% discount
So, cost price for shopkeeper
= $\frac{100-20}{100}$ × 50 Rs = 40 Rs
Now shopkeeper gets 2 kg free
Now total quantity = 50 + 2 = 52kg
Selling price = 52 × 1Rs = 52 Rs
Profit percent = $\frac{52-40}{40}$ × 100 = 30%

Sol.351.(a)

Marked price	:	Cost price
(100 + 16)%	:	(100 - 20)%
116	:	80

If S.P.= M.P. then Profit % = $\frac{116-80}{80}$×100
= $\frac{36}{80}$ × 100 = 45%

Sol.352.(c)
C.P of 20 dozen = 20 × 48 = ₹960
S.P = 8($\frac{11}{10}$ × 48) + 12($\frac{12}{10}$ × 48)
= 422.4 + 691.2 = ₹1113.6
Profit% = $\frac{1113.6-960}{960}$ × 100 = 16%

Sol.353.(d) C.P of apple = $\frac{100}{150}$ × 90 = 60
⇒ C.P of orange = $\frac{100}{200}$ × 40 = 20
⇒ Total C.P = 60 + 20 = ₹80

Sol.354.(a) Let milk = 9 liters
Cost price of milk = 9 × a = ₹9a
If he add 2 liter water on 9 liter of milk
= 11 lite(total mixture)
Then the selling price
= 11 × 1.5a = ₹16.5a
Percentage of profit = $\frac{16.5a-9a}{9a}$ × 100
⇒ $\frac{7.5a}{9a}$ × 100 = $\frac{250}{3}$ %

Sol.355.(a) According to the question,

	CP	:	SP	
Vishal →	10	:	9)	× 101
Param →	100	:	101)	× 9

(because SP is same for both)
Therefore
Vishal's CP = 101 × 10 = 1010
Param's CP = 100 × 9 = 900
Then,
Vishal : Param = 101 : 90

Sol.356.(c) According to the question,
CP of cow = ₹15000
After 1 year his profit = 18500 - 15000
= ₹3500
Again,
CP of cow = ₹19000
After 1 year his profit = 22300 - 19000
= ₹3300
Total profit = 3500 + 3000 = ₹6800
Total CP = 15000 +19000 = 34000
Then,
Profit percentage = $\frac{6800}{34000}$ × 100 = 20%

Sol.357.(c) Profit of 80% means,
⇒ $\frac{S.P}{C.P}$ = $\frac{180}{100}$ = $\frac{9}{5}$
Required % = $\frac{4}{9}$ × 100 = 44.44%

Sol.358.(b) 16$\frac{2}{3}$% = $\frac{1}{6}$
Actual profit = $\frac{1}{6-1}$ × 100 = 20%
Overall profit percentage
= 20 + 10 + $\frac{10 \times 20}{100}$ = 32%

Sol.359.(b) According to the question
⇒ $\frac{7}{8}$ of MP = 125% of CP
⇒ $\frac{MP}{CP}$ = $\frac{8}{7}$ × $\frac{5}{4}$ = $\frac{10}{7}$
Mark up% = $\frac{3}{7}$ × 100 = 42.86%

Sol.360.(c) Let the cost price of each shirt = 10 unit
Cost price of 40 shirt = 40 × 10 = 400
Selling price of 24 shirts at 20% profit
= 24 × 12 = 288
Selling price of 16 shirts at 10% profit
= 16 × 11 = 176
Profit = (288 + 176) - 400 = 64 unit
Selling price of 40 shirts at 15% profit
= 40 × 11.5 = 460
Profit = 460 - 400 = 60 unit
Difference between profit = 64 - 60 = 4 unit
According to the question,
⇒ 4 unit = 36 ⇒ 10 unit = 90
So, Cost price of each shirt = ₹90

Sol.361.(a)
CP of land purchased by P = ₹432000
Since Rate is decreased by 25%.
So, value of land after 2 years becomes
= 432000 × $\frac{3}{4}$ × $\frac{3}{4}$ = ₹243000
Land is purchased by Q but now, the rate increased due to construction 50% .
So, the value of land after 2 years
⇒ 243000 × $\frac{3}{2}$ × $\frac{3}{2}$ = ₹5,46,750

Sol.362.(a) Let the SP of article be ₹x
SP of 6 articles = 6x
SP of 80 articles = 80x
Loss = 6x
CP = 80x + 6x = 86x ⇒ 11180 = 86x
⇒ x = $\frac{11180}{86}$ = ₹130
So, SP of 1 article = ₹130

Sol.363.(a)

Ratio →	CP	:	SP
At 20% profit →	5	:	6
Faulty weight →	900	:	1000
10% less charge →	10	:	9
Final →	5	:	6

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Net profit% = $\frac{6-5}{5}$ × 100 = 20%

Sol.364.(d)

CP of bananas = $\frac{18}{12}$ × 300 = ₹450

SP of bananas = $\frac{24}{12}$ × 200 + $\frac{21}{12}$ × 100

= 400 + 175 = ₹575

Profit % = $\frac{575-450}{450}$ × 100

= $\frac{125}{450}$ × 100 = $27\frac{7}{9}$%

Sol.365.(d) ATQ,

Case 1 :- 42 × MP = 70 × CP

$\frac{MP}{CP} = \frac{70}{42} = \frac{5}{3} \times \frac{5}{5} = \frac{25}{15}$

Again ,

Case 2 :- 25 × SP = 21 × MP

$\frac{SP}{MP} = \frac{21}{25}$

Now,

Ratio ⇒ C.P. : S.P. : M.P.

15 : 21 : 25

Now, Required profit%

= $\frac{21-15}{15}$ × 100 ⇒ $\frac{600}{15}$ = 40%

Sol.366.(c)

Net % discount = 20 + 10 - $\frac{20 \times 10}{100}$ = 28%

Fractional value of 28% = $\frac{7}{25}$

Ratio → C.P. : S.P. : M.P.

Discount → 11×(18 : 25

Profit → 10 : 11) ×18

Final ⇒ 180 : 198 : 275

ATQ , S.P.(198 units) = ₹54000

Then , M.P. (275 units) = $\frac{54000}{198}$ × 275

M.P. = $\frac{54000}{198}$ × 275 = ₹75000

Sol.367.(a) Let original quantity = 100 and original price per kg = ₹100

So, total CP = 100 × 100 = 10000

According to the question,

SP of half of the sugar quantity sold at 20% profit = 50 × (100 × $\frac{120}{100}$)= 6000

SP of quarter of sugar quantity sold at 16% profit = 25 × (100 × $\frac{116}{100}$) = 2900

SP of reaming sugar quantity sold at 24% profit = 25 × (100 × $\frac{124}{100}$) = 3100

So, total SP = 6000 + 2900 + 3100 = 12000

Profit = 12000 - 10000 = 2000 which corresponds to ₹90,

So, CP of entire quantity of sugar in the bag = $\frac{10000 \times 90}{2000}$ = ₹450

Short Trick :- Let , total quantity of sugar = 4 units

Quantity → 2 : 1 : 1

Profit% → 20% : 16% : 24%

Overall Profit =

$\frac{20\% \times 2 + 16\% \times 1 + 24\% \times 1}{2+1+1}$ = 20%

20% = 90 Rs.

C.P. (100%) = 90 × 5 = 450 Rs.

Sol.368.(d) Let Original C.P. = 100,

so final S.P. = $\frac{130}{100}$ × 100 = 130

Price at which first dealer sold a table fan

= $\frac{125}{100}$ × 100 = 125

So, C.P. for second dealer = 125

Hence, profit made by second dealer (in %)

= $\frac{130-125}{125}$ × 100 = 4%

Short Trick :-

Ratio → C.P. : S.P.

1st dealer → 4 : 5

2nd dealer → x : y

Final profit ⇒ 10 : 13

x : y = 10 × 5 : 13 × 4 = 50 : 52

Profit made by 2nd dealer = 4%

Sol.369.(a) Raju makes a profit of 11.5% by selling article at Rs. 10927 .

Cost price = $\frac{10927 \times 100}{111.5}$ = Rs. 9800

Now , the discount that Raju gets due to festive seasons = 10927 - 9800 = 1127 Rs.

Discount % = $\frac{1127}{10927}$ × 100 = 10.3%

Sol.370.(b) CP ratio of A and B = 4 : 5

Let CP of A = 4x and CP of B = 5x

According to the question,

5x × $\frac{120}{100}$ − 4x × $\frac{110}{100}$ = 480

6x − 4.4x = 480

1.6x = 480 ⇒ x = 300

Difference in CP of B and A

= 5x - 4x = x = ₹300

Short Trick :-

Differ. b/w S.P.(60 - 44) units → 16 units = 480 Rs.

Ratio of C.P. ⇨ 40 : 50

(+10% (+20%

Ratio of S.P. ⇨ 44 : 60

⇒ 1 unit = 30 Rs.

Differ. b/w C.P. (10) units = 300 Rs.

Sol.371.(b) Total CP for manjeet

= 22000 Rs + 3000 Rs = 25000 Rs

Effective Profit = 12% = $\frac{3}{25}$

C.P. (25 units) = 25000 ₹

1 unit = 1000 Rs.

Profit (3 units) = 3000 Rs.

Now , Profit reduces by 500 Rs.

Net Profit = 2500 Rs.

Profit % = $\frac{2500}{25000}$ × 100 = 10%

Sol.372.(b)

$\frac{CP}{MP} = \frac{100 - discount\ \%}{100 \pm (Profit/loss)\ \%}$

Take Profit → +ve sign and

Loss = − ve sign

$\frac{CP}{MP} = \frac{100-30}{100-10} = \frac{70}{90}$

Profit % if Item sold at M.P.

= $\frac{20}{70}$ × 100 = $\frac{200}{7}$%

Sol.373.(d)

Fractional value of 25% = $\frac{1}{4}$

Ratio → C.P. : S.P.

at 25% Profit → 4 : 5

Here , S.P. (5 units) = 25 Rs.

C.P. (4 units) = 20 Rs.

S.P. (at 10% profit) = 20 × $\frac{11}{10}$ = 22 Rs.

Sol.374.(b)

Fractional value of $33\frac{1}{3}$% = $\frac{1}{3}$

Let , M.P. = 18 units

Ratio → C.P. : S.P. : M.P.

6 : 18

3 : 2

Final → 9 : 6 : 18

New Selling price = 18 × 80% = 14.4 units

Required profit % = $\frac{5.4}{9}$ × 100 = 60%.

Sol.375.(b) Let the CP of the first article be 4x and that of the second article be 5x.

SP of first article = 4x × $\frac{110}{100}$ = 4.4x

SP of second article = 5x × $\frac{120}{100}$ = 6x

Difference in both SP = 6x - 4.4x = 1.6x

According to question,

1.6x = 480, x = 300

Total CP = 4x + 5x = 9x = 9 × 300 = ₹2700

Short Trick :-

C.P. ⇨ 40 : 50

+10% +20%

S.P. ⇨ 44 : 60

Difference b/w Selling Price (16 units) = 16 units = 480 Rs.

Total Cost Price (40 + 50) units = 90 units = 90 × 30 = 2700 Rs.

Sol.376.(d) According to the question,

₹768 = (100 + x)% of CP —(1)

₹896 = (120 + x)% of CP —(2)

On subtracting (1) from (2) we get

₹128 = 20% of CP

So CP(100%) = 128 × 5 = ₹640.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Profit % in first case

$= \frac{768-640}{640} \times 100 = 20\%$.

Sol.377.(b) Let

CP of radio = x and CP of TV = y

According to the question,

$x \times \frac{125}{100} + y \times \frac{110}{100} = 30400$

25x + 22y = 608000 .....(1)

$x \times \frac{110}{100} + y \times \frac{125}{100} = 30700$

22x + 25y = 614000 .....(2)

On solving eqn. (1) and (2), we get

C.P. of radio = x = ₹12,000

Sol.378.(c) Let CP of one notebook = ₹3, so Total CP = 500 × 3 = ₹1,500

SP of 300 notebooks

$= \frac{1500}{300} \times 300 =$ ₹1,500

SP of 140 notebooks

$= \frac{1500}{300} \times \frac{120}{100} \times 140 =$ ₹840

SP of remaining 60 notebooks

= 60 × 3 = ₹180

Total SP = 1500 + 840 + 180 = ₹2,520

Profit %age $= \frac{2520-1500}{1500} \times 100$

$= \frac{1020}{15} = 68\%$

Sol.379.(c)

As the cost price here is Rs. 40

Profit on gain of 12% = Rs 4.8,

Profit on gain of 10% = Rs 4,

Loss on selling article at 5% loss = Rs. 2

Let x be the profit/loss on remaining article

Balancing the given profit and loss →

500 × 4.8 = (200 × 4) + {120 × (- 2)} + (180x)

⇒ 1840 = 180x ⇒ x = 10.22 Rs.

Required selling price of remaining Article = 40 + 10.22 = 50.22 Rs.

Sol.380.(a) Cost price for 60 oranges at 10 for 72 ₹ ⇒ $72 \times \frac{60}{10}$ = ₹ 432

Cost price for 60 oranges at 12 for 90 ₹

⇒ $90 \times \frac{60}{12}$ = ₹ 450

Amount spend on transaction = ₹ 118

Total C.P. of 120 units = 432 + 450 + 118 = ₹ 1000

S.P. of 120 units = $1000 \times \frac{126}{100}$ = ₹ 1260

S.P. of 32 units = $\frac{1260}{120} \times 32$ = ₹ 336

Sol.381.(a)

Let there be 100 articles of cost price 1 Rs each.

So total cost price = 100.

Now total profit = 300

Total selling price = 100 + 300 = 400

CP : SP ⇒ 1 : 4

Given he sells a fraction which amounts to CP.

No. of articles sold = $\frac{25}{100} = \frac{1}{4}$

Sol.382.(a) Expenditure of 20 kg sugar = 20 × 45 = 900

Expenditure of 25 kg sugar = 25 × 50 =1250

Expenditure of 35 kg sugar = 35 × 40 = 1400

Total expenditure

= 900 + 1250 + 1400 + 450 = 4000

Selling price = 80 × 52.5 = 4200

Profit percent = $\frac{200}{4000} \times 100 = 5\%$

Sol.383.(b) For 1st item:

$\frac{C.P.}{S.P.} = \frac{100}{120}$

C.P of 2nd item = S.P. of 1st item = 120

For 2nd item:

$\frac{C.P.}{S.P.} = \frac{120}{108}$

Total C.P. = 100 + 120 = 220

Total S.P. = 120 + 108 = 228

Profit % = $\frac{8}{220} \times 100 = 3\frac{7}{11}\%$

Short Trick :-

Ratio ⇨	C.P.	:	S.P.
1st Item(+20%) ⇨	5	:	6
2nd Item(-10%) ⇨	6	:	5.4
Total Ratio ⇨	11	:	11.4

Required Profit % = $\frac{0.4}{11} \times 100 = 3\frac{7}{11}\%$

Sol.384.(d) Fractional value = $3\frac{1}{3}\% = \frac{1}{30}$

Let , the cost price = 30 units

Selling price = 29 units

Then , the marked price = $29 \times \frac{5}{4} = 36.25$

Profit % = $\frac{6.25}{30} \times 100 \approx 21\%$

Sol.385.(d)

Total cost = 40 × 12 × 1.4 = 672 Rs.

Unbroken eggs = 480 - 80 = 400 Piece

Total selling price = 400 × 1.6 = 640 Rs.

Loss = 672 - 640 = 32 Rs.

Loss % = $\frac{32}{672} \times 100 = 4\frac{16}{21}\%$

Sol.386.(b)

Let , total quantity be 100 units.

According to question ,

30 × 12% + 28 × 25% + 42 × x%

= 100 × 30%

42x + 1060 = 3000

x = 46.19% ≈ 46.2%

Sol.387.(a)

Fractional value = 15% = $\frac{15}{100}$

Let , C.P. be 100 units

Then , S.P. (115 units) = 632500 Rs.

1 unit = 5500 Rs.

C.P. (100 units) = 550000 Rs.

New S.P. = 810000 Rs.

C.P. : New S.P. = 55 : 81

Profit % = $\frac{26}{55} \times 100 \approx 47.3\%$

Sol.388.(d) Net difference in percentage = 24% = 660 Rs.

C.P. (100%) = 2750 Rs.

When the article is sold at 3080 Rs.

Then , net profit = 3080 - 2750 = 330 Rs.

Net profit % = $\frac{330}{2750} \times 100 = 12\%$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Discount

Key Points:

1. Marked Price: The price on the label of a product, also called printed price or advertising price.

2. Discount: Amount of rebate on a fixed price is called discount.

3. Selling Price = Marked Price – Discount
Or Selling Price =

$$\frac{Marked\ Price \times (100 - Discount\%)}{Marked\ Price}$$

Let us say Rs. 100 is the marked price (MRP). and Discount is 10% i.e. 10 Rs
Therefore,
Selling price = 100 – 10 = Rs. 90

4. Discount is given / calculated on marked price.

$$Discount\ \% = \frac{M.P. - S.P.}{M.P} \times 100$$

Or, $\frac{Discount}{Marked\ Price} \times 100$

5. Successive Discount :- When two or more than two discounts are given.

Ex:- 20% and 10% discount given successively. What does it mean?
Let MRP or marked price be Rs. 100
$100 - 20\% \rightarrow 80 - 10\% \rightarrow 72$
∴ The total discount is Rs.28 i.e. 28% of 100.
∴ Successive discount of 20% and 10% is equivalent to 28% .
The above concept can be interpreted as a successive % concept.

Single equivalent discount :

$= (x + y - \frac{xy}{100})\%$

Here, $(20 + 10 - \frac{200}{100})\% = 30 - 2 = 28\%$

Example: What will be an equivalent discount for three successive discounts of 20%, 20%, and 10%?

Solution: First calculate an equivalent discount for any two of the three, let's take 20% and 20%.

$(20 + 20 - \frac{400}{100})\% = 40 - 4 = 36\%$

Now calculate equivalent discounts of 36% and 10%.

$(36 + 10 - \frac{360}{100})\% = 46 - 3.6 = 42.4\%$

⇒ 42.4% is the equivalent discount.
Single equivalent discount

$= (x + y + z - \frac{xy + yz + zx}{100} + \frac{xyz}{10000})\%$

where x, y and z are discount rates.

6. Present worth =
Amount – True discount

True discount = $\frac{Amount \times Rate \times Time}{100 + (Rate \times Time)}$

Variety Questions

Q.1. A banner at a garment shop advertises 'Buy 2 and get 5'. The shopkeeper has marked all the shirts at the same amount. Gaurav was his relative and the shopkeeper gave him an additional discount of 2% on the total bill. Gaurav purchased 5 shirts and paid ₹1,274. What is the marked price of each shirt ?
SSC MTS 30/10/2024 (Afternoon)
(a) ₹520 (b) ₹260 (c) ₹630 (d) ₹650

Q.2. In a scheme, a shopkeeper offers 4% discount if you buy three or more products. Ritu buys three bottles of guava juice for ₹330. If the shopkeeper still makes a profit of 10%, find the profit he would make if had sold it without discount (rounded off to 2 decimal places).
SSC MTS 22/10/2024 (Afternoon)
(a) 15.74% (b) 14.58% (c) 15% (d) 15.28%

Q.3. A shopkeeper buys two varieties of sugar at ₹120 and ₹80 per kg, respectively, and mixes them in the ratio 2 : 3. He then sets the marked price of each kg of the blended sugar at 50% above the cost he incurred per kg of the same, and then sold it after offering a 25% discount on the marked price. At what price (in ₹) did the shopkeeper sell each kg of the blended sugar ?
SSC MTS 09/10/2024 (Afternoon)
(a) 144 (b) 114 (c) 108 (d) 120

Q.4. Amit and Bilal buy goods for ₹1,500 and ₹2,000, respectively. Amit marks his goods up by y%, while Bilal marks his goods up by 2y% and offers a discount of y%. If both make the same profit, then find the value of y.
SSC CGL 23/09/2024 (1st Shift)
(a) 10.5 (b) 12 (c) 11.5 (d) 12.5

Q.5. If Ram purchases a fan, he gets 8% discount, however, if he purchases three fans he gets 6% on the first, 10% on the second and 12% on the third. If the price paid by the Ram for three fans is ₹6,800, then what will be the marked price of each fan ?
SSC CGL 11/09/2024 (3rd Shift)
(a) ₹2,400 (b) ₹2,500
(c) ₹2,450 (d) ₹2,550

Q.6. Ramesh purchased some items from a dealer on 19 November 2019. The bill generated was for ₹5,480. He had also purchased some items on 10 November 2019 having the bill value of ₹9,800. He cleared both the bills this time and paid the total amount in cash. If the dealer gives a scheme of 2% discount on the payments done within 10 days and 5% for the payments made in cash at the time of purchase, then find the amount paid by Ramesh on 19 November 2019.
SSC CGL 10/09/2024 (1st Shift)
(a) ₹ 14,850 (b) ₹ 14,810
(c) ₹ 14,890 (d) ₹ 14,950

Q.7. What is the discount that Rohan should offer on the remaining ₹ 8,000 of a laptop priced at ₹ 48,000, given that, he has already given a 12% discount on the first ₹ 28,000 and 8% discount on the next ₹ 12,000 to match the discount amount of 9.5% given on the total price?
SSC CHSL 03/07/2024 (4th Shift)
(a) ₹ 402 (b) ₹ 204 (c) ₹ 420 (d) ₹ 240

Q.8. A seller offers a discount of 12% if the total sale price of different products purchased by a single customer is below ₹3,000, and discount of 15% if the total sale value of all the products exceeds ₹3,000. A shirt costing ₹900 was sold to Anand after earning a margin of 9% and also a jacket costing ₹1,900 was sold to him after a margin of 6%. How much does Anand have to pay (in ₹) for the final settlement of the bill ?
SSC CPO 28/06/2024 (1st Shift)
(a) 2,953.60 (b) 3,005.40
(c) 2,645.60 (d) 2,635.60

Q.9. A shopkeeper offers 3 schemes of discounts to his customers. Which of the following schemes will fetch the minimum discount percentage ?
A)Two successive discounts of 24% and 27%.
B) Buy 5 get three free.
C) Buy 6 and get 10.
SSC CPO 27/06/2024 (1st Shift)
(a) A (b) C (c) Both A and C (d) B

Q.10. A merchant fixes the sale price of his goods at 42% above the cost price. He sells his goods at a 15% discount on marked price. His percentage of profit (rounded off to the nearest integer) is:
SSC CGL Tier II (26/10/2023)
(a) 21% (b) 42% (c) 35% (d) 27%

Q.11. If the price of an item is increased by 70% and then allows a scheme discount of 5% and 20% on this marked price. If price is paid in cash and an

Search on TG @apna_pdf

Search on Telegram @apna_pdf

additional discount of 20% is allowed then what is his gain percentage ?
SSC CPO 03/10/2023 (1st Shift)
(a) 2.25% (b) 3.25% (c) 4.36% (d) 3.36%

Q.12. On an item having a marked price of ₹ 1,600, successive discounts of y% and z% were offered. As a result, the item was sold for ₹ 1,056, Which of the options below CANNOT be a set of values for y and z ?
SSC CHSL 09/08/2023 (3rd Shift)
(a) y = 22, z = 15.5 (b) y = 4, z = 31.25
(c) y = 20, z = 17.5 (d) y = 12, z = 25

Q.13. A shopkeeper offers the following discount schemes for buyers on an article:
i. Two successive discounts of 15% each
ii. A discount of 25% followed by a discount of 5%
iii. Two successive discounts of 20% and 10%
iv. A discount of 30% Under which scheme will the selling price be maximum ?
SSC CGL 17/07/2023 (1st shift)
(a) Scheme iv (b) Scheme iii
(c) Scheme ii (d) Scheme i

Q.14. An electronic store owner allows two successive discounts of 20% and 25% on each item. The store has a reward points scheme which enables a customer to get free shopping worth ₹0.10 on every 1 reward point credited to the customer's account on previous purchases from the store. A customer decides to buy a laptop that is marked at ₹72,000. What will be its net selling price if he has 2850 reward points to his credit
SSC CGL 14/07/2023 (2nd shift)
(a) ₹43,200 (b) ₹42,915
(c) ₹42,215 (d) ₹42,942

Q.15. Victoria bought items that had a combined face value of $400,000. She was offered a 10% discount on part of the payment made in cash and a 2% surcharge on the portion of payments made via credit card. If Victoria paid a total of $3,78,000, how much did she pay, including surcharges, via credit card ?
Higher Secondary 30/06/2023 (Shift - 2)
(a) $1,53,000 (b) $1,58,100
(c) $1,63,200 (d) $1,47,900

Q.16. The marked price of every item being sold by a wholesaler was ₹400. The wholesaler was offering a stock-clearance sale, under which for every four items paid for, one item was being given free. In addition to that, a further 5% discount on the amount payable on the 'Buy 4, Get 1 free' scheme price was being offered to anyone making purchases worth more than 15,000. Rameshwar made purchases for which the amount payable, before applying the 5% discount, was 16,000. What was the effective discount percentage that was finally offered to Rameshwar during this transaction ?
Graduate Level 30/06/2023 (Shift - 1)
(a) 30% (b) 25% (c) 28.75% (d) 24%

Q.17. A trader marked a table at ₹37,062, and sold it allowing a 33% discount. If his profit was 42%, then the cost price (in ₹) of the table was:
Graduate Level 28/06/2023 (Shift - 4)
(a) 15,487 (b) 16,487
(c) 17,487 (d) 13,487

Q.18. A trader offers to sell a commodity under any of the two schemes mentioned below:
Scheme 1: The trader offers two successive discounts of 20% and 12.5% on the sale of each unit.
Scheme 2: The trader offers the buyer an option to 'pay for y units, get z units free'. The buyer realizes that if he needs to buy (y + z) units, it does not matter to him which of the two schemes he opts for. Which of the following options gives a correct ordered pair of (y, z) ?
Higher Secondary 28/06/2023 (Shift - 2)
(a) (3, 7) (b) (7, 10) (c) (10, 7) (d) (7, 3)

Q.19. Raghav went to a shopping mall to purchase clothes. He had two coupons with him, but only one can be used on a single day. Using the first coupon, a total discount of 30% could be obtained on the total amount. Using the second coupon, he will get 80% off on the price of the costliest shirt if he buys at least 3 shirts. What is the price at which Raghav can purchase 3 shirts at a minimum price if the prices of the three shirts are Rs.1,250, Rs.1,540 and Rs.1,375 ?
SSC CGL 12/12/2022 (4th Shift)
(a) Rs.2,760 (b) Rs.2,915.50
(c) Rs.2,775 (d) Rs.2,933

Q.20. A shopkeeper offers the following three schemes.
Scheme-I : Two successive discounts of 15% and 25%.
Scheme-II: Buy 5, get 3 free.
Scheme-III: Buy 4, get 6.
Which scheme is the best for customers?
SSC CGL 12/12/2022 (1st Shift)
(a) Scheme - I (b) Scheme - III
(c) Scheme - II (d) Any one-All are equal

Q.21. Sunil purchased a fan at a 10% discount on the labelled price. If he had purchased it at a 15% discount, he would have saved ₹400. Find the labelled price of the fan.
SSC CGL 02/12/2022 (3rd Shift)
(a) ₹8,400 (b) ₹7,500 (c) ₹800 (d) ₹8,000

Q.22. Under a sale offer, Tanvir was offered a 32% discount on the part of the marked price that was paid in cash, but had to add 1.2% on the part of the marked price paid through a credit card. If Tanvir paid 75% of the marked price in cash and the rest through a credit card, what percentage of the marked price was his total final payment ?
SSC CHSL 31/05/2022 (Evening)
(a) 76.6% (b) 75.9% (c) 76.1% (d) 76.3%

Q.23. The price of a cell phone is ₹20,000. On Sundays, the shopkeeper offers a cash discount of ₹1,000 on the purchase of the cell phone. Further, if someone purchases it through a credit card, he gives 5% additional discount. If someone is purchasing the cell phone on a Sunday through a credit card, then how much does he/she have to pay ?
SSC CHSL 27/05/2022 (Afternoon)
(a) ₹18,350 (b) ₹18,900
(c) ₹18,050 (d) ₹18,500

Q.24. An article was marked at ₹ x and sold at a discount of (x - 40)%. If the customer paid ₹(x - 32), then find the marked price of the article.
SSC CHSL 14/10/2020 (Evening)
(a) 75 (b) 60 (c) 80 (d) 50

Q.25. A dealer allows 25% discount on the marked price of an article and gains 20%. If the cost price of the article increases by 20%, what percent discount should he allow on the marked price so that his profit percentage remains the same ?
SSC CPO 13/12/2019 (Evening)
(a) 8.5% (b) 10% (c) 12% (d) 7.25%

Q.26. The marked price of an article is Rs 1500. If two successive discounts, each of x%, on the marked price is equal to a single discount of Rs 587.40, then what will be the selling price of the article if a single discount of x% is given on the marked price ?
SSC CGL Tier II (13/09/2019)
(a) Rs 1025 (b) Rs 1155
(c) Rs 1170 (d) Rs 1200

Q.27. A dealer buys an article marked at Rs20000 with two successive discounts of 20% and 5%. He spends Rs1000 for its repair and sells it for Rs 20000. What is his profit/loss percent (correct to two decimal places) ?
SSC CHSL 08/07/2019 (Morning)
(a) 25.64% profit (b) 23.64% loss

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(c) 23.46% profit (d) 25.64% loss

Q.28. There was 25% off on shirts. A lady bought that shirt and got an additional 20% discount for paying in cash and further 10% discount for being a loyal customer. She paid Rs 324. What was the price tag (in Rs) on the shirt ?
SSC CHSL 05/07/2019 (Afternoon)
(a) 650 (b) 725 (c) 600 (d) 750

Q.29. By how much above the cost price should an article be marked up for sale so that after allowing two successive discounts of 20% and 6.25% on it, a net gain of 20% is made on the cost ?
SSC CGL 07/06/2019 (Evening)
(a) $66\frac{2}{3}$% (b) $44\frac{1}{4}$% (c) 50% (d) 60%

Q.30. A shopkeeper sells an item for Rs 492 after allowing 18% discount on its marked price. Had he not allowed any discount, he would have earned a profit of 20% on the cost price. What is the cost price of the item ?
SSC CGL 07/06/2019 (Afternoon)
(a) Rs 500 (b) Rs 640
(c) Rs 540 (d) Rs 600

Q.31. A dealer buys an article at a discount of 20% on its list price and marks it at 25% above the list price. If he allows a 20% discount on the new list price, then his profit percent is :
SSC CGL 07/06/2019 (Morning)
(a) 24 (b) 25 (c) 20 (d) 27

Q.32. A man purchases 100 copies of a book from the publisher and gets a discount of 25%. He buys 50 copies from a retailer at a discount of 10%. He got an overall discount of:
SSC CGL 04/06/2019 (Evening)
(a) 16.5% (b) 17.5% (c) 20% (d) 35%

Q.33. The price of a refrigerator is Rs 22000. A shopkeeper marks its price 15% above its cost price and gives a discount of 8%. The discount is:
SSC CPO 15/03/2019 (Morning)
(a) Rs.1960 (b) Rs.1824
(c) Rs. 1672 (d) Rs.2024

Q.34. A trader gives a discount of 4% for purchases above Rs.25,000, 6% for purchases above Rs.35000 and 8% for purchases above Rs. 50,000. If the price of an item is marked Rs.38,500. What would be the amount of discount ?
SSC CPO 15/03/2019 (Morning)
(a) Rs.3740 (b) Rs.1810
(c) Rs.3080 (d) Rs.2310

Practice Questions

SSC CHSL 2024 Tier - 2

Q.35. The marked price of an article is ₹2,800. It is sold at three successive discounts of 15%, 8% and 5%. Find the selling price of the article (in ₹).
SSC CHSL Tier II (18/11/2024)
(a) 1,923.56 (b) 1,890.20
(c) 2,080.12 (d) 1,997.26

Q.36. The price of an electronic machine decreased by 5%, 10% and 15% during the first three years. What will be the price of the machine after three years if the value at the beginning was ₹ 8,000?
SSC CHSL Tier II (18/11/2024)
(a) ₹ 5,000 (b) ₹ 6,721
(c) ₹ 7,000 (d) ₹ 5,814

SSC MTS 2024 Tier - 1

Q.37. A retailer allows a trade discount of 25% and a further discount of 8% on the marked price of the products, if paid along with his shop's membership card. He makes a net profit of 15% on the cost. By what percentage are the products marked up by him ?
SSC MTS 01/10/2024 (Morning)
(a) $66\frac{2}{3}$% (b) $84\frac{1}{3}$%
(c) $59\frac{2}{3}$% (d) $46\frac{1}{3}$%

Q.38. In view of Diwali, Rajnee, an electronics shop owner, offers a discount scheme to her customers that on buying 15 decorative bulbs, they get 5 decorative bulbs free. What is the effective percentage discount given by Rajnee to her customers ?
SSC MTS 07/10/2024 (Evening)
(a) 25% (b) 33% (c) 30% (d) 20%

Q.39. A shopkeeper declares the following three schemes of discounts. Which scheme is most beneficial to a customer ?
A. Buy 25 items and get 30 of the same items
B. Two successive discounts of 12% and 18%
C. Two successive equal discounts of 15%
SSC MTS 08/10/2024 (Afternoon)
(a) A (b) B and C (c) Only C (d) Only B

Q.40. A trader sells 25 kg of rice at ₹1,400. A customer asks for 15% discount. The shopkeeper agrees to it but instead of 1 kg he gives 10% less rice. What is the effective discount that the customer gets (correct to one decimal place) ?
SSC MTS 15/10/2024 (Evening)
(a) 5.8% (b) 5.7% (c) 5.6% (d) 5.1%

Q.41. A shopkeeper marks his goods k% more than their cost price. If the shopkeeper allows a 20% discount and still gains 25%, then find the value of k.
SSC MTS 17/10/2024 (Evening)
(a) 65.25% (b) 56.25%
(c) 65.52% (d) 56.52%

Q.42. A shopkeeper sells a notebook that has a marked price of ₹80 at a discount of 8% and gives a pen costing ₹8.60 free with each notebook. Even then he makes a profit of 17%. Find the cost price of each note book correct to two places of decimals.
SSC MTS 18/10/2024 (Morning)
(a) ₹49.75 (b) ₹45.35
(c) ₹55.56 (d) ₹51.32

Q.43. A shopkeeper offers buy three, get one free; what is the percentage discount being offered by the shopkeeper in this scheme ?
SSC MTS 18/10/2024 (Afternoon)
(a) 33.33% (b) 30% (c) 20% (d) 25%

Q.44. A television costs ₹20,500 for a trader. He fixes its marked price as ₹24,000 and gives a discount of 15%. He further gives a discount of 5% for cash payment. Find his percentage of profit or loss.
SSC MTS 22/10/2024 (Morning)
(a) Gain $5\frac{9}{4}$% (b) Loss $5\frac{1}{4}$%
(c) Gain $5\frac{19}{14}$% (d) Loss $5\frac{19}{41}$%

Q.45. A shopkeeper offered following four different discount schemes for buyers on an item.
A. Two successive discounts of 8%
B. A discount of 11% followed by a discount of 5%.
C. Successive discounts of 13% and 3%
D. A discount of 16%.
If Rajiv wants to purchase the item from this shop at minimum price, he should opt for the discount scheme:
SSC MTS 23/10/2024 (Afternoon)
(a) C (b) B (c) A (d) D

Q.46. A retailer announces a discount of 25% for selling a mobile phone marked at ₹48,000. The cost price of the mobile phone is 45% below the marked price. He offers a further discount of 7.5% if the buyer returns his old mobile phone. What is the ratio of the profit percentages of the retailer with the return of the old mobile phone scheme to that of without

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

the return of the old mobile phone, respectively ?
SSC MTS 13/11/2024 (Morning)
(a) 32 : 23 (b) 12 : 11
(c) 11 : 12 (d) 23 : 32

Q.47. A shop has two promotional offers: buy three shirts, get one shirt free, or a 25% discount on the marked price. If a customer buys five using both offers, what discount will he get all together ?
SSC MTS 14/11/2024 (Evening)
(a) 30% (b) 50% (c) 25% (d) 27.5%

SSC CGL 2024 Tier - 1

Q.48. An article is marked at ₹550. If it is sold at a discount of 40%, then the selling price becomes 10% more than its cost price. What is the cost price (in ₹) ?
SSC CGL 09/09/2024 (1st Shift)
(a) 220 (b) 330 (c) 300 (d) 200

Q.49. In a clearance sale, a sari whose marked price was ₹10,490 is now sold for ₹9,441. What is the discount percentage on the sari ?
SSC CGL 09/09/2024 (3rd Shift)
(a) 10% (b) 15% (c) 18% (d) 12%

Q.50. If, on a marked price, the difference between selling prices with a discount of 65% and with two successive discounts of 30% and 40% is ₹105, then the marked price (in ₹) is:
SSC CGL 10/09/2024 (1st Shift)
(a) 1,650 (b) 1,050 (c) 1,500 (d) 1,320

Q.51. A shopkeeper allows a discount of 20% on the marked price of an item and thus gains 10%. What is the ratio of the cost price to the marked price of the item
SSC CGL 10/09/2024 (3rd Shift)
(a) 8 : 11 (b) 7 : 10 (c) 9 : 13 (d) 11 : 14

Q.52. A shopkeeper, on the eve of Diwali, allowed a series of discounts on television sets. Find the selling price of a television set, if the marked price of television is ₹1,200 and successive discounts are 15% and 10%.
SSC CGL 11/09/2024 (1st Shift)
(a) ₹945 (b) ₹918 (c) ₹975 (d) ₹965

Q.53. A shopkeeper marked an article at ₹5,000. The shopkeeper allows successive discounts of 20%,15% and 10%. The selling price of the article is:
SSC CGL 12/09/2024 (1st Shift)
(a) ₹2,750 (b) ₹3,000
(c) ₹2,800 (d) ₹3,060

Q.54. The difference between a discount of 25% and two successive discounts of 15% and 20% on a certain bill was ₹28. Find the amount of the bill.
SSC CGL 12/09/2024 (3rd Shift)
(a) ₹500 (b) ₹400 (c) ₹450 (d) ₹550

Q.55. A manufacturer announces a trade discount of 30% on his products for his dealers. One of the dealers purchased 6 smart phones manufactured by the company at the rate of Rs.25,000 each. What is the amount of trade discount?
SSC CGL 13/09/2024 (3rd Shift)
(a) Rs.50,000 (b) Rs.55,000
(c) Rs.1,05,000 (d) Rs.45,000

Q.56. A shopkeeper offers the following discount schemes for buyers.
I. Two successive discounts of 15% and 20%
II. Successive discount of 25 % and 10%
III. A discount of 33%
The selling price will be minimum under the scheme:
SSC CGL 18/09/2024 (1st Shift)
(a) I (b) I or II (c) III (d) II

Q.57. After offering two successive discounts a toy with a marked price of ₹150 is sold at ₹105. If the value of the first discount is 12.5%, what is the value of the second discount ?
SSC CGL 18/09/2024 (2nd Shift)
(a) 21% (b) 18% (c) 20% (d) 22%

Q.58. If the selling price of an article is ₹1,792 after a 20% discount, then the marked price of the article is:
SSC CGL 18/09/2024 (3rd Shift)
(a) ₹2,140 (b) ₹2,240
(c) ₹2,160 (d) ₹2,260

Q.59. An article marked for ₹275 is sold at 5% discount. The seller still gains 4.5%. What did he pay for it ?
SSC CGL 19/09/2024 (2nd Shift)
(a) ₹250 (b) ₹125 (c) ₹200 (d) ₹225

Q.60. A cooker is marked at ₹12,500. The dealer allows successive discounts of 6%, 6% and 4% on it. What is the net selling price of the cooker ?
SSC CGL 19/09/2024 (3rd Shift)
(a) ₹10,603.20 (b) ₹10,306
(c) ₹12,230 (d) ₹12,320.60

Q.61. A trader offers the following discount schemes on the purchase of a refrigerator.
(I) a discount of 10% followed by a discount of 8%
(ii) successive discounts of 12% and 10%
(iii) two successive discounts of 12%
(iv) a discount of 20%
In which scheme is the selling price the lowest ?
SSC CGL 23/09/2024 (1st Shift)
(a) (iv) (b) (i) (c) (ii) (d) (iii)

Q.62. An article is sold for₹747 after successive discounts of 17% and x%. If the marked price of the article is₹1,600, what is the value of x ?
SSC CGL 24/09/2024 (2nd Shift)
(a) 32.26 (b) 43.75 (c) 22.12 (d) 40.28

Q.63. During a new-year sale, a shopkeeper offers a discount scheme to his customers, 'Buy 5 Sweaters, Get 2 Sweaters Free'. Find the effective percentage discount given by the shopkeeper.
SSC CGL 25/09/2024 (2nd Shift)
(a) $28\frac{4}{7}$% (b) 25% (c) $22\frac{2}{9}$% (d) 30%

Q.64. Two successive percentage decrease of 25% each is by what percentage less than two successive percentage increase of 25% each ? (Round to two decimal places.)
SSC CGL 26/09/2024 (1st Shift)
(a) 50% (b) 43.75% (c) 22.22% (d) 56.25%

Q.65. A person first increases the price of a commodity by 8% and then he announces a discount of 18%. The actual discount (in%) on the original price is:
SSC CGL 26/09/2024 (1st Shift)
(a) 11.44 (b) 14.44 (c) 9.44 (d) 8.44

SSC CHSL 2024 Tier - 1

Q.66. A shopkeeper decides to raise the marked price of an article by 40%. How much percentage discount should he allow to be able to sell the article at the original marked price ?
SSC CHSL 01/07/2024 (1st Shift)
(a) $28\frac{4}{7}$% (b) $31\frac{2}{7}$%
(c) $24\frac{3}{7}$% (d) $26\frac{3}{7}$%

Q.67. One company is offering a 25% discount on a particular product. Anurag visited a store. He was trying to find a deal that would allow him to save at least ₹390. How many minimum items should he purchase if each item costs ₹340 ?
SSC CHSL 01/07/2024 (4th Shift)
(a) 4 (b) 7 (c) 6 (d) 5

Q.68. A dozen pairs of gloves of ₹180 are available at a discount of 10%. How many pairs of gloves can be bought for ₹54 ?
SSC CHSL 02/07/2024 (1st Shift)
(a) 2 (b) 8 (c) 6 (d) 4

Q.69. What is the effective discount percentage if a shopkeeper offers a scheme discount 'buy five and get one free' ?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 02/07/2024 (2nd Shift)
(a) 15.67% (b) 16.33%
(c) 15.33% (d) 16.67%

Q.70. Two offers were being made to Swaroop for a watch with a marked price of ₹1,600. Either two successive discounts of 20%, or two discounts of 30% and 10% after each other is offered. If Swaroop opted for the better plan over the other, how much more must he have saved ?
SSC CHSL 02/07/2024 (4th Shift)
(a) ₹22 (b) ₹35 (c) ₹16 (d) ₹30

Q.71. A company sells goods at a markup of 25% above the cost price. During a sale, the company offers a 10% discount on the marked price. If the customer pays ₹540 after the discount, then what was the original cost price of the goods ?
SSC CHSL 04/07/2024 (2nd Shift)
(a) ₹470 (b) ₹460 (c) ₹480 (d) ₹450

Q.72. Kamlesh offers the following two discount schemes to his customers on the sale of an article:
(i) Two successive discounts of 25% and 5%
(ii) Two successive discounts of 20% and 10%
What is the difference between the selling price (in ₹) of the article under these two discount schemes if its marked price is ₹1,000 ?
SSC CHSL 04/07/2024 (2nd Shift)
(a) 7.0 (b) 7.5 (c) 8.0 (d) 6.5

Q.73. The difference (in ₹) between a discount of 37% on ₹2,635 and two successive discounts of 23% and 7% on the same amount is (rounded off to 2 decimal places) :
SSC CHSL 05/07/2024 (4th Shift)
(a) 226.87 (b) 248.36
(c) 242.25 (d) 235.65

Q.74. To clear the old stock, Arshad offers a discount scheme to his customers - on buying 24 glass tumblers get 12 glass tumblers free. What is the effective percentage discount given by Arshad to his customers ?
SSC CHSL 08/07/2024 (2nd Shift)
(a) $34\frac{2}{3}\%$ (b) $30\frac{1}{3}\%$
(c) $32\frac{2}{3}\%$ (d) $33\frac{1}{3}\%$

Q.75. The marked price of an item is 1.4 times the cost price. In order to earn 23.2% profit, what percent discount can a shopkeeper allow ?
SSC CHSL 09/07/2024 (1st Shift)
(a) 15% (b) 17% (c) 13% (d) 12%

Q.76. A coat marked at ₹145 is offered at ₹127.6. The rate of retail discount offered is:
SSC CHSL 10/07/2024 (3rd Shift)
(a) 11% (b) 12% (c) 13% (d) 10%

Q.77. The marked price of a table lamp is ₹2,165. During the festive season, it is sold for ₹1,710.35. Find the percentage discount offered.
SSC CHSL 11/07/2024 (4th Shift)
(a) 21% (b) 22.5% (b) 20.5% (c) 18%

SSC CPO 2024 Tier - 1

Q.78. Find the single discount rate percentage equivalent to the successive discounts of 10%, 20% and 20%.
SSC CPO 27/06/2024 (1st Shift)
(a) 42.4% (b) 54.6% (c) 40% (d) 50%

Q.79. A doll is marked for ₹2,500. A customer pays ₹1,800 for it. If the customer got a series of two discounts and the rate of the first discount is 10%, then the rate of the second discount is:
SSC CPO 27/06/2024 (2nd Shift)
(a) 25% (b) 18% (c) 15% (d) 20%

Q.80. A product was offered at a 10% trade discount on the marked price. After a cash discount of 10%, the product was sold for ₹7,290. The marked price (in ₹) is:
SSC CPO 27/06/2024 (3rd Shift)
(a) 9,000 (b) 8,900 (c) 8,510 (d) 8,720

Q.81. In a store, an item with marked price of ₹82,500 is available at a discounted price of ₹79,200. What is the percentage of discount given on that item ?
SSC CPO 27/06/2024 (3rd Shift)
(a) 4% (b) 3% (c) 1% (d) 2%

Q.82. A shopkeeper wanted to sell ₹2,000 worth of products. But he had two options, giving three successive discounts of 10% each or giving a single discount of 28%. What was the difference between the two options of discounts (in rupees) ?
SSC CPO 29/06/2024 (1st Shift)
(a) 28 (b) 18 (c) 16 (d) 22

SSC Selection Post (Phase - XII)

Q.83. Find a single discount equivalent to the successive discount of 12%, 20%, 24% and 32%. (Correct to two places of decimals)
Matriculation Level 20/06/2024 (Shift - 1)
(a) 43.41% (b) 73.71%
(c) 63.62% (d) 53.51%

Q.84. The marked price of a fancy toy is ₹30,000. It is to be sold allowing two successive discounts of 20% and 24%, respectively. On cash payment, an additional 10% discount on the net price is also given. The selling price (in ₹) of the toy is:
Matriculation Level 20/06/2024 (Shift - 1)
(a) 16416 (b) 16520
(c) 17280 (d) 18350

Q.85. The price of a trouser is first decreased by 12% and then increased by 15%. If the initial price of the trouser was ₹1,500, find the final price (in ₹) of the trouser.
Matriculation Level 20/06/2024 (Shift - 1)
(a) 1,518 (b) 1,581 (c) 1,545 (d) 1,554

Q.86. If an electricity bill is paid before the due date, one gets a reduction of 5% on the amount of the bill. By paying the bill before the due date, a person got a reduction of ₹250. The original amount of his electricity bill (in ₹) was:
Matriculation Level 20/06/2024 (Shift - 4)
(a) 4000 (b) 4500 (c) 5000 (d) 5500

Q.87. To clear a stock of items, a seller gives an 8% discount on the marked price. He spends ₹x on the promotion of the discount offer. His total cost of the items is ₹2,50,000 and the marked price is 10% more than the cost price. Finally, he earns no profit or no loss. What is the value of x ?
Matriculation Level 21/06/2024 (Shift - 1)
(a) 6000 (b) 4500 (c) 3000 (d) 7500

Q.88. A dealer sells an article at a discount of 5% on the marked price. If the marked price is 20% above the cost price and the article was sold for ₹2,280, then the cost price would be:
Matriculation Level 21/06/2024 (Shift - 1)
(a) ₹2,500 (b) ₹2,000
(c) ₹3,500 (d) ₹3,000

Q.89. In a discount scheme, there is a 38% discount on the marked price of Rs.1,250, but the sale is done at Rs.434 only, then what additional discount did the customer get ?
Matriculation Level 21/06/2024 (Shift - 4)
(a) 48% (b) 40% (c) 58% (d) 44%

Q.90. A shopkeeper offers a cash discount of ₹275 first and then three successive discounts of 10%, 8% and 5% on the sale of a laptop. If the marked price of the laptop is ₹85,275, find its price for a customer.
Matriculation Level 24/06/2024 (Shift - 1)
(a) ₹ 65,561 (b) ₹ 66,561
(c) ₹ 65,861 (d) ₹ 66,861

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.91. An amusement park gives an offer to its customers that one person will be given free entry with four other people. What is the effective percentage discount given by the amusement park?
Matriculation Level 24/06/2024 (Shift - 1)
(a) 14% (b) 18% (c) 20% (d) 16%

Q.92. The marked price of a commodity was given as ₹425 per kg. After two successive discounts of 5% and y%, respectively, the retailer purchased it for ₹323 per kg. What was the value of y ?
Matriculation Level 24/06/2024 (Shift - 4)
(a) 19 (b) 20 (c) 24 (d) 18

Q.93. A store is running a scheme for offering a discount of 12% if the customer pays instantly, and a discount of 6% if purchased through credit card. The benefit of the scheme may be split on the amount of payment, however only one discount shall be given on one item. There is no discount on any other type of transaction. Ankur purchased a shirt from the store, whose marked price was ₹2,200, through credit card and paid instantly for the purchase of a coat marked at ₹7,500. What was the total amount (in ₹) billed ?
Matriculation Level 25/06/2024 (Shift - 1)
(a) 8668 (b) 8814 (c) 8778 (d) 8568

Q.94. An item costs Rs 15,000. A customer can choose either a 30% discount or buy two get one free offer. Jeevan chose the first offer and Rakshit chose the second offer. Find the difference in their payment for a single item.
Matriculation Level 25/06/2024 (Shift - 1)
(a) Rs.500 (b) Rs.10,500
(c) Rs.750 (d) Rs.10,000

Q.95. A shopkeeper offers 25% discount on all the toys. He offers a further discount of 5% on the reduced price to those customers who pay in cash. How much does a customer have to pay (in ₹) in cash for a toy of ₹510? (Correct to two decimal places)
Matriculation Level 26/06/2024 (Shift - 1)
(a) 360.38 (b) 250.65
(c) 363.38 (d) 146.25

Q.96. On a machine there is 12% trade discount on the marked price of ₹2,56,000, but the machine is sold for ₹2,05,000 after giving a cash discount. How much is this cash discount (in %) ? (Rounded to the nearest whole number)
Higher Secondary 21/06/2024 (Shift - 2)
(a) 12% (b) 8% (c) 9% (d) 10%

Q.97. A shopkeeper announced 17% rebate on the marked price of an article. If the selling price of the article is ₹1,245, then the marked price (in ₹) of the article is :
Higher Secondary 25/06/2024 (Shift - 4)
(a) 1500 (b) 1780 (c) 1600 (d) 1820

Q.98. Which of the following schemes will yield maximum discount on purchase of ₹x ?
1) 2 successive discounts of 25% and 15%
2) Single discount of 20%
3) 2 free on purchase of 3 items
4) 3 free on purchase of 7 items
Graduate Level 20/06/2024 (Shift - 3)
(a) Scheme 4 (b) Scheme 2
(c) Scheme 1 (d) Scheme 3

Q.99. Which of the following schemes will yield minimum discount ?
1) 2 successive discounts of 5% and 5%
2) Single discount of 10%
3) 2 successive discounts of 8% and 2%
Graduate Level 21/06/2024 (Shift - 3)
(a) Scheme 2 only
(b) Both Schemes 1 and 3
(c) Scheme 1 only
(d) Scheme 3 only

Q.100. On an item there is 8% discount on the marked price of ₹32,000. After giving an additional season's discount, the item is sold for ₹25,000. How much is the season's discount (in %)? (Correct to two places of decimal)
Graduate Level 26/06/2024 (Shift - 3)
(a) 12.08% (b) 14.08%
(c) 13.08% (d) 15.08%

Q.101. A shopkeeper offers the following three schemes:
I. Buy 9 get 1 free
II. Buy 7 get 8
III. Two successive discounts of 20% and 15%
Which scheme has the lowest discount percentage (all articles have the same marked price) ?
Graduate Level 26/06/2024 (Shift - 4)
(a) Scheme I (b) All are equal
(c) Scheme III (d) Scheme II

SSC CHSL 2023 Tier - 2

Q.102. For an electric bill for ₹50,000, what is the difference between a discount of 30% and two successive discounts of 26% and 5% ?
SSC CHSL Tier II (02/11/2023)
(a) ₹140 (b) ₹150 (c) ₹130 (d) ₹120

Q.103. The difference between a discount of 27% and two successive discounts of 20% and 10% on a certain bill was ₹56. Find the amount of the bill.
SSC CHSL Tier II (10/01/2024)
(a) ₹1,866 (b) ₹5,500
(c) ₹5,600 (d) ₹1,120

SSC CGL 2023 Tier - 2

Q.104. What is the single discount equivalent to the successive discounts of 20%, 35%, and 10%?
SSC CGL Tier II (26/10/2023)
(a) 53.2% (b) 65.4% (c) 48.7% (d) 42.3%

SSC CPO 2023 Tier - 1

Q.105. The price of a treadmill is marked at ₹1,250. A shopkeeper earns a profit of 14% after allowing a discount of 14% on the marked price. Find the cost price (to the nearest rupee) of the treadmill.
SSC CPO 03/10/2023 (3rd Shift)
(a) ₹943 (b) ₹1,043 (c) ₹840 (d) ₹845

Q.106. A vendor bought a book marked at ₹850 at successive discounts of 20% and 10%, respectively. He spent ₹55 on transport and sold the book for ₹980. What will be his profit percentage (rounded off to two decimal places) ?
SSC CPO 03/10/2023 (3rd Shift)
(a) 46.93% (b) 50.65%
(c) 48.25% (d) 45.65%

Q.107. Rakhi purchased a basket, a wallet and a belt. She got discounts of 5%, 8% and 10% on the basket, the wallet and the belt, respectively, on their respective marked prices of ₹80, ₹150 and ₹350. How much amount (in ₹) did she pay in total ?
SSC CPO 04/10/2023 (1st Shift)
(a) 51 (b) 529 (c) 580 (d) 519

Q.108. On an item, there is an 18% discount on the marked price of ₹26,000. After giving an additional season's discount, the item is sold at ₹16,000. How much was the season's discount correct upto two places of decimal?
SSC CPO 04/10/2023 (3rd Shift)
(a) 24.95% (b) 22.45%
(c) 24.65% (d) 35.25%

Q.109. Ramesh gives fifteen per cent additional discount along with a discount of 25% on the marked price of a sofa set. If the selling price of the sofa set is ₹12,750, then find the marked price of the sofa set.
SSC CPO 04/10/2023 (3rd Shift)
(a) ₹ 22,000 (b) ₹ 23,000
(c) ₹ 24,000 (d) ₹ 20,000

Q.110. An item with a marked price of ₹ z was sold for ₹6,622, after a discount of 12% was offered. What was the value of z

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CPO 05/10/2023 (1st Shift)
(a) ₹7,575 (b) ₹7,425
(c) ₹7,525 (d) ₹7,500

Q.111. An article is sold at a discount of 25% and an additional discount of 28% is allowed on cash payment. If Ramendra purchased the article by paying ₹10,800 in cash, then what was the marked price of the article ?
SSC CPO 05/10/2023 (3rd Shift)
(a) ₹20,800 (b) ₹20,000
(c) ₹19,800 (d) ₹18,000

SSC MTS 2023 Tier - 1

Q.112. Find a single discount equivalent to a discount series of 10%, 15% and 20%.
SSC MTS 12/09/2023 (3rd Shift)
(a) 39.20% (b) 42.20%
(c) 38.80% (d) 40.80%

SSC CHSL 2023 Tier - 1

Q.113. Amisha announced a festival discount of 30% on all items in her gift shop. Gurmeet bought a gift for himself. He got a discount of ₹1,110. What was the marked price of the gift ?
SSC CHSL 02/08/2023 (3rd Shift)
(a) ₹3,650 (b) ₹3,750
(c) ₹ 3,850 (d) ₹3,700

Q.114. A shopkeeper marked a product, 5% above the cost price and sold the product for ₹1890 by giving a discount of 10%. The cost price of the product is:
SSC CHSL 02/08/2023 (4th Shift)
(a) ₹1,701 (b) ₹2,100 (c) ₹2,000 (d) ₹2,205

Q.115. Catch Cola 300 ML with MRP ₹20 is displayed in a Hyper Market with an Offer 'BUY 2 GET 1 FREE'. With this offer, the Hyper Market is giving what percent discount ?
SSC CHSL 03/08/2023 (1st Shift)
(a) 50% (b) 33.33% (c) 20% (d) 40%

Q.116. A bag is listed at 1,500 and a discount of 20% is offered. If the customer wanted to get the bag at a net price of ₹1,104, what additional discount must be offered to the customer ?
SSC CHSL 03/08/2023 (4th Shift)
(a) 8% (b) 4% (c) 5% (d)10%

Q.117. A merchant advertise 10% off on the items bought from his store. Find the discount got by a customer who bought a bag worth ₹560, an exercise book worth ₹90 and a pen worth ₹45.
SSC CHSL 04/08/2023 (2nd Shift)
(a) ₹59 (b) ₹69.50 (c) ₹65 (d) ₹67.50

Q.118. The marked price of a cooler is ₹800. It is sold at a discount of 10%. Due to the festival season, the shopkeeper allowed a further discount of 5%. Find the selling price of the cooler.
SSC CHSL 07/08/2023 (1st Shift)
(a) ₹688 (b) ₹684 (c) ₹678 (d) ₹672

Q.119. A shopkeeper offers the following discount schemes for the purchase of his goods. Find the scheme which has the maximum discount.
(i) Two successive discounts of 20% and 10%
(ii) Discount of 10%
(iii) Buy 8 and get 4 free
(iv) Buy 9 and get 6 free
SSC CHSL 07/08/2023 (2nd Shift)
(a) (iii) (b) (ii) (c) (i) (d) (iv)

Q.120. A shopkeeper purchased an air conditioner for ₹24,000. He marks it for ₹30,000. He sells it to a customer at a discounted price and still earns a profit of 9%. What is the rate of discount given by the shopkeeper to the customer ?
SSC CHSL 07/08/2023 (4th Shift)
(a) 10.8% (b) 12.8% (c) 13.8% (d) 14.8%

Q.121. The company offers the following four types of successive discounts on a computer which is listed at ₹6,000.
i) 25% and 15% ii) 30% and 10%
iii) 35% and 5% iv) 20% and 20%
Which of these offers is best for a customer
SSC CHSL 08/08/2023 (1st Shift)
(a) Fourth offer (b) First offer
(c) Third offer (d) Second offer

Q.122. An article is marked at ₹450. If it is sold at a discount of 20%, then the selling price becomes 1.5 times of its cost price. What is the cost price (in ₹) ?
SSC CHSL 08/08/2023 (3rd Shift)
(a) 360 (b) 240 (c) 330 (d) 270

Q.123. Lakshita purchased a sofa set at a discount of 25%. As per her calculations, she noticed that if she would have not been given this discount, she would have paid ₹22,400 more as the cost of this sofa set. How much did Lakshita pay for the sofa set ?
SSC CHSL 10/08/2023 (2nd Shift)
(a) ₹ 22,400 (b) ₹ 33,600
(c) ₹ 67,200 (d) ₹ 67,000

Q.124. Rohita offers a discount of 20% on the marked price of an object. Due to recession of market, she further offers a discount of 30% on its sale. What is the equivalent single discount percentage corresponding to these two successive discounts offers ?
SSC CHSL 11/08/2023 (1st Shift)
(a) 42% (b) 56% (c) 40% (d) 44%

Q.125. On an item having a marked price of ₹500, Ravi was offered successive discounts of 36% and 5%, respectively, while Prabhat was offered a single discount of 40%. Who paid more for the item and by how much ?
SSC CHSL 11/08/2023 (4th Shift)
(a) Ravi, ₹4 (b) Prabhat, ₹5
(c) Ravi, ₹5 (d) Prabhat, ₹4

Q.126. A shopkeeper has announced a 25% rebate on the prices of stationery items. If anyone needs to have a rebate of ₹40, then how many stationery items each costing ₹32 should be purchased ?
SSC CHSL 14/08/2023 (1st Shift)
(a) 5 items (b) 6 items
(c) 4 items (d) 3 items

Q.127. The marked price on a fancy item is ₹250 but there is an 18% discount during festival season. The price of the fancy item after discount is:
SSC CHSL 14/08/2023 (2nd Shift)
(a) ₹204 (b) ₹205 (c) ₹202 (d) ₹208

Q.128. The marked price of a shirt is ₹ 2,000. It is sold at a discount of 15%. The shopkeeper has allowed a further discount of 5% due to the off season. Find the selling price of the shirt.
SSC CHSL 14/08/2023 (3rd Shift)
(a) ₹1,710 (b) ₹1,615
(c) ₹1,650 (d) ₹1,700

Q.129. A man offers a 40% discount on an item which has been marked 50% above the cost price. If the selling price of the item is ₹1,305, then the cost price is :
SSC CHSL 17/08/2023 (1st Shift)
(a) ₹1,360 (b) ₹1,450
(c) ₹1,680 (d) ₹1,560

Q.130. A shopkeeper gives an additional concession of 5% on an item which is already discounted by 15% on the marked price. If the buyer pays 3,068.5 for the item, then find the marked price.
SSC CHSL 17/08/2023 (2nd Shift)
(a) ₹3,500 (b) ₹3,700 (c) ₹3800 (d) ₹3780

Q.131. If an electricity bill is paid before the due date, one gets a reduction of 13% on the amount of the bill. By paying the bill before the due date, Ravi got a reduction of ₹260.39. The amount of his electricity bill (in ₹) was:
SSC CHSL 17/08/2023 (4th Shift)
(a) 2,003 (b) 2,580 (c) 2,230 (d) 2,064

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 2023 Tier - 1

Q.132. A shopkeeper offers the following two discount schemes.
A) Buy 3 get 4 free B) Buy 5 get 6 free
Which scheme has the maximum discount percentage ?
SSC CGL 14/07/2023 (1st shift)
(a) A
(b) A does not give any discount
(c) A and B both have the same discount percentage
(d) B

Q.133. After allowing a discount of 15%, the value of a washing machine is ₹29,750. If no discount is allowed, then the shopkeeper gains 12%. The cost price of the washing machine is:
SSC CGL 17/07/2023 (3rd shift)
(a) ₹ 31,250 (b) ₹ 31,500
(c) ₹ 31,750 (d) ₹32,000

Q.134. A shopkeeper offers the following two discount schemes.
A) Two successive discounts of 10% and 15%
B) Buy 5 get 2 free.
Which scheme has the maximum discount percentage?
SSC CGL 18/07/2023 (1st shift)
(a) B does not give any discount
(b) B
(c) A and B both have the same discount percentage
(d) A

Q.135. On purchase of articles worth ₹10,000, a shopkeeper offers a flat discount of ₹500 to his customers. Further, by shopping using a credit card, he gives an additional discount of 7%. If a customer purchases an article worth Rs.10000 using a credit card, then how much is he/she required to pay ?
SSC CGL 18/07/2023 (1st shift)
(a) ₹8,835 (b) ₹9,000
(c) ₹8,815 (d) ₹9,300

Q.136. The marked price of a ceiling fan is ₹4,200 and the shopkeeper allows a discount of 5% on it. If his profit is 14%, then the cost price of the fan is:
SSC CGL 18/07/2023 (3rd shift)
(a) ₹3,200 (b) ₹3,800
(c) ₹3,000 (d) ₹3,500

Q.137. The marked price on a book is ₹1,000. In a book fair, it is available for sale with a discount scheme offering two successive discounts of 12% and 8%. What is the final selling price (in ₹) of the book for a customer (rounded off t o the nearest integer) ?
SSC CGL 18/07/2023 (4th shift)
(a) 810 (b) 790 (c) 825 (d) 800

Q.138. A shopkeeper allows a discount of 10% on the printed price of his goods and thus gains 20%. What is the ratio between the cost price and the printed price of the item ?
SSC CGL 19/07/2023 (2nd shift)
(a) 3 : 4 (b) 2 : 3 (c) 4 : 5 (d) 1 : 2

Q.139. A dealer marks an article 60% above the cost price and sells it to a customer allowing two successive discounts of 10% and 20% on the marked price. If he gains ₹1,064 in the transaction, the cost price (in ₹) of the article is:
SSC CGL 19/07/2023 (4th shift)
(a) 8400 (b) 7000 (c) 6300 (d) 7200

Q.140. The marked price of a frock is ₹4,500. It is to be sold at ₹2,400 at two successive discounts. If the first discount is 20%, then the second discount will be:
SSC CGL 20/07/2023 (1st shift)
(a) 40% (b) 30% (c) $66\frac{1}{3}$% (d) $33\frac{1}{3}$%

Q.141. A shopkeeper offers three schemes as given below to sell a particular type of product.
Which of the following schemes offer(s) the maximum discount percentage ?
A. Buy 6, get 4 free
B. Buy 5, get 5 free
C. Two successive discounts of 18% and 24%
SSC CGL 20/07/2023 (2nd shift)
(a) Only B (b) Only B and C
(c) Only A and C (d) Only A

Q.142. A dealer's cost price for each fan he would like to sell is ₹2,000. After allowing a discount of 20% on its marked price, he gains 20%. His marked price of the fan is:
SSC CGL 20/07/2023 (4th shift)
(a) ₹5,000 (b) ₹2,500
(c) ₹3,000 (d) ₹4,000

Q.143. If successive discounts of 5%, 10% and p% are equivalent to a single discount of 31.6%, then the value of p is:
SSC CGL 21/07/2023 (1st shift)
(a) 15 (b) 25 (c) 20 (d) 30

Q.144. Ramlal marks up his goods by 40% and gives a discount of 10%. What is his net profit percentage ?
SSC CGL 21/07/2023 (4th shift)
(a) 24% (b) 26% (c) 28% (d) 32%

Q.145. A shop provides flat 50% discount on one shirt, while another shop provides two successive discounts of 30% and 30%. If the difference in the bill is ₹43, then find the cost of the shirt.
SSC CGL 21/07/2023 (4th shift)
(a) ₹3,580 (b) ₹3,850
(c) ₹3,260 (d) ₹4,300

Q.146. A shopping mart offers four different discounts schemes on the sale of an object as follows:
(1) A discount of 30%
(2) Two successive discounts of 15%
(3) Buy 2, get 1 free
(4) Buy 5, get 3 free
Which discount scheme offers the maximum discount to a customer ?
SSC CGL 24/07/2023 (3rd shift)
(a) (1) (b) (4) (c) (2) (d) (3)

Q.147. The marked price of an article is ₹50,000. Of three shopkeepers, the first one allows two successive discounts of 25% and 15%. The second one allows two successive discounts 20% and 20%. The third shopkeeper allows two successive discounts of 30% and 10%. From which shopkeeper does the customer get more profit ?
SSC CGL 25/07/2023 (2nd shift)
(a) First (b) Same for all the shopkeepers
(c) Third (d) Second

Q.148. The marked price of a microwave oven is ₹15,990 and it is sold for ₹12,792. What is the rate of discount offered ?
SSC CGL 25/07/2023 (4th shift)
(a) 25% (b) 20% (c) 21% (d) 24%

Q.149. Which of the following will yield maximum discount on ₹7,500 ?
1. Two successive discounts of 5% and 5%
2. Single discount of 10%
3. Two successive discounts of 8% and 2%
SSC CGL 26/07/2023 (2nd shift)
(a) 2 (b) 1
(c) All will yield the same discount (d) 3

Q.150. A shopkeeper gives a 12% additional discount on the discounted price, after giving an initial discount of 25% on the labelled price of a radio. If the final selling price of the radio is ₹792, then what is its labelled price (in ₹) ?
SSC CGL 27/07/2023 (1st shift)
(a) 1980 (b) 2330 (c) 1320 (d) 1200

SSC Selection Post (Phase - XI)

Q.151. In a sale, a shop is giving a discount as per the following scheme: 10% discount on clothes, 12% on groceries, 15% on stationery and 20% on footwear. Anjali bought a packet of tea, a notebook and bathroom sleepers whose

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

marked prices are ₹450, ₹100 and ₹850, respectively. How much amount (₹ in) does she have to pay ?
Graduate Level 28/06/2023 (Shift - 3)
(a) 1116 (b) 1261 (c) 1161 (d) 1471

Q.152. A silver puja thali set marked at ₹10,000 is sold with two successive discounts of 10% and 5%. An additional 5% discount is offered if the payment is made in cash mode. Find the selling price of the article on cash payment.
Higher Secondary 27/06/2023 (Shift - 3)
(a) ₹8,212.50 (b) ₹8,122.50
(c) ₹8,100.50 (d) ₹8,200.50

Q.153. The marked price of a commodity was given as ₹y per kg. After two successive discounts of 8% and 12.5%, respectively, the retailer purchased it for ₹3,059 per kg. What was the value of y ?
Higher Secondary 28/06/2023 (Shift - 2)
(a) 3840 (b) 3800 (c) 3900 (d) 3750

Q.154. A shopkeeper keeps the marked price of his goods 50% more than the cost price. If he gives successive discounts of 5%, 10% and 20% on marked price, then what is his profit percentage ?
Higher Secondary 28/06/2023 (Shift - 2)
(a) $2\frac{3}{5}$% (b) $1\frac{3}{5}$% (c) $1\frac{2}{5}$% (d) $2\frac{1}{5}$%

Q.155. A merchant purchases a smartwatch for ₹1,800 and fixes its list price in such a way that, after allowing a discount of 10%, he earns a profit of 22%. The list price of the smartwatch (in ₹) is:
Higher Secondary 30/06/2023 (Shift - 2)
(a) 2440 (b) 2450 (c) 2520 (d) 2180

Q.156. Somesh is a shopkeeper who gives two successive discounts on an umbrella marked ₹560. The first discount given is 17%. If the customer Mahesh pays ₹420 for the umbrella, then find the second discount given (correct to two places of decimals).
Matriculation Level 27/06/2023 (Shift - 1)
(a) 4.69% (b) 9.64% (c) 6.49% (d) 6.94%

Q.157. A store declares a discount scheme as "Buy 1 shampoo bottle and get 60% off on another shampoo of same quality, size and of the same price." What is the profit percentage of the store, if each shampoo bottle has the cost price 60% below the marked price ?
Matriculation Level 27/06/2023 (Shift - 2)
(a) 60% (b) 64% (c) 75% (d) 54%

Q.158. A book is sold at a discount of 32% and an additional discount of 25% is allowed on cash payment. If Ramesh purchased the book by paying Rs.2,550 in cash, find the marked price of the book
Matriculation Level 28/06/2023 (Shift - 1)
(a) Rs.5,000 (b) Rs.5,050
(c) Rs.4,950 (d) Rs.5,560

Q.159. Rajesh marks his goods 30% above the cost price but allows a 12% discount for cash payment. If he sells the goods for ₹3,500, find his cost price (up to one place of decimal).
Matriculation Level 28/06/2023 (Shift - 4)
(a) ₹3,090.5 (b) ₹3,095.9
(c) ₹3,054.9 (d) ₹3,059.4

Q.160. If a watch that is marked at ₹1,800 is being sold for ₹1,250, then the discount percentage at which the watch is being sold is:
Matriculation Level 30/06/2023 (Shift - 3)
(a) $30\frac{5}{9}$% (b) $28\frac{2}{9}$%
(c) $31\frac{3}{5}$% (d) $32\frac{5}{9}$%

SSC MTS 2022 Tier - 1

Q.161. Marked price of a computer is Rs. 10000. Selling price of computer is Rs. 7650. If two successive discounts of 15 percent and x percent are given, then what is the value of x ?
SSC MTS 02/05/2023 (Morning)
(a) 5 % (b) 15 % (c) 10 % (d) 20 %

Q.162. A product, whose marked price is Rs. 840, is sold for Rs. 798 by a wholesale shop. What is the percentage discount given by him ?
SSC MTS 03/05/2023 (Evening)
(a) 6% (b) 5% (c) 3% (d) 4%

Q.163. Marked price of a computer is Rs. 14000. Selling price of the computer is Rs. 9702. If two successive discounts of 23 percent and y percent are given, then what is the value of y ?
SSC MTS 04/05/2023 (Afternoon)
(a) 15 % (b) 10 % (c) 12 % (d) 5 %

Q.164. On a deal, the car dealer allowed 1% discount to a customer. If the discount allowed was Rs. 4000, then what is the selling price of the car ?
SSC MTS 04/05/2023 (Evening)
(a) Rs.388500 (b) Rs.380500
(c) Rs.395600 (d) Rs.396000

Q.165. A water purifier is on sale for 10% discount on the original price. A store-wide sale results in an additional discount of 15%. What is the total discount on the original price ?
SSC MTS 08/05/2023 (Morning)
(a) 18.50% (b) 19.50%
(c) 22.50% (d) 23.50%

Q.166. A shopkeeper sells an article at 10 percent loss after giving a discount of 20 percent. What is the ratio of cost price and marked price of the article ?
SSC MTS 10/05/2023 (Morning)
(a) 5 : 8 (b) 8 : 9 (c) 7 : 9 (d) 4 : 9

Q.167. The marked price of an article is 20 percent more than its cost price. If 10 percent discount is given on the marked price, then what will be the profit percentage ?
SSC MTS 11/05/2023 (Morning)
(a) 8 % (b) 15 % (c) 12 % (d) 10 %

Q.168. A dealer purchased a washing machine for Rs. 6400. After allowing a discount of 20% on its marked price, he still gains 30%. Find the marked price of the washing machine.
SSC MTS 15/05/2023 (Evening)
(a) Rs.12,000 (b) Rs.10,400
(c) Rs.11,000 (d) Rs.13,000

Q.169. A trader allowed a discount of 25 percent on a trolley bag having list price of Rs. 1488 and earns a profit of 20 percent. What is the cost price of the trolley bag ?
SSC MTS 16/05/2023 (Morning)
(a) Rs.908 (b) Rs.880
(c) Rs.930 (d) Rs.960

Q.170. On selling a car, a person gives a discount of 8 percent. If he gives a discount of 4 percent, then he receives Rs. 7200 more than in the case of 8 percent discount. What is the marked price of car ?
SSC MTS 19/05/2023 (Morning)
(a) Rs.150000 (b) Rs.160000
(c) Rs.180000 (d) Rs.110000

Q.171. The marked price of a pen is Rs. 5000. The shopkeeper gives two successive discounts of 15 percent and b percent to the customer. If the customer pays Rs. 4080 for the pen, then what is the value of b ?
SSC MTS 13/06/2023 (Morning)
(a) 3 % (b) 5 % (c) 7.5 % (d) 4 %

Q.172. An item is sold at two successive discounts of 20 percent and 20 percent. The selling price of the article after the second discount is Rs. 3616. If it is sold only at our discount of 20 percent, then what will be the selling price of the article
SSC MTS 19/06/2023 (Morning)
(a) Rs.3960 (b) Rs.4520
(c) Rs 4080 (d) Rs.5200

Q.173. Sapna bought book at a sale for Rs. 573.18, she received 18% discount on MRP. What is the MRP of the book ?
SSC MTS 20/06/2023 (Morning)

Search on TG @apna_pdf

Search on Telegram @apna_pdf

(a) Rs.649 (b) Rs.699
(c) Rs.749 (d) Rs.799

SSC CHSL 2022 Tier - 1

Q.174. $\frac{2}{5}$ of marked price is equal to $\frac{5}{8}$ of selling price. What is the discount percent ?
SSC CHSL 09/03/2023 (1st Shift)
(a) 40 % (b) 42 % (c) 36 % (d) 50 %

Q.175. A discount of 20 percent on article A is equal to the discount of 15 percent on the article B. What is the ratio of the marked price of articles A and B ?
SSC CHSL 13/03/2023 (2nd Shift)
(a) 3 : 4 (b) 6 : 7 (c) 7 : 8 (d) 6 : 11

Q.176. The marked price of a trouser is four time the cost price. To earn 64 percent profit, what should be the discount percentage ?
SSC CHSL 15/03/2023 (2nd Shift)
(a) 55 % (b) 62% (c) 65% (d) 59 %

Q.177. The marked price of a trouser and a jacket is in the ratio of 1 : 3. The shopkeeper gives 20 percent discount on the trouser. If the total discount offered on both of them together is 30 percent, then what is the discount percent on the jacket ?
SSC CHSL 16/03/2023 (1st Shift)
(a) 28.56 % (b) 41.25 %
(c) 33.33 % (d) 16.66 %

Q.178. Nikhil buys a diamond ring for his wife. Diamond ring is marked at Rs. 20,000 and two successive discounts of 25% and x% respectively are given. After getting two successive discounts, he paid Rs. 12,000. Find the value of x.
SSC CHSL 16/03/2023 (2nd Shift)
(a) 40% (b) 10% (c) 20% (d) 35%

Q.179. Piyush marks the price of his article 30 percent more than its cost price. If he sells the article for Rs. 5720 after allowing a discount of 20 percent, then what will be the cost price of the article ?
SSC CHSL 17/03/2023 (3rd Shift)
(a) Rs.5000 (b) Rs.5350
(c) Rs.5200 (d) Rs.5500

Q.180. A seller allows a discount of 9% on a watch. If he allows a discount of 6%, he earns Rs 30 more in profit. What is the marked price ?
SSC CHSL 20/03/2023 (2nd Shift)
(a) Rs.900 (b) Rs.1,400
(c) Rs.1,000 (d) Rs.1,300

Q.181. Marked price of a computer is Rs. 80000. It is sold for Rs. 65280 after two successive discounts. If one of the discount is 15 percent, then what is the value of other discount?
SSC CHSL 20/03/2023 (3rd Shift)
(a) 7 % (b) 5 % (c) 6% (d) 4 %

SSC CGL 2022 Tier - 2

Q.182. Find the single equivalent discount for successive discounts of 12%, 18% and 25% on the marked price of a car.
SSC CGL Tier II (03/03/2023)
(a) 35.28% (b) 42.65%
(c) 40.25% (d) 45.88%

Q.183. At a clearance sale, a shopkeeper gives 45% discount. If a customer paid ₹ 330 during the sale, then what is the marked price of the shirt ?
SSC CGL Tier II (07/03/2023)
(a) ₹550 (b) ₹600 (c) ₹500 (d) ₹650

SSC CGL 2022 Tier - 1

Q.184. A shopkeeper gives two successive discounts on a watch marked ₹2,750. The first discount given is 10%. If the customer pays ₹2,103.75 for the watch, then what is the second discount?
SSC CGL 02/12/2022 (4th Shift)
(a) 15% (b) 30% (c) 12% (d)10%

Q.185. A hotel is giving a discount of 12% on the booking of 2 or more rooms. Additionally, the hotel is offering a 5% discount only on payment using any card of SBI. Rakesh booked 2 rooms in the hotel for a day at the rate of Rs.1,500 per room per day. While checking out, he paid the bill using SBI Silver Card. How much amount did he have to pay ?
SSC CGL 05/12/2022 (1st Shift)
(a) Rs.2,498 (b) Rs.1,254
(c) Rs.2,508 (d) Rs.2,618

Q.186. If 3 coconuts are offered free on purchase of 12 coconuts, priced ₹25 each, what is the effective discount on each coconut ?
SSC CGL 06/12/2022 (2nd Shift)
(a) 20% (b) 24% (c) 20.83% (d) 15%

Q.187. In a shop, a discount of 5 percent is provided, and if the total payable amount after discount is more than ₹2,000, then an additional discount of 10 percent is provided. Determine the final amount to be paid (in ₹) by a customer, if he buys five products each of price ₹500.
SSC CGL 07/12/2022 (1st Shift)
(a) ₹2,500 (b) ₹2,225.5
(c) ₹2,375.5 (d) ₹2,137.5

Q.188. A discount of 20% is given for the purchase of two books by a bookseller and a discount of 25% is offered if a customer buys more than two books. A 10% discount is being offered to all the customers on purchase of one book. An additional 5% discount will be given to students. Sohan, a student of M.Com. in college, bought a book for Rs.513. What was the marked price of the book ?
SSC CGL 07/12/2022 (2nd Shift)
(a) Rs.650 (b) Rs.540
(c) Rs.600 (d) Rs.605

Q.189. A dealer offers 45% discount on a packet. She offers a further discount of 25% on the reduced price on cash payment. What does a customer have to pay for the packet of ₹2,800, in cash, to avail both discounts ?
SSC CGL 08/12/2022 (4th Shift)
(a) ₹1,480 (b) ₹1,350
(c) ₹1,155 (d) ₹1,230

Q.190. A shopkeeper offers a cash discount of ₹ 85 first and then two successive discounts of 10% and 2% on the marked price of a fan. If the marked price of the fan is ₹ 1,285, what is its selling price (in ₹)?
SSC CGL 09/12/2022 (2nd Shift)
(a) 1058.4 (b) 1000.4 (c) 958.4 (d) 1100

Q.191. A grocery shop is offering 10% discount on the purchase of Rs.500 and above. A 5% discount is given on the purchase of value above Rs.250 but below Rs.500. A discount of additional 1% is given if payment is made instantly in cash. How much would a customer have to pay by cash if he buys 25 packets of biscuits and one packet is priced at Rs.30 ?
SSC CGL 09/12/2022 (4th Shift)
(a) Rs.670.25 (b) Rs.668.25
(c) Rs.675 (d) Rs.667.05

Q.192. The printed price of a TV set is ₹14,500. It is sold for ₹10,000 with two consecutive discounts. If the first discount is 10%, then what is the second discount ?
SSC CGL 12/12/2022 (2nd Shift)
(a) 23.37% (b) 25.37%
(c) 20.37% (d) 27.37%

Q.193. An article costs Rs.4,000 to a shopkeeper, who marks its price at Rs.8,400. The shopkeeper sells it to a customer at a discount of 25%. The customer gets a further discount of 15% on the discounted price if the customer redeems a coupon issued by the store previously. What is the profit percentage (to the nearest integer) earned by the shopkeeper in this transaction ?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 13/12/2022 (1st Shift)
(a) 34% (b) 51% (c) 42% (d) 36%

SSC CPO 2022 Tier - 1

Q.194. A shopkeeper allows a discount of 15% on a textbook with the marked price Rs.100. On request, he further allows a discount of 10% on the new price of the goods. What is the overall discount given to the customer ?
SSC CPO 09/11/2022 (Afternoon)
(a) Rs.23.50 (b) Rs.75.00
(c) Rs.25.00 (d) Rs.76.50

Q.195. In a shop, a discount of 8% is provided. If the total payable amount after discount is more than ₹5,000, an additional discount of 20% is provided, then determine the final amount to be paid by customer, if he buys 12 products each of price ₹750
SSC CPO 09/11/2022 (Evening)
(a) ₹ 6,724 (b) ₹ 6,624
(c) ₹ 6,424 (d) ₹ 6,524

Q.196. In a showroom the price of a washing machine is ₹ 65,000. The customer gets a cash discount of ₹ 2,000, and gets a scratch card promising a percentage discount of 10% to 15%. Determine the difference between the least and the maximum selling prices of the washing machine.
SSC CPO 10/11/2022 (Morning)
(a) ₹3,150 (b) ₹3,570
(c) ₹3,200 (d) ₹3,650

Q.197. Elizabeth went to a furniture store and purchased a study table. She received a 20% discount on it. She would have saved Rs.1,000 more if she had received a 25% discount. What was the marked price of the study table ?
SSC CPO 11/11/2022 (Evening)
(a) Rs.21,100 (b) Rs.20,000
(c) Rs.18,900 (d) Rs.19,200

SSC CGL 2021 Tier - 2

Q.198. When an article is sold at 5 percent discount, then there is a profit of 14 percent. If the discount is 11 percent, then what will be the profit ?
SSC CGL Tier II (08/08/2022)
(a) 7.6 % (b) 8.4 % (c) 7.2 % (d) 6.8 %

Q.199. Marked price of an article is ₹ 28000. It can be sold at one of the following ways: Way A: A single discount of 24 percent. Way B: Two successive discounts of 16 percent and 10 percent. Which way will have lowest selling price and what will be the value of it ?
SSC CGL Tier II (08/08/2022)
(a) Way A, ₹ 21168 (b) Way B, ₹ 21280
(c) Way A, ₹ 21280 (d) Way B, ₹ 21168

SSC Selection Post (Phase - X)

Q.200. A shopkeeper offers the following two discount schemes on the sale of a watch having marked price ₹3,600.
(1) Two successive discounts of 15%.
(2) A discount of 10% followed by a discount of 20%. What is the difference between the selling price of the watch in case (1) and case (2) ?
Graduate Level 04/08/2022 (Shift - 2)
(a) ₹8 (b) ₹9 (c) ₹10 (d) ₹11

Q.201. A retailer offers the following discount schemes for buyers on an item.
i) Two successive discount of 20%.
ii) A discount of 25% followed by a discount of 15%.
iii) A discount of 40%.
Under which scheme(s) will the selling price be minimum ?
Graduate Level 05/08/2022 (Shift - 3)
(a) iii (b) ii (c) i and ii (d) i

SSC CHSL 2021 Tier - 1

Q.202. The marked price of every item being sold by a wholesaler was ₹300. The wholesaler was offering a stock-clearance sale under which, for every three items paid for, one item was being given free. In addition to this, a further 10% discount on the amount payable on the 'Buy 3, Get 1 free' scheme price was being offered to anyone making purchases worth more than ₹10,000. Ramesh made purchases for which this amount payable was ₹18,000. What was the effective percentage discount that was offered to Ramesh during this transaction ?
SSC CHSL 24/05/2022 (Morning)
(a) 32% (b) 31.5% (c) 32.5% (d) 32.75%

Q.203. A shopkeeper marks up his goods by 30% and then gives a discount of 10% on the marked price. Apart from this, he uses a faulty balance which reads 1 kg for 870 g. What is his net profit percentage ?
SSC CHSL 24/05/2022 (Afternoon)
(a) 38.42% (b) 34.84%
(c) 34.48% (d) 38.24%

Q.204. The price of an article is raised by 45% and then two successive discounts of 15% each are allowed. Ultimately the price of the article is _____.
SSC CHSL 26/05/2022 (Morning)
(a) decreased by 7.7625%
(b) increased by 4.7625%
(c) decreased by 4.7625%
(d) increased by 7.7625%

Q.205. The marked price of a mobile phone is ₹36,000. A shopkeeper gives a discount of 11% on the marked price. Further, if a customer purchases it through credit card the discount increases by 15%. Pooja purchases it through the credit card. How much does she pay ?
SSC CHSL 27/05/2022 (Morning)
(a) ₹ 31,000 (b) ₹ 32,000
(c) ₹ 30,880 (d) ₹ 30,600

Q.206. Anil offers his customer a discount of 15% on a T-shirt and he still makes a profit of 25%. What is the actual cost of the T-shirt marked ₹500 ?
SSC CHSL 30/05/2022 (Morning)
(a) ₹340 (b) ₹330 (c) ₹350 (d) ₹360

Q.207. A shopkeeper wanted to sell ₹3,000 worth of products. He gave two options — giving three successive discounts of 10% each, or giving a single discount of 30%. If a buyer chooses the former option how much extra/less does he pay as compared to the second option
SSC CHSL 30/05/2022 (Afternoon)
(a) ₹87 less (b) ₹60 extra
(c) ₹87 extra (d) ₹60 less

Q.208. If a company gives a discount of 20% on the marked price of an article and gains 20% on that particular article, then at what percentage above the cost price did the company mark its goods ?
SSC CHSL 30/05/2022 (Afternoon)
(a) 50% (b) 20% (c) 40% (d) 25%

Q.209. The marked price of a refrigerator is ₹60,000. A shopkeeper offers a flat discount of ₹12,000 on full cash payment. Further he offers an extra discount of 5% on the marked price to his regular customers. How much does a regular customer have to pay for the refrigerator ?
SSC CHSL 31/05/2022 (Morning)
(a) ₹ 45,000 (b) ₹ 48,000
(c) ₹ 44,000 (d) ₹ 47,000

Q.210. There is a 20% discount on a dozen pairs of shoes marked at ₹7,200. How many pairs of shoes can be bought with ₹1,440 ?
SSC CHSL 31/05/2022 (Evening)
(a) 3 (b) 5 (c) 2 (d) 4

Q.211. The marked price of a mobile phone was ₹35,600. The shop owner offered a 10% trade discount on the marked price but on further request by the customer, he sold the phone for

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

₹30,000 after giving a cash discount. How much is this cash discount as a percentage of the price after the trade discount? (Give your answer correct to 2 decimal places.)
SSC CHSL 01/06/2022 (Morning)
(a) 6.37% (b) 5.75% (c) 4.95% (d) 5.25%

Q.212. Under a sale offer for an item, Mahesh was offered 24% discount on the part of the marked price that was paid in cash, but was charged 1.5% on the part of the marked price paid through a credit card. If Mahesh paid 40% of the marked price in cash and the rest through a credit card and his total final payment was ₹6,391, what was the marked price of the item ?
SSC CHSL 01/06/2022 (Afternoon)
(a) ₹7,200 (b) ₹6,900 (c) ₹7,050 (d) ₹7,000

Q.213. An article is sold at a discount of 10% and an additional discount of 40% is allowed on cash payment. If Anita purchased an article by paying ₹2,700 in cash, the marked price of the article was:
SSC CHSL 02/06/2022 (Afternoon)
(a) ₹5,000 (b) ₹2,500 (c) ₹2,000 (d) ₹5,500

Q.214. The marked price of a laptop is Rs. 50,000. A shopkeeper gives the following four schemes of discount to his customers. Which one is more beneficial to the customers ?
(i) Discount of Rs. 10,000
(ii) Discount of flat 25%
(iii) Discount of 10% of 10%
(iv) Discount of 15% of 10%
SSC CHSL 03/06/2022 (Morning)
(a) i (b) iv (c) ii (d) iii

Q.215. A man offers a 21% discount on an item. He offers a further discount of 40% on the reduced price for the first 100 customers. If the selling price of the item is ₹4,740, and the customer is one of the first 100 then the marked price (in ₹) of the item is
SSC CHSL 03/06/2022 (Afternoon)
(a) 10,000 (b) 8,000
(c) 12,000 (d) 9,000

Q.216. The marked price of an article is 30% more than the cost price. A discount of 15% is offered on the marked price. By what percentage is the final price more than the cost price ?
SSC CHSL 07/06/2022 (Morning)
(a) 10.5% (b) 15.5% (c) 19.5% (d) 8.5%

Q.217. When payment is made online, the discount offered is 20%. Additional discount of 8% is given to ABC credit card holders. Sandeep buys a laptop of ₹35,000 by paying online and pays through his ABC credit card. How much does he need to pay ?
SSC CHSL 07/06/2022 (Morning)
(a) ₹25,750 (b) ₹25,760
(c) ₹25,770 (d) ₹25,740

Q.218. Under a sale offer, Suresh was offered a 20% discount on the part of the marked price that was paid in cash, but was charged 0.5% on the part of the marked price paid through a credit card. If Suresh paid 40% of the marked price in cash and the rest through a credit card, what percentage of the marked price was his total final payment ?
SSC CHSL 07/06/2022 (Evening)
(a) 93.2% (b) 92.6% (c) 92.8% (d) 92.3%

Q.219. The ratio of the cost price to the marked price of an article is 4 : 7. A discount of 25% is given on the marked price and the shopkeeper made a profit of ₹50. Find the cost price of the article.
SSC CHSL 08/06/2022 (Afternoon)
(a) ₹160 (b) ₹165 (c) ₹150 (d) ₹155

Q.220. One dozen books quoted at ₹120 are available at 15% discount. How many books can be bought for ₹51 ?
SSC CHSL 09/06/2022 (Morning)
(a) 8 (b) 5 (c) 6 (d) 7

Q.221. While selling to the retailer, a company allows 30% discount on the marked price of its products. If the retailer sells those products at marked price, his profit per cent will be ?
SSC CHSL 09/06/2022 (Afternoon)
(a) $42\frac{8}{7}\%$ (b) $42\frac{6}{7}\%$
(c) $42\frac{4}{7}\%$ (d) $42\frac{2}{7}\%$

Q.222. A washing machine is sold at a discount of 10% on its marked price. A further discount of 5% on the initial selling price is offered if a person makes the payment in cash. If the marked price of the machine is ₹54,000, how much will a customer paying in cash have to pay for purchasing it ?
SSC CHSL 10/06/2022 (Morning)
(a) ₹46,200 (b) ₹45,800
(c) ₹46,170 (d) ₹46,000

Q.223. Under a discount scheme, a dozen pair of gloves quoted at ₹200 is available at a discount of 20%. How many pairs of gloves can be bought for ₹320 ?
SSC CHSL 10/06/2022 (Evening)
(a) 15 (b) 20 (c) 18 (d) 24

SSC CGL 2021 Tier - 1

Q.224. An item costs ₹400. During a festival sale, a company offers a sale discount that offers x% off on its regular price along with a discount coupon of 10%. The price of the item after using both the sale discount and the discount coupon, is ₹216. What is the value of x ?
SSC CGL 11/04/2022 (Morning)
(a) 25 (b) 40 (c) 30 (d) 35

Q.225. A shopkeeper allows a 28% discount on the marked price of an article and still makes a profit of 30%. If he gains ₹30.90 on the sale of one article , then what is the marked price (to the nearest ₹) of the article ?
SSC CGL 13/04/2022 (Evening)
(a) 103 (b) 134 (c) 194 (d) 186

Q.226. A shopkeeper allows a 28% discount on the marked price of an article and still makes a profit of 30%. If he gains Rs. 39.90 on the sale of one article, then what is the marked price (to the nearest Rs.) of the article ?
SSC CGL 18/04/2022 (Morning)
(a) 200 (b) 240 (c) 173 (d) 133

Q.227. A manufacturer who marks the price of an article at Rupees 1,800, sells it to a dealer at a discount of 15%. The dealer gets a further discount of 8% on his net payment for paying in cash .What amount (to be nearest rupee) does the dealer pay to the manufacturer ?
SSC CGL 18/4/2022 (Evening)
(a) 1500 (b) 1408 (c) 1530 (d) 1378

Q.228. Two successive discounts of 20% and 25% on the marked price of an article are equal to a single discount of ₹250 . If the marked price of the article is 25% above the cost price, the cost price (in ₹) of the article is:
SSC CGL 19/4/2022 (Evening)
(a) 450 (b) 600 (c) 550 (d) 500

Q.229. A person bought a book at a 31% discount on its printed price. If no discount was given, then he would have to pay ₹2,480 more. How much did he pay (in ₹) for the book ?
SSC CGL 20/04/2022 (Evening)
(a) 7,000 (b) 8,000 (c) 5,520 (d) 4,560

Q.230. A shopkeeper marks an article x% above the cost price and sells it by allowing a 30% discount on the marked price . if there is a loss of 4.8%, then what is the value of x ?
SSC CGL 21/04/2022 (Afternoon)
(a) 30 (b) 40 (c) 36 (d) 35

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 2020 Tier - 2

Q.231. A discount of 10% is offered on the price of an article if the payment is made online. An additional discount of 5% is given to credit card holders. A person wishes to buy a watch priced at ₹60,000 by paying online through credit card. How much does he need to pay (in ₹) ?
SSC CGL Tier II (29/01/2022)
(a) 51,300 (b) 62,150
(c) 61,250 (d) 53,100

Q.232. A trader gains 25% by selling an article with 20% discount on its marked price. If the cost price of the article increases by 30%, then how much discount (in %) should he offer on the same marked price to gain 15% of profit?
SSC CGL Tier II (29/01/2022)
(a) 4.87% (b) 5.08% (c) 5.12% (d) 4.32%

Q.233. A dealer gains 20% by selling an article at 25% discount on its marked price. If the cost price of the article is decreased by 15%, how much discount percentage should he now give on the same marked price so as to earn the same percentage of profit as before ?
SSC CGL Tier II (03/02/2022)
(a) 32.50% (b) 35%
(c) 36.25% (d) 37.75%

Q.234. A dealer offers a cash discount of 20% and still makes a profit of 20%. If he further sells 8 articles at a rate of 6 articles, then how much percentage above the cost price does he mark on each article ?
SSC CGL Tier II (03/02/2022)
(a) 77.5% (b) 100%
(c) 112.5% (d) 87.5%

SSC MTS 2020 Tier - 1

Q.235. The marked price of an article is ₹ 400. A shopkeeper sells it by giving two successive discounts of 12% and 20% on its marked price. If he earns a profit of 10%, then the cost of the article is:
SSC MTS 05/10/2021 (Morning)
(a) ₹250 (b) ₹260 (c) ₹256 (d) ₹268

Q.236. Two dealers offer an item at the same marked price ₹3,000. The first dealer allows successive discounts of 10% and 15%. The other dealer allows successive discounts of 20% and 5%. Find the difference in the selling price of the item under the two offers.
SSC MTS 11/10/2021 (Morning)
(a) ₹15 (b) ₹20 (c) ₹10 (d) ₹25

Q.237. An article was subject to three successive discounts, whereby a customer had to pay ₹2,366.8 less than the marked price of ₹12,500. If the rates of the first two discounts were, respectively, 12% and 6%, then what was the rate percentage of the third discount?
SSC MTS 12/10/2021 (Afternoon)
(a) 3.6 (b) 2 (c) 2.5 (d) 3

Q.238. On the marked price of an article, the difference between the two selling prices, One with a single discount of 45% and the other with two Successive discounts of 20% and 25%, is ₹124. What is the marked price (in ₹) of the article ?
SSC MTS 14/10/2021 (Afternoon)
(a) 2,540 (b) 2,480 (c) 2,520 (d) 2,500

Q.239. In festival seasons, A gadget which is marked at rs 5,000 is sold at rs 4250 after a discount. If the discount percentage is decreased by 5%, then at which price will a customer buy it ?
SSC MTS 20/10/2021 (Morning)
(a) 5,000 (b) 4,000 (c) 4,750 (d) 4,500

Q.240. A bookseller buys books at a discount of 25% on the marked price. How much percent discount should he offer so as to gain 20% on the sale ?
SSC MTS 27/10/2021 (Morning)
(a) 25% (b) 20% (c) 30% (d) 10%

Q.241. A dealer marked the price of an item at 50% above the cost price. He allowed two successive discounts of 30% and 25% to a particular customer. As a result, he incurred a loss of ₹850. At what price did he sell the item to the said customer ?
SSC MTS 27/10/2021 (Evening)
(a) ₹3,150 (b) ₹3,250 (c) ₹3,050 (d) ₹3,200

SSC CGL 2020 Tier - 1

Q.242. A shopkeeper marks his goods 30% higher than the cost price and allows a discount of 10% on the marked price. In order to earn 6.5% more profit, what discount percent should he allow on the marked price ?
SSC CGL 13/08/2021 (Evening)
(a) 6 (b) 5.5 (c) 4 (d) 5

Q.243. The selling price of an article marked for Rs. 10000 after giving three discounts, 20%, 10% and k% is Rs. 6120. What will be the selling price (in Rs.) of the same article if a single discount of (k + 20)% is allowed ?
SSC CGL 16/08/2021 (Morning)
(a) 6500 (b) 8500 (c) 6800 (d) 8000

Q.244. Three shopkeepers A, B and C marked an identical article at 4820. A, B and C sold their article on successive discounts of 20% and 20%, 25% and 15%, 30% and 10% respectively. Which shopkeeper gives the maximum discount and how much (in Rs.) ?
SSC CGL 16/8/2021 (Afternoon)
(a) C, 1780 (b) A, 1735.20
(c) B, 1800 (d) C, 1783.40

Q.245. A shopkeeper allows 16% discount on every item. Even after giving the discount, he makes a profit of 8%. If he gives 8% discount instead of 16% on the item marked for Rs.1800, then what will be his profit percent ?
SSC CGL 16/8/2021 (Evening)
(a) 18.31 (b) 19 (c) 18.29 (d) 18

Q.246. The cost price and the marked price of an item are Rs.720 and Rs.900 respectively. When it is sold at a discount of x%, the profit $\frac{5x}{3}$%. What is the value of x ?
SSC CGL 17/08/2021 (Evening)
(a) $7\frac{4}{7}$ (b) $8\frac{4}{7}$ (c) $5\frac{5}{7}$ (d) $5\frac{4}{7}$

Q.247. A shopkeeper marked every item 25% above the cost price and allowed 10% discount. Shruti, being a regular customer, got 5% additional discount on the bill and paid Rs.2394 for the item purchased. What is the cost price of the item (in Rs.) ?
SSC CGL 18/08/2021 (Morning)
(a) 2440 (b) 2240 (c) 2220 (d) 2420

Q.248. A shopkeeper buys an article at 30% discount on its marked price and sells it at 5% discount on its marked price. If he earns a profit of Rs 65, then what is the marked price (in Rs) of the article ?
SSC CGL 18/08/2021 (Afternoon)
(a) 260 (b) 227.50 (c) 325 (d) 292.50

Q.249. In festival season, a shopkeeper allows a discount of 10% on every item. Even after giving the discount, he makes a profit of 20%. If he does not give any discount, then what will be his profit percent? (correct to 2 decimal places)
SSC CGL 23/08/2021 (Morning)
(a) 33 (b) 25 (c) 33.33 (d) 33.43

Q.250. A customer wanted to purchase an item marked for Rs. 10000. Shopkeeper offered two types of discounts, 25% flat discount or successive discounts of 14% and 12%. Which is the better offer for the customer and by how much ?
SSC CGL 24/08/2021 (Morning)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) second offer by Rs. 100
(b) first offer by Rs. 68
(c) second offer by Rs. 68
(d) first offer by Rs. 32

Q.251. A shopkeeper marks an article at a price such that after giving a discount of x% he gains 20%. If the cost price and the marked price of the article are ₹920 and ₹1472 respectively, then what is the value of x ?
SSC CGL 24/08/2021 (Evening)
(a) 18 (b) 20 (c) 25 (d) 30

SSC CHSL 2020 Tier - 1

Q.252. A merchant announces 25% discount on the price of a shirt. If one needs to have a total rebate of 875 and the price of each shirt is 250, then how many shirts should the person purchase?
SSC CHSL 13/04/2021 (Evening)
(a) 15 (b) 12 (c) 9 (d) 14

Q.253. At a factory outlet of a footwear company, every item is available at a discount of 10%. Charu selected footwear marked for Rs. 900. While paying the bill, it was found that the footwear was slightly damaged for which she got another discount of 10%. How much did she pay for the footwear ?
SSC CHSL 16/04/2021 (Evening)
(a) 729 (b) 801 (c) 810 (d) 720

Q.254. A shopkeeper charges ₹1.50 to photocopy a sheet of paper and a discount of 5.5% is given on all photocopies done after 400 sheets. How much will it cost to photocopy 800 sheets of paper ?
SSC CHSL 19/4/2021 (Evening)
(a) ₹1,167 (b) ₹1,160 (c) ₹1,276 (d) ₹1,176

Q.255. A customer availed a 10% discount on the purchase of a table and paid Rs.4950 for it. How much money would he have saved if he had bargained to get 12% discount ?
SSC CHSL 6/8/2021 (Evening)
(a) 110 (b) 99 (c) 108.90 (d) 660

Q.256. The list price of coconut oil is 15% more than its cost price. At what percent less should it be sold for no profit and no loss ?
SSC CHSL 9/8/2021 (Evening)
(a) $13\frac{3}{23}$ % (b) $13\frac{1}{23}$%
(c) $13\frac{2}{23}$% (d) $13\frac{4}{23}$%

Q.257. A marks her goods 25% above the cost price. She sells 25% of the goods at the marked price, 60% at 25% discount and the remaining at 10% discount. What is her overall gain or loss per cent ?
SSC CHSL 10/8/2021 (Evening)
(a) Gain 15.124% (b) Loss 18.175%
(c) Loss 3.125% (d) Gain 4.375%

Q.258. The marked price of an article is Rs. 660. A shopkeeper allows a discount of 20% and still gets a profit of 10%. If he sells it for Rs. 470, his profit or loss percent, correct to two decimal place will be :
SSC CHSL11/8/2021 (Morning)
(a) Profit 3.06% (b) Loss 5.43%
(c) Profit 7.59% (d) Loss 2.08%

SSC CPO 2020 Tier - 1

Q.259. Two successive discounts, each of x% on the marked price of the article, are equal to a single discount of Rs. 331.20. If the marked price of the article is Rs. 920, then the value of x is:
SSC CPO 23/11/2020 (Morning)
(a) 20 (b) 18 (c) 15 (d) 25

Q.260. If house tax is paid before the due date, one gets a reduction of 12% on the amount of the bill. By paying the tax before the due date, a person got a reduction of Rs.2100. The amount (in Rs.) of house tax was:
SSC CPO 23/11/2020 (Evening)
(a) 17,500 (b) 25,000 (c) 21,000 (d) 18,000

Q.261. On a marked price, the difference of selling prices with a discount of 35% and two successive discounts of 20% and 15% is Rs.504. The Marked price of the article (in Rs.) is:
SSC CPO 25/11/2020 (Evening)
(a) 18,000 (b)16,800 (c) 16,000 (d) 15,500

Answer Key :-

1.(d)	2.(b)	3.(c)	4.(d)
5.(b)	6.(b)	7.(d)	8.(d)
9.(d)	10.(a)	11.(d)	12.(a)
13.(d)	14.(b)	15.(a)	16.(d)
17.(c)	18.(d)	19.(b)	20.(c)
21.(d)	22.(d)	23.(c)	24.(c)
25.(b)	26.(c)	27.(c)	28.(c)
29.(d)	30.(a)	31.(b)	32.(c)
33.(d)	34.(d)	35.(c)	36.(d)
37.(a)	38.(a)	39.(d)	40.(c)
41.(b)	42.(c)	43.(d)	44.(d)
45.(d)	46.(d)	47.(c)	48.(c)
49.(a)	50.(c)	51.(a)	52.(b)
53.(d)	54.(b)	55.(d)	56.(c)
57.(c)	58.(b)	59.(a)	60.(a)
61.(d)	62.(b)	63.(a)	64.(c)
65.(a)	66.(a)	67.(d)	68.(d)
69.(d)	70.(c)	71.(c)	72.(b)
73.(a)	74.(d)	75.(d)	76.(b)
77.(a)	78.(a)	79.(d)	80.(a)
81.(a)	82.(b)	83.(c)	84.(a)
85.(a)	86.(c)	87.(c)	88.(b)
89.(d)	90.(d)	91.(c)	92.(b)
93.(a)	94.(a)	95.(c)	96.(c)
97.(a)	98.(d)	99.(c)	100.(d)
101.(a)	102.(b)	103.(c)	104.(a)
105.(a)	106.(a)	107.(b)	108.(a)
109.(d)	110.(c)	111.(b)	112.(c)
113.(d)	114.(c)	115.(b)	116.(a)
117.(b)	118.(b)	119.(d)	120.(b)
121.(c)	122.(b)	123.(c)	124.(d)
125.(a)	126.(a)	127.(b)	128.(b)
129.(b)	130.(c)	131.(a)	132.(a)
133.(a)	134.(b)	135.(a)	136.(d)
137.(a)	138.(a)	139.(b)	140.(d)
141.(a)	142.(c)	143.(c)	144.(b)
145.(d)	146.(b)	147.(c)	148.(b)
149.(a)	150.(d)	151.(c)	152.(b)
153.(b)	154.(a)	155.(a)	156.(b)
157.(c)	158.(a)	159.(d)	160.(a)
161.(c)	162.(b)	163.(b)	164.(d)
165.(d)	166.(b)	167.(a)	168.(b)
169.(c)	170.(c)	171.(d)	172.(b)
173.(b)	174.(c)	175.(a)	176.(d)
177.(c)	178.(c)	179.(d)	180.(c)
181.(d)	182.(d)	183.(b)	184.(a)
185.(c)	186.(a)	187.(d)	188.(c)
189.(c)	190.(a)	191.(b)	192.(a)
193.(a)	194.(a)	195.(b)	196.(a)
197.(b)	198.(d)	199.(d)	200.(b)
201.(a)	202.(c)	203.(c)	204.(b)
205.(d)	206.(a)	207.(c)	208.(a)
209.(a)	210.(a)	211.(a)	212.(d)
213.(a)	214.(c)	215.(a)	216.(a)
217.(b)	218.(d)	219.(a)	220.(c)
221.(b)	222.(c)	223.(d)	224.(b)
225.(d)	226.(b)	227.(b)	228.(d)
229.(c)	230.(c)	231.(a)	232.(d)
233.(c)	234.(b)	235.(c)	236.(a)
237.(b)	238.(b)	239.(d)	240.(d)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

241.(a)	242.(d)	243.(a)	244.(d)
245.(c)	246.(b)	247.(b)	248.(a)
249.(c)	250.(b)	251.(c)	252.(d)
253.(a)	254.(a)	255.(a)	256.(b)
257.(d)	258.(d)	259.(a)	260.(a)
261.(b)			

Solutions:-

Sol.1.(d) Let the marked price of shirt = x
According to question,
SP of shirt = $2x \times \frac{98}{100}$ = $1.96x$
Now,
$\Rightarrow 1.96x = 1274 \Rightarrow x = \frac{1274}{1.96}$ = ₹ 650

Sol.2.(b) According to question,
MP of the three bottles
$= 330 \times \frac{100}{96}$ = ₹ 343.75
CP of the three bottles
$= 330 \times \frac{100}{110}$ = ₹ 300
So, Profit % with discount
$= \frac{343.75 - 300}{300} \times 100 = 14.58$ %

Sol.3.(c) After mixing, cost price of blended sugar = $\frac{120 \times 2 + 80 \times 3}{2 + 3}$
= 96 perkg
Set the marked price of blended sugar at 50 % above ,
Marked price = $96 \times \frac{3}{2}$ = ₹144
After a discount of 25%, Selling price
$= 144 \times \frac{3}{4} = 108$

Sol.4.(d) According to the question,
$\Rightarrow 1500 \times \frac{(100 + y)}{100} - 1500$
$= 2000 \times \frac{(100 + 2y)}{100} \times \frac{(100 - y)}{100} - 2000$
$\Rightarrow 75 \times (100 + y) - 1500$
$= \frac{(100 + 2y) \times (100 - y)}{5} - 2000$
$\Rightarrow 7500 + 75y - 7500$
$= 10000 + 200y - 100y - 2y^2 - 10000$
$\Rightarrow 75y = 100y - 2y^2$
$\Rightarrow 2y^2 = 25y \Rightarrow y = \frac{25}{2} = 12.5$

Sol.5.(b) Average discount = $\frac{6 + 10 + 12}{3}$
$= \frac{28}{3}\% = \frac{28}{300}$ or $\frac{7 \rightarrow Discount}{75 \rightarrow MP}$
ATQ, 75 - 7 = 68 unit ---------- ₹6800
Then, 75 unit ---------- $\frac{6800}{68} \times 75$ = ₹7500
So, MP of each fan = $\frac{7500}{3}$ = ₹2500

Sol.6.(b) Amount paid by Ramesh on 19 november 2019 = 9800 × 98% + 5480 × 95% = 9604 + 5206 = ₹14810

Sol.7.(d) Overall discount given
= 48000 × 9.5% = ₹4560
Discount on first ₹28000
= 28000 × 12% = ₹3360
Discount on next ₹12000
= 12000 × 8% = ₹960
Hence, required discount
= 4560 - (3360 + 960) = ₹240

Sol.8.(d) S.P. of shirt after margin of 9%
$= 900 \times \frac{109}{100} = 981$
S.P. of Jacket after margin 6%
$= 1900 \times \frac{106}{100} = 2014$
Total C.P. for Anand before discount
= 2014 + 981 = 2995
Since shopping is below 3000 then discount offer will be 12 %
Hence , final Cost Price for anand
$= 2995 \times \frac{88}{100} = 2635.60$

Sol.9.(d)
Scheme A : Two successive discounts of 24% and 27%
Discount% = $(24 + 27 - \frac{24 \times 27}{100})\%$
= 51 - 6.48 = 44.52%
Scheme B : Buy 5 get 3 free
Discount% = $\frac{3}{5+3} \times 100 = 37.5\%$
Scheme C : Buy 6 and get 10
Discount% = $\frac{10-6}{10} \times 100 = 40\%$
Clearly, we can see that **Scheme B** will fetch the minimum discount percentage.

Sol.10.(a) Required profit%
$= 42\% - 15\% - \frac{42 \times 15}{100}\% = 27\% - 6.3\%$
$= 20.7\% \approx 21\%$

Sol.11.(d)
Let the initial price of the item = Rs. 100
Then, increased price = Rs. 170
Now, after discount of 5% and 20%
$= 170 \times \frac{19}{20} \times \frac{4}{5} = 129.20$
Again, at cash payment additional discount of 20% is given,
New, Selling price of the item
$= 129.20 \times \frac{4}{5} = 103.36$
Overall profit percent
$= \frac{103.36 - 100}{100} \times 100 = 3.36\%$

Sol.12.(a) Overall discount%
$= \frac{1600 - 1056}{1600} \times 100 = 34\%$
option (a) :- $22 + 15.5 - \frac{22 \times 15.5}{100}$
= 37.5 – 3.41 = 34.09%
Clearly , option (a) does not satisfy the value of y% and z% .

Sol.13.(d) For max. Selling price , discount should be minimum.
Scheme (1) :- $15 + 15 - \frac{15 \times 15}{100}$
= 27.75%
Scheme (2) :- $25 + 5 - \frac{25 \times 5}{100}$ = 28.75%
Scheme (3) :- $20 + 10 - \frac{20 \times 10}{100}$ = 28%
Scheme (4) :- 30%
Clearly , scheme (1) has min. Discount , so selling price will be maximum .

Sol.14.(b)
Marked price of laptop = 72000 Rs.
According to question,
Net discount %
$= 20 + 25 - \frac{20 \times 25}{100} = 40\%$
Price of laptop after discount
$= 72000 \times \frac{60}{100}$ = 43200 Rs.
Required price = 43200 – (2850 × 0.10)
= 42915 Rs.

Sol.15.(a) Let payment made through credit card be x
And payment made in cash be y
According to question,
$x + y = 400000$ --------(1)
$x \times \frac{102}{100} + y \times \frac{90}{100} = 378000$ --------(2)
$x \times \frac{102}{100} + (400000 - x) \times \frac{90}{100}$
= 378000
$\frac{102x + 36000000 - 90x}{100} = 378000$
$12x = 37800000 - 36000000 = 1800000$
$x = \frac{1800000}{12}$ = \$150000
Now payment made through credit card with 2% charges = $150000 \times \frac{102}{100}$
= $ 1,53,000.

Sol.16.(d) Buy 4 get 1 free :-
Discount = $\frac{1}{1+4} \times 100 = 20\%$
Price after 5% discount = 16000 × 95%
= 15200 Rs.
Clearly , he will get both the discount as the purchase made by him was more than 15000 Rs.
So ,
net effective discount
$= 20 + 5 - \frac{20 \times 5}{100} = 24\%$

Sol.17.(c)
$\frac{C.P.}{M.P.} = \frac{100 - D\%}{100 + P\%}$

Search on TC : @apna_pdf

Search on Telegram @apna_pdf

$\frac{C.P.}{37062} = \frac{67}{142}$

C.P. = $\frac{37062 \times 67}{142}$

C.P. = 261 × 67 = 17487 Rs.

Sol.18.(d) Scheme 1 :- Effective discount

= 20 + 12.5 - $\frac{20 \times 12.5}{100}$ = 30%

Scheme 2 :- By going through options one by one , option d satisfy

pay for y and get z free.

30% = $\frac{3}{10} \times 100$ or

$\frac{3}{7+3} \times 100 = \frac{Z}{Y+Z} \times 100$

So , pay for 7 and get 3 free.

Sol.19.(b) Minimum price at which Raghav can purchase 3 shirts

= (1250 + 1540 + 1375) × $\frac{70}{100}$

= 4165 × $\frac{7}{10}$ = ₹2915.50

Sol.20.(c) Scheme - I: net equivalent discount of 15% and 25%

= 15 + 25 - $\frac{15 \times 25}{100}$ = 40 - 3.75 = 36.25%

Scheme - II : Discount% = $\frac{3}{5+3}$ ×100

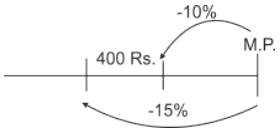
= $\frac{3}{8}$ × 100 = 37.5%

Scheme - III : Discount% = $\frac{6-4}{6}$ × 100

= $\frac{1}{3}$ × 100 = 33.33%

Clearly, we can see that scheme-II is the best for customers.

Sol.21.(d)



Let , M.P. of the fan be 100%

Difference in discount = 15% - 10% = 5%

Savings due to difference in discount (5%) = Rs 400

M.P. (100%) = $\frac{400}{5} \times 100$ = Rs 8000

Sol.22.(d) Total Percentage of MP, when Tanvir paid the payment through cash

= 75% × $\frac{68}{100}$ = 51%

Total Percentage of MP, when Tanvir paid the payment through credit card

= 25% × 1.012 = 25.3%

So, the required percentage = 51 + 25.3 = 76.3%

Sol.23.(c) Discount % on purchasing cell phone on Sunday = $\frac{1000}{20000}$ × 100 = 5%

Effective discount of 5% = 5 + 5 - $\frac{25}{100}$

= 10 - 0.25 = 9.75%

Payment by a person through credit card

= 20000 × 90.25% = ₹18050

Sol.24.(c) (x - 40)% of x = 32

$\frac{x-40}{100} \times x = 32$

$x^2 - 40x = 3200 \Rightarrow x^2 - 40x - 3200 = 0$

$(x - 80)(x + 40) = 0 \Rightarrow x = 80$ or - 40

$x = 80$ (As x cannot be negative)

Sol.25.(b) Let MP = 800 , Then SP = 600

CP = 600 × $\frac{5}{6}$ = 500 Rs.

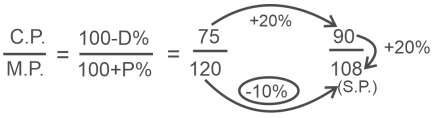
Increased CP = 500 × $\frac{6}{5}$ = 600

New SP = 600 × $\frac{6}{5}$ = 720

New discount = 800 - 720 = 80

Discount % = $\frac{80}{800} \times 100$= 10%

Short Trick :-



Discount % = $\frac{120-108}{120} \times 100$ = 10%

Sol.26.(c)

Effective discount = $\frac{587.40}{1500} \times 100$

= 39.16 %

$\Rightarrow x + x - \frac{x \times x}{100} = 39.16$

$\Rightarrow 200x - x^2 = 3916$

$\Rightarrow x^2 - 200x + 3916 = 0$

$\Rightarrow x^2 - 178x - 22x + 3916 = 0$

$\Rightarrow x(x - 178) - 22(x - 178) = 0$

$\Rightarrow x = 22\%$.....($x \neq 178$)

Desired SP = 1500 × $\frac{100-22}{100}$ = 1170 ₹.

Sol.27.(c) Discount equivalent to (20% and 5%) = 20 + 5 - $\frac{20 \times 5}{100}$ = 24%

C.P. for the dealer → 20000 × $\frac{76}{100}$

= 15200 Rs.

Final C.P. of article for dealer

15200 + 1000 = 16200 Rs.

Desired profit % = $\frac{20000-16200}{16200}$ × 100

= 23.46 %

Sol.28.(c)

Ratio →	M.P.	:	S.P.
-25% →	4	:	3
-20% →	5	:	4
-10% →	10	:	9

Final →	50	:	27

According to the question ,

27 units = 324 Rs. → 1 unit = 12 Rs.

Price tag (50 units) = 12 × 50 = 600 Rs.

Sol.29.(d) Effective discount →

20 + 6.25 − $\frac{20 \times 6.25}{100}$ = 25 %

Fractional value → 25% = $\frac{1}{4}$, 20% = $\frac{1}{5}$

Ratio →	C.P.	:	S.P.	:	M.P.
At 20% profit →	5	:	6		
At 25% discount →			3	:	4

C.P. : S.P. : M.P. =	5	:	6	:	8

Desired % = $\frac{8-5}{5}$ × 100 = 60%

Sol.30.(a)

Fractional value → 20% = $\frac{1}{5}$, 18% = $\frac{9}{50}$

Ratio →	S.P	:	M.P.	:	C.P.
At 18% discount →	41	:	50		
			6	:	5

Balancing the ratio for MP

SP	:	MP	:	CP
246	:	300	:	250

According to the question

246 unit = 492

1 unit = 2

CP (250) unit = 500

Sol.31.(b) 20% = $\frac{1}{5}$ and 25% = $\frac{1}{4}$

CP	:	List Price	:	New List Price	:	SP
4	:	5				
		4	:	5		
				5	:	4

Balancing the ratio for List price and New list price

CP	:	List Price	:	New List Price	:	SP
16	:	20	:	25	:	20

Desired gain % = $\frac{20-16}{16}$ × 100 = 25%

Sol.32.(c) Let the MP of a copy = 1 unit

MP of 100 copies = 100 × 1 = 100 unit

Discount from publisher = 100 × $\frac{25}{100}$= 25

MP of 50 copies = 50 × 1 = 50 unit

Discount from Retailer = 50 × $\frac{10}{100}$ = 5 unit

Total Discount = 25 + 5 = 30 unit

Desired Discount % = $\frac{30}{100+50}$ × 100

= 20%

Sol.33.(d)

Ratio →	C.P.	:	S.P.	:	M.P.
15% markup →	20	:			23
8% discount →			23	:	25

Final Ratio →	500	:	529	:	575

According to question ,

Cost Price (500 units) = 22000 Rs.

1 unit = 44 Rs.

Discount (46 units) = 46 × 44 = 2024 Rs.

Short Trick :-

Required discount

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\Rightarrow 22000 \times \frac{115}{100} \times \frac{8}{100} = 2024$ Rs.

Sol.34.(d) the amount of discount

$= 38500 \times \frac{6}{100} =$ Rs. 2310

Sol.35.(c) $15\% = \frac{3}{20}$, $8\% = \frac{2}{25}$, $5\% = \frac{1}{20}$

S.P. $= 2800 \times \frac{17}{20} \times \frac{23}{25} \times \frac{19}{20} = 2080.12$

Sol.36.(d)

$5\% = \frac{1}{20}$, $10\% = \frac{1}{10}$, $15\% = \frac{3}{20}$

Price of Machine after 3 years

$= 8000 \times \frac{19}{20} \times \frac{9}{10} \times \frac{17}{20}$

$= 2 \times 171 \times 17 = 5814$

Sol.37.(a) According to the question,

$MP \times \frac{3}{4} \times \frac{23}{25} = CP \times \frac{23}{20}$

$\frac{MP}{CP} = \frac{5}{3}$

Marked up % $= \frac{5-3}{3} \times 100 = 66\frac{2}{3}\%$

Sol.38.(a)

Total bulb shi give = 15 + 5 = 20

Free bulb shi give = 5

Required discount % $= \frac{5}{20} \times 100 = 25\%$

Sol.39.(d) For Scheme (A) :-

Discount% $= \frac{30-25}{30} \times 100 = 16\frac{2}{3}\%$

For Scheme (B) :-

Discount% $= 12 + 18 - \frac{12 \times 18}{100} = 30 - 2.16 = 27.84\%$

For Scheme (C) :-

Discount% $= 15 + 15 - \frac{15 \times 15}{100}$

$= 30 - 2.25 = 27.75\%$

Sol.40.(c)

Ratio → Initial : Final

Price → 20 : 17

Weight → 9 : 10

Final price → 180 : 170

Overall discount $= \frac{180 - 170}{180} \times 100$

$= \frac{100}{18} = 5.56\%$

Sol.41.(b) Let cost price = ₹100

Marked price = 100 + k%

According to question ,

$\Rightarrow$ 125 unit = (100 + k%) $\times \frac{4}{5}$

$\Rightarrow 125 - 80 = \frac{4K\%}{5}$

$\Rightarrow K\% = \frac{45 \times 5}{4} = 56.25\%$

Sol.42.(c)

Marked price of notebook = ₹80

SP of notebook = ₹ 80 $\times \frac{92}{100}$ = ₹ 73.6

A shopkeeper gives a pen free then SP = 73.6 - 8.6 = ₹ 65

Cost price of notebook

$= \frac{65}{117} \times 100$ = ₹ 55.56

Sol.43.(d) Required discount %

$= \frac{1}{3+1} \times 100 = 25\%$

Sol.44.(d) Cost price = ₹20,500

After getting two discount of 15% and 5%

Selling price $= 24000 \times \frac{17}{20} \times \frac{19}{20}$

= ₹19380

Loss = 20500 - 19380 = ₹1120

Loss % $= \frac{1120}{20500} \times 100 = \frac{224}{41} = 5\frac{19}{41}\%$

Sol.45.(d) According to question,

Discount by A buyer $= 8 + 8 - \frac{8 \times 8}{100}$

$= 16 - 0.64 = 15.36$ %

Discount by B buyer $= 11 + 5 - \frac{11 \times 5}{100}$

$= 16 - 0.55 = 15.45$ %

Discount by C buyer $= 13 + 3 - \frac{13 \times 3}{100}$

$= 16 - 0.39 = 15.61$ %

Discount by D buyer = 16 %

Therefore, Rajeev chooses buyer D to buy the item at minimum price.

Sol.46.(d) According to question,

C.P. of Mobile phone = 55% of M.P.

$= \frac{55}{100} \times 48000 = 26,400$

S.P. of Mobile phone with returning old phone $= 48000 \times \frac{3}{4} \times \frac{92.5}{100} = 33300$

Then, Profit%

$= \frac{33300 - 26400}{26400} \times 100 = \frac{6900}{246}\%$

S.P. of Mobile phone without returning old phone

$= 75\%$ of M.P. $= \frac{3}{4} \times 48000 = 36,000$

Then, Profit %

$= \frac{36000 - 26400}{26400} \times 100 = \frac{9600}{246}\%$

Now,

Required ratio → $\frac{6900}{246}\% : \frac{9600}{246}\%$

= 23 : 32

Sol.47.(c) Buy 3 get 1 free :-

Discount % $= \frac{1}{3+1} \times 100 = 25\%$

Or other discount = 25%

If a customer buys five shirts using both offers ,

He get each of shirt be discount 25%

So, discount he get overall discount in 5 shirts = 25%

Sol.48.(c)

Let the CP of an article be 100 units

Given : MP of an article = ₹ 550

SP of an article $= 550 \times \frac{60}{100}$ = ₹ 330

According to the question,

110 units = 330

100 units $= \frac{330}{110} \times 100$ = ₹ 300

Sol.49.(a)

Discount = 10490 - 9441 = ₹1049

Discount % $= \frac{1049}{10490} \times 100 = 10\%$

Sol.50.(c)

Effective discount of 30% & 40%

$= (30 + 40 - \frac{30 \times 40}{100})\% = 70 - 12 = 58\%$

Now, MP × (65 - 58)%= 105

MP × 7% = 105

MP $= \frac{105 \times 100}{7}$ = ₹1500

Sol.51.(a)

Cost price	:	Marked price
100 - 20	:	100 + 10
80	:	110
8	:	11

Sol.52.(b) Selling price of television

$= 1200 \times \frac{17}{20} \times \frac{9}{10}$ = ₹918

Sol.53.(d) Selling Price

$= 5000 \times \frac{4}{5} \times \frac{17}{20} \times \frac{9}{10} = 3,060$ ₹

Sol.54.(b)

Let the amount of bill = 100 unit

Given first discount = 25%

and two successive discount = 15% and 20% $= (15 + 20 - \frac{15 \times 20}{100})\% = 32$ %

Now , According to question

$\Rightarrow$ (32 - 25)% = ₹ 28

$\Rightarrow 7\% = 28 \Rightarrow 1\% = \frac{28}{7}$

100% = 4 × 100 = ₹400

Sol.55.(d) Amount of trade discount

$= 25000 \times 6 \times \frac{30}{100}$ = ₹ 45000

Sol.56.(c)

Scheme I : Successive discounts of 15% and 20% $= (15 + 20 - \frac{15 \times 20}{100})\% = 32\%$

Scheme II : Successive discount of 25 % and 10% $= (25 + 10 - \frac{25 \times 10}{100})\% = 32.5\%$

Scheme III : Discount of 33%

As , we can say if there is maximum discount percent , there will be minimum selling price

∴ Scheme III has minimum selling price

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.57.(c) Let, second discount = x %
According to the question,
$\Rightarrow 150 \times \frac{7}{8} \times \frac{(100-x)}{100} = 105$
$\Rightarrow 100 - x = 105 \times \frac{100 \times 8}{150 \times 7}$
$\Rightarrow 100 - x = 80 \Rightarrow x = 20\%$

Sol.58.(b) Selling price = MP × $\frac{4}{5}$
1792 = MP × $\frac{4}{5}$ ⇒ MP = 2240

Sol.59.(a)
let the C.P. of article be 100 unit
104.5 unit = $275 \times \frac{95}{100}$
1 unit = $275 \times \frac{95}{100} \times \frac{1}{104.5}$
100 unit = $275 \times \frac{95}{100} \times \frac{1}{104.5} \times 100$
= ₹250

Sol.60.(a) Selling price of cooker
$= 12500 \times \frac{47}{50} \times \frac{47}{50} \times \frac{24}{25}$
$= \frac{47 \times 47 \times 24}{5} = \frac{53016}{5}$ = ₹10603.20

Sol.61.(d) According to the question,
(i) Discount = $10 + 8 - \frac{10 \times 8}{100}$
= 18 - 0.8 = 17.2%
(ii) Discount = $12 + 10 - \frac{1\,2 \times 10}{100}$
= 22 - 1.2 = 20.8%
(iii) Discount = $12 + 12 - \frac{12 \times 12}{100}$
= 24 - 1.44 = 22.56%
(iv) Discount = 20%
It is clear from the above expression scheme (iii) the selling price is the lowest.

Sol.62.(b) $1600 \times \frac{83}{100} \times \frac{100-x}{100} = 747$
$\Rightarrow 100 - x = \frac{747 \times 100}{83 \times 16} = \frac{900}{16} = 56.25$
⇒ x = 100 - 56.25 = 43.75

Sol.63.(a)
Total sweater = 7, free sweater = 2
Effective discount = $\frac{2}{7} \times 100 = 28\frac{4}{7}\%$

Sol.64.(c) Net decrease
$= 25 + 25 - \frac{25 \times 25}{100} = 43.75\ \%$
Net Increase
$= 25 + 25 + \frac{25 \times 25}{100} = 56.25\ \%$
Required % = $\frac{(56.25 - 43.75)}{56.25} \times 100$
$= \frac{12.5}{56.25} \times 100 = 22.22\%$

Sol.65.(a) Actual discount
$= 8 - 18 - \frac{8 \times 18}{100} = -10 - 1.44 = -11.44\%$

Sol.66.(a) Let the MP = 100 units
MP after increment
$= 100 \times \frac{140}{100} = 140$ units
Required discount
$= \frac{140 - 100}{140} \times 100 = 28\frac{4}{7}\ \%$

Sol.67.(d)
Discount at each item = 340 × 25% = 85
Let minimum item purchased by Anurag = x
Then, according to the question,
$85x = 390 \Rightarrow x = 4.58$
Hence,
Anurag should purchase at least 5 items.

Sol.68.(d) Selling price of a dozen pairs of gloves = 180 × 90% = Rs.162
According to the question,
$\frac{162}{12} = \frac{54}{x} \Rightarrow x = 4$
Hence, pairs of gloves can be bought for Rs. 54 is 4 pairs.

Sol.69.(d) Buy 5 get 1 free
Let MP = 6 unit
Then, SP = 5 unit (as 1 unit is free)
Discount % = $\frac{1}{6} \times 100 = 16.67\%$

Sol.70.(c)
Two successive discount of 20%
$= 20 + 20 - \frac{20 \times 20}{100} = 36\%$
Two successive discount of 30% and 10%
$= 30 + 10 - \frac{30 \times 10}{100} = 37\%$
Required amount
$= 1600 \times \frac{37 - 36}{100}$ = ₹ 16

Sol.71.(c) Let the original cost price of the goods = 100 units
MP of the goods
= 100 × 125% = 125 units
SP of the goods
= 125 × 90% = 112.5 units
112.5 units = ₹ 540
(original cost price) 100 units
$= \frac{540}{112.5} \times 100$ = ₹ 480

Sol.72.(b)
(i) SP = $1000 \times \frac{3}{4} \times \frac{19}{20} = 712.5$
(ii) SP = $1000 \times \frac{4}{5} \times \frac{9}{10} = 720$
Difference between SP = 720 - 712.5 =7.5

Sol.73.(a) First discount = 37%
Second two successive discount (effective rate) = $23 + 7 - \frac{23 \times 7}{100}$
= 30 - 1.61 = 28.39%
Required amount = $2635 \times \frac{(37 - 28.39)}{100}$
$= 2635 \times \frac{8.61}{100} = 226.87$

Sol.74.(d) Effective discount %
$= \frac{12}{12 + 24} \times 100 = 33\frac{1}{3}\%$

Sol.75.(d) $\frac{MP}{CP} = \frac{100 + P\%}{100 - D\%}$
$\frac{14}{10} = \frac{100 + 23.2}{100 - D\%}$
$100 - D\% = \frac{5}{7} \times 123.2$
$100 - D\% = 88 \Rightarrow D\% = 12\%$

Sol.76.(b) Required discount%
$= \frac{145 - 127.6}{145} \times 100 = \frac{17.4}{145} \times 100 = 12\%$

Sol.77.(a) Marked price = 2,165
Selling Price = 1710.35
Discount % = $\frac{M.P. - S.P.}{M.P.} \times 100$
$= \frac{2165 - 1710.35}{2165} \times 100$
$= \frac{454.65}{2165} \times 100 = 21\ \%$

Sol.78.(a) 10% = $\frac{1}{10}$, 20% = $\frac{1}{5}$

MP		SP
10	:	9
5	:	4
5	:	4
250	:	144 = 125 : 72

Required %
$= \frac{125 - 72}{125} \times 100 = \frac{53}{125} \times 100 = 42.4\%$

Sol.79.(d) Let the second discount be x
According to question,
$2500 \times \frac{9}{10} \times x\% = 1800$
$2250 \times x\% = 1800$
$x\% = \frac{1800}{2250} = \frac{4}{5}$
$\Rightarrow x = \frac{5 - 4}{5} \times 100 = \frac{100}{5} = 20\%$

Sol.80.(a) Marked price
$= 7290 \times \frac{10}{9} \times \frac{10}{9}$ = ₹9000

Sol.81.(a) Discount %
$= \frac{82{,}500 - 79{,}200}{82{,}500} \times 100 = \frac{3300}{82{,}5}\% = 4\ \%$

Sol.82.(b) Net discount after three successive discount
$= 2000 - 2000 \times \frac{9}{10} \times \frac{9}{10} \times \frac{9}{10}$
= 2000 - 1458 = 542
Discount of 28% = $2000 \times \frac{28}{100} = 560$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Required difference = 18

Sol.83.(c) Single discount of 12% & 20%

$= (12 + 20 - \frac{12\times20}{100})\% = 32 - 2.4$

$= 29.6\% \approx 30\%$

Single discount of 24% & 32%

$= (24 + 32 - \frac{24\times32}{100})\% = 56 - 7.68$

$= 48.32\% \approx 48\%$

Now, single equivalent discount of 30% & 48% $= (30 + 48 - \frac{30\times48}{100})\% = 78 - 14.4$

$= 63.6\% \approx 63.62\%$

Sol.84.(a) SP of the toy

$= 30{,}000 \times \frac{4}{5} \times \frac{19}{25} \times \frac{9}{10} =$ ₹16416

Sol.85.(a) $12\% = \frac{3}{25}$, $15\% = \frac{3}{20}$

Final price of the trouser

$= 1500 \times \frac{22}{25} \times \frac{23}{20} =$ ₹1518

Sol.86.(c) If the bill is paid before the due date, the reduction is 5% which is equal to 250.

5 % = ₹ 250 ⇒ 1 % = ₹ 50

⇒ 100 % = ₹ 5000

Hence, original amount of his electricity bill = ₹ 5,000

Sol.87.(c) Let CP = 100%

$\Rightarrow MP = 100 \times \frac{11}{10} = 110\%$

$\Rightarrow SP = 110\% \times \frac{23}{25} = 101.2\%$

According to the question,

⇒ 100% = 250000

⇒ 1% = 2500 ⇒ 1.2% = 2500 × 1.2 = 3000

So, the value of x = ₹ 3000

Sol.88.(b) Let CP = 100 unit

$\Rightarrow MP = 100 \times \frac{120}{100} = 120$ unit

Then, $SP = 120 \times \frac{19}{20} = 114$ unit

According to question,

⇒ 114 unit = 2280 ⇒ 100 unit = ₹ 2000

So, CP = ₹ 2000

Sol.89.(d) $SP = 1250 \times \frac{31}{50} =$ ₹775

SP' = 434

Required discount $= \frac{775 - 434}{775} \times 100$

$= \frac{341}{775} \times 100 = 44\%$

Sol.90.(d)

Price of the laptop for a customer

$= (85275 - 275) \times \frac{9}{10} \times \frac{23}{25} \times \frac{19}{20}$

$= 85000 \times \frac{3933}{5000} =$ ₹ 66,861

Sol.91.(c)

Discount % $= \frac{1}{1+4} \times 100 = \frac{100}{5} = 20\%$

Sol.92.(b) ATQ,

$425 \times \frac{19}{20} \times y\% = 323$

$\frac{1{,}615}{4} \times y\% = 323$

$y\% = \frac{323\times4}{1615} = \frac{4}{5}$

Then, discount(y) $= \frac{5-4}{5} \times 100 = 20\%$

Sol.93.(a) Discount given when customer pays instantly = 12% = $\frac{3}{25}$

Discount given when custom pays through credit card = 6% = $\frac{3}{50}$

Total amount billed

$= 2200 \times \frac{47}{50} + 7500 \times \frac{22}{25}$

= 2,068 + 6600 = ₹8668

Sol.94.(a)

First offer : when 30% discount is given

Amount paid by customer

= 15,000 × 70% = ₹10500

Second offer : Buy two get one free

Amount paid by customer

$= 15{,}000 \times \frac{2}{2+1} =$ ₹10,000

Required difference = 10,500 - 10,000

= ₹500

Sol.95.(c) Amount paid by customer in cash $= 510 \times \frac{3}{4} \times \frac{19}{20} = \frac{2907}{8}$

= ₹363.38

Sol.96.(c) MP = 256000 ₹

$\Rightarrow SP = 256000 \times \frac{88}{100} = 225280$ ₹

Final SP = 205000 ₹

⇒ cash discount

$= \frac{225280 - 205000}{225280} \times 100$

⇒ Cash discount %

$= \frac{20280}{225280} \times 100 \approx 9\%$

Sol.97.(a) Let Marked price = 100 %

Selling price $= 100 \times \frac{83}{100} = 83$ %

Now, ⇒ 83 % = 1245

⇒ 100 % = 1500

Therefore, Marked Price will be ₹ 1500.

Sol.98.(d)

Scheme 1 : 2 successive discounts of 25% and 15%

Single discount of 25% & 15%

$= (25 + 15 - \frac{25\times15}{100})\%$

= 40 - 3.75 = 36.25%

Scheme 2 : Single discount of 20%

Scheme 3 : 2 free on purchase of 3 items

Discount % $= \frac{2}{2+3} \times 100 = 40\%$

Scheme 4: 3 free on purchase of 7 items

Discount % $= \frac{3}{3+7} \times 100 = 30\%$

Clearly, we can see that scheme 3 yields maximum discount on purchase of ₹x.

Sol.99.(c) **Scheme 1 :** 2 successive discounts of 5% and 5%

Single discount of 5% and 5%

$= (5 + 5 - \frac{5\times5}{100})\% = 10 - 0.25 = 9.75\%$

Scheme 2 : Single discount of 10%

Scheme 3 : 2 successive discounts of 8% and 2%

Single discount of 8% and 2%

$= (8 + 2 - \frac{8\times2}{100})\% = 10 - 0.16 = 9.84\%$

Clearly, we can see that only scheme 1 will yield minimum discount.

Sol.100.(d)

Let the season's discount be x%

ATQ,

$32{,}000 \times \frac{23}{25} \times x\% = 25{,}000$

$29{,}440 \times x\% = 25{,}000$

$x\% = \frac{25{,}000}{29440} = \frac{625}{736}$

$x = \frac{736-625}{736} \times 100 = \frac{11100}{736} = 15.08\%$

Sol.101.(a) **Scheme 1 :** Buy 9 get 1 free

Discount % $= \frac{1}{9+1} \times 100 = \frac{100}{10} = 10\%$

Scheme 2 : Buy 7 get 8

$\frac{8-7}{8} \times 100 = \frac{100}{8} = 12.5\%$

Scheme 3 : 2 successive discounts of 20% and 15%

Net discount % $= (20 + 15 - \frac{20\times15}{100})\%$

= 35 - 3 = 32%

Clearly, we can see that Scheme 1 has the lowest discount percentage.

Sol.102.(b) Single discount = 30%

And successive discount = 26% and 5%

Net discount = $26 + 5 - \frac{26\times5}{100} = 29.7\%$

Difference between these two discounts = 0.3%

∴ Discount = 50000 × 0.3% = 150

Sol.103.(c)

First discount = Single discount of 27%

Second discount = two successive discounts of 20% and 10%

∴ Net discount $= 20 + 10 - \frac{20\times10}{100} = 28\%$

Difference = 28% - 27% = 1%

Here 1% = 56

Hence,

total amount of bill = 100% =5600

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.104.(a)
Required single discount %
= (20 + 35 + 10 - $\frac{20\times35+35\times10+10\times20}{100}$ + $\frac{20\times35\times10}{10,000}$)%
= (65 - $\frac{700+350+200}{100}$ + $\frac{7000}{10,000}$)%
= (65 - 12.5 + 0.7)% = 53.2%

Sol.105.(a) Given, M.P = Rs. 1250
$\frac{C.P}{M.P} = \frac{100-D\%}{100+P\%}$
$\frac{C.P}{1250} = \frac{86}{114}$
⇒ C.P = $\frac{86}{114}$ × 1250 = Rs. 943

Sol.106.(a) M.P of the book = Rs. 850
S.P after getting two discount of 20% and 10% = 850 × $\frac{4}{5}$ × $\frac{9}{10} = Rs.\ 612$
Overall cost price of the book = 612 + 55 = Rs. 667
Selling price = Rs. 980
Profit % = $\frac{980-667}{667} \times 100 = 46.93\%$

Sol.107.(b) Price of basket after a discount of 5% = $\frac{19}{20} \times 80 = Rs.76$
Price of wallet after a discount of 8%
= $\frac{23}{25} \times 150 = Rs.\ 138$
Price of belt after a discount of 10%
= $\frac{9}{10} \times 350 = Rs.315$
Amount paid by Rakhi
= 76 + 138 + 315 = Rs. 529

Sol.108.(a) Selling price of item after giving discount of 18%
= 26000 × $\frac{82}{100}$ = Rs. 21320
Now, item sold at Rs. 16,000
Then, new season's discount
= (21320 - 16000) = 5320
Hence, desired % = $\frac{5320}{21320}$ ×100 = 24.95%

Sol.109.(d)
Let marked price of sofa set be x
According to the question,
$x \times \frac{85}{100} \times \frac{75}{100}$ = 12750
x = 12750 × $\frac{20}{17}$ × $\frac{4}{3}$ = Rs. 20,000

Sol.110.(c) Marked price
= $\frac{100}{88} \times 6622 = Rs.\ 7,525$

Sol.111.(b) According to the question,
Let marked price of item = x
$x \times \frac{3}{4} \times \frac{18}{25}$ = 10800 ⇒ x = 20000 Rs

Sol.112.(c) Equivalent discount of 10% and 15% = 10 + 15 − $\frac{10\times15}{100}$ = 23.5%
Now equivalent discount of 23.5% and 20% = 23.5 + 20 − $\frac{23.5\times20}{100}$ = 38.80%

Sol.113.(d) Marked price
= 1110 × $\frac{100}{30}$ = 3700 Rs.

Sol.114.(c) C.P. × $\frac{21}{20}$ × $\frac{9}{10}$ = 1890 ₹
Cost price = $\frac{1890\times200}{189}$ = 2,000 ₹

Sol.115.(b) Required discount
= $\frac{1}{(1+2)} \times 100$ = 33.33%

Sol.116.(a) 1500 × $\frac{4}{5}$ × k = 1104 ₹
k = $\frac{1104}{1200}$ = $\frac{92}{100}$
So, required discount %
= $\frac{100-92}{100} \times 100$ = 8%

Sol.117.(b) Total price of items
= 560 + 90 + 45 = 695 Rs.
Required discount = 695 ×10% = 69.5 Rs.

Sol.118.(b) Required S.P.
= 800 × $\frac{9}{10}$ × $\frac{19}{20}$ = ₹684

Sol.119.(d)
(i) 20 + 10 − $\frac{20\times10}{100}$ = 28%
(iii) $\frac{4}{12}$ × 100 = 33.33%
(iv) $\frac{6}{15}$ × 100 = 40%
Clearly , (iv) has a maximum discount .

Sol.120.(b) $\frac{Cost\ price}{Marked\ price} = \frac{100-D\%}{100+P\%}$
$\frac{24,000}{30,000} = \frac{100-D\%}{109}$
$100 - D\%$ = 87.2 ⇒ D% = 12.8%

Sol.121.(c)
1st offer :- 25 + 15 − $\frac{25\times15}{100}$ = 36.25%
2nd offer :- 30 + 10 − $\frac{30\times10}{100}$ = 37%
3rd offer :- 35 + 5 − $\frac{35\times5}{100}$ = 38.25%
4th offer :- 20 + 20 − $\frac{20\times20}{100}$ = 36%
Clearly , the 3rd offer is best for customers.

Sol.122.(b)
Cost price = $\frac{450\times80\%}{1.5}$ = $\frac{360}{1.5}$ = 240 ₹

Sol.123.(c) 25 % discount = $\frac{-1}{4}$
Difference (1 unit) = 22,400 ₹
He paid (3 units) = 22,400 × 3 = 67,200 ₹

Sol.124.(d) Net discount %
= 30 + 20 − $\frac{30\times20}{100}$ = 44%

Sol.125.(a)
Marked price of the item = Rs. 500
Overall discount for Ravi
= 36 + 5 − $\frac{36\times5}{100}$ = 39.2%
Prabhat got a discount of 40% ,
Hence, Ravi will pay more,
= (40 - 39.2)% × 500 = Rs. 4

Sol.126.(a) According to the question.
Discount on 1 article = 32 × $\frac{1}{4}$ = ₹ 8
Discount of ₹ 8 → 1 article
Discount of ₹ 40 → 5 articles

Sol.127.(b)
Price of fancy item after discount
= $\frac{250}{100}$ × 82 = ₹205

Sol.128.(b) Selling price of the shirt
= 2000 × $\frac{17}{20}$ × $\frac{19}{20}$ = ₹ 1,615

Sol.129.(b)
Let CP = 100R then MRP = 150R
SP = 90R = 1305
R = $\frac{29}{2}$, CP = 100 × $\frac{29}{2}$ = ₹1450

Sol.130.(c) Marked price of the article
= 3,068.5 × $\frac{20}{19}$ × $\frac{20}{17}$ = ₹3800

Sol.131.(a) According to the question,
13% = 260.39
1% = 20.03
Amount of electricity bill = 100% = ₹2003

Sol.132.(a) Schemes A :-
Discount % = $\frac{4}{7}$ × 100 = 57.14%
Schemes B :-
Discount % = $\frac{6}{11}$ × 100 = 54.54%
Clearly , max. discount is in 1st scheme.

Sol.133.(a) Marked price of the washing machine = 29750 × $\frac{100}{85}$ = Rs. 35000
If no discount is allowed then, shopkeeper gains 12% profit
So,
cost price = 35000 × $\frac{100}{112}$ = Rs.31250

Sol.134.(b) According to question,
A:- net discount % = 10 + 15 − $\frac{10\times15}{100}$
= 23.5 %
B :- discount % = $\frac{2}{5+2}$ × 100 = 28.57 %

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Clearly, we can see that scheme B has the maximum discount.

Sol.135.(a) According to question,
Cost price of article = 10000 Rs.
1st discount = 500 Rs. and 2nd discount = 7%
Required price of the article
$= (10000 - 500) \times \frac{93}{100}$ = 8835 Rs.

Sol.136.(d) $\frac{CP}{MP} = \frac{100 - discount\ \%}{100 + profit\ \%}$
$\frac{CP}{4200} = \frac{100 - 5}{100 + 14}$
Cost price = $4200 \times \frac{95}{114}$ = ₹3,500

Sol.137.(a) According to question,
Net discount % = $12 + 8 - \frac{12 \times 8}{100}$
= 19.04 %
Required selling price of book
$= 1000 \times \frac{(100 - 19.04)}{100}$
= 809.6 ≈ 810 Rs.

Sol.138.(a) $\frac{CP}{MP} = \frac{100 - discount\%}{100 + gain\ \%}$
$\frac{CP}{MP} = \frac{100 - 10}{100 + 20} = \frac{90}{120}$
Required ratio = 3 : 4

Sol.139.(b)
Let the cost price be 100 units.
According to question,
Marked price = 160 unit
Net discount on marked price
$= 10 + 20 - \frac{10 \times 20}{100}$ = 28%
Now,$[(\frac{160 \times (100 - 28)}{100}) - 100]$
units = 1064 Rs.
Cost price (100 unit)
$= 1064 \times \frac{100}{15.2}$ = 7000 Rs.

Sol.140.(d) Marked price = 4500 Rs.
Selling price = 2400 Rs.
$4500 \times \frac{80}{100} \times k = 2400$
$k = \frac{2400}{45 \times 80} = \frac{30}{45} = \frac{2}{3}$
Required discount % = $\frac{3 - 2}{3} \times 100$
$= 33\frac{1}{3}\%$

Sol.141.(a) According to question,
A: Discount % = $\frac{4}{10} \times 100$ = 40 %
B: Discount % = $\frac{5}{10} \times 100$ = 50%
C: Discount % = $18 + 24 - \frac{18 \times 24}{100}$
= 37.68 %
We can clearly see that scheme B has the maximum Discount.

Sol.142.(c) $\frac{C.P}{M.P} = \frac{100 - D\%}{100 + P\%}$
$\frac{2000}{M.P} = \frac{80}{120}$
$M.P = \frac{2000 \times 120}{80}$
Marked price (M.P.) = 3000 Rs.

Sol.143.(c)
Equivalent discount of 5% and 10%
$5 + 10 - \frac{5 \times 10}{100}$ = 14.5%
Now, equivalent discount of 14.5% and p%
$14.5 + p - \frac{14.5 \times p}{100} = 31.6$
1450 + 100p − 14.5p = 3160
85.5p = 1710
$p = \frac{1710}{85.5}$ = 20%

Sol.144.(b) Let cost price = 100 unit
Marked price = $100 \times \frac{140}{100}$ = 140 unit
After allowing the discount of 10%
Selling price of the goods
$= 140 \times \frac{90}{100}$ = 126 unit
Hence,
required profit% = $\frac{126 - 100}{100} \times 100$= 26%
Short trick :-
Net profit % = $40 - 10 - \frac{40 \times 10}{100}$ = 26%

Sol.145.(d) Equivalent discount of 30% and 30% = $30 + 30 - \frac{(30)^2}{100}$ = 51%
According to the question,
(51 − 50)% = 43 ⇒ 1% = ₹43
Hence, cost price of the shirt (100%)
= ₹4300

Sol.146.(b) (1) Discount of 30%
(2) Equivalent discount of 15% and 15%
$= 15 + 15 - \frac{15 \times 15}{100}$ = 27. 75%
(3)Discount on Buy 2 , get 1 free
$= \frac{1}{3} \times 100$ = 33.33%
(4)Discount on buy 5, get 3 free
$= \frac{3}{8} \times 100$ = 37.5%
So, maximum discount to a customer
⇒ (4) = 37.5%

Sol.147.(c) Equivalent discount given by first shopkeeper
$= 25 + 15 - \frac{25 \times 15}{100}$ = 36.25 %
Equivalent discount given by second shopkeeper = $20 + 20 - \frac{20 \times 20}{100}$ = 36 %
Equivalent discount given by third shopkeeper = $30 + 10 - \frac{30 \times 10}{100}$ = 37%
So, customers get the highest profit from the third shopkeeper.

Sol.148.(b) Required discount
$= \frac{15990 - 12792}{15990} \times 100$
$= \frac{319800}{15990}$ = 20%

Sol.149.(a) Case I. overall discount
$= 5 + 5 - \frac{5 \times 5}{100}$ = 10 - 0.25 = 9.75%
Case II. discount = 10%
Case III. overall discount
$= 8 + 2 - \frac{8 \times 2}{100}$ = 10 - 0.16 = 9.84%
Hence, maximum discount is offered in case II.

Sol.150.(d) Let MP be 100%
Effective discount%
$= (25 + 12 - \frac{25 \times 12}{100})\%$ = (37 - 3)% = 34%
(100 - 34)% = 66% ---------- ₹792
100% ---------- $\frac{792}{66} \times 100$ = ₹1200

Sol.151.(c) Anjali have to pay
= 450 × 88% + 100 × 85% + 850 × 80%
= 396 + 85 + 680 = 1161 Rs.

Sol.152.(b) According to question,
Selling price of Silver puja thali
$= 10000 \times \frac{90}{100} \times \frac{95}{100} \times \frac{95}{100}$
= Rs. 8122.50

Sol.153.(b) $Y \times \frac{23}{25} \times \frac{7}{8} = 3059$
$Y = \frac{3059 \times 8 \times 25}{23 \times 7} = \frac{133 \times 200}{7}$ = 3800Rs.

Sol.154.(a) Let , cost price of the article be 100 Rs. Then
Mark price = 150 Rs.
S.P. = $150 \times \frac{19}{20} \times \frac{9}{10} \times \frac{4}{5}$
$= \frac{150 \times 684}{1000}$ = 102.6
Required profit % = 2.6% or $2\frac{3}{5}\%$

Sol.155.(a) According to question:-
$\frac{C.P.}{M.P.} = \frac{100 - 10\%}{100 + 22\%} = \frac{90}{122}$
90 unit = 1800
Therefore,
List price (122 unit)
= 122 × 20 = Rs. 2440

Sol.156.(b) $560 \times \frac{83}{100} \times k = 420$
$k = \frac{3 \times 100}{4 \times 83} = \frac{75}{83}$
Required discount %
$= \frac{83 - 75}{83} \times 100$ = 9.64%

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.157.(c) Let , the marked price of a shampoo bottle be 100 Rs.
Cost of two bottles = 40 + 40 = 80 Rs.
Selling price of two bottles
= 100 + 100 × 40% = 140 Rs.
Required profit % = $\frac{140-80}{80} \times 100$ = 75%

Sol.158.(a) According to question,
Marked Price of book
= 2550 × $\frac{100}{68} \times \frac{100}{75}$ = Rs. 5000

Sol.159.(d)
Profit % = $30 - 12 - \frac{30 \times 12}{100}$ = 18 − 3.6
Profit % = 14.4%
Cost price = 3500 × $\frac{100}{114.4} \approx$ 3059.4 Rs.

Sol.160.(a) Required discount %
= $\frac{1800-1250}{1800} \times 100$
= $\frac{550}{18} = \frac{275}{9} = 30\frac{5}{9}$%

Sol.161.(c) According to the question,
$10000 \times \frac{85}{100} \times \frac{(100-x)}{100} = 7650$
$85x = 8500 - 7650 = x = 10\%$

Sol.162.(b) Discount %
= $\frac{840-798}{840} \times 100 \Rightarrow \frac{42}{840} \times 100 = 5\%$

Sol.163.(b) According to the question,
$14000 \times \frac{77}{100} \times \frac{(100-y)}{100}$ = ₹ 9702
$100 - y = 90 \Rightarrow y = 10\%$

Sol.164.(d) Discount = 1% = $\frac{1}{100}$
So, marked price = 100 , selling price = 99
Discount = 100 - 99 = 1 → 4000
Selling price = $\frac{4000}{1} \times 99$ = ₹3,96,000

Sol.165.(d) Total discount
= 10 + 15 − $\frac{10 \times 15}{100}$ = 23.50%

Sol.166.(b)
Let the C.P of the article = $100x$
S.P of the article = $100x \times \frac{9}{10} = 90x$
M.P of the article × $\frac{4}{5} = 90x$
M.P of the article = $90x \times \frac{5}{4}$
Ratio of C.P and M.P =
$100x : 90x \times \frac{5}{4} = 8 : 9$

Sol.167.(a) Let CP = 100 unit
Marked price = 120 unit
After given the discount of 10%
Selling price = 120 × $\frac{9}{10}$ = 108 unit
So, Profit % = $\frac{108-100}{100} \times 100 = 8\%$

Sol.168.(b)
Formula used :- $\frac{CP}{MP} = \frac{100 - discount\%}{100 + profit\ \%}$
$\frac{6400}{MP} = \frac{100-20}{100+30} \Rightarrow MP = 6400 \times \frac{130}{80}$
= ₹10,400

Sol.169.(c) According to question,
Selling price of bag
= 1488 × $\frac{75}{100}$ = Rs. 1116
Profit = 20%
Cost price = $\frac{1116 \times 100}{120}$ = Rs. 930

Sol.170.(c)
The marked price of the car is 100%.
Here, (8 − 4)% = Rs. 7200
So, Marked price = 7200 × $\frac{100}{4}$
= Rs. 180000

Sol.171.(d) According to question,
4080 = 5000 × $\frac{85}{100} \times \frac{(100-b)}{100}$
$(100 - b) = \frac{4080 \times 100 \times 100}{5000 \times 85}$
$b = 100 - 96 = 4\%$

Sol.172.(b) Marked price of the article
= 3616 × $\frac{5}{4} \times \frac{5}{4}$ = Rs. 5650
If article is sold at discount of 20% ,
Selling price = 5650 × $\frac{4}{5}$ = Rs. 4520

Sol.173.(b) Required MRP
= 573.18 × $\frac{50}{41}$ = ₹ 699

Sol.174.(c)
$\frac{2}{5}$ of M.P. = $\frac{5}{8}$ of S.P. $\frac{M.P.}{S.P.} = \frac{25}{16}$
Required discount %
= $\frac{25-16}{25} \times 100 = 36\%$

Sol.175.(a) According to the question,
A × $\frac{1}{5}$ = B × $\frac{3}{20}$ ⇒ ratio of the MP of A and B = $A : B = 3 : 4$

Sol.176.(d)
Ratio → M.P : C.P
Price → 400 : 100
When we get 64% profit then S.P = 164
Discount percentage
= $\frac{400-164}{400} \times 100 = 59\%$

Sol.177.(c)
Let M.P. of trouser and jacket be x and $3x$
Discount on trouser = $\frac{20}{100} \times x = 0.2x$
Discount on both trouser and jacket
= $\frac{30}{100} \times (x + 3x) = 1.2x$
Discount on jacket = $1.2x - 0.2x = x$
Discount % on Jacket = $\frac{x}{3x} \times 100 = 33.33\%$

Sol.178.(c) Marked price of ring = 20,000 ₹
Final selling price after two successive
discount = 20000 × $\frac{3}{4} \times x = 12000$
$x = \frac{12000 \times 4}{20000 \times 3} = \frac{4}{5}$
Required discount = $\frac{5-4}{5} \times 100 = 20\%$

Sol.179.(d) According to the question,
$\frac{CP}{MP} = \frac{10}{13}$
After allowing the discount of 20%
SP = $13 \times \frac{4}{5} \Rightarrow$ 10.4 unit
Now, SP (10.4) unit = 5720
So, CP(10 unit) = 5720 × $\frac{10}{10.4}$ = Rs. 5500

Sol.180.(c) Difference between the discount percentage = difference in value
9% - 6% = ₹30 ⇒ 3% = ₹30
marked price (100%) = ₹1000

Sol.181.(d) M.P. of computer = Rs. 80000
S.P. of computer = Rs. 65280
After 1st discount S.P. of computer
= 80000 − $\frac{80000 \times 15}{100}$ = Rs. 68000
2nd discount % = $\frac{(68000-65280)}{68000} \times 100$
= 4%

Sol.182.(d)
Effective discount = $x + y - \frac{xy}{100}$
$12 + 18 - \frac{12 \times 18}{100} = 27.84$
Again ,
$27.84 + 25 - \frac{27.84 \times 25}{100} = 45.88\%$
Short trick :- Ratio

MP	:	SP
25	:	22
50	:	41
4	:	3
5000	:	2706

equivalent discount will be
= $\frac{5000-2706}{5000} \times 100 = 45.88$

Sol.183.(b) Discount % = $\frac{MP - SP}{MP} \times 100$
45 MP = (MP - 330) × 100
MP = ₹600
Short trick :
Let MP be 100 units
Discount = 45% then SP = 55 units
55 units = ₹330 , 100 units = ₹600

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.184.(a) The marked price of the watch = Rs 2750
Then Price after discount of 10%
$= 2750 \times \frac{90}{100}$ = Rs 2475
Again a discount was given after which the price was reduced to 2103.75.
Discount given = 2475 - 2103.75
= Rs 371.25
Discount% = $\frac{371.25}{2475} \times 100$ = 15%

Sol.185.(c) Rate of hotel for a day = 1500 Rs. per room.
Discount of 12% on booking of 2 or more rooms and an additional discount of 5% on SBI card.
Required amount to pay
$= 1500 \times 2 \times \frac{88}{100} \times \frac{95}{100}$ = Rs 2508

Sol.186.(a)
Due to offer he get 3 coconuts free ,
Price for 3 coconuts = 25 × 3 = Rs.75
Total coconuts = 12 + 3 = 15 coconuts
Actual price for 15 coconuts = 25 × 15
= Rs. 375
Effective discount = $\frac{75}{375} \times 100$ = 20%

Sol.187.(d) Total price of five products = 500 × 5 = Rs 2500.
Net discount = a + b - $\frac{ab}{100}$
$= 10 + 5 - \frac{10 \times 5}{100} = 14.5$
Now, final price = $2500 \times \frac{85.5}{100}$
= Rs 2137.5.

Sol.188.(c) Sohan got two discount of 10% and 5 % on buying a book.
So, M.R.P of the book
$= 513 \times \frac{100}{90} \times \frac{100}{95} = Rs.600$

Sol.189.(c) Required amount that has to be paid by customer
$= 2800 \times \frac{11}{20} \times \frac{3}{4}$ = ₹1155

Sol.190.(a)
SP of fan = (1285 - 85) $\times \frac{9}{10} \times \frac{49}{50}$
$= 1200 \times \frac{441}{500} = \frac{5,292}{5}$ = ₹1,058.4

Sol.191.(b) The price of 1 packet = ₹30
So, the price of 25 packets = 30 × 25
= ₹750
Amount paid by customer through cash
$= 750 \times \frac{9}{10} \times \frac{99}{100} = \frac{2,673}{4}$ = ₹668.25

Sol.192.(a) Let the second discount be x%
ATQ,
$14,500 \times \frac{9}{10} \times x = 10,000$
$\frac{9x}{10} = \frac{10,000}{14,500} = \frac{20}{29}$
$x = \frac{20 \times 10}{29 \times 9} = \frac{200}{261} = \frac{261 - 200}{261} \times 100$
$= \frac{61}{261} \times 100 = 23.37\%$

Sol.193.(a) CP of an article = ₹4,000
SP of an article = $8,400 \times \frac{3}{4} \times \frac{17}{20}$
= ₹5355
Ratio of the CP and SP of an article
= 4,000 : 5,355 = 800 : 1071
Required percentage = $\frac{1071 - 800}{800} \times 100$
$= \frac{271}{800} \times 100 \approx 34\%$

Sol.194.(a) SP of textbook for shopkeeper = $100 \times \frac{17}{20} \times \frac{9}{10}$ = ₹76.5
So, the net discount given to the customer = 100 – 76.5 = ₹23.50

Sol.195.(b) First discount = 8%
If the payable amount is more than Rs. 5000 then,
Additional discount of 20% is given.
The final amount which is to be paid by customer = $750 \times 12 \times \frac{23}{25} \times \frac{4}{5}$ = ₹6624

Sol.196.(a) Fractional value of 10% and 15% is equal to $\frac{1}{10}$ and $\frac{3}{20}$ respectively.
Least SP of washing machine
= 65,000 – 2,000 = ₹63,000
When discount is maximum , then selling price is a minimum and vice versa .
Required difference between max. S.P. and min. S.P. = $63,000 \times [\frac{9}{10} - \frac{17}{20}]$
$= 63000 \times \frac{1}{20}$ = ₹3150

Sol.197.(b) Let the marked price of the sofa be Rs. x
$\frac{25x}{100} - \frac{20x}{100} = 1000 \Rightarrow \frac{x}{20} = 1000$
$\Rightarrow x = 20,000$

Sol.198.(d) Let the MP be x and CP be y.
According to the question,
$x \times \frac{95}{100} = y \times \frac{114}{100} \Rightarrow \frac{x}{y} = \frac{6}{5}$
So, MP = 6 and CP = 5
Now, new SP at 11 percent discount
$= 6 \times \frac{89}{100} = 5.34$
So, new profit percentage
$= \frac{5.34 - 5}{5} \times 100 = 6.8\%$

Sol.199.(d)
For Way A : SP = $28000 \times \frac{100 - 24}{100}$
$= 28000 \times \frac{76}{100}$ = ₹21,280
For Way B : SP = $28000 \times \frac{100 - 16}{100}$
$\times \frac{100 - 10}{100} = 28000 \times \frac{84}{100} \times \frac{90}{100}$
= ₹21,168
Clearly, we can see that Way B has lowest SP and it is equal to ₹21,168.
So, option (d) is the correct answer.

Sol.200.(b) Case 1 :
Equivalent discount of 15% = 15 +15 - $\frac{15 \times 15}{100} = 30 - \frac{225}{100} = 30 - 2.25 = 27.75\%$
Case 2 :
Equivalent discount of 10% and 20%
$= 10 + 20 - \frac{10 \times 20}{100} = 30 - 2 = 28\%$
Required difference between the SP of a watch = 3600 × (28 - 27.75)%
$= 3600 \times \frac{0.25}{100}$ = ₹9

Sol.201.(a)
Scheme1 : Equivalent discount of 20%
$= 20 + 20 - \frac{20 \times 20}{100} = 40 - 4 = 36\%$
Scheme2 : Equivalent discount of 25% and 15%
$= 25 + 15 - \frac{25 \times 15}{100} = 40 - 3.75 = 36.25\%$
Scheme3 : Single discount of 40%
Clearly, we can see that under scheme iii, the selling price of a retailer will be minimum .

Sol.202.(c) 'Buy 3, Get 1 free' scheme
Discount % = $\frac{4 - 3}{4} \times 100 = 25\%$
Since , an additional discount of 10% is given .
So, effective discount%
$= 25 + 10 - \frac{25 \times 10}{100} = 35 - 2.5 = 32.5\ \%$

Sol.203.(c)

Ratio →	C.P	:	S.P
30% markup →	10	:	13
10% discount →	10	:	9
wrong weight →	870	:	1000

Final → 87 : 117 or 29 : 39
Total Profit % = $\frac{39 - 29}{29} \times 100$
$\rightarrow \frac{10}{29} \times 100 = 34.48\%$

Sol.204.(b)
45% increase = 20 : 29
15% discount = 20 : 17
15% discount = 20 : 17

8000 : 8381
Percentage increase
$= \frac{381}{8000} \times 100 = 4.7625\%$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.205.(d)
Marked price of mobile phone = ₹36000
Since Pooja purchased it through a credit card. So, she get 15% discount.
The payment given by Pooja for mobile phone = $36000 \times \frac{85}{100}$ = ₹30600

Sol.206.(a)
CP of T- shirt = $500 \times \frac{85}{100} \times \frac{100}{125}$ = ₹340

Sol.207.(c) Single discount equivalent to three successive discounts of 10%
= a + b + c - $\frac{a \times b + b \times c + a \times c}{100}$ + $\frac{a \times b \times c}{10000}$.....(where a, b, c are discount rates)
=10 + 10 + 10 - $\frac{10 \times 10 + 10 \times 10 + 10 \times 10}{100}$ + $\frac{10 \times 10 \times 10}{10000}$ = 30 - $\frac{300}{100}$ + $\frac{1000}{10000}$
= 30 - 3 + 0.1 = 27.1%
So, required amount = (30 - 27.1)% of 3000 = 2.9% of 3000 = ₹87
So, the buyer needs to pay ₹87 extra.
Short Trick :-
At 10% discount , three times ⇒
Ratio → M.P. : S.P.
$(10)^3$: $(9)^3$

Final → 1000 : 729
Discount% = 27.1 %
Difference in discount →
30 – 27.1 = 2.9% of 3000 = 87 Rs.

Sol.208.(a) According to the question,
MP × $\frac{100-20}{100}$ = CP × $\frac{100+20}{100}$
MP × $\frac{80}{100}$ = CP × $\frac{120}{100}$
$\frac{MP}{CP} = \frac{120}{80} = \frac{3}{2}$
So, required percentage
= $\frac{3-2}{2}$ × 100 = 50%

Sol.209.(a) Discount on refrigerator on sull cash payment
= $\frac{12000}{60000}$ × 100 = $\frac{100}{5}$ = 20%
An extra discount offered by the shopkeeper to his regular customers So, the new discount is 25% .
Amount paid by customers for refrigerator = 60000 × $\frac{3}{4}$ = ₹45000

Sol.210.(a) MP of 1 pair of shoes
= 7200 × $\frac{1}{12}$ = ₹600
SP of 1 pair of shoes = 600 × $\frac{4}{5}$ = ₹480
So, the no of pairs of shoes can be bought in ₹1440 = $\frac{1440}{480}$ = 3 pair

Sol.211.(a) Let the second discount be x
According to question,
⇒ 35,600 × $\frac{9}{10}$ × $\frac{(100-x)}{100}$ = 30,000
⇒ 100 $-x$ = 30,000 × $\frac{10}{9}$ × $\frac{1}{356}$
⇒ x = 100 – 93.63 = 6.367 ≈ 6.37%

Sol.212.(d) Let MP = 100y
So, MP to be paid in cash
= 100y × $\frac{40}{100}$ = 40y
MP to be paid through credit card
= 100y - 40y = 60y
According to the question,
40y × $\frac{76}{100}$ + 60y × $\frac{101.5}{100}$ = 6391
30.4y + 60.9y = 6391
91.3y = 6391 ⇒ y = 70
So, MP = 100y = 100 × 70 = ₹7,000

Sol.213.(a)
MP of the article = 2700 × $\frac{10}{9}$ × $\frac{5}{3}$
= $\frac{2700 \times 50}{27}$ = ₹5,000

Sol.214.(c) (i) Discount % of 10,000
= $\frac{10,000}{50,000}$ × 100 = 20%
(ii) Discount % of flat 25% = 25%
(iii) Effective Discount of 10% of 10%
= 10 + 10 - $\frac{10 \times 10}{100}$ = 20 -1 = 19%
(iii) Effective Discount of 15% of 10%
= 15 + 10 - $\frac{15 \times 10}{100}$ = 25 - 1.5 = 23.5 %
So, we can clearly see that (ii) is best option for customers

Sol.215.(a) MP of the item
= 4740 × $\frac{100}{60}$ × $\frac{100}{79}$ = ₹10,000

Sol.216.(a) CP of an article = ₹100
MP of an article = 100 × 130% = ₹130
SP of an article = 130 × 85% = 130 × 0.85 = 110.5
Required % = $\frac{110.5-100}{100}$ × 100 = 10.5%

Sol.217.(b)
Total amount he needs to pay
= 35000 × $\frac{4}{5}$ × $\frac{23}{25}$ = ₹25760

Sol.218.(d) Total percentage of MP, when Suresh paid payment through cash
= 40% × $\frac{80}{100}$ = 32%
Total percentage of MP, when Suresh paid payment through credit card
= 60% × 1.005 = 60.3%
So, the required percentage
= 60.3 + 32 = 92.3%

Sol.219.(a) Cost price : Marked price = 4 : 7
Discount = 25% = $\frac{1}{4}$
Ratio of marked price : selling price
= 4 : 3
On balancing the ratio,
Cost price : Marked price : Selling price
= 16 : 28 : 21
Profit = 21 - 16 = 5 unit
5 unit = 50
16 unit = 160 So, Cost price = 160

Sol.220.(c)
Price of one book at 15% discount
= $\frac{120 \times \frac{100-15}{100}}{12}$ = $\frac{120 \times \frac{85}{100}}{12}$ = ₹8.5
Number of books that can be bought for ₹51 = $\frac{51}{8.5}$ = 6 books

Sol.221.(b)
Let the MP of product be ₹100
SP of product for Company = CP of the product for retailer = 100 × 70% = ₹70
Since, retailer sold the same product at marked price,
So, SP of product for retailer = ₹100
Required profit % = $\frac{100-70}{70}$ × 100
= $\frac{30}{70}$ × 100 = $42\frac{6}{7}$%

Sol.222.(c) Purchase price
= 54000 × $\frac{90}{100}$ × $\frac{95}{100}$ = 46170

Sol.223.(d) Selling price of a dozen pair of gloves = 200 × $\frac{80}{100}$ = 160
Rs. 160 = 12 piece
Rs.320 = 24 piece

Sol.224.(b) According to the question,
400 × $\frac{90}{100}$ × $\frac{(100-x)}{100}$ = 216
100 – x = 60 ⇒ x = 40

Sol.225.(d)
Ratio - C.P : M.P : S.P
25 : 18) × 13
10 : : 13) × 18
---
180 : 325 : 234
Profit = 234 - 180 = 54 units
54 units = 30.90 Rs
(M.P) 325 units = $\frac{30.90}{54}$ × 325
= 185.97 ≈ ₹186

Sol.226.(b)
Ratio - C.P : M.P : S.P
25 : 18) × 13
10 : : 13) × 18
---
180 : 325 : 234
Profit = 234 - 180 = 54 units
54 units = 39.90 Rs

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(M.P) 325 units = $\frac{39.90}{54}$ × 325

= 240.13 ≈ ₹ 240

Sol.227.(b) Amount paid by dealer to the manufacturer

= 1800 × $\frac{85}{100}$ × $\frac{92}{100}$

= 1407.6 ≈ ₹1,408

Sol.228.(d) 20% = $\frac{1}{5}$, 25% = $\frac{1}{4}$

MP : SP

5 : 4

4 : 3

20 : 12 = 5 : 3

Now discount =(MP – SP)= 5 – 3

= 2 units = 250 Rs

So MP = 5 units = 625 Rs

Given mark up is 25%

CP : MP

100 : 125

MP = 125 units = 625 Rs

⇒ 1 unit = 5 Rs

⇒ CP = 100 unit = 500 Rs

Sol.229.(c) After discount of 31%

MP : SP

100 : 69

Without discount he has to pay 31 units more.

31 units = 2480 Rs

1 unit = 80 Rs

Amount paid by the person

= 69 units = 69 × 80 = 5520 Rs

Sol.230.(c) $\frac{CP}{MP} = \frac{100 - Discount\ \%}{100 - loss\ \%}$

$= \frac{100-30}{100-4.8} = \frac{70}{95.2}$

Mark up = $\frac{MP - CP}{CP} \times 100$

= $\frac{25.2}{70} \times 100$ = 36%

Sol.231.(a) Required payment

= 60000 × $\frac{90}{100}$ × $\frac{95}{100}$ = ₹51,300

Sol.232.(d)

CP : MP = (100 - D) : (100 + P)

Where, D and P are discount and profit percent respectively,

CP : MP = (100 - 20) : (100 + 25)

= 80 : 125

Now, new CP = 80 × $\frac{130}{100}$ = 104 units.

SP, to earn profit of 15% = 104 × $\frac{115}{100}$

= 119.6 units

Required discount %

= $\frac{125 - 119.6}{125}$ × 100 = 4.32%

Sol.233.(c) CP : MP = 100 - D : 100 + P

Where D and P are discount and profit percentage.

CP : MP = 100 - 25 : 100 + 20

CP : MP = 5 : 8

Let CP be 500 and MP be 800

New CP = 500 × $\frac{85}{100}$ = 425

New SP for 20% profit. = 425 × $\frac{6}{5}$ = 510

Discount = $\frac{800 - 510}{800}$ × 100 = 36.25%

Short Trick :-

As CP is reduced by 15% we can reduce the SP by 15% to get the same profit.

Earlier discount = 25%

Now 15% more discount can be given,

Effective discount

= 25 + 15 - $\frac{15 \times 25}{100}$ ⇒ 40 - 3.75 = 36.25%

Sol.234.(b)

Let MP of each article be 100 units.

After 20% discount it becomes 80 units.

According to the question,

8SP = 6 MP

8SP = 6 × 80 ⇒ SP = 60 unit,

CP = $\frac{60}{120}$ × 100 = 50 units

Required percentage

= $\frac{100 - 50}{50}$ × 100 = 100%

Sol.235.(c) Let CP = 100

SP = 400 × $\frac{100 - 12}{100}$ × $\frac{100 - 20}{100}$

= 400 × $\frac{88}{100}$ × $\frac{80}{100}$ = ₹281.6

₹281.6 corresponds 110%, so CP

= $\frac{281.6 \times 100}{110}$ = ₹256

Sol.236.(a) Effective discount by first dealer = 10 + 15 – $\frac{10 \times 15}{100}$ = 25 – 1.5

= 23.5%

Effective discount by second dealer

= 20 + 5 – $\frac{20 \times 5}{100}$ = 25 – 1 = 24%

Difference in SP = Difference in discount

= 24 – 23.5 = 0.5%

Difference in SP = 0.5% of 3000

= $\frac{0.5}{100}$ × 3000 = ₹15

Sol.237.(b)

SP = 12500 - 2366.8 = 10133.2

12500 × $\frac{88}{100}$ × $\frac{94}{100}$ = 10340

Last discount = 10340 - 10133.2 = 206.8

Discount % = $\frac{206.8}{10340}$ × 100 = 2%

Sol.238.(b) Let MP = 100,

First SP = 100 × $\frac{55}{100}$ = 55

Second SP = 100 × $\frac{80}{100}$ × $\frac{75}{100}$ = 60

Difference between SP = 60 – 55 = 5 which corresponds to ₹124

So, MP = $\frac{124 \times 100}{5}$ = ₹2,480

Sol.239.(d) Given that MRP = Rs 5000

SP = Rs 4250

Discount = 5000 - 4250 = Rs 750

Discount % = $\frac{750}{5000}$ × 100 = 15%

If discount would be 5% less

New Discount = 10%

New SP = 5000 × $\frac{90}{100}$ = Rs 4500

Sol.240.(d) Let Marked price = 100

So Cost price = 75

As we knew that, MP – Discount = SP

So, 100 – Discount = 120 % of 75

100 – Discount = 90

Discount = 10

Discount % = $\frac{Discount}{Marked\ Price}$ × 100

= $\frac{10}{100}$ × 100= 10%

Sol.241.(a) Let CP = 100x , so MP= 150x

So SP = 150x × $\frac{70}{100}$ × $\frac{75}{100}$ = 78.75x

So loss = 100x - 78.75x = 21.25x which corresponds to Rs 850

So x = $\frac{850}{21.25}$ = 40

So, SP = 78.75x = 78.75 × 40 = Rs.3150

Sol.242.(d) Let the CP = 100

Then MP = 130

After first discount = 117

If 6.5% more Profit , then SP

= 117 + 6.5 = 123.5

Now discount = 6.5

Discount percentage = $\frac{6.5}{130}$× 100= 5%

Sol.243.(a) After first discount MP = 8000

After second discount = 7200

Third discount = $\frac{1080}{7200}$ × 100= 15%

K + 20 = 35%

After 35% discount selling price = 6500

Sol.244.(d)

Equivalent discount of shopkeeper A

= - 20 - 20 + $\frac{400}{100}$ = - 36%

Equivalent discount of shopkeeper B

= - 25 -15 + $\frac{375}{100}$ = - 36.25%

Equivalent discount of shopkeeper C

= - 30 - 10 + $\frac{300}{100}$ = 37%

Maximum discount is given by

= shopkeeper C

Discount = $\frac{37}{100}$ × 4820 = 1783.40

Sol.245.(c) Cost price of the Article

= 1800 × $\frac{84}{100}$ × $\frac{100}{108}$ = 1400 Rs.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

After giving 8% discount

$= \frac{92}{100} \times 1800 = 1656$ Rs.

Profit Percentage

$= \frac{256}{1400} \times 100 = 18.29\%$

Sol.246.(b) $720 + (\frac{5x}{3}\% \ of \ 720)$

$= 900 - (x\% \ of \ 900)$

$\Rightarrow 5x\% \ of \ 240 + (x\% \ of \ 900) = 180$

$\Rightarrow 12x + 9x = 180$

$\Rightarrow x = \frac{180}{21} = \frac{60}{7} \Rightarrow x = 8\frac{4}{7}$

Sol.247.(b) Let the cost price = 80

Marked price = 80 + (25% of 80) = 100

Selling price after 10% discount = 90

Selling price after 5% another discount = 85.5

85.5 unit = 2394

80 unit = 2240

Alternate Method

Let the cost price = 100x

Then $\frac{5}{4} \times \frac{9}{10} \times \frac{19}{20} \times 100x = 2394$

$\Rightarrow x = 2240$

Sol.248.(a) According to the question

25% of the MP = 65

Then MP = 260

Sol.249.(c)

C.P.	:	M.P.
100 - D%	:	100 + P%
90%	:	120%
3	:	4

Profit percent $= \frac{1}{3} \times 100 = 33.33\%$

Sol.250.(b) Successive discounts

$= 14 + 12 - \frac{14 \times 12}{100} = 24.32\%$

Difference between discount

= 25 - 24.32 = 0.68%

Difference in Rs. = 0.68% of 10,000 = 68

Sol.251.(c) According to the question

$920 \times \frac{120}{100} = 1472 \times \frac{100 - x}{100}$

$1104 = 1472 \times \frac{100 - x}{100}$

$\frac{1104}{1472} = \frac{100 - x}{100} \Rightarrow x = 25\%$

Sol.252.(d) Discount on one shirt

$= 250 \times \frac{25}{100} = 62.5$

Total number of shirts the person should purchase $= \frac{875}{62.5} = 14$

Sol.253.(a) Charu paid for the footwear

$= 900 \times \frac{9}{10} \times \frac{9}{10} = 729$ Rs.

Sol.254.(a) Cost for photocopy of first 400 sheets of paper $= 400 \times 1.5 = 600 \ Rs.$

Cost for photocopy of next 400 sheets of paper $= 400 \times 1.5 \times \frac{94.5}{100} =$ Rs. 567

Total cost = 600 + 567 = 1167 Rs.

Sol.255.(a) Selling price = 4950

Discount = 10%

Marked Price $= \frac{100}{90} \times 4950 = 5500$

SP (When 12% discount is given)

$= 5500 \times \frac{88}{100} = 4840$

Required Saving = 4950 - 4840 = 110

Sol.256.(b) Let, C.P. of coconut oil =100%

List price = 115%

For no profit and no loss

C.P = S.P

Discount $= \frac{15}{115} \times 100 = 13\frac{1}{23}\%$

Sol.257.(d) Let, total no. of goods = 100

Let, C.P of one good = 100

M.R.P. = 125

S.P of 25 goods = 25 ×125 = 3125

60 % of the goods at 25% discount

25% discount $= \frac{125}{4}$

S.P of 60 books

$= 60 \times (125 - \frac{125}{4}) = 5625$

Remaining book = 100 - (25 + 60) = 15

15% of the book at 10% discount

S.P of 15 book $= 15 \times \frac{9 \times 125}{10} = 1687.5$

Total C.P = 10000

Total S.P = 3125 + 5625 + 1687.5

= 10437.5

Profit = 10437.5 - 10000 = 437.5

Profit % $= \frac{437.5}{10000} \times 100 = 4.375\%$

Sol.258.(d) M.R.P = 660

C.P.	:	M.R.P.
100 - D	:	100 + P
80	:	110
8	:	11

11 → 660

8 → 480

C.P = 480

S.P. = 470

Loss = 10

Loss percent $= \frac{10}{480} \times 100 = 2.08\%$

Sol.259.(a) MP of the article = 920

discount = 331.20

SP of article =588.80

As there is successive discount so we will take square root to get the required discount

$\sqrt{920} : \sqrt{588.80}$

Taking square root and after simplifying we get 10:0.8

So required discount % $= \frac{0.2}{10} \times 100 = 20\%$

Sol.260.(a) According to the question

12% of bill = 2100

Bill $= \frac{2100}{12} \times 100 = 17{,}500$

Sol.261.(b)

Let the marked price = 100MP

After 35% discount SP = 65MP

After two successive discount of 20% and 15%, net discount

$= 20 + 15 - \frac{20 \times 15}{100} = 32\%$

So, SP will be 68 MP

Now difference of both the selling prices = (68 - 65)MP = 3 MP

As given, 3 MP = 504

marked price = 100 MP = 16800

Search on TG @apna_pdf

Search on Telegram @apna_pdf

Simple Interest

Key Points:-

1. Simple Interest on a sum (principal) of money at R% per annum for T years is given by:

$$SI = \frac{Principal \times Rate \times Time}{100} = \frac{PRT}{100}$$

2. Amount (A) = Principal + S.I.

3. Also, $P = \frac{SI \times 100}{R \times T}$, $T = \frac{SI \times 100}{R \times P}$,

$R = \frac{SI \times 100}{P \times T}$

Example: A man lends Rs. 500 at 10% per annum for 2 years. His interest will be:

Solution: Here, P = Rs. 500, R = 10% and T = 2 years.

$$SI = \frac{PRT}{100} = \frac{500 \times 10 \times 2}{100} = Rs.\ 100$$

Important Note :

1) Notice that in the formula, $SI = \frac{PRT}{100}$, we are just calculating $(T \times R)\%$ of P.

2) Simple Interest increases linearly with the number of years i.e. to get SI for 1 year ,you can directly divide given interest by the number of years.

Example: If SI is Rs. 400 for 4 years, then it will be Rs. 200 for 2 years.

3) Annual Installment in case of SI

$$= \frac{100A}{100t + \frac{rt(t-1)}{2}}$$

Where, A = Amount borrowed, t = Time period (number of installment),

r = Interest rate

Variety Questions

Q.1. Mohan borrows a sum of ₹4,22,092 at the rate of 20% per annum simple interest. At the end of the first year, he repays ₹21,679 towards the return of principal amount borrowed. If Mohan clears all pending dues at the end of the second year, including interest payment that accrued during the first year, how much does he pay (in ₹) at the end of the second year?

SSC CGL 09/09/2024 (1st Shift)

(a) 556367 (b) 558380

(c) 561347 (d) 564914

Q.2. A bank charges simple interest for ₹K at the rate of $r^{\frac{1}{2}}$ for n^2 years. Another bank charges simple interest for ₹L at the rate of $r^{\frac{3}{2}}$ for n^3 years and gives the same interest. The ratio between K and L is:

SSC CHSL 02/07/2024 (1st Shift)

(a) $r^{\frac{1}{2}} : n^{\frac{1}{2}}$ (b) $\frac{1}{r} : \frac{1}{n}$

(c) r n : 1 (d) $r^2 : n^2$

Q.3. The simple interest earned on ₹2,800 at a rate of 10% per annum for 3 years is ₹x and ₹1,736 is the simple interest earned on ₹6,200 at a rate of 14% for y years, then the value of $\frac{x}{y}$ is:

SSC CGL Tier II (26/10/2023)

(a) 140 (b) 380 (c) 550 (d) 420

Q.4. A sum of ₹800 amounts to ₹1,040 in 3 years at simple interest. If the interest rate is increased by 3%, find the amount.

SSC MTS 14/09/2023 (2nd Shift)

(a) ₹1,102 (b) ₹ 1,212

(c) ₹ 1,112 (d) ₹ 1,012

Q.5. A person invests ₹5,000 at a simple interest rate of 5% per annum for 5 years. At the end of 5 years, she reinvests the entire amount at the same rate of interest for another 3 years. What will be the total interest earned by the person at the end of 8 years ?

SSC MTS 13/09/2023 (3rd Shift)

(a) ₹2,156.50 (b) ₹2,256.50

(c) ₹2,323.50 (d) ₹2,187.50

Q.6. In 't' years, the simple interest earned on a certain amount at the rate of 10% per annum is 5/8th of the principal amount. If the rate of interest is made three-fourth of 10% and the simple interest remains the same, which of the following statements is true about the changed value of time?

SSC CHSL 14/08/2023 (4th Shift)

(a) It remains the same as 't'.

(b) It becomes three-fourth of the time 't'.

(c) It increases to $8\frac{1}{3}$ years

(d) It decreases to $5\frac{1}{2}$ years.

Q.7. At a certain annual rate (rounded off to the nearest integer) of simple interest, a sum of money becomes nine times its original value in 21 years. By how much does the rate of interest change if the same sum of money has to become 12 times its original value in 25 years?

SSC CHSL 10/08/2023 (2nd Shift)

(a) Decreases by 6% (b) Increases by 6%

(c) Increases by 8% (d) Decreases by 8%

Q.8. If a sum of money becomes ₹6,000 in 3 years and ₹10,500 in 7 years and 6 months at the same rate of simple interest, then what is the rate of interest?

SSC CHSL 07/08/2023 (4th Shift)

(a) $33\frac{1}{3}$% (b) $25\frac{1}{2}$%

(c) $45\frac{2}{3}$% (d) $66\frac{1}{3}$%

Q.9. Ravi borrowed some money at the rate of 5% per annum for the first three years, 8% per annum for the next two years and 10% per annum for the period beyond 5 years. If he paid a total simple interest of ₹12,750 at the end of 7 years, then how much money did he borrow?

SSC CHSL 07/08/2023 (1st Shift)

(a) ₹25,000 (b) ₹26,000

(c) ₹27,000 (d) ₹24,000

Q.10. What will be the total amount payable on ₹ 25,000 in 2 years if the rate of simple interest in successive years is 4% and 5% respectively ?

SSC CHSL 04/08/2023 (1st Shift)

(a) ₹26,250 (b) ₹28,250

(c) ₹26,000 (d) ₹27,250

Q.11. A financial institution claims that it returns three times the principal in 25 years on a certain rate of simple interest per annum. What is the rate of simple interest?

SSC CHSL 03/08/2023 (4th Shift)

(a) 8% (b) 6% (c) 4% (d) 5%

Q.12. The simple interest on a certain sum for 3 years at 8% per annum is ₹9120 less than the simple interest on the same sum for 7 years at 8% per annum. Find the sum.

SSC CHSL 03/08/2023 (1st Shift)

(a) ₹28500 (b) ₹28250

(c) ₹28750 (d) ₹28000

Q.13. Ashima borrowed ₹75,000 from a nationalized bank on 26th March 2022 at the rate of 9% per annum simple interest. If she cleared the account on 7th June of the same year, then what amount did she pay?

SSC CHSL 02/08/2023 (3rd Shift)

(a) ₹75,000 (b) ₹76,350

(c) ₹1,350 (d) ₹75,350

Q.14. How long (in years) will a sum of money invested at 6% per annum simple interest to increase its value by 40% ?

SSC CHSL 02/08/2023 (1st Shift)

(a) $6\frac{2}{3}$ (b) $5\frac{2}{3}$ (c) $6\frac{1}{3}$ (d) $4\frac{1}{3}$

Q.15. What is the present worth of ₹1,100 due in 2 years at 5% simple interest per annum ?

SSC CGL 26/07/2023 (3rd shift)

(a) ₹3,000 (b) ₹2,000 (c) ₹1,000 (d) ₹1,500

Q.16. The interest on a certain deposit at 4.5% p.a. is ₹135 in one year. How much will the additional interest in one year be on the same deposit at 5% p.a.?

SSC CGL 24/07/2023 (3rd shift)

(a) ₹16 (b) ₹15 (c) ₹14 (d) ₹18

Q.17. A certain amount is lent at x% p.a.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

simple interest for 3 years. Instead, if the amount was lent at 3x% p.a. simple interest for 'y' more years, then the simple interest would have been seven times the earlier interest. What is the value of y ?
SSC CGL 21/07/2023 (3rd shift)
(a) 3 (b) 4 (c) 5 (d) 6

Q.18. Archana took a loan of ₹78,000 from a bank on 24th January 2012 at $8\frac{3}{4}$ % per annum simple interest and paid it back on 18th June 2012. Find the total amount paid by Archana. (Approximated to nearest integer)
SSC CGL 19/07/2023 (3rd shift)
(a) ₹80,723 (b) ₹90,730
(c) ₹85,733 (d) ₹88,730

Q.19. A man invests a total sum of ₹10,000 in a company. A part of the sum was invested at 10% simple interest per annum and the remaining part at 15% simple interest per annum. If the total interest accrued to him in two years equals ₹2,400, the sum invested at 15% simple interest per annum is:
SSC CGL 14/07/2023 (3rd shift)
(a) ₹8,000 (b) ₹4,000
(c) ₹6,000 (d) ₹5,000

Q.20. A money lender finds that due to the fall in the annual rate of interest from 18% to 15%, his yearly income diminishes by Rs.750. His capital is:
Graduate Level 30/06/2023 (Shift - 1)
(a) Rs.25,500 (b) Rs.25,000
(c) Rs.5,000 (d) Rs.2,500

Q.21. Simple Interest received by a person in 12 years on a principal of Rs. 12000 is 120 percent of the principal. What is the annual rate of interest?
SSC MTS 17/05/2023 (Afternoon)
(a) 20% (b) 12 % (c) 10 % (d) 5 %

Q.22. A sum of money becomes three times of itself at the rate of 10 percent per annum on simple interest. Which of the following statement(s) is/are correct?
I. It will become 5 times of itself at the rate of 20 percent per annum on simple interest in the same time period.
II. It will become 7 times of itself at the rate of 30 percent per annum on simple interest in the same time period.
SSC CHSL 21/03/2023 (1st Shift)
(a) Only II (b) Neither I nor II
(c) Only I (d) Both I and II

Q.23. $\frac{1}{2}$ of a certain sum is lent at 20 percent rate of interest. $\frac{2}{5}$ of the remaining sum is lent at 25 percent rate of interest. The remaining sum is lent at 10 percent rate of interest. If the simple interest received on the total sum for 2 years is Rs. 360, then what is the sum ?
SSC CHSL 09/03/2023 (3rd Shift)
(a) Rs.1200 (b) Rs. 800
(c) Rs.1000 (d) Rs.1400

Q.24. A person lent Rs. 23000 to B for 3 years and Rs. 19000 to C for 4 years on simple interest at the same rate of interest and received Rs. 3625 in all from both of them as interest. What is the annual rate of interest?
SSC CGL 06/12/2022 (4th Shift)
(a) 1.5 % (b) 3 % (c) 2.5 % (d) 4 %

Q.25. Suman paid ₹9,600 in interest on a loan she obtained 5 years ago with a simple interest rate of 16%. What was the amount of the loan she had taken?
SSC CGL 03/12/2022 (2nd Shift)
(a) ₹ 13,250 (b) ₹ 12,500
(c) ₹ 12,000 (d) ₹ 11,750

Q.26. Damani purchased an item costing ₹7,500 and paid ₹3,500 as a down payment for the same. If the simple interest charged for the remaining amount is 9% per annum and Damani cleared all dues after 4 months of the purchase, how much did Damani pay after 4 months as interest?
SSC CGL 01/12/2022 (4th Shift)
(a) ₹120 (b) ₹100 (c) ₹132 (d) ₹125

Q.27. 6 copies of a book can be bought for a certain sum payable at the end of a year and 7 copies of the same book can be bought for the same sum in cash money. What is the rate per annum of simple interest (correct to one decimal place)?
SSC MTS 02/11/2021 (Afternoon)
(a) 10.9% (b) 15.5% (c) 16.7% (d) 30.4%

Q.28. Find the interest accrued on a sum of Rs.1,680 in two years,at the rate of 4.375% simple interest per annum.
Graduate Level 03/08/2022 (Shift - 3)
(a) Rs.73.50 (b) Rs.1,470
(c) Rs.735 (d) Rs.147

Q.29. A sum of ₹5,000 is divided into two parts such that the simple interest on the first part for $4\frac{1}{5}$ years at $6\frac{2}{3}$% p.a. is double the simple interest on the second part for $2\frac{3}{4}$ years at 4% p.a. The ratio of the second part to the first part is:
SSC CGL Tier II (03/02/2022)
(a) 11 : 14 (b) 11 : 13 (c) 14 : 11 (d) 13 : 11

Q.30. Eight copies of a book can be bought for a certain sum payable at the end of a year and ten copies of the same book can be bought for the same sum in cash money. What is the rate percentage of the interest?
SSC MTS 20/10/2021 (Afternoon)
(a) 30% (b) 25% (c) 10% (d) 15%

Q.31. A certain sum amounts to Rs 81840 in 3 years and to Rs 92,400 in 5 years at x% p.a. Under simple interest. If the rate of interest becomes (x + 2)%, then in how many years will the same sum double itself?
SSC CGL 20/08/2021 (Morning)
(a) 12.5 (b) 8 (c) 10 (d) 20

Q.32. A man invested an amount of Rs 105750 at simple interest in the name of his son, daughter and his wife in such a way that they get the same interest after 3, 4 and 5 years respectively. If the rate of interest is 5% per annum, then the amount invested for the wife is:
SSC CHSL 12/08/2021 (Evening)
(a) 27000 (b) 28000
(c) 25000 (d) 30000

Q.33. A person invested a total of ₹ 9,000 in three parts at 3%, 4% and 6% per annum on simple interest. At the end of a year, he received equal interest in all three cases. The amount invested at 6% is: SSC CHSL 16/10/2020 (Morning)
(a) ₹2,000 (b) ₹3,000
(c) ₹4,000 (d) ₹5,000

Q.34. A man takes a loan of some amount at some rate of simple interest. After three years, the loan amount is doubled and the rate of interest is decreased by 2%. After 5 years, if the total interest paid on the whole is Rs 13,600, which is equal to the same when the first amount was taken for $11\frac{1}{3}$ years, then the loan taken initially is:
SSC CHSL 14/10/2020 (Afternoon)
(a) Rs 13,600 (b) Rs 12,500
(c) Rs 10,000 (d) Rs 12,000

Q.35. A sum of Rs. 12,000 was borrowed at a rate of simple interest. After four months, Rs. 6000 more was borrowed and rate of interest on the total principal was doubled than that of the previous rate. At the end of the year, 2800 was paid as the interest. Find the rate that was applicable in the initial.
SSC CHSL 13/10/2020 (Morning)
(a) 14% (b) 16% (c) 12% (d) 10%

Q.36. A person invested a sum of Rs. 18,600 at x % p.a. and another sum that is twice the former at (x + 2) % p.a. , both at a simple interest. If the total interest

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

earned on both investments for $3\frac{1}{2}$ years is Rs 23,110.50 , then the rate of interest p.a. on the second investment is.
SSC CPO 11/12/2019 (Morning)
(a) 11% (b) 10.5% (c) 13% (d) 12.5%

Q.37. A person invested one-fourth of the sum of Rs 25000 at a certain rate of simple interest and the rest at 4% p.a. higher rate. If the total interest received for 2 years is Rs 4,125. What is the rate at which the second sum was invested?
SSC CGLTier II (13/09/2019)
(a) 9.5% (b) 9.25% (c) 5.255% (d) 7.5%

Q.38. A sum amounts to Rs 14,395.20 at 9.25% p.a. simple interest in 5.4 years. What will be the simple interest on the same sum at 8.6 % p.a. in 4.5 years?
SSC CGL Tier II (12/09/2019)
(a) Rs 3715.20 (b) Rs 3627
(c) Rs 3797.76 (d) Rs 3672

Q.39. The simple interest on Rs x for m years at a rate of r % is equal to the same on Rs y for n years at the rate of s %, then $\frac{x}{y}$ is equal to:
SSC MTS 16/08/2019 (Morning)
(a) $\frac{nr}{ms}$ (b) $\frac{ns}{mr}$ (c) $\frac{ms}{nr}$ (d) $\frac{mr}{ns}$

Q.40. A sum doubles in seven years at simple interest. In how many years will the sum become five times the original sum ?
SSC MTS 09/08/2019 (Afternoon)
(a) 35 (b) 21 (c) 28 (d) 30

Q.41. A sum of Rs 10000 is invested in three schemes of simple interest. The annual interest rates are respectively, 4%, 6% and 10%. Rs 4000 were invested in the first scheme. If the total interest earned after five years is Rs 2800, then how much money was invested in the third scheme?
SSC MTS 08/08/2019 (Evening)
(a) Rs 1500 (b) Rs 5000
(c) Rs 1000 (d) Rs 3000

Q.42. A sum of Rs 1500 is invested at simple interest for x months. If the rate of interest is $\frac{x}{8}$ % per annum, then the sum grows to Rs 1590. What is the value of x?
SSC MTS 07/08/2019 (Morning)
(a) 3.2 (b) 2.4 (c) 32 (d) 24

Q.43. A certain sum was invested on simple interest. The amount to which it had grown in five years was $1\frac{1}{4}$ times the amount to which it had grown in three years. The percentage rate of interest was:
SSC CHSL 11/07/2019 (Morning)
(a) 10% (b) 20% (c) 25% (d) 15%

Q.44. A borrows a sum of Rs 1000 from his friend B on 31 December 2015 on the condition that he will return the same after one year with simple interest at 12%. However, A gets into a position of returning the money on 1 May 2016. How much amount he has to return to B ?
SSC CHSL 10/07/2019 (Morning)
(a) Rs 1,331.5 (b) Rs 1,045
(c) Rs 1,120 (d) Rs 1,040

Practice Questions

SSC CHSL 2024 Tier - 2

Q.45. A sum on simple interest at the rate of 5% per annum amounts to ₹4,160 in 6 years. Find the sum.
SSC CHSL Tier II (18/11/2024)
(a) ₹3,100 (b) ₹3,200
(c) ₹2,800 (d) ₹2,900

SSC MTS 2024 Tier - 1

Q.46. Rohan deposited ₹500 for 2 years, ₹650 for 4 years and 1,300 for 6 years, at the same rate of interest. He received the total simple interest of ₹1,140. What is the rate of interest per annum?
SSC MTS 30/09/2024 (Afternoon)
(a) 10% (b) 9.5% (c) 10.5% (d) 11%

Q.47. Etika invested some amount at a rate 9% per annum and earns a S.I. of ₹810 after 3 years. If the rate of interest has been 4% higher, how much more interest (in ₹) would have Etika earned on the same amount in the same time period ?
SSC MTS 08/10/2024 (Evening)
(a) 240 (b) 405 (c) 360 (d) 540

Q.48. Vipul, Ashima, and Priya invested a total of ₹21,000 at 3%, 6%, and 5% per annum, respectively, on simple interest. If at the end of the year, all three persons received an equal amount of interest, then the amount (in ₹) invested by Ashima is:
SSC MTS 15/10/2024 (Morning)
(a) 5,000 (b) 3,000 (c) 2,000 (d) 4,000

Q.49. A person invested a certain sum of money at 6% per annum simple interest and another sum at 8% per annum simple interest at the same time. After 4 years, he received interest ₹1,560 from both sums. One-fifth of the first sum is equal to one-sixth of the second sum. Find the total sum invested.
SSC MTS 17/10/2024 (Evening)
(a) ₹5,500 (b) ₹6,000
(c) ₹5,000 (d) ₹4,500

Q.50. What sum of money, when lent at 6% for 4 years, will produce the same interest as ₹800 earns in 5 years at $4\frac{1}{2}$%
SSC MTS 18/10/2024 (Morning)
(a) ₹750 (b) ₹700 (c) ₹650 (d) ₹625

'**Q.51.** Divyansh invested $\frac{1}{4}$ of his capital at 10%, $\frac{1}{5}$at 20% and the remaining at 30% simple interest per annum, respectively. If his annual income is ₹3,220, then find the capital (in ₹).
SSC MTS 21/10/2024 (Evening)
(a) 13,500 (b) 17,000
(c) 15,300 (d) 14,000

Q.52. A borrows ₹7,500 for 4 years at 8% p.a. simple interest. B borrows the same amount at simple interest of 9% for the first year, 10% for the second year and 6% for the next two years. What is simple interest paid by A and B in total (in ₹) ?
SSC MTS 22/10/2024 (Morning)
(a) 4,275 (b) 4,175 (c) 4,725 (d) 4,545

Q.53. Pooja invested a certain sum in a scheme at simple interest of r% per annum for 12.5 years and get interest equal to $\frac{3}{4}$ of sum invested.
SSC MTS 22/10/2024 (Evening)
(a) $5\frac{3}{4}$ (b) 6 (c) 4 (d) $7\frac{1}{2}$

Q.54. Raghu lends ₹9,600 and ₹11,800 at simple interest to two different persons for the same time at the rate of 7% per annum and 8% per annum, respectively. If he had received ₹9,696 as total interest from both, find the time period for which the amounts were lent.
SSC MTS 30/10/2024 (Afternoon)
(a) 10 years (b) 8 years
(c) 6 years (d) 12 years

Q.55. A sum of ₹12,000 becomes double at simple interest in 7 years at a certain rate of simple interest. Find the time (in years) it takes for the amount to become ₹60,000 at the same rate of interest.
SSC MTS 13/11/2024 (Morning)
(a) 28 (b) 30 (c) 20 (d) 25

SSC CGL 2024 Tier - 1

Q.56. If a sum of ₹5,000 is taken at a simple rate of interest of 15% per annum for 3 years and another sum of ₹8,000 is taken at a simple interest of 12% per annum for 4 years, the positive difference

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

of the interests paid is:
SSC CGL 09/09/2024 (2nd Shift)
(a) ₹1,643 (b) ₹1,590
(c) ₹1,286 (d) ₹1,378

Q.57. Ramesh has ₹18,000. He deposited ₹7,000 in a bank at the rate of 5% per annum and ₹6,000 in other bank at the rate of 6% per annum simple interest. If he received ₹1,160 as simple interest at the end of one year, then the rate of interest per annum on rest of the capital is equal to:
SSC CGL 09/09/2024 (3rd Shift)
(a) 10% (b) 11% (c) 9% (d) 8%

Q.58. Kiran lent ₹4,000 to two persons such that one part of it at the rate of 8% per annum and the remaining part at the rate of 10% per annum. He got an annual simple interest of ₹352. Then the sum lent at 10% is:
SSC CGL 10/09/2024 (1st Shift)
(a) ₹1800 (b) ₹2200 (c) ₹2400 (d) ₹1600

Q.59. Simple interest on a certain sum is one-fifth of the sum and the interest rate per cent per annum is 5 times the number of years. If the rate of interest increases by 3%, then how much will the simple interest (in ₹) be on ₹5,600 for 6 years?
SSC CGL 10/09/2024 (3rd Shift)
(a) 4668 (b) 4168 (c) 4268 (d) 4368

Q.60. The interest accrued on a sum of ₹16,000 lent at a simple interest rate of 14% p.a. for the time in those many years, which gives a simple interest of three-fifths of a certain sum at 10% p.a., is:
SSC CGL 11/09/2024 (1st Shift)
(a) ₹13,440 (b) ₹12,970
(c) ₹15,360 (d) ₹14,280

Q.61. Sohan borrows a sum of ₹1,41,545 at the rate of 11% per annum simple interest. At the end of the first year, he repays ₹25,490 towards the return of principal amount borrowed. If Sohan clears all pending dues at the end of the second year, including interest payment that accrued during the first year, how much does he pay (in ₹) at the end of the second year?
SSC CGL 11/09/2024 (3rd Shift)
(a) 1,44,391 (b) 1,36,453
(c) 1,41,222 (d) 1,37,407

Q.62. A certain sum of money becomes seven times itself when invested at a certain rate of simple interest, in 14 years. How much time (in years, rounded off to 2 decimal places) will it take to become 18 times itself at the same rate ?
SSC CGL 12/09/2024 (1st Shift)
(a) 27.33 (b) 39.67 (c) 42.78 (d) 35.5

Q.63. A trader owes a merchant ₹9,810 due in 1 year, but the trader wants to settle the account after 6 months. If the rate of simple interest is 9% per annum, how much cash (in ₹) should he pay?
SSC CGL 13/09/2024 (2nd Shift)
(a) 9,550 (b) 9,450 (c) 9,540 (d) 9,405

Q.64. A sum of ₹10,000 is taken as a loan by Rajesh at a rate of 15% p.a. simple interest for 2 years. But Rajesh could not repay it at the agreed time and asked for an extension of two more years. So, the lender included the interest amount for the period as principal for the next two years at the same rate of interest. The total amount paid by Rajesh at the end of 4 years is:
SSC CGL 13/09/2024 (3rd Shift)
(a) ₹18,590 (b) ₹16,900
(c) ₹17,650 (d) ₹15,630

Q.65. A certain sum of money is given at a certain rate of simple interest for 6 years. Had it been given at 7% higher rate, it would have fetched ₹1,512 more. Find the sum (in ₹).
SSC CGL 18/09/2024 (1st Shift)
(a) 3,200 (b) 3,600 (c) 3,100 (d) 4,200

Q.66. A total of ₹2,00,000 is divided into two parts for investing in different banks on simple interest. One yields 4% p.a. while the other yields 6% p.a. If the total interest at the end of one year is equivalent to 4.7% p.a. on the whole amount, the amount (in ₹) invested in each bank is _____, respectively.
SSC CGL 18/09/2024 (2nd Shift)
(a) 1,30,000 and 70,000
(b) 1,45,000 and 55,000
(c) 1,20,000 and 80,000
(d) 1,60,000 and 40,000

Q.67. A sum of ₹1,456, when invested for ten years, amounts to ₹2,366 on maturity. Find the rate of simple interest per annum that was to be paid on the sum invested.
SSC CGL 19/09/2024 (2nd Shift)
(a) 5.75% (b) 6.5% (c) 6.25% (d) 6.15%

Q.68. The difference between the simple interests on the principal of ₹500 at an interest rate of 5% per annum for 3 years and 4% per annum for 4 years is:
SSC CGL 23/09/2024 (1st Shift)
(a) ₹7.5 (b) ₹5 (c) ₹15 (d) ₹10

Q.69. In how much time (in years, rounded off to 2 decimal places) will ₹10,800 amount to ₹24,800 if invested at simple interest at the rate of 15.5% per annum?
SSC CGL 24/09/2024 (1st Shift)
(a) 7.72 (b) 8.36 (c) 9.54 (d) 6.89

Q.70. Ramu lent ₹3,000 to Raju and a certain sum to Ravi at the same time and at the same rate of simple interest of 8% per annum. After 5 years, he received a sum of ₹1,600 from Raju and Ravi together as interest. Find the sum lent to Ravi.
SSC CGL 24/09/2024 (3rd Shift)
(a) ₹1,000 (b) ₹1,250
(c) ₹1,200 (d) ₹1,500

Q.71. If ₹1,875 becomes ₹2,625 in 4 years, what will ₹24,000 become at the end of 9 years at the same rate of interest, under simple interest?
SSC CGL 26/09/2024 (1st Shift)
(a) ₹45,600 (b) ₹21,600
(c) ₹34,800 (d) ₹43,200

SSC CHSL 2024 Tier - 1

Q.72. In how many years will the simple interest on a sum of money be equal to the principal at the rate of $2\frac{6}{7}$% per annum?
SSC CHSL 01/07/2024 (1st Shift)
(a) 34 years (b) 37 years
(c) 35 years (d) 33 years

Q.73. Reshma took a loan of ₹12,00,000 with simple interest for as many years as the rate of interest. If she paid ₹9,72,000 as interest at the end of the loan period, what was the rate of interest per annum
SSC CHSL 01/07/2024 (2nd Shift)
(a) 9% (b) 8.7% (c) 8% (d) 7.5%

Q.74. An amount becomes double in 7 years on simple interest. The amount would be four times in ___ years on the same rate of simple interest.
SSC CHSL 01/07/2024 (3rd Shift)
(a) 14 (b) 18 (c) 21 (d) 28

Q.75. The simple interest on a sum of money for $1\frac{1}{2}$ years at 10% per annum is ₹30 more than the simple interest on the same sum for 1 year at 12% per annum. Find the sum.
SSC CHSL 02/07/2024 (2nd Shift)
(a) ₹1,050 (b) ₹1,250
(c) ₹1,000 (d) ₹1,20

Q.76. A man invested a sum of ₹5,000 on simple interest for 5 years such that the rate of interest for the first 2 years is 10% per annum, for the next 3 years it is 12% per annum How much interest (in ₹), will he earn at the end of 5 years?
SSC CHSL 03/07/2024 (2nd Shift)
(a) 3180 (b) 3000 (c) 2450 (d) 2800

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.77. The simple interest on a sum for 8 years is $\frac{4}{5}$ of the sum. The rate of interest per annum is:
SSC CHSL 03/07/2024 (4th Shift)
(a) 15% (b) 5% (c) 20% (d) 10%

Q.78. How much time (in years) will it take for an amount of ₹4,50,000 to yield ₹45,000 as simple interest at a 5% per annum rate of interest ?
SSC CHSL 04/07/2024 (2nd Shift)
(a) 4 (b) 2 (c) 5 (d) 3

Q.79. An amount of ₹8,000 was invested for 2 years, partly in scheme 1 at the rate of 5% simple interest per annum and the rest in scheme 2 at the rate of 4% simple Interest per annum. The total interest received at the end was ₹720. The amount of money invested in scheme 1 is:
SSC CHSL 04/07/2024 (4th Shift)
(a) ₹7,200 (b) ₹4,400
(c) ₹3,640 (d) ₹4,000

Q.80. An equal sum of money was lent to P and Q at 8.6% per annum for a period of 7 years and 8 years, respectively. If the difference in interest paid by them was ₹172, then the sum lent to each was:
SSC CHSL 05/07/2024 (2nd Shift)
(a) ₹2,000 (b) ₹3,000
(c) ₹2,150 (d) ₹185

Q.81. If the ratio of principal and simple interest for 5 years is 10 : 7, then the rate of interest per annum is:
SSC CHSL 05/07/2024 (3rd Shift)
(a) 10% (b) 11% (c) 15% (d) 14%

Q.82. What will be the amount due on ₹12,000 in 2 years when the rate of simple interest on successive years is 9% and 10%, respectively ?
SSC CHSL 08/07/2024 (2nd Shift)
(a) ₹14,250 (b) ₹14,350
(c) ₹14,150 (d) ₹14,280

Q.83. A sum of money becomes five times its original value in 15 years when invested at a certain simple interest rate. If the sum was invested twice the time at the same rate of interest, what would be the final amount?
SSC CHSL 08/07/2024 (3rd Shift)
(a) The money becomes 9 times its original value
(b) The money becomes 7 times its original value
(c) The money becomes 6 times its original value
(d) The money becomes 8 times its original value

Q.84. Ram invested a certain sum of money at simple interest. It amounted to $\frac{5}{4}$ of itself in 3 years. What will be its rate per cent per annum?
SSC CHSL 08/07/2024 (4th Shift)
(a) 8.20% (b) 9.12% (c) 7.25% (d) 8.33%

Q.85. If a sum of ₹3,260 on simple interest amounts to ₹5,420 in 6 years, then what will this sum amount to in 4 years at the same rate of interest?
SSC CHSL 09/07/2024 (2nd Shift)
(a) ₹4,500 (b) ₹3,700
(c) ₹4,700 (d) ₹3,900

Q.86. An amount invested fetched a total simple interest of ₹4,050 at the rate of 9% per annum in 5 years. What is the amount invested (in ₹)?
SSC CHSL 09/07/2024 (3rd Shift)
(a) 9,050 (b) 7,500
(c) 8,300 (d) 9,000

Q.87. What will be the amount due on ₹36,000 in 2 years when the rate of simple interest for successive years is 8% and 6%, respectively ?
SSC CHSL 09/07/2024 (4th Shift)
(a) ₹ 38,880 (b) ₹ 40,320
(c) ₹ 41,760 (d) ₹ 41,040

Q.88. Ramu invested some money at 8% simple interest per annum, and it was grown up to ₹820 in 8 years. If the same sum was invested at 20% simple interest per annum for a period of 10 years, find the amount.
SSC CHSL 10/07/2024 (4th Shift)
(a) ₹ 1,200 (b) ₹ 1,320
(c) ₹ 1,000 (d) ₹ 1,500

Q.89. A sum of ₹5,000 was lent to two people, one at the rate of 16% and the other at the rate of 24%. If the simple interest after one year is ₹960, what is the sum lent at the higher rate?
SSC CHSL 11/07/2024 (2nd Shift)
(a) ₹ 2,500 (b) ₹ 2,000
(c) ₹ 3,000 (d) ₹ 1,500

SSC CPO 2024 Tier - 1

Q.90. A person borrowed ₹ 1760 at 6% per annum and ₹ 2240 at 9% per annum at simple interest for the same period. He had to pay ₹ 1536 in all as interest. Find the time (in years).
SSC CPO 27/06/2024 (1st Shift)
(a) 3 (b) 4 (c) 5 (d) 2

Q.91. A person deposited some amount of money in the bank at simple interest. After 20 years, the amount became nine times the amount deposited. In how many years will the amount become 13 times the amount if the interest rate remains the same?
SSC CPO 27/06/2024 (3rd Shift)
(a) 30 (b) 25 (c) 28 (d) 23

Q.92. A certain sum of money is given at a certain rate of simple interest for 4 years. Had it been given at 11% higher rate for the same time, it would have fetched ₹1320 more. Find the sum (in ₹).
SSC CPO 28/06/2024 (2nd Shift)
(a) 2500 (b) 3000 (c) 4580 (d) 3240

Q.93. A part of ₹48,500 is invested at a simple interest of 15% per annum. The rest of the money is invested at the rate of 10% simple interest per annum after 2 years of the first investment. The ratio of interest after 5 years from the time when the first amount was invested is 5 : 3. How much is the second part that was invested(in ₹) at the rate of 10% simple interest ?
SSC CPO 29/06/2024 (1st Shift)
(a) 20,940 (b) 29,100
(c) 24,900 (d) 19,400

Q.94. If the simple interest on a certain sum of money for 20 months at the rate of 19.2% per annum exceeds the simple interest on the same sum for 15 months at the rate of 11.2% p.a. by ₹2,920, then what is the sum (in ₹ to the nearest hundreds)?
SSC CPO 29/06/2024 (2nd Shift)
(a) 16,620 (b) 12,660
(c) 16,200 (d) 16,660

SSC Selection Post (Phase - XII)

Q.95. Rohan buys a bike priced at ₹95,000. He pays ₹25,000 at once and the rest after 18 months, on which he is charged a simple interest at the rate of 10% per annum. The total amount (in ₹) he pays for the bike is:
Matriculation Level 20/06/2024 (Shift - 1)
(a) 1,23,200 (b) 1,02,320
(c) 1,03,500 (d) 1,05,500

Q.96. Sanjana borrows ₹16,000 at 24% per annum simple interest and Savithri borrows ₹18,200 at 20% per annum simple interest. In how many years will their amounts of debts be equal?
Matriculation Level 20/06/2024 (Shift - 4)
(a) 10 (b) 11 (c) 15 (d) 12

Q.97. On a deposit of ₹1,50,000, R gets ₹2,000 as interest on simple rate of interest in a year. How much amount (in ₹) should he deposit to get interest of ₹4,500 ?
Matriculation Level 21/06/2024 (Shift - 1)
(a) 3,77,500 (b) 2,77,500

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(c) 4,25,500 (d) 3,37,500

Q.98. A borrows ₹20,000 from B and C. B lends him a certain sum of money at 25% simple interest per annum, while C lends him the remaining sum of money at 21% simple interest per annum. The total interest paid by A in one year is ₹4,500. The sum (in ₹) borrowed from B is:
Matriculation Level 21/06/2024 (Shift - 1)
(a) 9,000 (b) 6,000 (c) 7,500 (d) 12,500

Q.99. Mr Gogia invested an amount of ₹ 13,900 divided into two different schemes A and B at the simple interest rate of 14% pa and 11% pa, respectively. If the total amount of simple interest earned in 2 years is ₹3,508, what was the amount invested in scheme B ?
Matriculation Level 21/06/2024 (Shift - 1)
(a) ₹7,200 (b) ₹6,500
(c) ₹6,400 (d) ₹7,500

Q.100. A sum of money invested at simple interest amounts to ₹1,01,264 in 3 years and to ₹1,01,654 in 4 years. What was the sum invested (in ₹) ?
Matriculation Level 21/06/2024 (Shift - 4)
(a) 1,00,194 (b) 2,01,094
(c) 1,01,094 (d) 1,00,094

Q.101. The simple interest on a certain sum is one-fifth of the sum and the interest rate per cent per annum is 3.2 times the number of years. If the rate of interest increases by 4%, then the simple interest (in ₹) on ₹7,500 for 4 years is:
Matriculation Level 21/06/2024 (Shift - 4)
(a) 2,500 (b) 3,000 (c) 3,600 (d) 5,100

Q.102. A sum was put at simple interest at a certain rate for 4 years. Had it been put at 5% higher rate, it would have fetched ₹520 more. Find the sum.
Matriculation Level 21/06/2024 (Shift - 4)
(a) ₹2,200 (b) ₹2,600 (c) ₹2,400 (d) ₹2,000

Q.103. If a certain sum of money at 5% per annum simple interest amounts to ₹810 in $2\frac{1}{2}$ years, then the certain sum is:
Matriculation Level 24/06/2024 (Shift - 1)
(a) ₹740 (b) ₹750 (c) ₹720 (d) ₹730

Q.104. A bank gives simple interest at the rate of 4.5% per annum. How much money (in ₹) should a person deposit to get ₹7,500 as interest every year ?
Matriculation Level 25/06/2024 (Shift - 1)
(a) 1,33,333.33 (b) 2,33,333.33
(c) 2,66,666.67 (d) 1,66,666.67

Q.105. ₹50,000 is deposited in a bank account. There was already some money in the account. Now the bank gives ₹7,500 as simple interest in a year. The rate of simple interest is 4.5% per annum. How much money (in ₹) was already there in the account ?
Matriculation Level 26/06/2024 (Shift - 1)
(a) 1,33,333.33 (b) 1,66,666.67
(c) 1,16,666.67 (d) 1,13,333.33

Q.106. A certain sum of money amounts to ₹1,250 in 4 years and to ₹1,520 in $5\frac{1}{2}$ years at a certain rate of simple interest. Find the rate of interest per annum (correct to two places of decimals).
Higher Secondary 25/06/2024 (Shift - 2)
(a) 43.96% (b) 33.96%
(c) 23.96% (d) 53.96%

Q.107. In what duration (in years) will ₹1,500 amount to ₹2,250 at simple interest 10% per annum ?
Higher Secondary 25/06/2024 (Shift - 4)
(a) 3.5 (b) 5 (c) 3 (d) 5.5

Q.108. Manish invested a certain sum of money at 10% per annum simple interest. If he receives an interest of ₹72780 after 1 year, the sum (in ₹) he invested is:
Graduate Level 21/06/2024 (Shift - 3)
(a) 727812 (b) 728383
(c) 727925 (d) 727800

Q.109. The simple interest on a sum of money is $\frac{9}{45}$ of the sum. If the number of years is numerically 5 times of rate percent per annum, then find the rate percent per annum.
Graduate Level 26/06/2024 (Shift - 4)
(a) 7% (b) 2% (c) 5% (d) 3%

SSC CHSL 2023 Tier - 2

Q.110. A person borrowed some money on simple interest. After 3 years, he returned $\frac{4}{3}$ of the money to the lender. What was the rate of interest ?
SSC CHSL Tier II 02/11/2023
(a) $11\frac{2}{9}$ % p.a (b) $11\frac{3}{9}$ % p.a
(c) $11\frac{4}{9}$ % p.a (d) $11\frac{1}{9}$ % p.a

Q.111. In how many years will ₹2,500 invested at the rate of 16% p.a. simple interest, amount to ₹4,100 ?
SSC CHSL Tier II 10/01/2024
(a) 4 (b) 3 (c) 5 (d) 6

SSC CPO 2023 Tier - 1

Q.112. Rajesh invested ₹10,000 by dividing it into two different investment schemes, A and B, at simple interest rates of 8% and 10%, respectively. If the total interest earned in 2 years is ₹1,680, the amount invested in scheme A is:
SSC CPO 03/10/2023 (1st Shift)
(a) ₹4,000 (b) ₹2,000 (c) ₹6,000 (d) ₹8,000

Q.113. If an amount of ₹80 becomes ₹96 in 2 years in a bank account which gives simple annual interest, then an amount of ₹62,000 will become _____ in the same account after 5 years.
SSC CPO 03/10/2023 (2nd Shift)
(a) ₹93,000 (b) ₹84,600
(c) ₹82,400 (d) ₹88,200

Q.114. Ramesh borrowed ₹15,000 at a certain rate of simple interest from a bank. He repaid (the principal but not interest) ₹6,000 after 5 years, and after 5 more years he paid ₹18,600 and settled his account. Find the rate of simple interest per annum.
SSC CPO 04/10/2023 (2nd Shift)
(a) 10% (b) 8% (c) 12% (d) 6%

Q.115. Kanchan lent ₹10,000 for 2 years and ₹5,000 for 4 years at the same rate of simple interest. If the total interest received by Kanchan is ₹2,000, then what was the rate of interest?
SSC CPO 04/10/2023 (3rd Shift)
(a) 4% (b) 2% (c) 3% (d) 5%

SSC MTS 2023 Tier - 1

Q.116. A sum of money deposited at simple interest amounts to ₹1,020 in three years and ₹980 in two years. The sum deposited is :
SSC MTS 01/09/2023 (2nd Shift)
(a) ₹900 (b) ₹880 (c) ₹920 (d) ₹840

Q.117. A car dealer borrows ₹20,000 from a bank for a period of 2 years at a simple interest rate of 8% per annum. If he repays the loan in full at the end of the 2 year period, how much will he have to pay?
SSC MTS 04/09/2023 (1st Shift)
(a) ₹3,600 (b) ₹23,600
(c) ₹23,200 (d) ₹3,200

Q.118. A sum invested at the rate of 6% simple interest per annum grows to ₹1,13,880 in 5 years. What is the simple interest, If the same amount is invested for 8 years at the rate of 9% per annum?
SSC MTS 04/09/2023 (2nd Shift)
(a) ₹63,072 (b) ₹60,565
(c) ₹65,392 (d) ₹58,050

Q.119. The ratio of principal and amount is 5 : 6 for one year. Find the rate of simple interest per annum?
SSC MTS 04/09/2023 (3rd Shift)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) 10% (b) 11% (c) 15% (d) 20%

Q.120. The simple interest on a certain sum for 4 years at the rate of 15% pa. is ₹4,500 less than the simple interest on the same sum for 6 years at the same rate of interest. Find the sum
SSC MTS 06/09/2023 (2nd Shift)
(a) ₹12,000 (b) ₹13,000
(c) ₹15,000 (d) ₹14,000

Q.121. In a certain time, a sum becomes 5 times at the rate of 6% per annum on simple interest. At what rate of interest, the same sum becomes 8 times in the same duration?
SSC MTS 08/09/2023 (2nd Shift)
(a) 8.5% (b) 10.5% (c) 5.5% (d) 12.5%

Q.122. If the ratio of the principal and the simple interest for 5 years is 10 : 7, then the rate of interest per annum is:
SSC MTS 08/09/2023 (3rd Shift)
(a) 18% (b) 16% (c) 12% (d) 14%

Q.123. ₹8,000 becomes ₹9,800 in three years at simple interest rate. If the rate of interest becomes two times of itself, then what will be the amount of the same principle in four years?
SSC MTS 11/09/2023 (2nd Shift)
(a) ₹10,800 (b) ₹11,800
(c) ₹12,800 (d) ₹13,500

Q.124. A certain sum of money lent out at simple interest amounts to ₹12,600 in 2 years and ₹16,200 in 4 years. The rate percent per annum is:
SSC MTS 11/09/2023 (3rd Shift)
(a) 25% (b) $12\frac{6}{7}$% (c) $17\frac{1}{2}$% (d) 20%

Q.125. The simple interest on a sum of money is four times the principal. The rate percent per annum and time in years are equal. Find the rate percent per annum.
SSC MTS 12/09/2023 (1st Shift)
(a) 10% (b) 12% (c) 15% (d) 20%

Q.126. A certain sum is invested at a simple interest rate of 12% per annum for a certain period of time. If the sum becomes four times the principal at the end of the period, what is the duration of the investment?
SSC MTS 14/09/2023 (1st Shift)
(a) 22 years (b) 24 years
(c) 25 years (d) 20 years

SSC CHSL 2023 Tier - 1

Q.127. A man deposited ₹10,000 at simple interest in a fund. The interest rate on the fund increases by 4% every year. If the interest rate at the time of the amount deposit was 8%, what is the interest earned (in ₹) by him after 5 years
SSC CHSL 02/08/2023 (4th Shift)
(a) 6,000 (b) 8,400 (c) 5,800 (d) 8,000

Q.128. If the simple interest on a certain sum of money is ₹11,220 at the rate of $16\frac{1}{2}$% per annum for 8 years and 3 months, then what is the principal amount (in ₹, rounded off to the nearest rupee)?
SSC CHSL 03/08/2023 (3rd Shift)
(a) 4,228 (b) 6,822 (c) 8,422 (d) 8,242

Q.129 A man invested ₹25,400 on simple interest for 9 years to obtain a total amount of ₹67,790 on a certain annual rate of interest. What was the rate of interest (rounded off to 2 decimal places) to obtain the above amount?
SSC CHSL 04/08/2023 (4th Shift)
(a) 14.58% (b) 18.54%
(c) 18.45% (d) 15.84%

Q.130. A person invested a certain amount at a rate of 12% simple interest and another amount at a rate of 10% simple interest. He received an annual interest of ₹130. However, if he had interchanged the amounts invested, he would have received ₹4 more as interest. How much did he invest at the rate of 12% simple interest originally?
SSC CHSL 07/08/2023 (3rd Shift)
(a) ₹500 (b) ₹650 (c) ₹560 (d) ₹600

Q.131. If the simple interest on ₹2,500 is more than the interest on ₹1,500 by ₹360 in 3 years, then find the rate of interest per annum.
SSC CHSL 08/08/2023 (4th Shift)
(a) 11% (b) 9% (c) 10% (d) 12%

Q.132. Simple interest on a certain sum is one-fourth of the sum and the interest rate per annum is four times the number of years. If the rate of interest increases by 2%, then how much will the simple interest (in ₹) be on ₹3,600 for 6 years?
SSC CHSL 09/08/2023 (1st Shift)
(a) 2,562 (b) 2,514 (c) 2,642 (d) 2,592

Q.133. The simple interest (in ₹, rounded off to the tens place) on ₹12,300 from 22 May 1993 to 2 August 1993 (both days are included) at the rate of 12% per annum is:
SSC CHSL 09/08/2023 (4th Shift)
(a) 300 (b) 200 (c) 250 (d) 350

Q.134. A man invested ₹4,500 at 5% per annum and ₹5,500 at 8% per annum simple interest. Both investments were for 4 years each. The amount received from the lower rate of interest is what percent (rounded off to the nearest integer) of the amount received from the higher rate of interest?
SSC CHSL 10/08/2023 (1st Shift)
(a) 63% (b) 74% (c) 51% (d) 48%

Q.135. An amount of ₹P was put at simple interest at a certain rate for 4 years. If it had been put at a 6% higher rate for the same period, it would have fetched ₹600 more interest. What is the value of 2.5 P ?
SSC CHSL 10/08/2023 (4th Shift)
(a) ₹ 3,750 (b) ₹6,250
(c) ₹ 4,850 (d) ₹ 2,500

Q.136. The simple interest on a sum of money in 6 years at the rate of 15% per annum is ₹1,440 less than the simple interest accrued on the same sum in 9 years at 18% per annum. What is the sum of money (in ₹) ?
SSC CHSL 11/08/2023 (4th Shift)
(a) 1,800 (b) 2,000 (c) 2,700 (d) 2,400

Q.137. A money lender lent ₹30,000 in two parts, one at the rate of 8% and the other at 9%. If the total annual simple interest on the amount is ₹2,650, then what is the amount of money lent at the rate of 8%?
SSC CHSL 14/08/2023 (1st Shift)
(a) ₹6,000 (b) ₹5,000
(c) ₹4,500 (d) ₹5,500

Q.138. A man borrowed a certain sum of money at the rate of 10% per annum simple interest for the first three years and 15% per annum simple interest for the period beyond three years. If he pays a total interest of ₹2,884.50 at the end of 7 years, then the sum of money (in) that he borrowed is:
SSC CHSL 14/08/2023 (2nd Shift)
(a) 3,860 (b) 3,090 (c) 4,550 (d) 3,205

Q.139. If ₹2,000 is invested at a simple interest rate of 5% per annum and the interest is added to the principal after 10 years, then in how many years will it amount to ₹4,000 at the same rate of interest ?
SSC CHSL 14/08/2023 (3rd Shift)
(a) $18\frac{2}{3}$ years (b) $16\frac{1}{3}$ years
(c) $16\frac{2}{3}$ years (d) $18\frac{1}{3}$ years

SSC CGL 2023 Tier - 1

Q.140. If ₹72 amounts to ₹104.4 in 3 years, what will ₹120 amount to in 5 years at the same rate percent per annum?
SSC CGL 14/07/2023 (4th shift)
(a) ₹ 450 (b) ₹ 330 (c) ₹ 210 (d) ₹ 215

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.141. A sum of money invested at a certain rate of simple interest per annum amounts to ₹14,522 in seven years and to ₹18,906 in eleven years. Find the sum invested (in ₹).
SSC CGL 17/07/2023 (2nd shift)
(a) 6850 (b) 6900 (c) 6800 (d) 6750

Q.142. A person took a loan at 5% per annum simple interest during the first year and with an increase of 0.5% simple interest every year from the second year onwards. After 4 years, he paid ₹4,600 as a total interest to settle the loan completely. How much was the loan?
SSC CGL 17/07/2023 (3rd shift)
(a) ₹ 20,000 (b) ₹ 19,000
(c) ₹ 18,000 (d) ₹ 21,000

Q.143. If the simple interest for 5 years is equal to 25% of the principal, then the interest will be equal to the principal after _____ years.
SSC CGL 18/07/2023 (1st shift)
(a) 20 (b) 30 (c) 25 (d) 22

Q.144. A man took a loan of ₹32,400 at a certain rate of simple interest per annum. The rate of interest is one-fourth of the number of years for which the loan is taken. If he paid ₹11,664 as interest at the end of the loan period, the rate of interest was:
SSC CGL 19/07/2023 (2nd shift)
(a) 3% (b) 8% (c) 5% (d) 12%

Q.145. A person borrowed some money on simple interest. After 4 years, he returned $\frac{9}{5}$ of the money to the lender. What was the rate of interest?
SSC CGL 21/07/2023 (2nd shift)
(a) 25% p.a. (b) 10% p.a.
(c) 15% p.a. (d) 20% p.a.

Q.146. R wants to deposit ₹80,000 in the bank for a year. In his account, the bank gives 12% simple annual interest but charges ₹3,000 as a processing fee for the account. What would be his percentage earnings in the account?
SSC CGL 21/07/2023 (4th shift)
(a) 8.75% (b) 9% (c) 8.5% (d) 8.25%

Q.147. S deposits a total of ₹50,000 in two accounts which give 8% and 12% simple interest annually, respectively. After one year, he gets a total ₹5,200. How much money does he deposit in the account with a 12% interest rate?
SSC CGL 25/07/2023 (4th shift)
(a) ₹30,000 (b) ₹32,000
(c) ₹20,000 (d) ₹25,000

SSC Selection Post (Phase - XI)

Q.148. A sum of ₹16,875 was lent out at simple interest, and at the end of 1 year 8 months, the total amount was 18,000. Find the rate of interest per annum.
Graduate Level 27/06/2023 (Shift - 4)
(a) 3.7% (b) 4% (c) 5% (d) 6.66%

Q.149. The simple interest on ₹2,460 will be 162 less than the simple interest on ₹3,000 at the rate of 5% per annum simple interest. Find the time taken in years.
Graduate Level 28/06/2023 (Shift - 3)
(a) 4 (b) 6 (c) 5 (d) 3

Q.150. The simple interest earned on ₹7,000 in 2 years at the rate of R% per annum equals the simple interest earned on ₹5,000 at the rate of 5% per annum in 14 years. The value of R (in percentage) is:
Matriculation Level 27/06/2023 (Shift - 1)
(a) 28% (b) 15% (c) 25% (d) 20%

SSC CHSL 2022 Tier - 2

Q.151. A sum of money doubles itself in 4 years at simple interest. In how much time will it become 7 times at the same rate of interest?
SSC CHSL Tier II (26/06/2023)
(a) 25 years (b) 23 years
(c) 24 years (d) 21 years

SSC MTS 2022 Tier - 1

Q.152. A person lent a certain sum of money at the annual rate of 20 percent on simple interest. In 10 years, the interest amounted to Rs. 800 more than the sum lent. What is the sum lent?
SSC MTS 09/05/2023 (Afternoon)
(a) Rs. 800 (b) Rs. 500
(c) Rs. 1200 (d) Rs. 400

Q.153. After 55 years, a sum invested at simple interest at the rate of r percent becomes twice of itself. What is the value of 'r' ?
SSC MTS 10/05/2023 (Morning)
(a) $\frac{17}{20}$% (b) $\frac{11}{30}$% (c) $\frac{13}{15}$% (d) $\frac{20}{11}$%

Q.154. In how many least number of complete years will a sum of money become more than four times of itself at the rate of 14 percent per annum on simple interest?
SSC MTS 10/05/2023 (Evening)
(a) 20 years (b) 25 years
(c) 29 years (d) 22 years

Q.155. What is the maturity value of Rs.7416 at the end of 3 years at 8.33% simple interest? (approx)
SSC MTS 11/05/2023 (Evening)
(a) Rs.10400 (b) Rs.9270
(c) Rs.9990 (d) Rs.8840

Q.156. The simple interest received on a sum is $\frac{4}{9}$ of the sum. The number of years is equal to the annual rate of interest.What is the annual rate of interest?
SSC MTS 11/05/2023 (Evening)
(a) 7.5 percent (b) 6.66 percent
(c) 6 percent (d) 5.25 percent

Q.157. A sum of Rs. 600 becomes Rs. 840 at simple interest in 4 years. In how many years will the sum of Rs. 1500 amounts to Rs. 2100 at the same rate of simple interest?
SSC MTS 15/05/2023 (Evening)
(a) 5 years (b) 4 years
(c) 2 years (d) 3 years

Q.158. What will be the ratio of simple interest earned by a certain amount at the same rate of interest for 8 years and 20 years?
SSC MTS 16/05/2023 (Evening)
(a) 5 : 7 (b) 2 : 5 (c) 3 : 5 (d) 4 : 3

Q.159. If the time period increases by 5 years, then simple interest increases by Rs. 3600 on a sum of Rs. 6000. What is the annual rate of interest?
SSC MTS 13/06/2023 (Afternoon)
(a) 15% (b) 12% (c) 12.5% (d) 10%

Q.160. A sum of Rs.6000 is divided into two parts. The annual simple interest on the first part at the annual rate of 10 percent is equal to the annual simple interest on the second part at the annual rate of 15 percent. How much is the interest on each part for one year?
SSC MTS 14/06/2023 (Morning)
(a) Rs.300 (b) Rs.330 (c) Rs.360 (d) Rs.420

Q.161. A sum of Rs.1500 amounts to Rs.2175 in 3 years at simple interest. If rate of interest is increased by 3 percent, then what will be the new amount?
SSC MTS 15/06/2023 (Morning)
(a) Rs.2310 (b) Rs.2050
(c) Rs.2460 (d) Rs.2250

Q.162. A = Rs 6000 is invested at simple interest for 5 years and annual rate of interest is 15 percent. B = Rs. 5000 is invested at simple interest for 2 years and annual rate of interest is 20 percent. What is the ratio of interests earned in A and B respectively?
SSC MTS 19/06/2023 (Morning)
(a) 19 : 12 (b) 9 : 4 (c) 16 : 5 (d) 18 : 11

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.163. A person lent certain sum of money at the annual rate of 8 percent on simple interest and the interest received in 9 years is Rs. 560 less than the sum lent. What is the sum lent ?
SSC MTS 20/06/2023 (Morning)
(a) Rs.560 (b) Rs.1000
(c) Rs.2000 (d) Rs.1120

Q.164. Rohan borrows a certain sum at simple interest Rate of interest is 3 percent per annum for first 3 years. 4 percent per annum for next 5 years and 6 percent per annum for next 7 years. If he paid Rs. 2485 as interest, then what is the sum borrowed?
SSC MTS 20/06/2023 (Evening)
(a) Rs. 2500 (b) Rs. 3500
(c) Rs. 4000 (d) Rs. 3600

SSC CHSL 2022 Tier - 1

Q.165. A person lent Rs. 12,000 to B for 3 years and Rs. 10,000 to C for 4 years on simple interest at the same rate of interest and received Rs.6,080 in all from both of them as interest. What is the annual rate of interest?
SSC CHSL 14/03/2023 (1st Shift)
(a) 15% (b) 8 % (c) 11% (d) 5%

Q.166. A person invested a total sum of Rs. 15,500 in three different schemes of simple interest at the annual rate of 4 percent, 6 percent and 10 percent. At the end of one year he got same interest in all three schemes. What is the sum invested at the rate of 6 percent?
SSC CHSL 14/03/2023 (4th Shift)
(a) Rs.5400 (b) Rs.5000
(c) Rs.5500 (d) Rs.6500

Q.167. Rs.P are invested at 5% per annum of simple interest. After T years an interest of Rs.82 is earned and the amount becomes Rs.902. What is the value of T?
SSC CHSL 15/03/2023 (3rd Shift)
(a) 4 years (b) 1 year
(c) 3 years (d) 2 years

Q.168. A sum of Rs. 3000 becomes Rs. 6000 when invested in a scheme of simple interest. If the annual rate of interest and the number of years for which the sum was invested are same, then what is the annual rate of interest?
SSC CHSL 17/03/2023 (1st Shift)
(a) 5% (b) 20% (c) 10% (d) 15%

Q.169. In how much time will a sum of Rs.12500 amounts to Rs.20000 at the rate of 8 percent per annum at simple interest?
SSC CHSL 21/03/2023 (2nd Shift)
(a) 10 years (b) 7.5 years
(c) 8 years (d) 12.5 years

SSC CGL 2022 Tier - 2

Q.170. The difference of simple interest from two banks on ₹8,000 in 3 years is ₹800. If the rate of interest per annum in two banks are R1 and R2, then what is the value of R1 - R2 ? (Where R1> R2)
SSC CGL Tier II (02/03/2023)
(a) $5\frac{1}{3}$% (b) $3\frac{1}{3}$% (c) $1\frac{1}{3}$% (d) $2\frac{1}{3}$%

Q.171. In 5 years, the simple interest on an amount of Rs. X is $\frac{2^{th}}{5}$ of the principal. The rate of interest per annum is:
SSC CGL Tier II (06/03/2023)
(a) 12% (b) 8% (c) 10% (d) 5%

SSC CGL 2022 Tier - 1

Q.172. A person lent a certain sum of money at the annual rate of 25 percent on simple interest. In 6 years the interest amounted to Rs.360 more than the sum lent. What is the sum lent?
SSC CGL 01/12/2022 (2nd Shift)
(a) Rs.600 (b) Rs.360 (c) Rs.720 (d) Rs.540

Q.173. A sum is deposited in a bank which gives simple interest. The sum becomes 1.25 times in 3 years. If there is a requirement of ₹7,60,000 after seven years, how much amount (in ₹) should one deposit to fulfill the requirement?
SSC CGL 07/12/2022 (2nd Shift)
(a) 5,20,000 (b) 5,70,000
(c) 4,80,000 (d) 6,00,000

Q.174. In a certain duration of time, a sum becomes 2 times of itself at the rate of 5% per annum simple interest. What will be the rate of interest if the same sum becomes 5 times of itself in the same duration?
SSC CGL 08/12/2022 (1st Shift)
(a) 20 % (b) 16 % (c) 10 % (d) 18 %

Q.175. A certain amount will become six times in 20 years. How long does it take for the same amount to become 5 times? Assume the same rate of simple interest in each case.
SSC CGL 08/12/2022 (3rd Shift)
(a) 16 years 8 months
(b) 15 years 8 months
(c) 15 years
(d) 16 years

Q.176. A person deposited ₹15,600 in a fixed deposit at 10% per annum simple interest. After every second year he adds his interest earned to the principal. The interest at the end of 4 years is:
SSC CGL 12/12/2022 (3rd Shift)
(a) ₹6,655 (b) ₹6,864 (c) ₹3,975 (d) ₹3,744

Q.177. The monthly income of Mr. Roy is Rs.18,000. He took a loan of Rs.30,000 on simple interest for 3 years at the rate of 5% per annum. The amount that he will be paying as simple interest in 3 years is what percent of his monthly salary?
SSC CGL 13/12/2022 (1st Shift)
(a) 30% (b) 35% (c) 20% (d) 25%

SSC CGL 2021 Tier - 2

Q.178. Sum ₹ 20000 and ₹ 40000 are given on simple interest at the rate of 10 percent and 15 percent per annum respectively for three years. What will be the total simple interest?
SSC CGL Tier II (08/08/2022)
(a) ₹ 36000 (b) ₹ 24000
(c) ₹ 32000 (d) ₹ 28000

SSC Selection Post (Phase - X)

Q.179. If a man deposits Rs.12,100 in a bank at a simple interest of 15% per annum, then how much money will he receive from the bank after 3 years?
Higher Secondary 03/08/2022 (Shift - 4)
(a) Rs.17,545 (b) Rs.16,520
(c) Rs.15,115 (d) Rs.17,200

SSC MTS 2021 Tier - 1

Q.180. Kriti invested a sum of money at a certain rate of simple interest per annum for 3 years in "Bachat scheme". Had she invested the same sum in "Shiksha scheme" for 3 years which has a 2% higher simple interest rate per annum, the investment would have fetched ₹540 more. How much did Kirti invest?
SSC MTS 05/07/2022 (Evening)
(a) ₹9,500 (b) ₹9,000 (c) ₹7,000 (d) ₹8,000

Q.181. The simple interest on a certain sum of money for 2 years at 7% per annum is double the compound interest on ₹1,000 for 2 years at 10% per annum, compounded annually.What is the sum placed on simple interest?
SSC MTS 11/07/2022 (Evening)
(a) ₹1,000 (b) ₹2,000
(c) ₹3,000 (d) ₹4,000

Q.182. Ridhaan took a loan of 12000 at the rate of 8% simple interest per annum. What amount will he have to pay after 6 months, if he decides to repay the entire loan amount with interest at that time?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC MTS 25/07/2022 (Morning)
(a) Rs 12,580 (b) Rs 12,480
(c) Rs 14,690 (d) Rs 13,720

Q.183. Karun borrowed ₹12,000 from Varun and ₹15,000 from Tarun, each for two years at the same rate of simple interest per annum, If he paid an interest of ₹1,680 to Varun at the end of 2 years, then what is the interest that Karun paid to Tarun at the end of the 2-year period?
SSC MTS 26/07/2022 (Morning)
(a) 2050 (b) 1800 (c) 2100 (d) 2350

SSC CGL 2021 Tier - 1

Q.184. The simple interest on a certain sum is $\frac{1}{8}$ of the sum when the number of years is equal to half of the rate percentage per annum. Find the simple interest (in ₹) on ₹15,000 at the same rate of simple interest for 8 years.
SSC CGL 12/04/2022 (Afternoon)
(a) 5,800 (b) 5,000 (c) 6,000 (d) 5,250

SSC CGL 2020 Tier - 2

Q.185. If the amount obtained by A by investing ₹9,100 for three years at a rate of 10% p.a. on simple interest is equal to the amount obtained by B by investing a certain sum of money for five years at a rate of 8% p.a. on simple interest, then 90% of the sum invested by B (in ₹) is
SSC CGL Tier II (29/01/2022)
(a) 8,450 (b) 7,605 (c) 8,540 (d) 7,800

Q.186. A sum of ₹50,250 is divided into two parts such that the simple interest on the first part for $7\frac{1}{2}$ years at $8\frac{1}{3}$% p.a. is $\frac{5}{2}$ times the simple interest on the second part for $5\frac{1}{4}$ years at 8% p.a. What is the difference (in ₹) between the two parts?
SSC CGL Tier II (03/02/2022)
(a) 10,275 (b) 12,750 (c) 12,570 (d) 15,270

SSC MTS 2020 Tier - 1

Q.187. A salesperson, with a view to promote sales of an item, applies the principle of simple interest. He declares that 300 pieces of the item can be obtained immediately against cash payment, but a customer will get only 200 pieces of the item if he defers the payment for a year. What is the rate percentage of interest on the whole?
SSC MTS 05/10/2021 (Morning)
(a) 30 (b) 25 (c) 50 (d) 40

Q.188. A person invested a sum of ₹6,500 at x% per annum at simple interest and a sum of ₹7,500 at (x - 2)% per annum at simple interest. If the total interest earned on both the investments for 3 years is ₹3,750, then the rate of interest is:
SSC MTS 12/10/2021 (Morning)
(a) 14% (b) 10% (c) 8% (d) 12%

Q.189. A man takes a loan of ₹6,000 from his friend on 1st January 2019 with the condition that he will repay with accrued simple interest at the rate 6.25%, as and when the interest touches ₹75. On which date does the loan period expire?
SSC MTS 18/10/2021 (Evening)
(a) 14th February 2019
(b) 15th January 2020
(c) 20th October 2019
(d) 15th March 2019

Q.190. A sum was invested at simple interest at x% p.a. for $2\frac{1}{2}$ years. Had it been invested at (x + 3)% for the same time, it would have fetched ₹585 more. The simple interest on the same sum for $4\frac{2}{3}$ years at 14% p.a. is:
SSC MTS 27/10/2021 (Afternoon)
(a) ₹5,096 (b) ₹5,460 (c) ₹4,732 (d) ₹4,900

Answer Key :-

1.(d)	2.(c)	3.(d)	4.(c)
5.(d)	6.(c)	7.(b)	8.(a)
9.(a)	10.(d)	11.(a)	12.(a)
13.(b)	14.(a)	15.(c)	16.(b)
17.(b)	18.(a)	19.(b)	20.(b)
21.(c)	22.(d)	23.(c)	24.(c)
25.(c)	26.(a)	27.(c)	28.(d)
29.(c)	30.(b)	31.(c)	32.(a)
33.(a)	34.(c)	35.(d)	36.(d)
37.(b)	38.(a)	39.(b)	40.(c)
41.(c)	42.(d)	43.(b)	44.(d)
45.(b)	46.(a)	47.(c)	48.(a)
49.(a)	50.(a)	51.(d)	52.(c)
53.(b)	54.(c)	55.(a)	56.(b)
57.(c)	58.(d)	59.(d)	60.(a)
61.(a)	62.(b)	63.(d)	64.(b)
65.(b)	66.(a)	67.(c)	68.(b)
69.(b)	70.(a)	71.(a)	72.(c)
73.(a)	74.(c)	75.(c)	76.(d)
77.(d)	78.(b)	79.(d)	80.(a)
81.(d)	82.(d)	83.(a)	84.(d)
85.(c)	86.(d)	87.(d)	88.(d)
89.(b)	90.(c)	91.(a)	92.(b)
93.(b)	94.(c)	95.(d)	96.(b)
97.(d)	98.(c)	99.(c)	100.(d)
101.(c)	102.(b)	103.(c)	104.(d)
105.(c)	106.(b)	107.(b)	108.(d)
109.(b)	110.(d)	111.(a)	112.(d)
113.(a)	114.(b)	115.(d)	116.(a)
117.(c)	118.(a)	119.(d)	120.(c)
121.(b)	122.(d)	123.(c)	124.(d)
125.(d)	126.(c)	127.(d)	128.(d)
129.(b)	130.(a)	131.(d)	132.(d)
133.(a)	134.(b)	135.(b)	136.(b)
137.(b)	138.(d)	139.(c)	140.(c)
141.(a)	142.(a)	143.(a)	144.(a)
145.(d)	146.(d)	147.(a)	148.(b)
149.(b)	150.(c)	151.(c)	152.(a)
153.(d)	154.(d)	155.(b)	156.(b)
157.(b)	158.(b)	159.(b)	160.(c)
161.(a)	162.(b)	163.(c)	164.(b)
165.(b)	166.(b)	167.(d)	168.(c)
169.(b)	170.(b)	171.(b)	172.(c)
173.(c)	174.(a)	175.(d)	176.(b)
177.(d)	178.(b)	179.(a)	180.(b)
181.(c)	182.(b)	183.(c)	184.(c)
185.(b)	186.(b)	187.(c)	188.(b)
189.(d)	190.(a)		

Solutions :-

Sol.1.(d) SI = $\frac{principal \times rate \times time}{100}$

SI for first year = $\frac{422092 \times 20 \times 1}{100}$

= ₹ 84418.40

Remaining amount after repayment
= 422092 - 21679 = ₹ 400413

SI for second year = $\frac{400413 \times 20 \times 1}{100}$

= ₹ 80082.60

Mohan total pay the amount end of the second years = 84418.40 + 400413 + 80082.60 = ₹ 564914

Sol.2.(c) SI = $\frac{PRT}{100}$

According to the question,

$$\frac{K \times r^{\frac{1}{2}} \times n^2}{100} = \frac{L \times r^{\frac{3}{2}} \times n^3}{100}$$

$$K \times r^{\frac{1}{2}} \times n^2 = L \times r^{\frac{3}{2}} \times n^3$$

$$\frac{K}{L} = \frac{r^{\frac{3}{2}} \times n^3}{r^{\frac{1}{2}} \times n^2} = \frac{r \times r^{\frac{1}{2}} \times n^3}{r^{\frac{1}{2}} \times n^2} = \frac{r\,n}{1}$$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Hence, $K : L = r\ n : 1$

Sol.3.(d) ATQ,

$SI_1 = \frac{2800 \times 3 \times 10}{100} = 840$

x = ₹840

$SI_2 = \frac{6200 \times y \times 14}{100} = 868y$

1736 = 868y

y = 2yrs

Then, $\frac{x}{y} = \frac{840}{2} = 420$

Sol.4.(c) According to the question,

S.I = 1040 - 800 = ₹ 240

$S.I = \frac{p \times r \times t}{100} \Rightarrow 240 = \frac{800 \times r \times 3}{100}$

(rate) r = 10%

New rate = 10 + 3 = 13%

Required amount

$= 800 + \frac{800 \times 13 \times 3}{100} =$ ₹1,112

Sol.5.(d) According to the question,

100% = ₹5000

125% = ₹6250

New Principal = ₹6250

100% = ₹6250

115% = ₹7187.5

Total interest earned in 8 years =

(7187.5 – 5000) = ₹2187.5

Sol.6.(c) $S.I = \frac{P \times R \times T}{100}$

Let the principal = $8x$

$5x = \frac{8x \times 10 \times T}{100}$

T = 6 years 3 months

According to the question,

$5x = \frac{8x \times 10 \times 3 \times T}{100 \times 4}$

(time) T = $8\frac{1}{3}$ years

Sol.7.(b) 1st rate = $\frac{800}{21} \approx 38\%$

2nd rate = $\frac{1100}{25} = 44\%$

Required difference = 44 – 38 = 6%

Sol.8.(a)

S.I. in 4.5 years = 10,500 - 6000 = 4,500 ₹

S.I. in 3 years = $\frac{4,500}{4.5} \times 3 = 3,000$ ₹

S.I. in 1 years = 1,000 ₹

Principal = 6000 – 3000 = 3000 ₹

Interest rate = $\frac{1000}{3000} \times 100 = 33\frac{1}{3}\%$

Sol.9.(a) Total interest rate%

= 3 × 5% + 2 × 8% + 2 × 10% = 51%

51% of principal = ₹12750

Principal = $\frac{12750 \times 100}{51}$ = ₹25000

Sol.10.(d) Total interest rate = 5 + 4 = 9%

Total amount = 25,000 × $\frac{109}{100}$ = 27,250 ₹

Sol.11.(a)

S.I. in 25 years = 2 times the principal

Rate = $\frac{2 \times 100}{25} = 8\%$

Sol.12.(a) Required difference

= 7 × 8% - 3 × 8% = 32%

32% of principal = ₹ 9120

Principal = $\frac{9120 \times 100}{32}$ = ₹ 28500

Sol.13.(b) Total Time = 26th march 2022 to 7th june 2022

5 + 30 + 31 + 7 = 73 days

Simple interest = $\frac{75,000 \times 9 \times 73}{100 \times 365}$

$= \frac{750 \times 9 \times 1}{5} =$ 1350 ₹

Amount = 75,000 + 1350 = 76,350 ₹

Sol.14.(a)

Simple interest in 1 year = 6% of principal

Required time to become 40% of principal = $\frac{1}{6} \times 40 = \frac{20}{3} = 6\frac{2}{3}$ years

Sol.15.(c) Simple interest = $\frac{P \times R \times T}{100}$

According to question,

$1100 - P = \frac{P \times 5 \times 2}{100}$

$1100 - P = \frac{P}{10} \Rightarrow P = \frac{11000}{11} = 1000$ Rs.

Sol.16.(b) According to the question,

Initial interest = ₹ 135

$135 = \frac{P \times 4.5 \times 1}{100}$

Deposit $(P) = \frac{135 \times 100}{4.5}$ = ₹ 3000

Now, simple interest at the rate of 5% on the same deposit = $\frac{3000 \times 5 \times 1}{100}$ = ₹150

Hence, required interest = 150 – 135 = ₹15

Short trick :-

4.5 % of principal = 135 Rs.

(5 – 4.5)% of principal = $\frac{135}{4.5} \times 0.5 = 15$ Rs.

Sol.17.(b) Simple interest in first case :-

$S.I. = \frac{P \times x \times 3}{100}$

Simple interest in second case :-

$S.I. = \frac{P \times 3x \times (3+y)}{100}$

According to the question ,

$\frac{\frac{p \times x \times 3}{100}}{\frac{P \times 3x \times (3+y)}{100}} = \frac{1}{7}$

$\frac{P \times x \times 3}{100} \times \frac{100}{P \times 3x \times (3+y)} = \frac{1}{7}$

$\frac{1}{(3+y)} = \frac{1}{7} \Rightarrow y = 4$ years

Sol.18.(a) Total days from 24 january 2012 to 18 june 2012

= 7 + 29 + 31 + 30 + 31 + 18 = 146 days

Simple interest = $\frac{Principal \times Rate \times Time}{100}$

Simple interest

$= \frac{78000 \times 35 \times 146}{4 \times 100 \times 366} = 2722.54 = 2723$ ₹

Amount = 78000 + 2723 = 80723 ₹

Sol.19.(b) Let , the sum invested at 10% simple interest be x ₹ and sum invested at 15% simple interest be $(10000 - x)$ ₹

According to thee question ,

$\frac{x \times 10 \times 2}{100} + \frac{(10000-x) \times 15 \times 2}{100} = 2400$ ₹

$20x + 300000 - 30x = 240000$

$10x = 60000 \Rightarrow x = 6000$ ₹

Now , Sum invested at 15% S.I. = 4000 ₹

Sol.20.(b)

Principal × (difference in rates) = 750 Rs.

Principal × (18% – 15%) = 750 Rs.

Principal = $\frac{750 \times 100}{3}$ = 25000 Rs.

Sol.21.(c)

Interest = 12000 × $\frac{120}{100}$ = ₹ 14400

$S.I = \frac{principal \times rate \times time}{100}$

$14400 = \frac{12000 \times rate \times 12}{100}$

Rate = 10%

Sol.22.(d) Let principal be ₹100

Then, Amount = ₹300

And S.I = ₹ 200

Then, S.I. = $\frac{100 \times 10 \times t}{100} = 200$

⇒ t = 20 years

According to question;

For Rate of interest = 20%

S.I. = $\frac{100 \times 20 \times 20}{100}$ = ₹ 400

Then amount = 400 +100 = ₹ 500

So, It will become 5 times of itself at the rate of 20 percent per annum on simple interest in the same time period.

For Rate of interest = 30%

S.I. = $\frac{100 \times 30 \times 20}{100}$ = ₹ 600

Then amount = 600+100 = ₹ 700

So, It will become 7 times of itself at the rate of 30 percent per annum on simple interest in the same time period.

Therefore both statements I and II are correct.

Sol.23.(c) Let , total principal be 10 units.

According to the questions ,

5 units , at 20% for 2 years.

2 units , at 25% for 2 years

and 3 units , at 10% for 2 years

$360 = \frac{5U \times 20 \times 2}{100} + \frac{2U \times 25 \times 2}{100} +$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\frac{3U \times 10 \times 2}{100}$

3.6 U = 360 ₹ ⇒ U = 100₹

Total Principal (10U) = 1000 ₹

Sol.24.(c) Given, P_1 = 23000, T_1 = 3 years and P_2 = 19000 and T_2 = 4 years.

$\frac{23000 \times 3 \times R}{100} + \frac{19000 \times 4 \times R}{100} = 3625$

$\Rightarrow 690R + 760R = 3625$

$\Rightarrow 1450R = 3625 \Rightarrow R = 2.5\%$

Hence, the rate of interest is 2.5%

Sol.25.(c) Simple Interest = $\frac{P \times R \times T}{100}$

9600 = $\frac{P \times 16 \times 5}{100}$

P = $\frac{9600 \times 100}{80}$ = Rs 12000

Sol.26.(a) Remaining amount to be paid in 4 months = 7500 − 3500 = Rs.4000

Simple Interest = $\frac{P \times R \times T}{100}$

According to Question ,

Simple Interest = $\frac{4000 \times 9 \times 4}{12 \times 100}$ = Rs. 120

Sol.27.(c)

Let the price of each book = Rs 1.

Price of 6 books = Rs 6.

Price of 6 books payable after 1 year = Rs 7.

Clearly, Interest = Rs 1.

Rate of interest = $\frac{1}{6} \times 100 = 16.7\%$

Sol.28.(d) Given, Principal = Rs. 1680, time = 2 years and rate % = 4.375%

S.I = $\frac{PRT}{100} = \frac{1680 \times 2 \times 4.375}{100} = Rs.147$

Sol.29.(c) Let the two parts be x and y

According to the question,

$\frac{x \times 4\frac{1}{5} \times 6\frac{2}{3}}{100} = 2(\frac{y \times 2\frac{3}{4} \times 4}{100})$

$\frac{x \times \frac{21}{5} \times \frac{20}{3}}{100} = 2(\frac{y \times \frac{11}{4} \times 4}{100})$

x : y = 11 : 14

So, ratio of second part to first part = y : x = 14 : 11

Sol.30.(b) Let the price of each book be ₹1,

Price of 8 books = ₹8

Price of 10 books = ₹10

Required rate = $\frac{10-8}{8} \times 100 = 25\%$

Sol.31.(c) Simple interest for 2 years = 92400 − 81840 = Rs. 10560

Simple interest for 3 years

= $\frac{10560}{2}$ × 3 = Rs. 15840

Principal = 81840 − 15840 = Rs. 66000

Rate = $\frac{5280}{66000}$ × 100 = 8%

New rate = (8 + 2)% = 10%

In 10 years,the same sum becomes double of itself.

Sol.32.(a) Interest rate after 3 years for son = 5 × 3 = 15 %

Interest rate after 4 years for daughter = 5 × 4 = 20 %

Interest rate after 5 years for wife = 5 × 5 = 25 %

Investment Ratio = $\frac{1}{15} : \frac{1}{20} : \frac{1}{25}$

= 20 : 15 : 12

Total Investment (47 units) = Rs. 105750

Investment for wife (12 units)= Rs. 27000

Sol.33.(a)

Rate Ratio → 3 : 4 : 6

Investment Ratio → $\frac{1}{3} : \frac{1}{4} : \frac{1}{6}$ = 4 : 3 : 2

4x + 3x + 2x = 9000 ⇒ x = 1000

Amount at 6% = 2x = 2 × 1000 = 2000

Sol.34.(c) Let Principal = P and rate = R,

P × R × $\frac{34}{3 \times 100}$ = 13600

PR = 120000

P×R ×3 + 2P ×(R - 2) × 5 = 13600 × 100

⇒ 360000 + 1200000 - 20P = 1360000

⇒ 1560000 - 20P = 1360000

⇒ 20P = 200000 ⇒ P = 10000

Sol.35.(d) Let , rate = r%

$\frac{12000 \times r \times 4}{100 \times 12} + \frac{18000 \times 2r \times 8}{100 \times 12}$ = 2800

40 r + 240 r = 2800 ⟹ r = 10%

Sol.36.(d) We know,

Rs 18,600 at x% and Rs. 37,200 at (x + 2)%

As per question,

⇒ 18600 × $\frac{7}{2}$ × $\frac{x}{100}$ + 37200 × $\frac{7}{2}$ × $\frac{(x+2)}{100}$ = $\frac{231105}{10}$

⇒ 186 × $\frac{7}{2}[x + 2x + 4]$ = $\frac{231105}{10}$

⇒ 3x + 4 = $\frac{2201}{62}$ ⇒ x = 10.5%

So, the second rate is x + 2 = 12.5%

Sol.37.(b) Let r be the rate of interest.

According to the question ,

$\frac{6250 \times r \times 2}{100} + \frac{18750 \times (r+4) \times 2}{100}$

= 4125

⇒ 12500r + 37500r + 150000 = 412500

⇒ r = 5.25

Desired rate of interest

= 5.25 + 4 = 9.25 %

Sol.38.(a) Let P be the principal.

According to the question,

(14395.20 - P) = $\frac{P \times 9.25 \times 5.4}{100}$

⇒ P = (14395.20 - P) × $\frac{100}{9.25 \times 5.4}$

⇒ 49950P = 1439520000 - 100000P

⇒ 149950P =1439520000 ⇒ P = 9600

Desired S.I. = $\frac{9600 \times 8.6 \times 4.5}{100}$ = 3715.20

Sol.39.(b) According to the question

$\frac{x \times m \times r}{100} = \frac{y \times n \times s}{100} \Rightarrow \frac{x}{y} = \frac{ns}{mr}$

Sol.40.(c) Let the principal = 1 unit and rate of interest = r

According to the question

1 = $\frac{1 \times 7 \times r}{100}$ ⇒ r = 14$\frac{2}{7}$%

Now,Let the desired time = t

In this period the sum amounts to = 5 unit

Interest earned in this period = 5 - 1 = 4 unit

⇒ 4 = $\frac{1 \times \frac{100}{7} \times t}{100}$ ⇒ t = 28 years

Short Trick :-

Let , Principal = 2 units

Sum doubled means ,

Interest 2 units → 7 years

Sum become five times,

Interest 8 units → 28 years

Sol.41.(c)

Interest earned in 5 years = 2800

⇒ Interest earned in one year = 560

Interest earned from first scheme in one year = $\frac{4000 \times 1 \times 4}{100}$ = 160

Interest earned from other two schemes in one year = 560 - 160 = 400

Let the amount invested in second scheme = k

According to the question

$\frac{k \times 6 \times 1}{100} + \frac{(6000-k) \times 10 \times 1}{100}$ = 400

⇒ k = 5000

Money invested in third scheme = 6000 - 5000 = 1000

Sol.42.(d)

Interest earned = 1590 - 1500 = 90

According to the question,

90 = $\frac{1500 \times \frac{x}{12} \times \frac{x}{8}}{100}$ ⇒ $x^2 = 576$

⇒ x = 24

Sol.43.(b)

	5th year	:	3rd year
Amount →	5	:	4

Interest earned in 2 years = 5 − 4 = 1 unit

Interest earned in 1 year = 0.5 unit

Interest earned in 3 year = 1.5 unit

Principal = 4 − 1.5 = 2.5 units

Desired rate of interest = $\frac{0.5 \times 100}{2.5 \times 1}$ = 20%

Sol.44.(d) Principal = 1000

Rate of interest = 12%

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Time Period = 4 months or $\frac{1}{3}$ years

Interest earned

$= \frac{Principal \times Rate \times Time\ Period}{100}$

$= \frac{1000 \times 12 \times \frac{1}{3}}{100} = 40$

Amount returned to B = 1000 + 40 = 1040

Sol.45.(b) Let sum = ₹x

For six years rate of interest will be 6 × 5 % = 30%

$\Rightarrow x \times \frac{130}{100} = 4160$

$\Rightarrow x = \frac{4160 \times 10}{13} = 3200$

∴Sum = ₹3200

Sol.46.(a) S.I = $\frac{P \times R \times T}{100}$

$\Rightarrow \frac{500 \times R \times 2}{100} + \frac{650 \times R \times 4}{100}$

$+ \frac{1300 \times R \times 6}{100}$ = ₹ 1140

⇒ 10R + 26R + 78R = ₹ 1140

⇒ 114R = ₹ 1140 ⇒ R = 10%

Sol.47.(c) S.I = $\frac{P \times R \times T}{100}$

$\Rightarrow 810 = \frac{P \times 9 \times 3}{100} \Rightarrow$ P = ₹ 3000

When interest rate increase = 9 + 4 = 13%

Then,

S.I = $\frac{3000 \times 13 \times 3}{100}$ = ₹ 1170

So, required interest = 1170 - 810 = ₹ 360

Sol.48.(a) According to question,

Ratio of their sum = $\frac{1}{3} : \frac{1}{6} : \frac{1}{5}$

= 10 : 5 : 6

Now,

⇒ 21 units = ₹ 21000

⇒ 5 units = $\frac{21000}{21}$ × 5 = ₹ 5000

Hence, The amount invested by Ashima = ₹ 5000

Sol.49.(a) Let first sum = x

Second sum = y

According to question ,

$\Rightarrow \frac{1}{5} \times x = \frac{1}{6} \times y \Rightarrow \frac{x}{y} = \frac{5}{6}$

Now ,

$\Rightarrow \frac{5x \times 6 \times 4}{100} + \frac{6x \times 8 \times 4}{100} = 1560$

$\Rightarrow 312x = 156000 \Rightarrow x = 500$

∴ Total sum invested = 500 × 11 = ₹5500

Sol.50.(a) Let the sum be x

According to question,

$\Rightarrow \frac{x \times 4 \times 6}{100} = \frac{800 \times 5 \times 4.5}{100}$

$\Rightarrow x = \frac{800 \times 5 \times 4.5}{24}$ = ₹750

Sol.51.(d) Let total capital was = 20x unit

According to question ,

$\Rightarrow \frac{5x \times 10 \times 1}{100} + \frac{4x \times 20 \times 1}{100}$

$+ \frac{11x \times 30 \times 1}{100}$ = ₹3220

$\Rightarrow 5x + 8x + 33x = 32200$

$\Rightarrow 46x = 32200 \Rightarrow x = 700$

∴ Total capital = 700 × 20 = ₹14000

Sol.52.(c) Total simple interest paid by A = 7500 × (4 × 8)% = ₹2400

Total simple interest paid by B = 7500 × (9 + 10 + 2 × 6)% = ₹2325

Total S.I. interest paid by A and B = 2400 + 2325 = ₹4725

Sol.53.(b) According to the question,

SI = $\frac{3}{4}$ × Principal , rate = r % and time = 12.5 year

Now, S.I. = $\frac{P \times R \times T}{100}$

$\Rightarrow \frac{3P}{4} = \frac{P \times r \times 12.5}{100} \Rightarrow \frac{3}{4} = \frac{12.5r}{100}$

$\Rightarrow r = \frac{300}{12.5 \times 4}$ = 6%

Sol.54.(c) According to question,

$\Rightarrow 9696 = \frac{9600 \times 7 \times T}{100} + \frac{11800 \times 8 \times T}{100}$

⇒ 9696 = 672T + 944T

⇒ 9696 = 1616T ⇒ T = 6 years

Sol.55.(a)

Total time = 28 years

Sol.56.(b) Interest on 5000 for 3 years at 15% per annum

⇒ 5000 × 45% = 2250

Interest on 8000 for 4 years at 12% per annum

⇒ 8000 × 48% = 3840

Difference of interest paid = 3840 - 2250 = 1590

Sol.57.(c) Principal = ₹18000

Interest on ₹7000 = 7000 × 5% = ₹350

Interest on ₹6000 = 6000 × 6% = ₹360

Remaining interest = 1160 - (350 + 360) = ₹450

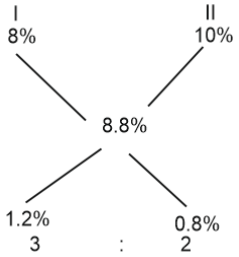
Balance amount = 18000 - (7000 + 6000) = ₹5000

Hence, Required Rate % = $\frac{450}{5000}$ × 100 = 9%

Sol.58.(d)

Overall rate% = $\frac{352}{4000}$×100 = 8.8%

Using Alligation method, we have ;



So, the sum lent at 10%

$= \frac{2}{2+3}$ × 4000 = ₹1600

Sol.59.(d)

Simple Interest = $\frac{Principal \times rate \times time}{100}$

$\Rightarrow \frac{1}{5}$ Principal = $\frac{Principal \times 5(t) \times time}{100}$

⇒ time = 2 years

And rate = 10%

New rate = 13 %

SI = $\frac{5600 \times 13 \times 6}{100}$ = 4368

Sol.60.(a) Let the time be t and rate = 10%

According to question,

⇒ Simple interest = $\frac{3}{5}$ × principal

Then, Simple interest

$= \frac{principal \times Rate \times Time}{100}$

$\Rightarrow \frac{3}{5}$ × principal

$= \frac{principal \times 10 \times t}{100} \Rightarrow$ t = 6

Now, Simple interest

$= \frac{16000 \times 14 \times 6}{100}$ = ₹ 13,440

Sol.61.(a)

Remaining principal after repaying ₹25,490 at the end of first year = 1,41,545 - 25,490 = ₹1,16,055

SI = 1,41,545 × 11% + 1,16,055 × 11%

= (1,41,545 + 1,16,055) × 11%

= 2,57,600 × 11% = ₹ 28,336

So, the amount paid at the end of second year = 28,336 + 1,16,055 = ₹1,44,391

Sol.62.(b)

Amount = Principal (1 + $\frac{rate \times time}{100}$)

$\Rightarrow$ 7 P = P (1 + $\frac{14\,r}{100}$) ⇒ r = $\frac{300}{7}$ %

Now,

18 P = P (1 + $\frac{300}{7 \times 100}$ t)

$\Rightarrow 17 = \frac{300}{7 \times 100}$ t ⇒ t = 39.67 years

Sol.63.(d) Cash should he pay

$= \frac{9810}{109}$ × 104.5 = Rs. 9405

Sol.64.(b) For first two years

Principal = ₹10,000 , rate = 15% ,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SI = $\frac{10000 \times 15 \times 2}{100}$ = ₹3000

For next 2 years,

Principal = 13000 , Rate = 15%

SI = $\frac{13000 \times 15 \times 2}{100}$ = ₹3900

So , total amount paid by Rajesh at the end of 4 years = 13000 + 3900 =₹16900

Sol.65.(b) According to question

$\Rightarrow \frac{P \times (R+7) \times 6}{100} - \frac{P \times R \times 6}{100}$ = 1512

$\Rightarrow \frac{6P}{100}$ (R + 7 - R) = 1512

$\Rightarrow \frac{42P}{100}$ = 1512

⇒ 42P = 151200 ⇒ P = $\frac{151200}{42}$ = 3600

Sol.66.(a) According to the question,

4 % 6 %

4.7 %

1.3 % 0.7 %

13 : 7

⇒ (13 + 7) = 20 units = 200000

⇒ 1 unit = 10000

So,

⇒ 13 units = 130000 and 7 units = 70000

Hence, the amount invested in each bank 130000 and 70000 respectively,

Sol.67.(c) S.I. = 2366 - 1456 = 910

S.I. = $\frac{p \times r \times t}{100}$

Rate = $\frac{910 \times 100}{1456 \times 10}$ ⇒ Rate = 6.25%

Sol.68.(b) interest for 3 years = 5% × 3 = 15%

interest for 4 years = 4% × 4 = 16%

Difference = 16% - 15% = 1%

Now,

Required difference = 500 × $\frac{1}{100}$ = ₹ 5

Sol.69.(b) Interest = 24,800 - 10,800 = 14000

14000 = $\frac{10,800 \times 15.5 \times T}{100}$

T = $\frac{14000 \times 100}{10800 \times 15.5}$ = 8.36 years

Sol.70.(a) Interest paid by Raju in 5 years = (8 × 5) % of 3000 = ₹1200

Interest paid by Ravi = 1600 - 1200 = ₹ 400

Interest paid by Ravi in % = (8 × 5) % = 40%

40% = ₹ 400

100% = ₹ 1000

Hence, sum lent to ravi = ₹ 1000

Sol.71.(a) Interest for one year

= $\frac{2625 - 1875}{4}$ = $\frac{750}{4}$ = ₹187.5

Rate = $\frac{187.5}{1875}$ × 100 = 10%

Interest after 9 year = (9 × 10) % of 24000 = $\frac{90}{100}$ × 24000 = ₹21600

Amount after 9 years = 24000 + 21600 = ₹45600

Sol.72.(c) S.I. = Principal … (given)

Let the simple interest and principal be x

S.I. = $\frac{p \times r \times t}{100}$

x = $\frac{x \times 20 \times t}{100 \times 7}$ ⇒ t = 35 years

Sol.73.(a) SI = $\frac{PRT}{100}$

Let Reshma took a loan at x% interest rate per annum

So, According to the question,

972000 = $\frac{1200000 \times x \times x}{100}$

972000 × 100 = 1200000 × x^2

x^2 = $\frac{972000 \times 100}{1200000}$ = 81 ⇒ x = 9

Hence, required interest rate = 9%

Sol.74.(c) SI = $\frac{p \times r \times t}{100}$

Let the principal is 1 units,

According to the question,

⇒ 1 = $\frac{1 \times r \times 7}{100}$ ⇒ r = $\frac{100}{7}$

When the principal is 4 times then,

3 = $\frac{1 \times 100 \times t}{100 \times 7}$

t (time) = 21 years

Sol.75.(c) SI = $\frac{PRT}{100}$

According to the question,

$\frac{P \times 10 \times 1.5}{100} - \frac{P \times 12 \times 1}{100}$ = 30

$\frac{P \times 10 \times 1.5 - P \times 12 \times 1}{100}$ = 30

15P - 12P = 3000

3P = 3000 ⇒ P = Rs. 1000

Sol.76.(d) Total interest gain in 5 year = 2 × 10% + 3× 12% = 56%

So, interest earn at the end of 5 year = 5000 × 56% = 2800

Sol.77.(d) Let principal = x , SI = $\frac{4}{5}x$

SI = $\frac{PRT}{100}$ ⇒ $\frac{4}{5}x$ = $\frac{x \times R \times 8}{100}$

400 = 40R ⇒ R = 10%

Sol.78.(b) SI = $\frac{P \times R \times T}{100}$

45000 = $\frac{450000 \times 5 \times t}{100}$ ⇒ t = 2 years

Sol.79.(d) Overall rate

= $\frac{720}{8000}$ × 100 = 9%

Rate on scheme 1st = 5 × 2 = 10%

Rate on scheme 2nd = 4 × 2 = 8%

By alligation method : -

1st scheme 2nd scheme

rate ⟶ 10% 8%

Overall rate ⟶ 9%

1 : 1

So the amount in both schemes is equal. Hence, the amount of money invested in scheme 1st is 4000.

Sol.80.(a) For P = 7 × 8.6%

For Q = 8 × 8.6%

difference (8.6 × 1 units) = ₹172

Required sum (100 units) = $\frac{172}{8.6}$ × 100 = ₹2000

Sol.81.(d) $\frac{P}{SI}$ = $\frac{10}{7}$ ⇒ $\frac{P}{\frac{P \times R \times 5}{100}}$ = $\frac{10}{7}$

$\frac{100}{5R}$ = $\frac{10}{7}$ ⇒ R = 14%

Sol.82.(d) Amount due

= 12000 × $\frac{119}{100}$ = ₹14,280

Sol.83.(a) SI = $\frac{p \times r \times t}{100}$

4 = $\frac{1 \times r \times 15}{100}$ ⇒ r = $\frac{400}{15}$

Now,

SI = $\frac{1 \times 400 \times 30}{100 \times 15}$ = 8

So the final amount will be 1 + 8 = 9 units

That means the amount will be 9 times of its original value.

Sol.84.(d) Let simple interest = 100 unit

Amount after 3 year

= 100 × $\frac{5}{4}$ = 125 unit

Interest in 3 year = 25 unit

So, rate % = $\frac{100 \times 25}{100 \times 3}$ = 8.33%

Sol.85.(c)

SI in 6 years = 5420 - 3260 = ₹2160

SI in 4 years = $\frac{2160}{6}$ × 4 = ₹1440

Sum amount to in 4 years = 3260 + 1440 = ₹4700

Sol.86.(d) SI = $\frac{p \times r \times t}{100}$

4050 = $\frac{p \times 9 \times 5}{100}$ ⇒ p = ₹ 9,000

Sol.87.(d)

Interest for two years = (8 + 6)% = 14%

Hence, required amount = 36000 × $\frac{114}{100}$ = ₹41,040

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.88.(d) Let the principal be 100%
SI for 8 yrs = 8 × 8 = 64%
164% = ₹820
100% = $\frac{820}{164}$ × 100 = ₹500
Required amount = 500 + 500 ×10 × 20 %
= 500 + 1000 = ₹1500

Sol.89.(b) Rate% = $\frac{960}{5000}$ × 100 = 19.2%
Now, we have ;

I	II
16%	24%

19.2%

4.8%	3.2%
3 :	2

So, the sum lent at the higher rate
= $\frac{2}{3+2}$ × 5000 = ₹2000

Sol.90.(c)
SI ∝ P × R (when time is constant)
$SI_1 : SI_2$ = 1760 × 6 : 2240 × 9 = 11 : 21
(11 + 21) = 32 unit = ₹1536
Then, 11 unit = $\frac{1536}{32}$ × 11 = ₹528
Now, SI = 1760 × 6 % × t = 528
t = $\frac{528 \times 100}{1760 \times 6}$ = 5 yrs

Sol.91.(a) Let principal = x then, S.I. = $8x$
Time = 20 years
Rate = $\frac{S.I. \times 100}{P \times t}$ = $\frac{8x \times 100}{x \times 20}$ = 40%
Time to be 13 times = $\frac{12x \times 100}{x \times 40}$
= 30 years

Sol.92.(b) According to question,
Higher interest for 4 years = 4 × 11
= 44%
According to question,
44% = 1,320
100% = $\frac{1320}{44}$ × 100 = 3000
Hence, sum = 3000

Sol.93.(b)
Let 1st part be x and 2nd part be y
x is invested for 5 years and y is invested for 3 years
Interest for x in 5 years = 5 × 15% = 75%
Interest for y in 3 years = 3 × 10% = 30%
According to question
$\frac{75\% \ of \ x}{30\% \ of \ y} = \frac{5}{3} \Rightarrow \frac{x}{y} = \frac{5 \times 30}{3 \times 75} = \frac{2}{3}$
Now second part (y) = $\frac{3}{5}$ × 48,500
= ₹ 29100

Sol.94.(c)
Interest for 20 months = $\frac{19.2}{12}$×20 = 32%
Interest for 15 months = $\frac{11.2}{12}$×15 = 14%
Difference in interest = 32 - 14 = 18%
According to question,
18% = 2920
100% (sum) = $\frac{2920}{18}$×100
= 16222 = 16200 (approx)

Sol.95.(d)
Principal = 95000 - 25000 = ₹70,000
SI for 18 months = 70,000 × 10% × $\frac{18}{12}$
= ₹10500
Total amount paid for the bike
= 95,000 + 10500 = ₹1,05,500

Sol.96.(b) We know,
Simple Interest = $\frac{P \times R \times T}{100}$
And amount = $\frac{P \times R \times T}{100}$ + P
Sanajna's amount = Savithri's amount
⇒ $\frac{16000 \times 24 \times T}{100}$ + 16000
= $\frac{18200 \times 20 \times T}{100}$ + 18200
⇒ 3840 T = 3640 T + 2200
⇒ 200 T = 2200 ⇒ T = 11 years.

Sol.97.(d) We know that,
SI = $\frac{Principal \times rate \times time}{100}$
⇒ 2000 = $\frac{150000 \times R \times 1}{100}$ ⇒ R = $\frac{4}{3}$
Now, 4500 = $\frac{P \times \frac{4}{3} \times 1}{100}$
⇒ P = $\frac{4500 \times 3 \times 100}{4}$ ⇒ P = ₹ 337500

Sol.98.(c) Let money lent by B = x Rs.
And money lent by C = 20,000 - x Rs.
Interest by B = $\frac{Principal \times rate \times time}{100}$
⇒ SI_1= $\frac{x \times 25 \times 1}{100}$
And , Interest by C = SI_2
= $\frac{(20000 - x) \times 21 \times 1}{100}$
Now,
Total simple interest = SI_1 + SI_2
⇒ Total simple interest
= $\frac{x \times 25 \times 1}{100}$ + $\frac{(20000 - x) \times 21 \times 1}{100}$
⇒ 4500 = $\frac{25x + 420000 - 21x}{100}$
⇒ 450000 = 4 x + 420000
⇒ 4x = 30000 ⇒ x = ₹ 7500

Sol.99.(c)
Let amount invested in scheme A = x
And amount invested in scheme B
= 13,900 - x
According to question,
⇒ $\frac{x \times 14 \times 2}{100}$ + $\frac{(13,900 - x) \times 11 \times 2}{100}$
= 3508
⇒ 3508 = $\frac{28x + 305800 - 22x}{100}$
⇒ 3508 = $\frac{6x}{100}$ + 3058
⇒ $\frac{6x}{100}$ = 3508 - 3058 = 450 ⇒ x = ₹ 7500
So, the amount invested in scheme B
= 13900 - 7500 = ₹ 6400

Sol.100.(d) SI for 1 yr i.e.(4 - 3) =101654 -101264 = ₹390
SI for 3 yrs = 390 × 3 = ₹1170
Total sum invested = 101264 - 1170
= ₹1,00,094

Sol.101.(c) According to question,
P = 5SI, R = 3.2T
Now, SI = $\frac{PRT}{100}$ ⇒ SI = $\frac{5SI \times R \times R}{3.2 \times 100}$
320 = 5R^2 ⇒ R^2 = 64 ⇒ R = 8%
New rate% = 8 + 4 = 12%
Hence, required SI = 7500 × 4 × 12%
= ₹3600

Sol.102.(b) Let the sum be 100%
According to question,
4 × 5% = 20% → ₹520
100% → $\frac{520}{20}$ × 100 = ₹2600

Sol.103.(c) Let the principal be 100%
SI = 2.5 × 5%= 12.5%
Amount = 112.5% = ₹ 810
100% = $\frac{810}{112.5}$ × 100 = ₹ 720

Sol.104.(d) According to question
P × 4.5% = 7500
P × $\frac{9}{200}$ = 7500 ⇒ P = $\frac{7500 \times 200}{9}$
= $\frac{5,00,000}{3}$ = ₹1,66,666.67

Sol.105.(c) Let the money already in the account be x
According to the question,
(50,000 + x) × 4.5% × 1= 7,500
2250 + 4.5x% = 7500
4.5x% = 5250
x = $\frac{5250}{4.5}$ × 100 = 1,16,666.67

Sol.106.(b) Given:
Interest in ($5\frac{1}{2}$ - 4) years = 1520 - 1250
Interest in $1\frac{1}{2}$ years = 270 Rs.
Interest in 1 year = 270 × $\frac{2}{3}$ = 180 Rs.
Interest in 4 years = 720 Rs
Given amount in 4 years = 1250 Rs.
⇒ Principal = 1250 - 720 = 530 Rs.
Now, rate of interest = $\frac{180}{530}$ × 100
= 33.96%

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.107.(b) Amount = Rs. 2250
Principal = Rs. 1500
⇒ SI = 2250 - 1500 = Rs. 750
SI = $\frac{Principal \times rate \times time}{100}$
⇒ 750 = $\frac{1500 \times 10 \times T}{100}$
⇒ (Time) T = 5 years

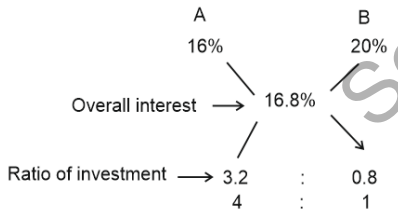
Sol.108.(d) Let the sum be 100%
10% → ₹72780
100% → $\frac{72780}{10}$ × 100 = ₹727800

Sol.109.(b) Let the principal and SI be 45 x and 9x respectively
T = 5R (given)
As we know, SI = $\frac{P \times T \times R}{100}$
$9x = \frac{45x \times 5R \times R}{100}$
$9x = \frac{9x}{4}R^2 \Rightarrow R^2 = 4 \Rightarrow$ R = 2%

Sol.110.(d) According to question,
If principal = 3 unit , then Amount = 4 unit
Interest = $\frac{P \times R \times T}{100}$
$1 = \frac{3 \times R \times 3}{100} \Rightarrow R = \frac{100}{9}\% = 11\frac{1}{9}\%$

Sol.111.(a)
Principal = 2500, Amount = 4100
Interest = $\frac{P \times R \times T}{100}$
1600 = $\frac{2500 \times 16 \times T}{100}$
∴T = $\frac{1600}{25 \times 16}$ = 4 years

Sol.112.(d) S.I for 2 years of A = 16%
S.I for 2 years of B = 20%



Hence, amount invested by A
= $\frac{4}{5} \times 10000 = Rs.\ 8,000$

Sol.113.(a) According to question,
S.I = $\frac{p \times r \times t}{100}$
96 - 80 = $\frac{80 \times r \times 2}{100}$ ⇒ r = 10%
S.I = $\frac{62000 \times 10 \times 5}{100}$ = 31000
Amount = 62000 + 31000 = 93000 Rs

Sol.114.(b) According to the question,
Total amount paid by ramesh
= 6000 + 18600 = 24600
So the interest = 24600 - 15000 = 9600
Now,
$\frac{15000 \times 5 \times r}{100} + \frac{(15000-6000) \times 5 \times r}{100}$
= 9600
750r + 450r = 9600 ⇒ (rate) r = $\frac{9600}{1200}$ = 8%

Sol.115.(d) According to the question,
2000 = $\frac{10000 \times R \times 2 + 5000 \times R \times 4}{100}$
2000 = 200R + 200R
Rate (R) = $\frac{2000}{400}$ = 5%

Sol.116.(a)
S.I. for one year = 1020 − 980 = ₹40
S.I. for two year = ₹80
Sum = 980 − 80 = ₹900

Sol.117.(c) Total rate for 2 years = 16%
Required amount = 116% of 20,000
= ₹23,200

Sol.118.(a) 130% of amount = ₹1,13,880
100% of amount = ₹87,600
SI = 72% of 87600 = ₹63,072

Sol.119.(d) According to the question,
Required rate = $\frac{6-5}{5}$ × 100 = 20%

Sol.120.(c) According to the question,
$\frac{P \times 15 \times 6}{100} - \frac{15 \times 4 \times P}{100}$ = 4500
$\frac{90P - 60P}{100}$ = 4500 ⇒ 30P = 450000
Principal (P) = ₹15,000

Sol.121.(b) According to the question,
Let the principal = x
S.I = $\frac{P \times R \times T}{100} \Rightarrow 4x = \frac{x \times 6 \times T}{100}$
T = $\frac{4x \times 100}{6x} = \frac{200}{3}$ years
Interest = $8x - x = 7x$
Rate = $\frac{7x \times 100 \times 3}{200 \times x}$ = 10.5%

Sol.122.(d) Let principal and simple interest is 10x and 7x
T = 5 years , R = ?
SI = $\frac{PRT}{100} \Rightarrow 7x = \frac{10x \times R \times 5}{100}$ ⇒ R = 14%

Sol.123.(c) S.I = $\frac{p \times r \times t}{100}$
S.I = 9800 - 8000 = 1800 Rs
1800 = $\frac{8000 \times r \times 3}{100}$ ⇒ r = 7.5%
New rate = 7.5 × 2 = 15%
Amount after 4 years will be
⇒ 8000 + $\frac{8000 \times 15 \times 4}{100}$ = Rs. 12800

Sol.124.(d) Interest of one year
= $\frac{16200 - 12600}{2}$ = 1800
Principal = 12600 − 1800 × 2
⇒ 12600 − 3600 = 9000
Rate = $\frac{1800}{9000}$ × 100 = 20%

Sol.125.(d) According to the question,
Let the principal (p) = 1 unit
So interest will be = 4 units
Rate (r) = time (t)
S.I = $\frac{p \times r \times t}{100} \Rightarrow 4 = \frac{1 \times r \times r}{100}$
(rate) r = 20%

Sol.126.(c) Let principal = 100 unit
Then, amount = 400 unit , simple interest = 300 unit
300 = $\frac{100 \times 12 \times time}{100}$
Time = 25 years

Sol.127.(d) Total interest rate in 5 years
= 8 + 12 + 16 + 20 + 24 = 80%
Required interest = 10,000 × 80%
= 8,000 Rs.

Sol.128.(d) S.I. = $\frac{P \times R \times T}{100}$
11,220 = $\frac{P \times 16.5 \times 33}{4 \times 100}$
P = $\frac{340 \times 4 \times 100}{16.5}$ = 8242.24 = 8242 Rs.

Sol.129.(b)
Interest = 67790 − 25400 = 42390 Rs.
42390 = $\frac{25400 \times R \times 9}{100}$
Rate = $\frac{42390}{254 \times 9} = \frac{4710}{254}$ = 18.54%

Sol.130.(a) Let the amount invested at 12% be x and at 10% be y.
$(y - x) \times 2\%$ = 4 ₹
$(y - x)$ = 200₹ ⇒ $y = 200 + x$
Now ,
$x \times 12\% + y \times 10\% = 130$
$x \times 12\% + (200 + x) \times 10\% = 130$
$x \times 22\%$ = 110 ⇒ x = 500₹

Sol.131.(d)
Let the rate percent per annum = x%
Then ,
$\frac{(2500 - 1500) \times x \times 3}{100}$ = 360 ₹
x = 12%

Sol.132.(d)
Let principal = 4P then S.I. = P
and time = T then Rate = 4T
P = $\frac{4P \times 4T \times T}{100}$ ⇒ T = $\frac{5}{2}$
Rate = 4 × $\frac{5}{2}$ = 10%
New Rate = 10 + 2 = 12%
Now ,
S.I. = $\frac{3600 \times 12 \times 6}{100}$ = 2592 ₹

Sol.133.(a) Time = 73 days
Rate = 12%

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

S.I. = $\frac{12,300 \times 12 \times 73}{365 \times 100}$

= $\frac{123 \times 12}{5}$ = 295.2 Rs. ≈ 300 Rs.

Sol.134.(b) S.I. from 1st principal
= 4500 × 5% × 4 = 900 ₹
$Amount_1$ = 4500 + 900 = 5400 ₹
S.I. from 2nd principal
= 5500 × 8% × 4 = 1760 ₹
$Amount_2$ = 5500 + 1760 = 7260 ₹

Required % = $\frac{5400}{7260} \times 100 \approx 74\%$

Sol.135.(b) 4 × 6% of principal = 600 ₹

Principal = $\frac{600}{24} \times 100$ = 2500 ₹

Now , 2.5 P = 2500 × 2.5 = 6250 ₹

Sol.136.(b) Let the sum of money = Rs. x
According to the question,

1440 = $\frac{x \times 18 \times 9}{100}$ - $\frac{x \times 15 \times 6}{100}$

$\Rightarrow 162x - 90x = 144000$

$\Rightarrow 72x = 144000 \Rightarrow x = 2000$

Hence, the sum of money = Rs. 2000

Short trick:-
162% - 90% = 1440
72% = 1440 ⇒ 100% = 2000

Sol.137.(b) Let the amount given on the rate of 8% = x

S.I = $\frac{p \times r \times t}{100}$

2650 = $\frac{x \times 8 \times 1}{100} + \frac{(30000 - x) \times 9 \times 1}{100}$

265000 = 8x + 270000 − 9x ⇒ x = ₹ 5000

Sol.138.(d) According to the question,

2884.50 = $\frac{P \times 10 \times 3}{100} + \frac{P \times 15 \times 4}{100}$

2884.50 = $\frac{30P + 60P}{100}$ ⇒ 90P = 288450

Borrowed money (P) = ₹3205

Sol.139.(c)

Simple interest = $\frac{2000 \times 5 \times 10}{100}$ = ₹1000

So, total amount = 2000 + 1000 = ₹3000
Again , sum become ₹4000
Simple interest = 4000 − 3000 = ₹1000

Hence, time = $\frac{100 \times SI}{principal \times rate}$

= $\frac{100 \times 1000}{3000 \times 5}$ = $6\frac{2}{3}$ year

Total time = 10 + $6\frac{2}{3}$ = $16\frac{2}{3}$ year

Sol.140.(c) Simple interest in one years

= $\frac{104.4 - 72}{3}$ = 10.8 ₹

Rate % = $\frac{10.8}{72} \times 100$ = 15%

Now, Amount = principal + SI
So, ₹120 becomes in 5 year

= 120 + $\frac{120 \times 15 \times 5}{100}$ = ₹210

Sol.141.(a) Simple Interest = $\frac{P \times R \times T}{100}$

According to question,
(18906 − 14522) =

($\frac{P \times R \times 11}{100}$) - ($\frac{P \times R \times 7}{100}$)

4384 = ($\frac{P \times R \times 4}{100}$) ⇒ PR = 109600

Now, (14522 − P) = ($\frac{109600 \times 7}{100}$)

Principal = 6850 Rs.

Sol.142.(a) Total interest in 4 years
= 5 + 5.5 + 6 + 6.5 = 23%
Let total loan = 100 unit
Then, total amount after 4 years = 123 unit
According to the question,
23 unit = Rs. 4600 ⇒ 1 unit = Rs. 200
So, loan = 200 × 100 = Rs. 20,000

Sol.143.(a) Let the principal be 100 unit
According to question,

Interest in 5 years = 100 × $\frac{25}{100}$ = 25 units

Required time = $\frac{5}{25} \times 100$ = 20 years

Sol.144.(a) According to the question,
$T = 4R$

So, 11664 = $\frac{32400 \times R \times 4R}{100}$

R^2 = $\frac{11664}{324 \times 4}$ = 9 ⇒ Rate (R) = 3 %

Sol.145.(d) Let the sum borrowed = Rs. P

Then, amount received after 4 years = $\frac{9}{5}P$

S.I = $\frac{9}{5}P - P = \frac{4}{5}P$

Now, required rate percentage

= $\frac{S.I \times 100}{P \times T}$ = $\frac{4P \times 100}{5 \times P \times 4}$ = 20%

Sol.146.(d) Profit of R in one year without any charges = 80000 × $\frac{12}{100}$

= ₹ 9600
After charges ₹3,000 as a processing fee for the account
His net profit = 9600 − 3000 = ₹ 6600

Hence, required % = $\frac{6600}{80000} \times 100$ = 8.25%

Sol.147.(a) Let S deposited his money in two accounts both at 8% interest .
So , overall interest = 50000 × 8%
= 4000 Rs.
But actually he received 5200 , this is because interest in one of the accounts is 12% .
Difference = 5200 − 4000 = 1200 Rs.
x × 4% = 1200 ⇒ x = 30000 Rs.

Sol.148.(b)

S.I. = $\frac{Principal \times Rate \times Time}{100}$

(18000 − 16875) = $\frac{16875 \times Rate \times 5}{3 \times 100}$

Rate = $\frac{1125 \times 300}{16875 \times 5}$ = $\frac{300}{15 \times 5}$ = 4%

Sol.149.(b)

$\frac{3000 \times 5 \times T}{100} - \frac{2460 \times 5 \times T}{100}$ = 162 Rs.

15000T − 12300T = 16200

T = $\frac{16200}{2700}$ = 6 years

Sol.150.(c) Equating simple interest :-

$\frac{7000 \times R \times 2}{100}$ = $\frac{5000 \times 5 \times 14}{100}$

R = $\frac{5 \times 5 \times 14}{7 \times 2}$ = 25%

Sol.151.(c) Let principal be x ₹
According to the question ,
Simple interest in 4 years = x ₹
Require time for 6x interest = 24 years
So , money became 7 times in 24 years

Sol.152.(a) Let Principal = x

S.I = $\frac{principal \times rate \times time}{100}$

x + 800 = $\frac{x \times 20 \times 10}{100}$

(principal) x = ₹ 800

Sol.153.(d) Let the principal and amount respectively = 100x, 200x
Then, interest = 200x - 100x = 100x
According to the question,

S.I = $\frac{principal \times rate \times time}{100}$

100x = $\frac{100x \times r \times 55}{100}$ ⇒ r = $\frac{20}{11}$%

Sol.154.(d) 14% = $\frac{7}{50}$

Let P = 50 and S.I. = 7
Amount > 4 × Principal
Amount > 200
So interest should be > 150

Required years > $\frac{150}{7}$

Required years > 21.42
Required minimum complete years
= 22 years

Sol.155.(b) S.I = $\frac{principal \times rate \times time}{100}$

S.I = $\frac{7416 \times 8.33 \times 3}{100}$

S.I = ₹ 1853.25
Maturity value = 1853.25 + 7416
= ₹ 9269.25 (₹ 9270 approx)

Sol.156.(b) Let the $principal$= 9x

Interest = 9x × $\frac{4}{9}$ = 4x

Let the time and rate = t

S.I = $\frac{principal \times rate \times time}{100}$

4x = $\frac{9x \times t \times t}{100}$ ⇒ t= $\sqrt{\frac{4 \times 100}{9}}$ = 6.66%

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.157.(b) According to the question,

240 = $\frac{600 \times R \times 4}{100}$ ⇒ R = 10%

Now, 600 = $\frac{1500 \times 10 \times T}{100}$

⇒ T = $\frac{600}{150}$ = 4 years

Sol.158.(b) Required ratio = 8 : 20 = 2 : 5

Sol.159.(b) According to the question,
S.I. increase in 5 years = ₹ 3600

S.I increase in 1 year = $\frac{3600}{5}$ = ₹ 720

Annual Interest Rate = $\frac{720}{6000}$ × 100 = 12%

Sol.160.(c) Simple interest = $\frac{P \times R \times T}{100}$

Let the two part be x and $(6000 - x)$.
According to question,

$\frac{x \times 10 \times 1}{100}$ = $\frac{(6000 - x) \times 15 \times 1}{100}$

⇒ x = ₹ 3600

Required Interest = $\frac{3600 \times 10 \times 1}{100}$

= Rs. 360

Sol.161.(a) According to question,

New amount = 2175 + 3 × $\frac{1500 \times 3}{100}$

= Rs.2310

Sol.162.(b)

Interest for A = $\frac{6000 \times 5 \times 15}{100}$ = Rs. 4500

Interest for B = $\frac{5000 \times 2 \times 20}{100}$ = Rs. 2000

Required ratio = 9 : 4

Sol.163.(c) According to the question,
Let the principal = x

S.I = $\frac{principal \times rate \times time}{100}$

$x - 560 = \frac{x \times 8 \times 9}{100}$

$100x - 56000 = 72x$

(principal) $x = \frac{56000}{100 - 72}$ = ₹ 2000

Sol.164.(b) Total interest for 1st three years = 3 × 3 = 9 %
total interest for next 5 years = 5 ×4 = 20%
total interest for next 7 years = 7 × 6 = 42%
Total interest = 9% + 20% + 42% = 71%

Sum borrowed = $\frac{2485}{71}$ × 100 = 3500

Sol.165.(b) According to the question,

6080 = $\frac{12000 \times 3 \times R}{100}$ + $\frac{10000 \times 4 \times R}{100}$

⇒ 760 R = 6080 ⇒ R = 8%

Sol.166.(b) Fractional value of 4% , 6% and 10% is equal to $\frac{1}{25}$, $\frac{3}{50}$ and $\frac{1}{10}$ respectively .
Ratio → Principal : Interest

At 4% → 25 : 1)×3 or 75 : 3
At 6% → 50 : 3
At 10% → 10 : 1)×3 or 30 : 3

Total Principal (75 + 50 + 30) units
= 15500 ₹
1 unit = 100 ₹
Principal at 6% (50 units) = 5000 ₹

Sol.167.(d) Principal + Interest = Amount
Principal = 902 – 82 = 820

S.I. = $\frac{P \times rate \times time}{100}$

82 = $\frac{820 \times 5 \times time}{100}$

Time = $\frac{82 \times 100}{820 \times 5}$ = 2 years.

Sol.168.(c) S.I = $\frac{principal \times rate \times time}{100}$

Time = rate = x

⇒ 3000 = $\frac{3000 \times x^2}{100}$ ⇒ x = 10

So, rate = 10%

Sol.169.(b) According to the question,

7500 = $\frac{12500 \times 8 \times T}{100}$

⇒ T = $\frac{7500}{1000}$ = 7.5 years

Sol.170.(b) S .I. = $\frac{P \times R \times T}{100}$

800 = $\frac{P \times R_1 \times T}{100} - \frac{P \times R_2 \times T}{100}$

$R_1 - R_2 = \frac{800 \times 100}{8000 \times 3}$

$R_1 - R_2 = 3\frac{1}{3}\%$

Sol.171.(b) Let , Principal = 5 units
Then , Simple Interest = 2 units
According to Question,

S.I. = $\frac{P \times R \times T}{100}$ ⇒ 2 = $\frac{5 \times R \times 5}{100}$

Rate = 8%

Sol.172.(c) Let , the principal be Rs. x

$Simple\ Interest = \frac{P \times R \times T}{100}$

x + 360 = $\frac{x \times 25 \times 6}{100}$ ⇒ 2x + 720 = 3x

⇒ x = Rs. 720

Sol.173.(c) Let the rate be R and principal be P.
Amount = 1.25 P , time = 3 years.

$\frac{P \times R \times T}{100}$ + P = 1.25P ⇒ R = $\frac{25}{3}$%

Let amount required to deposit be X,

$\frac{X \times 25 \times 7}{100 \times 3}$ + X = 760000

⇒ $\frac{7X}{12}$ + X = 760000 ⇒ $\frac{19X}{12}$ = 760000

⇒ X = 4,80,000

Sol.174.(a) Let the principal be x

Time = $\frac{S.I \times 100}{P \times R} = \frac{x \times 100}{x \times 5} = 20 years$

Now, Amount = 5x , S.I = 5x - x = 4x

Rate% = $\frac{S.I \times 100}{P \times T} = \frac{4x \times 100}{x \times 20} = 20\%$

Sol.175.(d) Let the principal = ₹100
SI on ₹100 ,when it becomes 6 times of itself for 20 years = 600 - 100 = ₹500
SI on the same sum ,when it becomes 5 times of itself for n yrs = (500 - 100)
= ₹400

So, the required time = $\frac{20}{500}$ × 400 = 16 yrs

Sol.176.(b) Principal for first 2 years
= ₹15,600
Then, SI for 2 years at 10%
= 15,600 × 2 × 10% = ₹3120
Now, principal for another 2 years
= 15,600 + 3120 = ₹18,720
Then, SI for another 2 years at the same rate = 18,720 × 20% = ₹3744
So, the interest at the end of 4 years
= 3120 + 3744 = ₹6864

Sol.177.(d) SI on a sum of ₹30,000 for 3 yrs at 5% = 30,000 × 15% = ₹4500
The monthly salary of Mr.Roy = ₹18,000

Required percentage = $\frac{4500}{18,000}$ × 100 = 25%

Sol.178.(b) Total SI

= $\frac{20000 \times 10 \times 3}{100}$ + $\frac{40000 \times 15 \times 3}{100}$

= 6000 + 18000 = ₹24,000

Sol.179.(a) Amount of money received from the bank after 3 years =

12100 × {100 + (15 × 3)}% = 12100 × $\frac{145}{100}$

= ₹17,545

Sol.180.(b) Let the principal = 100%
SI on principal P at 2% higher rate for 3 year = 6%
6% corresponds to ₹ 540

100% corresponds to $\frac{540}{6}$ × 100 = ₹9000

So, Kirti invested ₹9000

Sol.181.(c) In compound interest case ,
Aggregate rate of interest

= 10 + 10 + $\frac{10 \times 10}{100}$ = 21%

Compound interest = 21% of ₹1000 = ₹210
According to the question,
Simple interest is twice of compound interest = 210 × 2 = 420
Aggregate simple interest rate is
7% + 7% = 14%
14% = ₹420 ⇒ 1% = 30
Then, the sum placed on simple interest
100% = 30 × 100 = 3000

Sol.182.(b) Interest = $\frac{12000 \times 8 \times 1}{100 \times 2}$ = 480

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Total amount = 12000 + 480 = Rs 12480

Sol.183.(c) 1680 = $\frac{12000 \times 2 \times r}{100}$

⇒ R = 7%

Interest of tarun = $\frac{15000 \times 2 \times 7}{100}$ = ₹2100

Sol.184.(c)

Let sum = 8x, so S.I. = $\frac{1}{8} \times 8x = x$

Let rate of interest = R ,

so number of years = $\frac{R}{2}$

According to the question,

x = $\frac{8x \times R \times \frac{R}{2}}{100}$ ⇒ R^2 = 25 ⇒ R = 5%

Required SI = $\frac{15000 \times 5 \times 8}{100}$ = ₹6,000

Sol.185.(b) Amount obtained by A

= 9100 + $\frac{9100 \times 10 \times 3}{100}$ = 11830

Amount obtained by B = P + $\frac{P \times 8 \times 5}{100}$

= $\frac{7}{5}P$

According to the question,

11830 = $\frac{7}{5}P$ ⇒ P = $\frac{11830 \times 5}{7}$ = 8450

90% of 8450 = Rs. 7605

Short Trick :-

Let , the Principal invested by B is P .

According to question ,

9100 × 1.3 = P × 1.4

P = 6500 × 1.3 = 8450 Rs.

90% of P = 8450 × 0.9 = 7605 Rs.

Sol.186.(b)

Let the two parts be in the ratio A : B.

According to the question,

A × $7\frac{1}{2}$ × $8\frac{1}{3}$ % = $\frac{5}{2}$ × B × $5\frac{1}{4}$ × 8%

A × $\frac{15}{2}$ × $\frac{25}{3}$ = $\frac{5}{2}$ × B × $\frac{21}{4}$ × 8

$\frac{A}{B} = \frac{42}{25}$

Total Principal (42 + 25) units = ₹50250

1 unit = ₹ 750

Required difference (42 - 25) units

17 units = 750 × 17 = ₹12,750

Sol.187.(c)

Let the price of each article = ₹1

Price of 300 articles = ₹300

Price of 200 articles = ₹200

Interest levied by shopkeeper for deferred payment

= $\frac{300 - 200}{200}$ × 100 = 50%

Sol.188. (b)

$\frac{6500 \times (x) \times 3}{100} + \frac{7500 \times (x-2) \times 3}{100}$

= 3750

⇒ 195x + 225 (x - 2) = 3750

⇒ 195x + 225x − 450 = 3750

⇒ 420x = 4200 ⇒ x = 10%

Sol.189.(d) Simple interest earned on ₹6,000 at 6.25% for 1 year = 375.

Time taken to earn ₹75 as interest

= $\frac{75}{375} = \frac{1}{5}$ years = 73 days.

So, his loan period expires after 73 days after 1st January i.e. 15th March.

Sol.190.(a) Difference of 3% interest for 2.5 years = 3 × 2.5 = 7.5% which corresponds to Rs.585

Effective interest rate for $4\frac{2}{3}$ years at 14%

= $4\frac{2}{3}$ × 14 = $\frac{196}{3}$ %

So, SI on same principal for $4\frac{2}{3}$ years at 14% = 585 × $\frac{196}{3}$ × $\frac{2}{15}$ = Rs.5096

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Compound Interest

Key - Points:

1. For one year or one term simple interest and compound interest are the same.

2. In simple interest you divide the simple interest by the number of years to calculate one year interest but in compound interest this is not applicable.

3. Compound Interest is the interest on amount (principal + Interest); Symbol we will use 'CI'.
Let us say one person borrows Rs.100 for 3 years at the rate of 10% annually. What amount should he have to return after 3 years?
Here is the approximation technique to solve this problem:

100	10%	110	10%	121	10%	133.10
	10		11		12.1	

Compound interest will be =
133.10 – 100 = 33.1 Rs.
The above concept can also be written as:

Amount = $\frac{100 \times 110 \times 110 \times 110}{100 \times 100 \times 100}$ = 133.10

CI = Amount – Principal
CI = 133.10 – 100 = 33.10

Or, Amount = Principal $(1 + \frac{r}{100})^t$

$= 100\,(1 + \frac{10}{100})^3$

$= 100 \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10} = 133.10$

CI = 33.10
So all the above concepts have the same result, but if you want to solve questions quickly and without using formulas then it is advised to develop mastery on approximation technique.
Note: Notice that in CI, interest is calculated on the amount at the end of every year while in SI interest for each year is calculated on the Principal amount.

4. If rate of interest is different for different year, let us say 10% for 1st year, 20% for 2nd year, and 30% for 3rd year then amount will be calculated as follows:

100	10%	110	20%	132	30%	171.60
	10		22		39.6	

We can also do it as: Amount = $\frac{100 \times 110 \times 120 \times 130}{100 \times 100 \times 100} = 171.60\ Rs.$

Important formulas :
Amount = A
Principal = P
Compound Interest = CI
Rate of interest = R
Time = no. of cycles = n

1. CI = Amount - Principal

2. When interest is compounded annually :

A (in CI) = $P(1 + \frac{R}{100})^n$

3. When interest is compounded half-yearly :

A (in CI) = $P(1 + \frac{R/2}{100})^{2n}$

4. When interest is compounded quarterly :

A (in CI) = $P(1 + \frac{R/4}{100})^{4n}$

5. When interest is compounded monthly :

A (in CI) = $P(1 + \frac{R/12}{100})^{12n}$

6. When the interest is compounded annually and time period is given in fraction, say for $3\frac{2}{5}$ years:-

A (in CI) = $P(1 + \frac{R}{100})^3 \times (1 + \frac{\frac{2}{5}R}{100})$

7. When different interest rates for different years are given, say R_1%, R_2%, R_3%, and R_4% for 1st, 2nd, 3rd and 4th year respectively :

A (in CI) = $P(1 + \frac{R_1}{100}) \times (1 + \frac{R_2}{100}) \times (1 + \frac{R_3}{100}) \times (1 + \frac{R_4}{100})$

8. Equated monthly instalment (EMI) concept :

Amount borrowed = $\frac{x}{(1 + \frac{R}{100})^n}$

where x = Instalment (EMI)
Example : Find the amount which is needed to be paid each year to clear the debt of ₹2,10,000 in 2 years at 10% interest rate.
Solution :

$210000 = \frac{x}{(1 + \frac{10}{100})^2} + \frac{x}{(1 + \frac{10}{100})}$

$210000 = \frac{x}{(\frac{11}{10})^2} + \frac{x}{(\frac{11}{10})}$

$\Rightarrow 210000 = \frac{100x}{121} + \frac{10x}{11}$

$\Rightarrow 210000 = \frac{100x + 110x}{121}$

$\Rightarrow 210000 = \frac{210x}{121} \Rightarrow x$ = ₹1,21,000

9. When the interest is compounded 8 monthly, time period is 2 years and the interest rate is 12% p.a., then
For 12 months, interest rate = 12%, so for 8 months, interest rate = $\frac{8 \times 12}{12}$ = 8%
Here, time period = 2 years = 24 months
So, $\frac{24}{8}$ = 3 , so we need to conduct 3 cycles each of interest rate 8% in order to calculate required CI.

10. Effective C.I. rate for two interest rates = $(a + b + \frac{ab}{100})$%, where a and b are interest rates.

11. Effective C.I. rate for three interest rates =
$(a + b + c + \frac{ab + bc + ca}{100} + \frac{abc}{10000})$%
where a, b and c are interest rates.

12. Effective rates :-

Years → Rate ↓	2nd	3rd	4th
5%	10.25%	15.7625%	21.550625%
10%	21%	33.1%	46.41%
20%	44%	72.8%	107.36%

Variety Questions

Q.1. The compound interest on ₹10,000 at 20% per annum is ₹4,641. If compounded half yearly, for how many years was the principal invested ?
SSC CGL Tier II (26/10/2023)
(a) 4 (b) 6 (c) 3 (d) 2

Q.2. Jonathan had borrowed a sum of money 3 years ago at 10% interest per annum compounded annually for a 5-year period, with the amount to be paid at the end of the period being ₹1,61,051. However, there is no prepayment penalty and Jonathan has received some bonus payment now, with which he has decided to clear his debt. How much does Jonathan have to pay now to clear his debt ?
SSC CPO 03/10/2023 (1st Shift)
(a) ₹1,33,100 (b) ₹1,33,200
(c) ₹1,33,000 (d) ₹1,32,900

Q.3. Money is doubled in a bank account in 7 years, when the Interest is compounded annually: What time in years is needed to make an amount 8 times in the bank ?
SSC MTS 14/09/2023 (2nd Shift)
(a) 21 (b) 14 (c) 35 (d) 28

Q.4. A bank offers compound interest at the rate 5% per annum calculated half yearly on its deposits. A customer deposits ₹2,400 each on 1st January

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

and 1st July of a year. Find the amount he received at the end of the year.
SSC MTS 12/09/2023 (2nd Shift)
(a) ₹180.50 (b) ₹4,981.50
(c) ₹181.50 (d) ₹4,081.50

Q.5. The compound interest accrued on a sum of ₹20,000 at the end of 2 years compounded annually is ₹2,050. Find the compound interest at the end of the 3rd year.
SSC CHSL 17/08/2023 (4th Shift)
(a) ₹3,153.50 (b) ₹2,852.50
(c) ₹3,152.50 (d) ₹3,154.50

Q.6. A deposited ₹1,56,250 at 8% simple interest for 2 years. How much more money will A have in his account at the end of two years, if at the same rate of interest the sum is invested in compound interest, compounded annually.
SSC CHSL 11/08/2023 (2nd Shift)
(a) ₹1,740.90 (b) ₹1,000
(c) ₹2,000 (d) ₹1,540.40

Q.7. A money - lender claims he lends money at a simple rate of interest of 8% per annum. But he cleverly includes the interest amount in the principal when he calculates it every six months. The effective rate of interest becomes:
SSC CHSL 09/08/2023 (2nd Shift)
(a) 8.16% (b) 8.2% (c) 8.8% (d) 8.25%

Q.8. What is the approximate present value (in ₹ lakh) of an income of ₹2.1 lakh to be received after 2 years if the rate of interest is 5% ?
SSC CHSL 08/08/2023 (2nd Shift)
(a) 1.815 (b) 1.975 (c) 1.725 (d) 1.905

Q.9. What will be the present value of ₹13,230 due two years hence, when the interest is compounded at the rate of 5% per annum ?
SSC CHSL 07/08/2023 (1st Shift)
(a) ₹13,000 (b) ₹10,500
(c) ₹11,500 (d) ₹12,000

Q.10. If the difference between the compound interest and simple interest on a certain sum of money for 3 years at the rate of 4% per annum is ₹76, then what is the sum ?
SSC CHSL 04/08/2023 (1st Shift)
(a) ₹16,725 (b) ₹12,925
(c) ₹15,625 (d) ₹18,825

Q.11. A sum amounts to ₹6,120 in 2 years and ₹7,340 in 3 years at compound interest. The sum (in ₹) is (rounded off to 2 decimal places):
SSC CHSL 03/08/2023 (2nd Shift)
(a) 4,050.13 (b) 4,254.63
(c) 4,850.32 (d) 4,560.23

Q.12. A certain amount of money was lent for a period of 1 year 9 months at a rate of 10% per annum compounded annually. If the compound interest is ₹1,460, find the amount of money lent.
SSC CHSL 02/08/2023 (1st Shift)
(a) ₹8,200 (b) ₹7,500
(c) ₹6,000 (d) ₹8,000

Q.13. Rs. 2400 is lent at the rate of 10 percent per annum. Which of the following statement(s) is/are correct?
I. The compound interest (compounding annually) for 3 years is Rs. 794.4.
II. The difference between simple interest and compound interest (compounding annually) after 3 years is Rs. 75.8
SSC MTS 18/05/2023 (Afternoon)
(a) None of the statements are correct
(b) Only statement I is correct
(c) Only statement II is correct
(d) Both statement I and II are correct

Q.14. A sum of Rs.7500 amounts to Rs.15000 in two years at compound interest calculated annually. How much will Rs.7500 becomes in four years?
SSC MTS 18/05/2023 (Morning)
(a) Rs.60000 (b) Rs.30000
(c) Rs.50000 (d) Rs.45000

Q.15. A sum was lent for one year at the rate of 16 percent per annum on compound interest (compounding annually). If the compounding had been done half yearly, then the interest would have increased by Rs. 64. What was the sum lent?
SSC MTS 15/05/2023 (Evening)
(a) Rs. 10000 (b) Rs. 6000
(c) Rs. 14000 (d) Rs. 20000

Q.16. The difference between compound interest and simple interest on Rs. x at 25% per annum for 2 years is Rs. 325. Find the value of x.
SSC MTS 10/05/2023 (Afternoon)
(a) Rs. 5200 (b) Rs. 4000
(c) Rs. 5300 (d) Rs. 2400

Q.17. What is the effective annual rate of interest corresponding to a nominal rate of 10% per annum payable half - yearly?
SSC MTS 08/05/2023 (Morning)
(a) 10.25% (b) 12.75%
(c) 9.25% (d) 11.50%

Q.18. Rs. 6000 is lent at the annual rate of 10 percent for 2 years. Which of the following is statement(s) is/are correct ?
I. Simple interest to be received on this sum is Rs. 1200
II. Compound Interest (compounding annually) to be received on this sum is Rs. 1260
SSC CHSL 10/03/2023 (2nd Shift)
(a) Statement I is correct
(b) Both statement I and II are correct
(c) Statement II is correct
(d) None of them are correct.

Q.19. Vipul and Manish invested the sum of ₹ 15000 and ₹ 20000 at the rate of 20 percent p.a. and 30 percent p.a. respectively on compound interest (compounding annually). If the time period is 3 years for both, then what will be the total compound interest earned by Vipul and Manish ?
SSC CGL Tier II (08/08/2022)
(a) ₹ 32480 (b) ₹ 31688
(c) ₹ 29460 (d) ₹ 34860

Q.20. A person invests Rs 55,000 for two years on compound interest such that the rate of interest for the first year is 8% per annum and that for the second year is 12% per annum, and the interest is compounded annually. What is the total interest earned by the person ?
SSC MTS 20/07/2022 (Evening)
(a) Rs 11,645 (b) Rs 11,528
(c) Rs 12,386 (d) Rs 10,847

Q.21. A borrows an amount of ₹3,600 from B at a rate of 20% simple interest for 2 years and lends 75% of this amount to C at 20% compound interest for 2 years. A uses the remaining amount for his personal purpose. Find the total loss incurred by A.
SSC MTS 12/07/2022 (Afternoon)
(a) ₹928 (b) ₹852 (c) ₹1,152 (d) ₹1,024

Q.22. In what time will ₹3,90,625 amount to ₹4,56,976 at 8% per annum, interest being compounded half - yearly ?
SSC CHSL 08/06/2022 (Afternoon)
(a) 2 years (b) $1\frac{1}{2}$ years
(c) $2\frac{1}{2}$ years (d) 1 years

Q.23. A certain sum is invested at 26% p.a, interest compounded annually. In how many years (approx) will it double ?
SSC CHSL 01/06/2022 (Morning)
(a) 4 (b) 3 (c) 2 (d) 5

Q.24. Divide ₹66,300 between A and B in such a way that the amount that A receives after 8 years is equal to the amount that B receives after 10 years; with compound interest being compounded annually at a rate of 10% per annum.
SSC CGL 20/04/2022 (Evening)
(a) A = ₹35,520, B = ₹30,810
(b) A = ₹35,200, B = ₹31,100
(c) A = ₹37,000, B = ₹29,300
(d) A = ₹36,300, B = ₹30,000

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.25. A certain sum was invested for three years in a scheme in which the interest gets compounded annually. During the first two years, the scheme provided growth at the rates of 80% and 60%, respectively, but during the third year there was a decline by 40%. What was the overall interest rate for three years ?
SSC MTS 12/10/2021 (Afternoon)
(a) 24% (b) 20% (c) 22.5% (d) 48.6%

Q.26. A sum of ₹5,760 amounts to ₹7,200 in 4 years and to ₹x in 12 years at a certain rate percent per annum, when the interest is compounded yearly in both the cases. What is the value of x ?
SSC MTS 06/10/2021 (Evening)
(a) 11500 (b) 11250 (c) 12500 (d) 12250

Q.27. Atul borrowed a sum of Rs. 12000 and agreed to repay it by paying Rs. 4800 at the end of first year and Rs. 9240 at the end of second year. What is the rate of compound interest compounded annually ?
SSC CGL 24/08/2021 (Afternoon)
(a) 10 % (b) 12 % (c) $\frac{8}{5}$ % (d) 8 %

Q.28. A and B together borrowed a sum of ₹ 51,750 at an interest rate of 7% p.a. compound interest in such a way that to settle the loan, A paid as much amount after three years as paid by B after 4 years from the day of borrowing. The sum (in ₹) borrowed by A was:
SSC CGL 05/03/2020 (Afternoon)
(a) 25,000 (b) 25,650
(c) 24,860 (d) 26,750

Q.29. A certain sum amounts to Rs 4,205.55 at 15% p.a. In $2\frac{2}{5}$ years, interest compounded yearly. The sum (in ₹) is:
SSC CGL Tier II (13/09/2019)
(a) 3,200 (b) 3,500 (c) 2,700 (d) 3,000

Q.30. A sum of Rs 18000 is lent at 10% p.a. compound interest, compounded annually. What is the difference between the compound interest for 3rd year and 4th year ?
SSC CGL Tier II (11/09/2019)
(a) Rs 220.60 (b) Rs 217.80
(c) Rs 221.80 (d) Rs 215.40

Q.31. What will be the compound interest on a sum of Rs 31,250 for 2 years at 12% p.a., if the interest is compounded 8-monthly ?
SSC CGL Tier II (11/09/2019)
(a) ₹8106 (b) ₹8116 (c) ₹8016 (d) ₹8156

Q.32. If the compound interest in the third year at 8% p.a. on a certain sum is Rs 3600, then what is the difference between the compound interest in the 4th and 5th year ? (nearest to an integer in Rs)
SSC MTS 22/08/2019 (Evening)
(a) ₹ 304 (b) ₹ 335 (c) ₹ 288 (d) ₹ 311

Q.33. What is the present value of Rs. 14739 payable in 3 years at the rate of 6.25% yearly compound interest ?
SSC MTS 21/08/2019 (Evening)
(a) Rs 12184 (b) Rs 12288
(c) Rs 12473 (d) Rs 12148

Q.34. If the rate of interest is 20% per annum, compounded yearly and the interest on a certain sum in the second year is Rs 250, then what will be the interest on the same sum in the fifth year
SSC MTS 20/08/2019 (Morning)
(a) ₹ 518 (b) ₹ 400 (c) ₹ 360 (d) ₹ 432

Q.35. A certain sum invested on compound interest (compounded annually) grows to Rs 5040 in three years. If the rate of interest is 20% for the first year, 40% for the second and 50% for the third year, then what is the sum ?
SSC MTS 07/08/2019 (Morning)
(a) ₹1210 (b) ₹2566 (c) ₹1800 (d) ₹2000

Q.36. The simple interest on a certain sum at 20% p.a for two years is Rs. 250. What is the compound interest (compounded annually) on the same sum at the same rate for the same period ?
SSC MTS 05/08/2019 (Evening)
(a) ₹ 275 (b) ₹ 900 (c) ₹ 550 (d) ₹ 750

Q.37. A certain amount invested at a certain rate, compounded annually, grows to an amount in five years, which is a factor of 1.1881 more than to what it would have grown in three years. What is the rate percentage ?
SSC CHSL 04/07/2019 (Evening)
(a) 9 (b) 8.1 (c) 8 (d) 9.2

Q.38. Rs 60000 invested at a certain rate for a certain even number of years, compounded annually, grows to Rs 63,654. To how much amount would it grow if it is invested at the same rate for half period ?
SSC CHSL 04/07/2019 (Afternoon)
(a) Rs 61800 (b) Rs 61809
(c) Rs 61675 (d) Rs 61827

Q.39. A sum invested at 8% p.a. amounts to Rs 20280 at the end of one year, when the interest is compounded half yearly. What will be the simple interest on the same sum for $4\frac{3}{5}$ years at double the earlier rate of interest ?
SSC CHSL 04/07/2019 (Morning)
(a) Rs 13500 (b) Rs 13800
(c) Rs 14200 (d) Rs 14500

Q.40. The difference between the compound interest and simple interest on Rs x at 8% per annum for 2 years is Rs 19.20. What is the value of x ?
SSC CGL 10/06/2019 (Afternoon)
(a) 2,500 (b) 3,200 (c) 2,800 (d) 3,000

Q.41. A sum of Rs 12,000 amounts to Rs 20,736 in 3 years at a certain rate percent per annum, interest compounded annually. What will the amount of the same sum be in 2 years at the same rate on compound interest ?
SSC CGL 10/06/2019 (Morning)
(a) Rs 15,640 (b) Rs 17,820
(c) Rs 17,280 (d) Rs 14,520

Q.42. A person borrowed a certain sum at 10% p.a. for three years, interest being compounded annually. At the end of two years, he repaid a sum of Rs. 6634 and at the end of the third year, he cleared off the debt by paying Rs. 13,200. What was the sum borrowed by him ?
SSC CGL 06/06/2019 (Evening)
(a) Rs. 16,400 (b) Rs. 15,400
(c) Rs. 15,600 (d) Rs. 16,500

Q.43. The compound interest on a certain sum in $2\frac{1}{2}$ years at 10% p.a., interest compounded yearly, is Rs 1,623. The sum is :
SSC CGL 04/06/2019 (Afternoon)
(a) Rs 5,000 (b) Rs 6,000
(c) Rs 6,500 (d) Rs 7,200

Q.44. The interest on Rs 24,000 in years compounded annually when the rates are 8% p.a and 10% p.a for two successive years is:
SSC CPO 16/03/2019 (Afternoon)
(a) ₹3994 (b) ₹4512 (c) ₹5040 (d) ₹5866

Q.45. The annual interest compounded on any amount is Rs 1,320 for the second year and Rs 1,452 for the third year. What will be the original amount at the beginning of the first year ?
SSC CPO 15/03/2019 (Evening)
(a) 12,650 (b) 13,200
(c) 12,970 (d) 12,000

Q.46. A sum of Rs 18,000 is invested for 16 months at 8% per annum compounded half-yearly. What is the percentage gain ?
SSC CPO 12/03/2019 (Evening)
(a) 9% (b) 11% (c) 10% (d) 12%

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Practice Questions

SSC CHSL 2024 Tier - 2

Q.47. If an increase of 40% is observed on an amount in 4 years at simple interest, what will be the compound interest on ₹80,000 after 4 years at the same rate of interest ?
SSC CHSL Tier II (18/11/2024)
(a) ₹ 39,724 (b) ₹ 29,728
(c) ₹ 17,128 (d) ₹ 37,128

SSC CPO 2024 Tier - 1

Q.48. A sum of money at compound interest doubles itself in 4 years. In how many years does the sum become 8 times of itself at the same rate of interest
SSC CPO 27/06/2024 (1st Shift)
(a) 15 (b) 12 (c) 8 (d) 10

Q.49. A certain amount of money becomes thrice in 5 years at compound interest. How many years it will take to become 9 times ?
SSC CPO 28/06/2024 (1st Shift)
(a) 15 years (b) 8 years
(c) 10 years (d) 25 years

SSC CHSL 2023 Tier - 2

Q.50. The compound interest of ₹6,000 in two years, if the rate of interest is 2.5% per annum for the first year and 2% per annum for the second year, will be:
SSC CHSL Tier II 10/01/2024
(a) ₹273 (b) ₹135 (c) ₹270 (d) ₹240

SSC CPO 2023 Tier - 1

Q.51. A sum of ₹1,00,000 was taken from a bank at the rate of 7% p.a to be compounded annually for 5 years. Calculate the compound interest. (Closest to a ₹)
SSC CPO 03/10/2023 (2nd Shift)
(a) ₹40,567 (b) ₹40,000
(c) ₹20,963 (d) ₹40,255

Q.52. A sum of money was invested at 10% interest per year, compounded half-yearly, for 18 months. If the amount payable on maturity was ₹64,827, what was the sum invested ?
SSC CPO 04/10/2023 (1st Shift)
(a) ₹55,600 (b) ₹56,500
(c) ₹56,800 (d) ₹56,000

Q.53. Peter invested a certain sum of money in a scheme paying 10% simple interest per annum, while Rachel invested half of the sum that Peter invested in a scheme paying 10% interest per annum compounded annually. Also, while Peter invested for 2 years, Rachel invested for 3 years. If the difference in the interest earned by Peter and Rachel was ₹897, what was the sum that Rachel had invested ?
SSC CPO 04/10/2023 (2nd Shift)
(a) ₹12,900 (b) ₹13,000
(c) ₹13,100 (d) ₹12,960

Q.54. If interest be compounded half-yearly, then find the compound interest on ₹8,000 at 20% p.a. for 1 year.
SSC CPO 05/10/2023 (1st Shift)
(a) ₹1685 (b) ₹1680 (c) ₹1675 (d) ₹1690

Q.55. Find the amount (integral value only) if a sum of ₹6,500 is being borrowed at 10% interest per annum for 2 years if interest is compounded half - yearly.
SSC CPO 05/10/2023 (2nd Shift)
(a) ₹7900 (b) ₹8150 (c) ₹8250 (d) ₹7650

SSC MTS 2023 Tier - 1

Q.56. Geeta deposited a certain sum of money in her bank account which amounted to ₹27,783 in 3 years at 5% per annum, the interest being compounded annually. What amount did she deposit ?
SSC MTS 01/09/2023 (1st Shift)
(a) ₹25,500 (b) ₹25,000
(c) ₹26,000 (d) ₹24,000

Q.57. A sum of money becomes ₹6,400 in 3 years and ₹8,100 in 5 years on compound interest compounded annually. Find the rate of interest per annum.
SSC MTS 01/09/2023 (2nd Shift)
(a) $12\frac{3}{8}$ (b) $12\frac{4}{8}$ (c) $12\frac{6}{8}$ (d) $12\frac{5}{8}$

Q.58. The difference in interests earned on ₹1,50,000 at an 8% rate of interest per annum in a year when the interest in compounded semi-annually and annually, respectively, is ₹ _____.
SSC MTS 01/09/2023 (3rd Shift)
(a) 360 (b) 120 (c) 240 (d) 420

Q.59. At what rate of interest per annum, compounded annually, will an amount of ₹8,000 yield a compound interest of ₹904.2 in 2 years ?
SSC MTS 04/09/2023 (1st Shift)
(a) 6% (b) 8% (c) 10% (d) 5.5%

Q.60. Find the compound interest (Compounded annually) on ₹2,000 for 2 $\frac{1}{2}$ years at 10% per annum.
SSC MTS 04/09/2023 (2nd Shift)
(a) ₹ 561 (b) ₹ 500 (c) ₹ 521 (d) ₹ 541

Q.61. The difference between the compound interest (Compounded annually) and simple interest for an amount of ₹85,000 in 2 years is ₹850. Find the rate of interest per annum.
SSC MTS 04/09/2023 (3rd Shift)
(a) 5% (b) 10% (c) 8% (d) 12%

Q.62. ₹1,250 at 12% per annum compounded annually will amount to ₹1,568 in:
SSC MTS 05/09/2023 (1st Shift)
(a) 4 yrs (b) 1 yr (c) 2 yrs (d) 3 yrs

Q.63. Find the amount of ₹75,000 for one year at the rate of 16% per annum, if the interest is compounded quarterly. (rounded off to two decimal places)
SSC MTS 05/09/2023 (2nd Shift)
(a) ₹87,379.40 (b) ₹89,773.40
(c) ₹87,937.40 (d) ₹87,739.40

Q.64. In how many years will a sum of ₹18,000 at 20% per annum compounded half yearly becomes ₹ 23,958 ?
SSC MTS 05/09/2023 (3rd Shift)
(a) $1\frac{1}{2}$ (b) $3\frac{1}{2}$ (c) $1\frac{1}{4}$ (d) $2\frac{1}{2}$

Q.65. What is the difference between the compound interest, interest compounded half yearly on ₹72,000 for 1.5 years at 10% per annum and its simple interest for 3 years at 5% per annum ?
SSC MTS 06/09/2023 (1st Shift)
(a) ₹559 (b) ₹549 (c) ₹540 (d) ₹449

Q.66. At what rate per annum will a sum of ₹6,400 fetch a compound interest (Compounded annually) of ₹1,344 in 2 years ?
SSC MTS 06/09/2023 (2nd Shift)
(a) 10% (b) 8% (c) 12% (d) 5%

Q.67. What sum of money invested at 8% per annum in $1\frac{1}{2}$ years, compounded half-yearly, shall become ₹17,576 ?
SSC MTS 06/09/2023 (3rd Shift)
(a) ₹16,500 (b) ₹15,000
(c) ₹15,525 (d) ₹15,625

Q.68. A deposited ₹62,500 at the rate of 8% per annum compounded half yearly, then what is the compound interest at the end of two years ?
SSC MTS 08/09/2023 (1st Shift)
(a) ₹18,161.12 (b) ₹12,171.72
(c) ₹10,821.18 (d) ₹10,616.16

Q.69. Find the amount if ₹10,200 is invested at the rate of 8% per annum compound interest for $1\frac{1}{2}$ years when interest is compounded half yearly (up to two decimal places).

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC MTS 08/09/2023 (2nd Shift)
(a) ₹11,743.61 (b) ₹11,473.61
(c) ₹11,764.28 (d) ₹11,347.28

Q.70. What will be the compound interest on ₹30,000 at 10% per annum for $1\frac{1}{2}$ years, when interest is compounded half-yearly ?
SSC MTS 08/09/2023 (3rd Shift)
(a) ₹4,728.75 (b) ₹4,800.75
(c) ₹5,728.75 (d) ₹4,928.75

Q.71. An amount of ₹2,000 amounts to ₹2,880 in 2 years. What will be the rate of interest if compounded annually ?
SSC MTS 11/09/2023 (1st Shift)
(a) 12% (b) 28% (c) 10% (d) 20%

Q.72. What is the compound interest (in₹) on ₹20,500 for 2 years at 10% per annum, if the interest is compounded annually ?
SSC MTS 11/09/2023 (2nd Shift)
(a) 5,403 (b) 4,305 (c) 4,530 (d) 4,350

Q.73. In how many years will ₹1,60,000 become ₹2,79,841 at a compound interest (Compounded annually) rate of 15% per annum ?
SSC MTS 11/09/2023 (3rd Shift)
(a) 6 (b) 3 (c) 5 (d) 4

Q.74. Hema invested ₹1,728 at the rate of compound interest (Compounded annually) for 3 years. She got ₹4,096 after the specified period. Find the rate of interest per annum.
SSC MTS 12/09/2023 (1st Shift)
(a) $33\frac{1}{2}$% (b) $30\frac{1}{2}$%
(c) $33\frac{1}{3}$% (d) $30\frac{1}{3}$%

Q.75. A sum of ₹15,000 was lent for 3 years at the rate of 4%, 5%, 6% per annum, respectively, at compound interest for the first year, second year and third year compounded annually. Find the compound interest for 3 years.
SSC MTS 12/09/2023 (3rd Shift)
(a) ₹2,380.60 (b) ₹2,382.60
(c) ₹2,362.80 (d) ₹2,380.80

Q.76. On what sum of money will the difference between the simple interest and compound interest (Compounded annually) for 3 years at 5% per annum be ₹15.25 ?
SSC MTS 13/09/2023 (1st Shift)
(a) ₹2,500 (b) ₹1,000
(c) ₹4,000 (d) ₹2,000

Q.77. Find the compound interest (in ₹) on ₹500 in 2 years at 20% per annum if the interest being compounded half - yearly.
SSC MTS 13/09/2023 (3rd Shift)
(a) 232.05 (b) 132.05
(c) 225.08 (d) 264.05

Q.78. Mr Kalra borrowed ₹1,35,000 to meet the expenses of his son's education. If the rate of interest is 12% per annum compounded annually, then how much amount will he have to make after 2 years and 3 months to settle the account ?
SSC MTS 14/09/2023 (1st Shift)
(a) ₹1,74,424.32 (b) ₹1,50,640.40
(c) ₹1,49,920.32 (d) ₹1,74,760

Q.79. What is the amount (in ₹) due on a sum of money ₹12,500 after one year if the compound interest is payable half-yearly at 12% per annum ?
SSC MTS 14/09/2023 (3rd Shift)
(a) 14,450 (b) 14,540
(c) 15,440 (d) 14,045

SSC CHSL 2023 Tier - 1

Q.80. Find the compound interest on ₹50,000 for one year at 8% per annum when compounded half yearly.
SSC CHSL 02/08/2023 (2nd Shift)
(a) ₹3,900 (b) ₹3,880
(c) ₹4,080 (d) ₹3,950

Q.81. In how many years will ₹40000 amount to ₹46656 at the rate of 8% compound interest per annum ?
SSC CHSL 02/08/2023 (3rd Shift)
(a) 5 (b) 2 (c) 4 (d) 3

Q.82. What is the compound interest on ₹62,500 for 2 years at 8% per annum compounded yearly ?
SSC CHSL 03/08/2023 (3rd Shift)
(a) ₹10,500 (b) ₹10,300
(c) ₹10,400 (d) ₹10,600

Q.83. What is the present value of the sum if the interest compounded at the rate of 18% per anmim for two years is ₹981 ?
SSC CHSL 03/08/2023 (4th Shift)
(a) ₹2,800 (b) ₹2,500
(c) ₹3,600 (d) ₹2,400

Q.84. What is the compound interest on ₹25,000 for 3 years at 10% per annum compounded yearly ?
SSC CHSL 04/08/2023 (2nd Shift)
(a) ₹8,125 (b) ₹8,000
(c) ₹8,200 (d) ₹8,275

Q.85. Ashok invested ₹18,000 for 3 years at 5% compound interest in a post office. If the interest is compounded once in a year, what sum will he get after 3 years ?
SSC CHSL 04/08/2023 (3rd Shift)
(a) ₹ 22,961.50 (b) ₹ 20,837.25
(c) ₹ 22,6291.75 (d) ₹ 21,926.00

Q.86. A certain sum was invested at the rate of 10% for a period of 2 years at compound interest and compounded annually. The same sum was invested for the same period and same rate of interest at simple interest. If the difference of compound interest and simple interest was ₹200, find the sum.
SSC CHSL 04/08/2023 (4th Shift)
(a) ₹30,000 (b) ₹25,000
(c) ₹22,000 (d) ₹20,000

Q.87. Akhilesh invested a certain sum which amounted to ₹82,000 in 2 years at 6% per annum compound interest, compounded annually. What was the sum invested (in ₹) by Akhilesh? (round off to the nearest integer)
SSC CHSL 07/08/2023 (2nd Shift)
(a) 73,980 (b) 72,680
(c) 72,980 (d) 70,980

Q.88. Kalyan invested a sum of ₹12,000 for two years compounded at 5% and 10%, respectively. What is the compound interest (in ₹) at the end of two years ?
SSC CHSL 07/08/2023 (3rd Shift)
(a) 1,880 (b) 1,920 (c) 1,900 (d) 1,860

Q.89. Radha deposited ₹1,60,000 at a 10% rate of compound interest per annum for two years. If the interest is compounded semi-annually, then what is the compound interest (in₹) ?
SSC CHSL 07/08/2023 (4th Shift)
(a) 16,400 (b) 34,481
(c) 74,256 (d) 33,600

Q.90. Find the compound interest on ₹10,000 for $1\frac{1}{2}$ years at 20% per annum interest is payable half - yearly
SSC CHSL 08/08/2023 (1st Shift)
(a) ₹3,315 (b) ₹3,310
(c) ₹3,305 (d) ₹3,320

Q.91. On a sum of money for 2 years compound interest and simple interest are ₹550 and ₹500. Find the rate of interest (in per annum).
SSC CHSL 08/08/2023 (3rd Shift)
(a) 40% (b)10% (c) 20% (d) 30%

Q.92. Basanthi deposited ₹50,000 in a co - operative bank which is giving compound interest at the rate of 10% per annum. What will be her interest in the 3rd year ?
SSC CHSL 08/08/2023 (4th Shift)
(a) ₹66,550 (b) ₹6,050
(c) ₹5,050 (d) ₹10,050

Q.93. The difference between the simple interest and the compound interest on a

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

certain amount at 9 % per annum for two years is ₹ 162, what is the principal ?
SSC CHSL 09/08/2023 (1st Shift)
(a) ₹ 19700 (b) ₹ 19000
(c) ₹ 20000 (d) ₹19500

Q.94. What is the present value of ₹ 9,360 at an interest rate 20% at the end of two years compounded annually ?
SSC CHSL 09/08/2023 (3rd Shift)
(a) ₹6,400 (b) ₹6,450 (c) ₹6,500 (d)₹6,550

Q.95. If the difference between the simple interest and the compound interest for 3 years at the rate of 10% per annum on a certain sum is equal to ₹310, then that sum of money is:
SSC CHSL 10/08/2023 (1st Shift)
(a) ₹8,000 (b) ₹9,500
(c) ₹12,000 (d) ₹10,000

Q.96. What is the difference between the compound interest on ₹6,400 for 1 year at 5% per annum compounded yearly and half - yearly ?
SSC CHSL 10/08/2023 (3rd Shift)
(a) ₹8 (b) ₹9 (c) ₹4 (d) ₹7

Q.97. In what time will ₹3,20,000 amount to 4,05,000 if compounded at 12.5% per annum ?
SSC CHSL 10/08/2023 (4th Shift)
(a) 1Year (b) 2 Years
(c) 3 Years (d) 4 Years

Q.98. A sum of ₹10,000 was invested at a rate of 10% per annum for a period of 2 years, compounded half-yearly. Find the compound interest.
SSC CHSL 11/08/2023 (4th Shift)
(a) ₹2,151.0625 (b) ₹2,055
(c) ₹2,255 (d) ₹2,155.0625

Q.99. What sum will become ₹9,826 in 18 months if the rate of interest is $2\frac{1}{2}$% per annum and the interest is compound half - yearly ?
SSC CHSL 14/08/2023 (1st Shift)
(a) ₹ 9,392.00 (b) ₹ 9,444.00
(c) ₹ 9,512.45 (d) ₹ 9,466.55

Q.100. The difference between the simple and compound interest on a certain sum of money at an 8% rate of interest per annum for two years is ₹56. Find the sum.
SSC CHSL 17/08/2023 (1st Shift)
(a) ₹8,750 (b) ₹7,058
(c) ₹7,805 (d) ₹8,057

Q.101. Compound interest on a certain sum of money invested for 1.5 years at the rate of 10% per annum, compounded half yearly is Rs. 5,044. What is the sum ?
SSC CHSL 17/08/2023 (2nd Shift)
(a) ₹ 32,000 (b) ₹ 37,044
(c) ₹ 33,000 (d) ₹ 22,000

SSC MTS 2022 Tier - 1

Q.102. The difference between compound interest and simple interest on a sum of Rs. 16,000 for two years is Rs. 160. Find the per annum rate of interest.
SSC MTS 02/05/2023 (Morning)
(a) 12% (b) 10% (c) 11% (d) 15%

Q.103. The difference in simple interest and compound interest on a certain sum of money in 2 years at 3% per annum is 90 paisa. What is the sum (in ₹) ?
SSC MTS 03/05/2023 (Evening)
(a) Rs. 9000 (b) Rs. 5000
(c) Rs. 3000 (d) Rs. 1000

Q.104. If interest is being compounded half yearly, then what sum will amount to Rs. 51840 in 2 years at the rate of 40 percent per annum on compound interest ?
SSC MTS 03/05/2023 (Evening)
(a) Rs.25000 (b) Rs.15000
(c) Rs.20000 (d) Rs.30000

Q.105. At what rate of compound interest per annum, a sum of Rs 20000 becomes Rs 23152.50 in 1 year 6 months compounded half - yearly ?
SSC MTS 04/05/2023 (Afternoon)
(a) 10% per annum (b) 5% per annum
(c) 12% per annum (d) 8% per annum

Q.106. Priya borrowed a certain sum at the rate of 12% per annum. If she paid Rs. 10176 at the end of 2 years as interest compounded annually. What was the sum she borrowed ?
SSC MTS 04/05/2023 (Evening)
(a) Rs.30000 (b) Rs.20000
(c) Rs.50000 (d) Rs.40000

Q.107. Rs. 20000 is lent at compound interest at an annual rate of 16 percent for 1 year. If the compounding of interest is done half yearly, then how much interest will be obtained ?
SSC MTS 08/05/2023 (Evening)
(a) Rs. 3180 (b) Rs. 3396
(c) Rs. 3224 (d) Rs. 3328

Q.108. On a certain sum, the simple interest for 2 years is Rs. 12000. If the sum is Rs. 12000, then what will be the compound interest (compounding annually) on the same sum at the same rate of interest for the first 3 years ?
SSC MTS 09/05/2023 (Morning)
(a) Rs. 29250 (b) Rs. 29300
(c) Rs. 28500 (d) Rs. 22750

Q.109. The compound interest (compounding annually) on a certain sum for 2 years at the rate of 60 percent per annum is Rs. 6240. What will be the simple interest on the same sum for 3 years at the same rate of interest ?
SSC MTS 09/05/2023 (Afternoon)
(a) Rs. 6800 (b) Rs. 7200
(c) Rs. 7100 (d) Rs. 6500

Q.110. At what rate of compound interest (compounding annually) per annum will a sum of Rs.250000 becomes Rs.275625 in 2 years ?
SSC MTS 17/05/2023 (Morning)
(a) 8% per year (b) 3% per annum
(c) 10% per year (d) 5% per year

Q.111. Rs. 6000 is lent at the rate of 8 percent per annum on compound interest (compounded quarterly). What will be the compound interest of 6 months ?
SSC MTS 17/05/2023 (Evening)
(a) Rs.268.6 (b) Rs.190.5
(c) Rs.164.6 (d) Rs.242.4

Q.112. A sum becomes Rs. 33800 in 2 years and Rs. 43,940 in 3 years, when lent in a scheme of compound interest (compounding annually). If double the sum is invested in the same scheme for 2 years, then what will be the amount obtained at the end of 2 years ?
SSC MTS 13/06/2023 (Morning)
(a) Rs. 62480 (b) Rs. 67600
(c) Rs. 71240 (d) Rs. 60,420

Q.113. If interest is being compounded half yearly and rate of interest is 20 percent per annum, then in how much time (in months) Rs.15000 will become Rs. 19965 at compound interest ?
SSC MTS 13/06/2023 (Evening)
(a) 12 (b) 30 (c) 24 (d) 18

Q.114. Rs. 30000 is lent at compound interest (compounded annually) for 3 years. If the rate of interest is 10 percent for the first year, 20 percent for the second year and 30 percent for the third year, then what will be the total compound interest ?
SSC MTS 14/06/2023 (Afternoon)
(a) Rs. 21480 (b) Rs. 19270
(c) Rs. 20560 (d) Rs. 22580

Q.115. The amount received on a certain sum after 3 years and 5 years on compound interest (compounding annually) is Rs. 20,736 and Rs. 29,859.84 respectively. What is that sum ?
SSC MTS 14/06/2023 (Evening)
(a) Rs. 9000 (b) Rs. 14000
(c) Rs. 15000 (d) Rs. 12000

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.116. On a certain sum the compound interest (compounding annually) for fourth year is Rs. 15000 and the compound interest (compounding annually) for sixth year is Rs. 25350. What is the rate of interest per annum ?
SSC MTS 20/06/2023 (Morning)
(a) 35 percent (b) 30 percent
(c) 40 percent (d) 25 percent

SSC CHSL 2022 Tier - 1

Q.117. Simple interest and compound interest (Compounding annually) on a principal at a certain rate of interest for 2 years is Rs.1600 and Rs. 1760 respectively. What is the principal ?
SSC CHSL 10/03/2023 (1st Shift)
(a) 10000 (b) 7000 (c) 6000 (d) 4000

Q.118. Nutan gets two offers of loan from a bank and an app. The app offered Rs.10,000 at 15 Percent per annum compounded annually for 2 years and the bank offered the same amount at the same rate and for the same time but on simple interest. Find the difference between the interests.
SSC CHSL 10/03/2023 (3rd Shift)
(a) Rs.375 (b) Rs.400
(c) Rs. 250 (d) Rs.225

Q.119. If 10 percent per annum rate of compound interest compounded yearly is equivalent to the x percent compound interest compounded half yearly, then what is the value (Approximate) of x ?
SSC CHSL 14/03/2023 (2nd Shift)
(a) 6.25 percent (b) 5.32 percent
(c) 4.88 percent (d) 4.55 percent

Q.120. Rajeev invested Rs.3,000 for 2 years at compound interest (compounded annually) in a company which paid him interest of Rs.1320 . What will be the annual rate of interest at which Rajeev invested his money ?
SSC CHSL 15/03/2023 (4th Shift)
(a) 30% (b) 24% (c) 16% (d) 20%

Q.121. A person borrowed Rs. 8000 on compound interest at the rate of 20 percent per annum. If the interest is compounded half yearly, then what will be the amount to be paid after 1.5 years
SSC CHSL 16/03/2023 (3rd Shift)
(a) Rs. 10648 (b) Rs. 11488
(c) Rs. 10825 (d) Rs. 9865

Q.122. A sum becomes 1.96 times of itself in 2 years when invested at compound interest (compounding annually). What is the annual rate of interest ?
SSC CHSL 16/03/2023 (4th Shift)
(a) 20% (b) 25% (c) 40% (d) 30%

Q.123. A sum amounts to Rs. 6580 in 2 years and amounts to Rs. 7896 in 3 years on compound interest (compounding annually) at the same rate of interest. What is the annual rate of interest ?
SSC CHSL 17/03/2023 (4th Shift)
(a) 30% (b) 40% (c) 15 % (d) 20%

SSC CGL 2022 Tier - 2

Q.124. Find the amount (integral value only) if a sum of ₹6,500 is being borrowed at 10% interest per annum for 2 years if interest is compounded half - yearly.
SSC CGL Tier II (06/03/2023)
(a) ₹8,150 (b) ₹7,900 (c) ₹7,650 (d) ₹8,250

SSC CGL 2022 Tier - 1

Q.125. What is the present value of Rs.10,000 received in 2 years, if the interest rate is 12% per year discounted semi-annually ?
SSC CGL 09/12/2022 (2nd Shift)
(a) Rs.7,020.94 (b) Rs.7,920.90
(c) Rs.7,920.94 (d) Rs.7,900.94.

SSC CPO 2022 Tier - 1

Q.126. On a certain sum, the difference between compound interest and simple interest at 10% per annum for 2 years is Rs.250. The sum is _____.
SSC CPO 09/11/2022 (Morning)
(a) Rs.25,450 (b) Rs.26,550
(c) Rs.25,000 (d) Rs.26,000

Q.127. Find the difference between the simple interest and the compound interest payable annually on a sum of Rs.6,500 at 7% per annum for 3 years. (Correct to two decimal places.)
SSC CPO 09/11/2022 (Afternoon)
(a) Rs.94.34 (b) Rs.97.78
(c) Rs.98.73 (d) Rs.95.67

SSC CGL 2021 Tier - 2

Q.128. The compound interest (compounding annually) on a certain sum at the rate of 8 percent per annum for two years is ₹6656. What would be the simple interest on the same sum at the same rate of interest for two years ?
SSC CGL Tier II (08/08/2022)
(a) ₹ 5600 (b) ₹ 6224
(c) ₹ 6400 (d) ₹ 6336

SSC Selection Post (Phase - X)

Q.129. Arif repaid a loan by paying ₹15,625 after 3 years at a rate of 25% p.a. Compounded annually, what was the amount of the loan ?
Graduate Level 01/08/2022 (Shift - 4)
(a) ₹9,000 (b) ₹8,000
(c) ₹9,500 (d) ₹10,000

Q.130. In how many years will a sum of ₹800 at 30% p.a. compounded half - yearly becomes ₹1216.70 ?
Graduate Level 04/08/2022 (Shift - 4)
(a) 1.5 years (b) 1 year
(c) 2.5 years (d) 2 years

SSC MTS 2021 Tier - 1

Q.131. A sum of money becomes two times of itself in 8 years at simple interest, and it becomes four times of itself in 2 years at compound interest, when interest is compounded annually. Find the ratio of the rate of simple interest to the rate of compound interest offered per year.
SSC MTS 05/07/2022 (Evening)
(a) 2 : 3 (b) 3 : 5 (c) 5 : 3 (d) 1 : 8

Q.132. Rs 15000 is lent for one year at the rate of 20% per annum , the interest being compounded annually. If the compounding of the interest is done half-yearly, then how much more interest will be obtained at the end of the one-year period on the same initial sum ?
SSC MTS 19/07/2022 (Morning)
(a) 250 (b) 200 (c) 150 (d) 180

Q.133. The difference between the compound interest and simple interest on a sum of ₹2,500 for 2 years is ₹100. Find the rate of interest per annum, if the nominal rate of interest per annum is the same for both simple and compound interest, and in the case of compound interest, the interest is compounded annually.
SSC MTS 19/07/2022 (Afternoon)
(a) 40% (b) 25% (c) 20% (d) 12%

Q.134. A sum invested at a certain rate of interest per annum, compounded annually, amounts to 14400 in 2 years and to 25,920 in 4 years. What is the sum invested ?
SSC MTS 21/07/2022 (Morning)
(a) Rs 8200 (b) Rs 7500
(c) Rs 8500 (d) Rs 8000

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 2021 Tier - 1

Q.135. The effective annual rate of interest, corresponding to a nominal rate of 6% per annum, compounded half-yearly is:
SSC CHSL 07/06/2022 (Evening)
(a) 0.0608 (b) 0.0609
(c) 0.0606 (d) 0.0607

Q.136. Ramesh bought a house for ₹2,00,000. At the end of the first year, he sold it at a loss of 10% on his investment. He invested the money thus obtained at a rate of 20% p.a. interest compounded annually for 2 years. The value of this investment would amount to
SSC CHSL 08/06/2022 (Morning)
(a) ₹2,59,200 (b) ₹2,52,300
(c) ₹2,56,900 (d) ₹2,54,600

Q.137. On a sum of money, when invested for 2 years, compound interest and simple interest are ₹300 and ₹250, respectively. For both simple and compound interests the rate of interest per annum is the same, and for compound interest, interest is compounded annually. Find the rate of interest per annum.
SSC CHSL 09/06/2022 (Afternoon)
(a) 10% (b) 20% (c) 40% (d) 30%

Q.138. A sum of ₹14,375, when invested at r% interest per year compounded annually, amounts to ₹16,767 after two years. What is the value of r ?
SSC CHSL 10/06/2022 (Evening)
(a) 9 (b) 6 (c) 7 (d) 8

SSC CGL 2021 Tier - 1

Q.139. A certain sum is deposited for 4 years at a rate of 10% per annum on compound interest compounded annually. The difference between the interest at the end of 2 years and that at the end of 4 years is ₹5,082. Find the sum (in ₹).
SSC CGL 11/04/2022 (Morning)
(a) 20,000 (b) 25,500
(c) 50,820 (d) 10,164

Q.140. Joseph deposited a total of ₹52,500 in a bank in the names of his two daughters aged 15 years and 16 years in such a way that they would get equal amounts when they become 18 years old . If the bank gives 10% compound interest compounded annually, then what is the amount (in ₹) that Joseph had deposited in the name of his younger daughter ?
SSC CGL 18/04/2022 (Afternoon)
(a) 25,500 (b) 24,500
(c) 25,000 (d) 26,000

SSC CGL 2020 Tier - 2

Q.141. A sum of money becomes ₹11,880 after 4 years and ₹17,820 after 6 years on compound interest, if the interest is compounded annually. What is half of the sum (in ₹) ?
SSC CGL Tier II (29/01/2022)
(a) 2,410 (b) 2,640 (c) 2,750 (d) 2,530

SSC MTS 2020 Tier - 1

Q.142. A sum of ₹6,400 invested on the basis of yearly compounding of interest, grows to ₹7,056 in two years. What is the percentage rate of interest ?
SSC MTS 05/10/2021 (Morning)
(a) 6.25 (b) 4 (c) 7.5 (d) 5

Q.143. A sum of ₹3,364 is divided in two parts such that the amounts received on them after 3 years and 5 years, respectively, is the same when the rate of interest is 5% p.a., compounded yearly. The difference between the two parts is:
SSC MTS 08/10/2021 (Evening)
(a) ₹180 (b) ₹166 (c) ₹164 (d) ₹160

Q.144. A sum invested at compound interest amounts to ₹13,824 in 2 years and to ₹16,588.80 in 3 years at a certain rate percent per annum, interest being compounded yearly. What will be the amount of the same at the end of the 4th year (nearest to a rupee) ?
SSC MTS 14/10/2021 (Evening)
(a) ₹20,238 (b) ₹18,248
(c) ₹19,907 (d) ₹18579

Q.145. A farmer borrowed ₹1,32,000 from a money lender to do cultivation in his field. The rate of interest is 12.5% p.a. Compounded annually. At the end of two years, he cleared his loan by paying ₹1,07,062.50 and his scooter. The cost (in ₹) of the scooter is:
SSC MTS 20/10/2021 (Afternoon)
(a) 50,000 (b) 45,000
(c) 75,000 (d) 60,000

Q.146. If a certain sum at compound interest becomes $2\frac{1}{2}$ times in 5 years, then in how many years will it become $6\frac{1}{4}$ times, at the same rate of interest p.a.?
SSC MTS 22/10/2021 (Afternoon)
(a) 9 years (b) 12 years
(c) 8 years (d) 10 years

Q.147. Kanika took a loan of ₹10,000 for 2 years on compound interest at the rate of 5% per annum, interest being compounded annually. How much money would she have saved if she had taken the loan on simple interest ?
SSC MTS 27/10 /2021 (Morning)
(a) ₹1,025 (b) ₹1,000 (c) ₹25 (d) ₹400

Q.148. Amit borrows a sum of ₹8,000 at 10% p.a. compound interest for 4 years. He repays ₹2,800 at the end of the first year and ₹2,600 at the end of the second year. To clear the loan, how much should he pay after 4 years, interest being compounded yearly ?
SSC MTS 27/10/2021 (Afternoon)
(a) ₹4,800 (b) ₹4,880
(c) ₹4,840 (d) ₹4,780

SSC CGL 2020 Tier - 1

Q.149. What is the compound interest (in Rupee) on a sum of 8192 rupee for $1\frac{1}{4}$ years at 15% per annum, if interest is compounded 5-monthly ?
SSC CGL 13/08/2021 (Morning)
(a) 1640 (b) 1740 (c) 1634 (d) 1735

Q.150. A certain sum amounts to Rs. 2,91,600 in 2 years and to Rs. 3,14,928 in 3 years on compound interest compounded annually. How much will be the simple interest (in Rs.) on Rs. 40,000 at the same rate for 2 years ?
SSC CGL 16/08/2021 (Evening)
(a) 7500 (b) 6400 (c) 8000 (d) 9600

Q.151. A certain sum becomes Rs. 13650 at 15% p.a. simple interest after 2 years. What will be the amount (in Rs.) of the same sum after 1 year at the same rate of interest, if the interest is compounded half yearly? (nearest to a Rs.)
SSC CGL 17/08/2021 (Morning)
(a) 13625 (b) 11000 (c) 12134 (d) 10500

Q.152. A borrowed a sum of Rs. 1,60,000 from B at 10% per annum simple interest. At the same time he lent the same sum to C at the same time on compounded interest, compounded semi-annually for 2 years. Find the amount (in Rs.) earned by A in the whole transaction.
SSC CGL 17/08/2021 (Afternoon)
(a) 4280 (b) 4281 (c) 2481 (d) 2840

Q.153. A man borrowed a certain sum and agrees to repay it by paying Rs.4000 at the end of first year and Rs.7700 at the end of second year. If the rate of compound interest compounded annually is 10% per annum, then find the sum (in Rs.) borrowed ?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 17/08/2021 (Evening)
(a) 11500 (b) 11000 (c) 9000 (d) 10,000

Q.154. A sum of Rs. 3125 amounts to Rs. 3515.20 in 3 years at x% p.a., interest being compounded yearly. What will be the simple interest (in Rs) on the same sum and for the same time at (x + 2)% p.a ?
SSC CGL 18/08/2021 (Afternoon)
(a) 554 (b) 562.50 (c) 565.50 (d) 550

Q.155. A person borrowed a sum of Rs. 30800 at 10% p.a for 3 years, interest compounded annually. At the end of two years, he paid a sum of Rs. 13268. At the end of 3rd year, he paid Rs. x to clear of the debt. What is the value of x ?
SSC CGL 23/08/2021 (Evening)
(a) 26200 (b) 26620
(c) 26400 (d) 26510

Q.156. A sum of Rs. 9500 amounts to Rs. 11495 in 2 years at a certain rate percent per annum, interest compounded yearly, ? What is the simple interest (in Rs.) on the same sum for the same time and double the rate ?
SSC CGL 24/08/2021 (Morning)
(a) 3420 (b) 3990 (c) 3800 (d) 4560

SSC CHSL 2020 Tier - 1

Q.157. Anamika paid Rs. 4965 as compound interest on a loan of Rs. 15000 after 3 years when compounded annually. Suman took a loan of Rs. 10000 at the same rate on simple interest. How much interest did Suman pay after 3 years ?
SSC CHSL 12/04/2021 (Morning)
(a) 4500 (b) 4000 (c) 3000 (d) 3500

Q.158. The simple interest on a certain sum for 3 years at 12% per annum is Rs. 6750. What is the compound interest (in Rs.) on the same sum for 2 years at 20% per annum, if interest is compounded half-yearly? (round off to the nearest Rs.)
SSC CHSL 12/04/2021 (Evening)
(a) 8000 (b) 8702 (c) 7729 (d) 6750

Q.159. A sum of Rs. 2432 amounts to Rs. 2681.28 in 2 years at a certain rate percent per annum, interest compounded yearly. What will be the simple interest (in Rs.) on the same sum for $4\frac{3}{8}$ years at double the same rate ?
SSC CHSL 13/04/2021 (Afternoon)
(a) 1276.80 (b) 1094.40
(c) 1064 (d) 1368

Q.160. A man invested a total of ₹ 12,050 in two parts, one at 10% p.a. Simple interest for 2 years and the other at the same rate at compound interest, interest being compounded annually, for the same time. The amount he received from the parts are equal. The sum (in ₹) invested at the compound interest is :
SSC CHSL 15/04/2021 (Morning)
(a) 5,780 (b) 5,580 (c) 6,000 (d) 5,800

Q.161. Krishan invested a sum of ₹ 25,000 in two parts. He earned 11% p.a simple interest on part 1 and 10% p.a compound interest compounded annually on part 2. If the total interest received by him after 2 years is ₹ 5,370, then find the sum invested on simple interest.
SSC CHSL 05/08/2021 (Evening)
(a) ₹ 11,000 (b) ₹ 12,000
(c) ₹ 12,500 (d) ₹ 13,000

SSC CPO 2020 Tier -1

Q.162. A Sum amounts to Rs. 7,562 in 4 years and to Rs. 8,469.44 in 5 years at a certain rate percent per annum. When the interest is compounded annually, The rate of interest is:
SSC CPO 23/11/2020 (Morning)
(a) 8% (b) 12% (c) 20% (d) 15%

Answer Key :-

1.(d)	2.(a)	3.(a)	4.(b)
5.(c)	6.(b)	7.(a)	8.(d)
9.(d)	10.(c)	11.(b)	12.(d)
13.(b)	14.(b)	15.(a)	16.(a)
17.(a)	18.(b)	19.(d)	20.(b)
21.(c)	22.(a)	23.(b)	24.(d)
25.(b)	26.(b)	27.(a)	28.(d)
29.(d)	30.(b)	31.(b)	32.(d)
33.(b)	34.(d)	35.(d)	36.(a)
37.(a)	38.(a)	39.(b)	40.(d)
41.(c)	42.(b)	43.(b)	44.(b)
45.(d)	46.(b)	47.(d)	48.(b)
49.(c)	50.(a)	51.(d)	52.(d)
53.(b)	54.(b)	55.(a)	56.(d)
57.(b)	58.(c)	59.(d)	60.(d)
61.(b)	62.(c)	63.(d)	64.(a)
65.(b)	66.(a)	67.(d)	68.(d)
69.(b)	70.(a)	71.(d)	72.(b)
73.(d)	74.(c)	75.(c)	76.(d)
77.(a)	78.(a)	79.(d)	80.(c)
81.(b)	82.(c)	83.(b)	84.(d)
85.(b)	86.(d)	87.(c)	88.(d)
89.(b)	90.(b)	91.(c)	92.(b)
93.(c)	94.(c)	95.(d)	96.(c)
97.(b)	98.(d)	99.(d)	100.(a)
101.(a)	102.(b)	103.(d)	104.(a)
105.(a)	106.(d)	107.(d)	108.(c)
109.(b)	110.(d)	111.(d)	112.(b)
113.(d)	114.(a)	115.(d)	116.(b)
117.(d)	118.(d)	119.(c)	120.(d)
121.(a)	122.(c)	123.(d)	124.(b)
125.(c)	126.(c)	127.(b)	128.(c)
129.(b)	130.(a)	131.(d)	132.(c)
133.(c)	134.(d)	135.(b)	136.(a)
137.(c)	138.(d)	139.(a)	140.(c)
141.(b)	142.(d)	143.(c)	144.(c)
145.(d)	146.(d)	147.(c)	148.(c)
149.(c)	150.(b)	151.(c)	152.(c)
153.(d)	154.(b)	155.(c)	156.(c)
157.(c)	158.(b)	159.(c)	160.(c)
161.(b)	162.(b)		

Solutions :-

Sol.1.(d) If rate is compounded half yearly, then Rate = $\frac{R}{2}$ and, Time = 2n, where n = no of years

CI = $P[(1 + \frac{\frac{R}{2}}{100})^{2n} - 1]$

$4641 = 10{,}000[(1 + \frac{10}{100})^{2n}]$

$\frac{4641}{10{,}000} + 1 = (\frac{11}{10})^{2n}$

$\frac{14641}{10{,}000} = (\frac{11}{10})^{2n}$

$(\frac{11}{10})^4 = (\frac{11}{10})^{2n} \Rightarrow n = 2$ years

Sol.2.(a) Given,
Amount after 5 years = 1,61,051

Principal before 5 year = $1{,}61{,}051 \times \frac{10^5}{11^5}$

Amount to be paid after 3 years

$= 1{,}61{,}051 \times \frac{10^5}{11^5} \times \frac{11^3}{10^3}$

$= 1{,}61{,}051 \times \frac{10^2}{11^2}$ = Rs. 1,33,100

Sol.3.(a)
The amount becomes 2 times in 7 years.
time taken to form amount (2^3 times = 8 times) = 3 × 7 = 21 years

Sol.4.(b) Rate compounded half yearly
Then, rate = 2.5%

Amount = $2400 \times (1 + \frac{2.5}{100})^2 + 2400 \times (1$

Search on Telegram @apna_pdf

$+\frac{2.5}{100}) = 2400 \times (\frac{41}{40})^2 + 2400 \times (\frac{41}{40})$

$= \frac{2400 \times 1681}{1600} + \frac{2400 \times 41}{40}$

= 2521.50 + 2460 = ₹4,981.50

Sol.5.(c)

Principal : Amount

20000 : 22050

10000 : 11025

$\sqrt{10000} : \sqrt{11025}$ = 100 : 105

Rate = $\frac{105-100}{100} \times 100$ = 5%

Hence, CI for 3 year

= 22050 × $\frac{5}{100}$ + 2050 = ₹3,152.50

Sol.6.(b) Difference between rate %

= $\frac{8 \times 8}{100}$ = 0.64%

Extra money = 1,56,250 × 0.64% = ₹1000

Sol.7.(a)

Simple interest calculated half - yearly ,

So rate = 4%

Effective rate of interest for one year

= 4 + 4 + $\frac{4 \times 4}{100}$ = 8.16 %

Sol.8.(d) Effective rate %

= 5 + 5 + $\frac{5 \times 5}{100}$ = 10.25%

Present value = $\frac{210000}{110.25}$ × 100

= 1.905 lakh

Sol.9.(d) Net % growth rate

= 5 + 5 + $\frac{5 \times 5}{100}$ = 10.25%

So, Present value = $\frac{13,230}{110.25} \times 100$

= 12,000 Rs.

Sol.10.(c)

$(C.I. - S.I)_{3yr}$ = P$(\frac{R}{100})^2 \times \{\frac{300+R}{100}\}$

76 = $\frac{16P}{10000} \times \{\frac{304}{100}\}$

P = $\frac{76000000}{16 \times 304}$ = 15,625 ₹

Sol.11.(b) Scaling factor for 1 year

= $\frac{7340}{6120} = \frac{367}{306} \approx 1.2$

Scaling factor for 2 year = $(1.2)^2$ = 1.44

Principal = $\frac{6120}{1.44}$ = ₹4250

Nearest value in the given option

= ₹ 4254.63

Sol.12.(d) Rate for 1st years = 10%

Rate for next 9 months = 10 × $\frac{9}{12}$ = 7.5%

Net effective interest rate

= 10 + 7.5 + $\frac{10 \times 7.5}{100}$ = 18.25%

Now , principal × 18.25% = 1460 Rs.

Principal = $\frac{1460 \times 100}{18.25}$ = 8000 Rs.

Sol.13.(b) According to the question,

I. rate = 10%

Amount = 2400 × $\frac{11}{10} \times \frac{11}{10} \times \frac{11}{10}$

= ₹ 3194.4

Interest = 3194.4 – 2400

= ₹ 794.4 (correct)

II. S.I = $\frac{2400 \times 10 \times 3}{100}$ = ₹ 720

C.I = ₹ 794.4 (from statement I)

Required difference = 794.4 – 720

= ₹ 74.4 (incorrect)

So Only statement I is correct

Sol.14.(b) solution :- Multiplying factor in Compound Interest for the same year is equal.

According to question,

7500 —×2→ 15000 —×2→ 30000

Therefore,

Required Price = Rs. 30000

Sol.15.(a) Rate for a year = 16%

Successive Rate for a year if compounded half yearly = 16.64%

According to the question,

(16.64 – 16)% = 64 = 0.64 % = ₹ 64

Therefore, sum (100)% = $\frac{64}{0.64} \times 100$

= ₹10000

Sol.16.(a) $(CI - SI)_{2years}$ = P$(\frac{R}{100})^2$

325 = $x(\frac{25}{100})^2 \Rightarrow x$ = 325 × 4 × 4

$\Rightarrow x$ = Rs. 5200

Sol.17.(a) Effective rate of 10% half yearly = 5 + 5 + $\frac{5 \times 5}{100}$ = 10.25%

Sol.18.(b) According to the question,

SI = $\frac{6000 \times 10 \times 2}{100}$ = 1200

CI = 6000 × $\frac{11}{10} \times \frac{11}{10}$ - 6000

= 7260 - 6000 = 1260

So, both statement are correct.

Sol.19.(d)

Fractional value 20% = $\frac{1}{5}$ and 30% = $\frac{3}{10}$

15000 × $\{(\frac{6}{5} \times \frac{6}{5} \times \frac{6}{5})$ - 1} = 10920 ₹

20000 × $\{(\frac{13}{10} \times \frac{13}{10} \times \frac{13}{10})$ - 1} = 23940 ₹

Total C.I. = 10920 + 23940 = 34860 ₹

Sol.20.(b) According to the question

Rate for 1st year = 8% and second year = 12 %

Then the effective rate

= 8 + 12 + $\frac{8 \times 12}{100}$ = 20.96%

Interest = 55000 × $\frac{20.96}{100}$

= 550 × 20.96 = ₹11528

Sol.21.(c) Amount taken from B by A

P = 3600, rate = 20%, Time 2 years

Interest = $\frac{P \times R \times T}{100} = \frac{3600 \times 20 \times 2}{100}$

= 1440 Rs

Now amount given to C by A

Principal = 3600 × $\frac{75}{100}$ = 2700

Rate = 20% = $\frac{1}{5}$, Time = 2 year

Ratio → Principal : Amount

For 2 years → $(5)^2$: $(6)^2$

Final → 25 : 36

Interest = 36 - 25 = 11 units

25 units = 2700

11 units = $\frac{2700}{25} \times 11$ = 1188

Total amount taken by A from C

= 2700 + 1188 = 3888

Total amount given by A to B

= 3600 + 1440 = 5040

Total loss = 5040 - 3888 = 1152

Sol.22.(a) Principle = ₹3,90,625

Amount = ₹4,56,976 ⇒ Rate = 8%

Interest being compounded half yearly,

Effective rate = 4%

A = P$(1 + \frac{r}{100})^n$

$\Rightarrow \frac{456976}{390625} = (1 + \frac{4}{100})^n$

$\Rightarrow \frac{456976}{390625} = (\frac{26}{25})^n$

$\Rightarrow (\frac{26}{25})^4 = (\frac{26}{25})^n \Rightarrow$ n = 4 years

As Interest being compounded half yearly, So, n = 2 years

Sol.23.(b) Formula:- No. of years it takes to double the money = $\frac{69}{R}$ + 0.35

So, time = $\frac{69}{26}$ + 0.35

= 2.65 + 0.35 = 3 years

Sol.24.(d)

Difference in years (10 – 8) = 2years

Rate of interest = 10%

Amount received by A and B is equal .

Ratio = A : B

Interest ratio = $(10)^2$: $(11)^2$

So , principal ratio = $(11)^2$: $(10)^2$

= 121 : 100

Total principal (121 + 100) = 66300 Rs.

Principal for A (121 units)

= 121 × 300 = 36300 Rs.

Principal for B (100 units)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

= 100 × 300 = 30000 Rs.

Sol.25.(b) Let the sum invested = 100
After 3 year the sum becomes

$= 100 \times \frac{180}{100} \times \frac{160}{100} \times \frac{60}{100} = 172.8$

We know that ,

$A = P\left(1 + \frac{R}{100}\right)^3$

$\Rightarrow 172.8 = 100\left(1 + \frac{R}{100}\right)^3$

$\Rightarrow 1.2 = \left(1 + \frac{R}{100}\right) \Rightarrow 0.2 = \frac{R}{100}$

⇒ R = 20%

Sol.26.(b) In equal intervals of time in C.I. sum gets multiplied by same factor

Required value $= 7200 \times \frac{7200}{5760} \times \frac{7200}{5760}$

$= 7200 \times \frac{5}{4} \times \frac{5}{4}$ = ₹11,250

Sol.27.(a)
Let the rate of compound Interest = x%
Amount after one year = 12000 + 120x
After the payment amount left =
12000 + 120x - 4800 = 7200 + 120x
Interest for the second year

$= (7200 + 120x)\frac{x}{100} = 72x + 1.2x^2$

Total amount= $7200 + 120x + 72x + 1.2x^2$
$9240 = 7200 + 192x + 1.2x^2$
$2040 = 192x + 1.2x^2$
On solving x = 10%

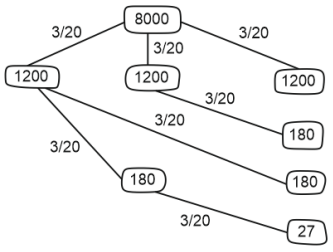
Sol.28.(d) Amount of A after 3 years. and the amount of B after 4 years is equal .

$A\left(\frac{107}{100}\right)^3 = B\left(\frac{107}{100}\right)^4 \Rightarrow A:B = 107:100$

⇒ A + B = 207 units = ₹ 51750
⇒ 1 unit = ₹ 250
"A" borrowed (107 units) = ₹ 26750

Sol.29.(d) 15% = $\frac{3}{20}$

Let the principal = 20^3 = 8000 unit



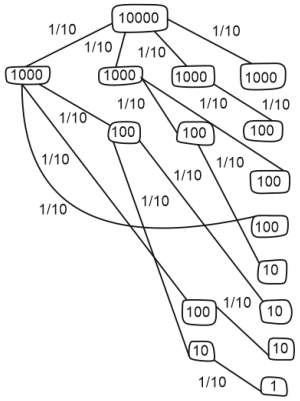
Total interest earned

$= 1200 + 1200 + 180 + \frac{2}{5} \times (1200 + 180 + 180 + 27) = 3214.8$ unit

According to the question
(8000 + 3214.8) unit = 4205.55
1 unit = 0.375
8000 unit = 8000 × 0.375 = 3000

Sol.30.(b) 10% = $\frac{1}{10}$

Let the principal = 10^4 = 10000



Difference between 4th year and 3rd year
CI = 100 + 10 + 10 + 1 = 121 units
According to the question
10000 units = 18000 Rs.
1 unit = 1.8 Rs.
121 units = 217.8 Rs.
Short Trick :- Required difference

$= 18000 \times \frac{1}{10} \times \frac{11}{10} \times \frac{11}{10}\left(\frac{11}{10} - 1\right)$

$= 18 \times \frac{121}{10} = 217.80$ ₹

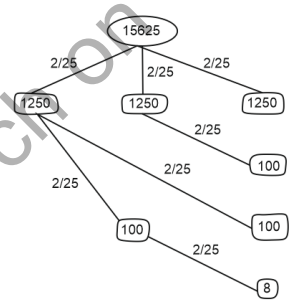
Sol.31.(b) Since interest is compounded 8 monthly,

effective rate of interest $= 12 \times \frac{8}{12} = 8\%$

effective time period $= 2 \times \frac{12}{8} = 3$ years

Now, 8% = $\frac{2}{25}$

Let the principal = 25^3 = 15625



Interest earned = 1250 + 1250 + 1250 + 100 + 100 + 100 + 8 = 4058 unit
15625 unit = 31250 ⇒ 1 unit = 2
4058 unit = 4058 × 2 = 8116

Short-trick: Effective rate :- 8% = $\frac{2}{25}$

For three compounding cycle :-

Principal	:	Amount
$(25)^3$	:	$(27)^3$
15625	:	19683

Now,
15625 units = 31250 Rs. , 1 unit = 2 Rs.
C.I. =(19683 - 15625) = 4058 unit
C.I. = 4058 × 2 = 8116 Rs.

Sol.32.(d) Rate = 8% = $\frac{108}{100}$

4th year's CI = $3600 \times \frac{108}{100} = 3888$

5th year's CI = $3888 \times \frac{108}{100} = 4199.04$

Desired difference = 4199.04 - 3888
≈ 311 Rs.

Sol.33.(b)

Fractional value of 6.25% = $\frac{1}{16}$

	Principal	:	Amount
1st yr. →	16	:	17
2nd yr. →	16	:	17
3rd yr. →	16	:	17
Total →	4096	:	4913

According to the question
4913 unit = 14739 ⇒ 1 unit = 3
4096 unit = 4096 × 3 = 12288

Sol.34.(d) Fractional value of 20% = $\frac{1}{5}$

C.I. in 2nd year = 250 Rs.

CI after 5th yr. $= 250 \times \frac{6}{5} \times \frac{6}{5} \times \frac{6}{5}$
= 432

Sol.35.(d) Fractional value of 20% , 40% and 50% are $\frac{1}{5}$, $\frac{2}{5}$ and $\frac{1}{2}$ respectively

Let the principal be x Rs.

$x \times \frac{6}{5} \times \frac{7}{5} \times \frac{3}{2} = 5040$

$x = \frac{5040 \times 5 \times 5}{3 \times 7 \times 3} = 2000$ Rs.

Sol.36.(a) Simple interest earned in one year = $\frac{250}{2} = 125$

We know that ,
Compound interest earned in two years = simple interest of two years + interest earned on the simple interest of first year
Desired Compound interest

$= 250 + \frac{125 \times 20}{100} = 275$

Sol.37.(a)
Let the amount after 3 years = 10000
the amount after 5 years = 11881

Scaling factor = $\left(1 + \frac{r}{100}\right)$

Scaling factor = $\sqrt[t]{\frac{Amount}{Principal}}$

Where , t = time interval

Scaling factor = $\left(1 + \frac{r}{100}\right) = \sqrt[2]{\frac{11881}{10000}}$

$= \frac{109}{100} \Rightarrow$ Rate = 9%

Sol.38.(a) Let the rate of interest = r and time period = 2t
According to the question

$63654 = 60000\left(1 + \frac{r}{100}\right)^{2t}$

$\Rightarrow \left(1 + \frac{r}{100}\right)^t = \sqrt{\frac{63654}{60000}}$ .....(1)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Amount earned in 't' years at same rate of interest 'r' ⇒ $60000(1+\frac{r}{100})^t$

⇒ $60000 \times \sqrt{\frac{63654}{60000}} = 61800$

Sol.39.(b) Since interest is compounded half yearly, effective Rate = $8 \times \frac{1}{2} = 4\%$ and effective time period = 1 × 2 = 2 years

Now, fractional value of 4% = $\frac{1}{25}$

Let the principal be = 'x' Rs.

Then, $x \times \frac{26}{25} \times \frac{26}{25} = 20280$ Rs.

$x = \frac{20280 \times 25 \times 25}{26 \times 26} = 30 \times 25 \times 25$

= 18750 Rs.

Now, for simple interest :-

Rate of interest = 2 × 8 = 16%

Desired S.I. = $\frac{18750 \times 16 \times 23}{5 \times 100} = 13800$

Sol.40.(d)

Difference between CI and SI for 2 yrs.

= $P \times (\frac{R}{100})^2 \Rightarrow 19.20 = P \times (\frac{64}{10000})$

⇒ P = 3000 Rs.

Sol.41.(c) Rate of interest

= $[(\frac{Amount}{Principle})^{\frac{1}{t}} - 1] \times 100$

Where t = time

Rate = $[(\frac{20736}{12000})^{\frac{1}{3}} - 1] \times 100 = 20\%$

Now, Fractional value of 20% = $\frac{1}{5}$

Amount after 2 yrs. = $12000 \times \frac{6}{5} \times \frac{6}{5}$

Amount = 17280 Rs.

Sol.42.(b) Interest rate ⇒ 10% = $\frac{1}{10}$

1st yrs. ⇒ 10 : 11

2nd yrs. ⇒ 10 : 11

Final ⇒ 100 : 121

Let the principal = 100 units

Amount after 2 years = 121 units

According to the question,

(121 units - 6634 Rs.) × $\frac{11}{10}$ = 13200

121 units = 12000 + 6634

1 unit = 154

Principal (100 units) = 15400 Rs.

Sol.43.(b) For Compound interest :-

	Principal	:	Amount
Rate 1st yr (10%) ⇒	10	:	11
Rate 2nd yr (10%) ⇒	10	:	11
Rate 3rd yr (5%) ⇒	20	:	21

Final Ratio ⇒ 2000 : 2541

According to question,

541 units = 1623 Rs. ⇒ 1 unit = 3 Rs.

2000 units = 6000 Rs.

Sol.44.(b)

Net rate % = $8 + 10 + \frac{8 \times 10}{100} = 18.8\%$

C.I. ⇒ $24000 \times \frac{18.8}{100} = 4512$ Rs.

Sol.45.(d) Difference in Amounts

⇒ 1452 - 1320 = 132 Rs.

So, Rate = $\frac{132}{1320} \times 100 = 10\%$

Now, 10% = $\frac{1}{10}$

Let the principal = 100 units

C. I. for the 2nd yr. = 11 units

As per the question,

11 units = Rs 1320,

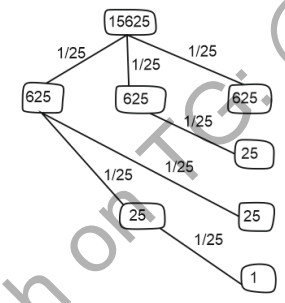
Then, 100 units = 12000 Rs.

Sol.46.(b)

Since interest is compounded half yearly, effective rate of interest = $\frac{8}{2}$ = 4% and effective time period = $\frac{16}{12} \times 2$

= $2\frac{2}{3}$ years, Now, 4% = $\frac{1}{25}$

Let the principal = 25^3 = 15625



Interest earned = 625 + 625 + 25 + $\frac{2}{3}$ (625 + 25 + 25 + 1) = 1725.67 unit

Desired %age = $\frac{1725.67}{15625} \times 100$

= 11.04 % ≈ 11%

Sol.47.(d) 40 % = $\frac{2}{5}$

Let Principal = 5 unit, Amount after 4 year = 7 unit

∴Rate of interest(R) = $\frac{S.I. \times 100}{P \times T}$

⇒ R = $\frac{2 \times 100}{5 \times 4}$ = 10 %

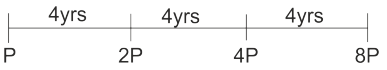
Equivalent Rate of interest for 4 cycle of 10% = 46.41%

∴ C.I. = $80,000 \times \frac{46.41}{100}$

= 8 × 4641 = ₹37128

Sol.48.(b)

As we know, For a fixed time period sum gets multiplied by the same factor.



Required no. of yrs to become sum of money 8 times of itself = 4 + 4 + 4 =12yrs

Sol.49.(c)

The amount becomes 3 times in 5 yrs.

Time taken for the amount to become

= (3^2 times = 9 times) ⇒ 5 × 2 = 10 yrs.

Sol.50.(a)

Principal = 6000, Time = 2 years

Amount after 2 years

= $6000 \times \frac{102.5}{100} \times \frac{102}{100} = 6273$

∴ Compound interest

= 6273 - 6000 = ₹ 273

Sol.51.(d) According to the question,

Amount after 5 years,

$100000 \times \frac{107}{100} \times \frac{107}{100} \times \frac{107}{100} \times \frac{107}{100} \times \frac{107}{100}$ = 140255.17

C.I = 140255.17 - 100000 = 40255 (approx)

Sol.52.(d) C.I is compounded half yearly, R = 5 % and Time = 3 cycle of six months

		Principal	:	amount
1st year	→	20	:	21
2nd year	→	20	:	21
3rd year	→	20	:	21

Overall → 8000 : 9261

9261 units = 64827

Principal invested (8000) units

⇒ $\frac{64827}{9261} \times 8000 = ₹56,000$

Sol.53.(b) According to the question,

Let the sum invested by Peter and Rachel be 2 and 1 units respectively.

(on S.I) Interest for peter for 2 years

= 20% × 2 = 40%

(on C.I) Interest for rachel for 3 years

= 33.1% × 1 = 33.1%

Difference = 40 - 33.1 = 6.9%

(difference) 6.9% = 897

(Sum invested by Rachel) 100%

= $\frac{897}{6.9} \times 100$ = 13000 Rs

Sol.54.(b) Interest is compounded half yearly, the rate = 10% and Time = 2 years.

Principal	:	amount
10	:	11
10	:	11
100	:	121

100 unit = 8000

Then, C.I (121 - 100) unit

= $21 \times 80 = Rs.1,680$

Sol.55.(a) According to the question,

Rate compounded half yearly so,

Rate = 5%, time = 4 circle of 6 - 6 months

Required sum = $6500 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20}$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\times \frac{21}{20}$ = 7900.79 (7900 approx)

Sol.56.(d) Ratio - principal : amount

1st year - 20 : 21
2nd year - 20 : 21
3rd year - 20 : 21

Total - 8000 : 9261

According to the question,
9261 units = ₹ 27783 ⇒ 1 unit = ₹ 3
Hence, deposited amount (8000 units)
= ₹ 24,000

Sol.57.(b) 6400 = $P(1 + \frac{r}{100})^3$ ....eq .(1)

8100 = $P(1 + \frac{r}{100})^5$ ....eq .(2)

Divide equation (2) by equation (1)we get

$(1 + \frac{r}{100})^2 = \frac{81}{64}$

$(1 + \frac{r}{100}) = \frac{9}{8} \Rightarrow r = 12\frac{4}{8}\%$

Sol.58.(c)
When compounded annually rate = 8%
Effective rate percent when compounded semi-annually = $4 + 4 + \frac{4 \times 4}{100}$ = 8.16%

Required difference
= 1,50,000 × (8.16 − 8)% = 240

Sol.59.(d) According to the question,

$\frac{8904.2}{8000} = (1 + \frac{r}{100})^2$

$\frac{44521}{40000} = (1 + \frac{r}{100})^2 \Rightarrow 1 + \frac{r}{100} = \frac{211}{200}$

$\frac{r}{100} = \frac{11}{200} \Rightarrow r = \frac{11}{2}$ = 5.5%

Sol.60.(d)
Effective rate for 2 years at 10% = 21

Effective rate for $2\frac{1}{2}$ years

$= 21 + 5 + \frac{21 \times 5}{100}$ = 27.05%

Compound interest = 27.05% of 2000
= ₹541

Sol.61.(b) According to the question,

$(C.I - S.I)_{for\ 2\ years} = \frac{principal \times rate^2}{100^2}$

$850 = \frac{85000 \times rate^2}{100^2}$

$rate^2 = 100 \Rightarrow$ Rate = 10%

Sol.62.(c) Principle = 1250 , Rate = 12% , Amount = 1568 , T = ?

We know that , $A = P(1+ \frac{R}{100})^T$

$1568 = 1250(1 + \frac{12}{100})^T \Rightarrow \frac{1568}{1250} = (\frac{28}{25})^T$

$\frac{784}{625} = (\frac{28}{25})^T \Rightarrow (\frac{28}{25})^2 = (\frac{28}{25})^T$

T = 2 Years

Sol.63.(d) According to the question, when rate is compounded quarterly then,

Rate = $\frac{16}{4}$ = 4%

time = 4 cycle of 3 - 3 months

Amount = $75000 \times \frac{26}{25} \times \frac{26}{25} \times \frac{26}{25} \times \frac{26}{25}$ = ₹87,739.40 (approx)

Sol.64.(a) Rate compounded half yearly
So, rate = 10 % and time becomes double

Amount = principal × $(1 + \frac{r}{100})^t$

According to the question,

$23958 = 18000 \times (1 + \frac{10}{100})^{2t}$

$\frac{23958}{18000} = (\frac{11}{10})^{2t} \Rightarrow (\frac{11}{10})^3 = (\frac{11}{10})^{2t}$

2 t = 3 ⇒ Time = $1\frac{1}{2}$ years

Sol.65.(b) Rate compounded half yearly
So, rate = 5% and time = 3 cycle of 6 - 6 months
Effective rate (on C.I) = 15.7625%
Effective rate (on S.I) = 15%
Required difference

$= 72000 \times \frac{15.7625 - 15}{100}$ = ₹ 549

Sol.66.(a)

Amount = principal × $(1 + \frac{R}{100})^t$

$7744 = 6400 \times (1 + \frac{R}{100})^2$

$(\frac{88}{80})^2 = (1 + \frac{R}{100})^2$

$\frac{R}{100} = \frac{1}{10} \Rightarrow$ rate = 10%

Sol.67.(d) Rate compounded half yearly
So, rate = 4% and time = 3 half year

Now, $17576 = P \times (1 + \frac{4}{100})^3$

$26^3 = P \times (\frac{26}{25})^3$

Sum of money (P) = 25^3 = ₹15,625

Sol.68.(d) Rate compounded half yearly

Then, rate = 4% = $\frac{1}{25}$, and time = 4 cycles of 6 - 6 months

Ratio - principal : amount

$(25)^4 : (26)^4$

Final ratio - 390625 : 456976
Principal = 390625 units = ₹62,500
1 unit = ₹ 0.16
Then ,
CI = 456976 − 390625 = 66351 units
= 66351× 0.16 = ₹10,616.16

Sol.69.(b) According to the question, when rate compounded half yearly then,

Rate = $\frac{8}{2}$ = 4%

time = 3 cycles of 6 - 6 months

Amount = $10200 \times \frac{26}{25} \times \frac{26}{25} \times \frac{26}{25}$
= ₹11,473.61

Sol.70.(a) Principal = 30,000 , R = 10% , T = $1\frac{1}{2}$ Years ,

But compounded half-yearly so R = 5% , T = 3 cycle of 6 months
Effective rate of 5% for two years

$= 5 + 5 + \frac{5 \times 5}{100}$ = 10.25%

Effective rate of 10.25% and 5%

$= 10.25 + 5 + \frac{10.25 \times 5}{100}$ = 15.7625%

CI = 15.7625% of 30,000 = ₹4728.75

Sol.71.(d)
Principal : Amount
2000 : 2880
$\sqrt{100} : \sqrt{144}$
10 : 12

Rate = $\frac{12 - 10}{10} \times 100$ = 20%

Sol.72.(b)

amount = $20500 \times \frac{11}{10} \times \frac{11}{10}$ = 24805

C.I = 24805 - 20500 = ₹ 4,305

Sol.73.(d) Given:- P = 1,60,000 , A = 2,79,841 , R = 15% , T = ?

$\frac{279841}{160000} = (1 + \frac{15}{100})^T$

$(\frac{23}{20})^4 = (\frac{23}{20})^T \Rightarrow$ T = 4 years

Sol.74.(c) For 3 years -

$\sqrt[3]{1728} : \sqrt[3]{4096}$
12 : 16

Rate = $\frac{16 - 12}{12} \times 100 = 33\frac{1}{3}$ %

Sol.75.(c)
Effective rate percent of 4% , 5% and 6%

$= 4 + 5 + 6 + \frac{4 \times 5 + 5 \times 6 + 4 \times 6}{100} + \frac{4 \times 5 \times 6}{10000}$ = 15.752%

CI = 15.752% of 15,000 = ₹2362.80

Sol.76.(d)

$(CI - SI)_{3years} = P \times (\frac{R}{100})^2 (\frac{300 + R}{100})$

$15.25 = P \times (\frac{5}{100})^2 (\frac{300 + 5}{100})$

$15.25 = P \times (\frac{1}{400})(\frac{305}{100})$

Required sum (P) = $\frac{15.25 \times 400 \times 100}{305}$
= ₹2,000

Sol.77.(a)
Rate compounded half yearly hence,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Rate = 10% and time
= 4 cycle of 6 - 6 months
Effective rate of 10% for 4 cycle = 46.41%
CI = 46.41% of 500 = ₹ 232.05

Sol.78.(a)

Rate for three month = $\frac{12\%}{12} \times 3 = 3\%$

Amount = $135000 \times \frac{112}{100} \times \frac{112}{100} \times \frac{103}{100}$
= ₹1,74,424.32

Sol.79.(d)
Effective rate of 6% for 2 years = 12.36%
Required amount = 112.36% of 12500
= ₹14045

Sol.80.(c) Effective interest rate
$= 4 + 4 + \frac{4 \times 4}{100} = 8.16\%$

Compound interest = $50,000 \times \frac{8.16}{100}$
= 4080 Rs.

Sol.81.(b) Required time =
$(\frac{108}{100})^n = \frac{46656}{40000} \Rightarrow (\frac{108}{100})^n = \frac{11664}{10000}$
$\Rightarrow (\frac{108}{100})^n = (\frac{108}{100})^2 \Rightarrow$ n = 2 years

Sol.82.(c)

Net % rate = $8 + 8 + \frac{8 \times 8}{100} = 16.64\%$

Total C.I. = $62,500 \times \frac{16.64}{100}$ = 10,400 Rs.

Sol.83.(b)

Net % rate = $18 + 18 + \frac{18 \times 18}{100} = 39.24\ \%$

Principal × 39.24% = 981 Rs.

Principal = $\frac{981 \times 100}{39.24}$ = 2500 Rs.

Sol.84.(d) Effective rate of interest for 3 years = 33.1%
So , C.I. = 25,000 × 33.1% = 8275 ₹

Sol.85.(b)
Net effective interest rate = 15.7625%
Amount after 3 year
= 18,000 × 115.7625% = ₹ 20837.25

Sol.86.(d) Net effective rate in C.I.
$= 10 + 10 + \frac{10 \times 10}{100} = 21\%$
Difference = 21% – 20% = 1%
Now, 1% of principal = 200 ₹
Principal (100%) = 20000 ₹

Sol.87.(c)

Net rate % = $6 + 6 + \frac{6 \times 6}{100} = 12.36\%$

According to the question ,
112.36 % of principal = 82,000 ₹

Principal = $\frac{82,000}{112.36} \times 100 \approx 72,980$ ₹

Sol.88.(d) Net % interest rate
$= 5 + 10 + \frac{5 \times 10}{100} = 15.5\%$
C.I. = 12,000 × 15.5% = 1860 ₹

Sol.89.(b)
Ratio = Principal : Amount
In 4 year = $(20)^4 : (21)^4$

Total = 1,60,000 : 1,94,481
Principal (1,60,000 units) = 1,60,000 ₹
1 unit = 1 ₹
Interest = 1,94,481 –1,60,000 = 34,481 ₹

Sol.90.(b)
Here, interest compounded half- yearly

Rate = $\frac{20}{2}$ = 10%

Time = $1\frac{1}{2}$ years = 3 cycle

Effective rate of 3 cycle = 33.1%
C.I. = 10,000 × 33.1% = 3310 ₹

Sol.91.(c) S.I. for 1 year = 250
Difference between C.I. and S.I. for 2 year = 50

So , rate % = $\frac{50}{250} \times 100 = 20\%$

Sol.92.(b) Interest in 3rd year = 50,000 × $\frac{1}{10} \times \frac{11}{10} \times \frac{11}{10}$ = 50 × 121 = 6050 ₹

Sol.93.(c) $(C.I. - S.I.)_{2\,year} = P(\frac{R}{100})^2$

P = $\frac{162 \times 10000}{81}$ = 20000 ₹

Sol.94.(c)

Net rate % = $20 + 20 + \frac{20 \times 20}{100} = 44\%$

Present value = $\frac{9360}{144} \times 100$ = 6500 Rs.

Sol.95.(d) Effective rate at 10% for 3 years in case of C.I. = 33.1%
Effective rate at 10% for 3 years in case of S.I. = 30%
Required difference = 3.1% = 310 ₹

Principal(100%) = $\frac{310}{3.1} \times 100$ = 10,000 ₹

Sol.96.(c)
Effective rate when compounded half - yearly = $2.5 + 2.5 + \frac{2.5 \times 2.5}{100} = 5.0625\ \%$

Required difference
= 6400 × (5.0625 – 5)%

= $6400 \times \frac{0.0625}{100}$ = ₹4

Sol.97.(b) $3,20,000 \times (\frac{9}{8})^n = 4,05,000$

$(\frac{9}{8})^n = \frac{4,05}{3,20} = \frac{81}{64}$

$(\frac{9}{8})^n = (\frac{9}{8})^2$

Time period = 2 years

Sol.98.(d) Given, Principal = 10,000 , Rate = 10% and time = 2 years
Interest is compounded half-yearly, so r = 5 % and time = 4 years.
Compound interest =

$[10,000 \times (\frac{21}{20})^4 - 10,000]$

= 12155.0625 - 10000 = Rs. 2155.0625

Sol.99.(d) According to the question,

Rate = $\frac{5}{2 \times 2 \times 100} = \frac{1}{80}$ (because rate compounded half yearly)
Ratio - principle : amount
$(80)^3 : (81)^3$

Final - 512000 : 531441
531441 units = ₹ 9826
(principle) 512000 units
= $\frac{9826}{531441} \times 512000$ = ₹ 9466.55

Sol.100.(a) P = $\frac{56 \times 10000}{64}$ = ₹8750

Sol.101.(a) According to the question, interest compounded half yearly
So, rate = 5% and time = 3 cycle

Now , 5% = $\frac{1}{20}$

Ratio - Principal : amount
1st year - 20 : 21
2nd year - 20 : 21
3rd year - 20 : 21

Final ratio - 8000 : 9261
Compound interest = 9261 – 8000
= 1261 units
1261 units = ₹5,044
1 unit = ₹ 4
Principal = 8000 × 4 = ₹ 32,000

Sol.102.(b) $(CI - SI)_{2\,years} = P(\frac{R}{100})^2$

$160 = 16000 \times (\frac{R}{100})^2$

$R^2 = \frac{160 \times 100 \times 100}{16000} \Rightarrow R = 10\%$

Sol.103.(d) $(CI - SI)_{2\,years} = P(\frac{R}{100})^2$

$90 = P(\frac{3}{100})^2 \Rightarrow P = \frac{90 \times 100 \times 100}{3 \times 3}$
= 100000 paise = ₹1000

Sol.104.(a) Rate compounded half yearly,
Then, Rate = 20% = $\frac{1}{5}$ and time = 4 cycle

Ratio → Principal : Amount
1st time → 5 : 6
2nd time → 5 : 6
3rd time → 5 : 6
4th time → 5 : 6

Final ratio → 625 : 1296
Amount (1296 units) = ₹51840

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

1 unit = ₹40
hence , Principal (625 units) = ₹25000

Sol.105.(a) Rate is compounded half yearly,
So, the time will be 3 years.
According to the question,
$\sqrt[3]{200000} : \sqrt[3]{231525}$
$\sqrt[3]{8000} : \sqrt[3]{9261}$
20 : 21
Rate = $\frac{21-20}{20} \times 100 = 5\%$
Rate is compounded half yearly so,
The rate will be 10% per annum.

Sol.106.(d) 12% = $\frac{3}{25}$
Ratio → Principal : Amount
1st year → 25 : 28
2nd year → 25 : 28

Final ratio → 625 : 784
Compound Interest = 784 − 625 = 159 units ⇒ 159 units = ₹10176
Principal (625) units = $\frac{10176}{159} \times 625$
= ₹40,000

Sol.107.(d) According to the question,
Effective rate of 8% = 16.64%
Required interest
= 20000 × $\frac{16.64}{100}$ = ₹ 3328

Sol.108.(c) According to the question,
Principle = 12000 ,
simple interest = 12000 , time = 2 years
Rate = $\frac{100 \times SI}{Principle \times Time} = \frac{100 \times 12000}{12000 \times 2}$
= 50%
Now, for the same sum at the same rate, compound interest
Ratio → Principal : Amount
1st year → 2 : 3
2nd year → 2 : 3
3rd year → 2 : 3

Final ratio → 8 : 27
Principal (8)unit = ₹12000
Compound interest (19) unit
= $\frac{12000}{8} \times 19$ = ₹28500

Sol.109.(b)
Effective rate of 60% = 120 + $\frac{60 \times 60}{100}$
= 156% ⇒ 156% = ₹ 6240
(principal) 100% = $\frac{6240}{156} \times 100$ = ₹ 4000
S.I = $\frac{principal \times rate \times time}{100}$
S.I = $\frac{4000 \times 60 \times 3}{100}$ = ₹ 7200

Sol.110.(d) A = P × $(1 + \frac{R}{100})^T$
According to question,
275625 = 250000 × $(1 + \frac{R}{100})^2$
$(1 + \frac{R}{100})^2 = \frac{275625}{250000}$
$1 + \frac{R}{100} = \frac{525}{500} = \frac{21}{20} \Rightarrow \frac{R}{100} = \frac{1}{20}$
R(Rate of Interest) = 5% per year

Sol.111.(d) Rate compounded quarterly
So, Rate = $\frac{8}{12} \times 3 = 2\% = \frac{1}{50}$
Ratio → Principal : Amount
3 month → 50 : 51
3 month → 50 : 51

Final ratio → 2500 : 2601
Principal (2500) unit = Rs. 6000
Interest = 2601 − 2500 = 101 unit
Interest (101) units = $\frac{6000}{2500} \times 101$
= Rs. 242.4

Sol.112.(b) According to question,
Rate of interest = $\frac{43940 - 33800}{33800} \times 100$
= 30% ⇒ 33800 = P × $(1 + \frac{30}{100})^2$
P = $\frac{33800 \times 10 \times 10}{13 \times 13}$ = Rs. 20000
Now, new principal = 20000 × 2
= Rs. 40000
Amount = 40000 × $(1 + \frac{30}{100})^2$
= 40000 × $\frac{13}{10} \times \frac{13}{10}$ = Rs. 67600

Sol.113.(d) Rate compounded half yearly,
Then, Rate = 10% = $\frac{1}{10}$
Amount = P × $(1 + \frac{R}{100})^T$
⇒ 19965 = 15000 × $(1 + \frac{1}{10})^T$
⇒ $\frac{19965}{15000} = (1 + \frac{1}{10})^T$
⇒ $\frac{1331}{1000} = (\frac{11}{10})^T \Rightarrow (\frac{11}{10})^3 = (\frac{11}{10})^T$
On comparing above equation, We get
⇒ time (T) = 3 years
According to the question interest is being compounded half yearly so the required time will be 18 months.

Sol.114.(a) Amount
= 30000 × $\frac{11}{10} \times \frac{6}{5} \times \frac{13}{10}$ = ₹ 51,480
Interest = 51,480 − 30000 = ₹ 21,480

Sol.115.(d) According to the question,
$\sqrt{\frac{29859.84}{20736}} = \frac{1728}{1440} = \frac{6}{5}$
Rate = $\frac{6-5}{5} \times 100 = 20\%$
Ratio - principal : amount
1st year - 5 : 6
2nd year - 5 : 6
3rd year - 5 : 6

Final ratio - 125 : 216
Amount = 216 unit
216 unit = Rs. 20,736
Principal (125) unit = $\frac{20736}{216} \times 125$
= Rs. 12000

Sol.116.(b)
For 2 year = $\sqrt{15000} : \sqrt{25350}$
= 10 : 13
rate% = $\frac{13-10}{10} \times 100 = 30\%$

Sol.117.(d) According to the question,
R % = $\frac{CI - SI}{\frac{1}{2}SI} \times 100$
⇒ $\frac{160}{800} \times 100 \Rightarrow 20\%$
Then, principle = $\frac{100 \times 1600}{20 \times 2}$ = 4000 Rs.

Sol.118.(d) Compound interest of the loan from an app
= 10,000 × $\frac{23}{20} \times \frac{23}{20}$ − 10,000 = 3225 Rs
Simple interest of the loan from bank
= $\frac{10000 \times 15 \times 2}{100}$ = 3000Rs
Therefore, the difference between the interest (CI - SI) = 3225 - 3000 = 225 Rs.

Sol.119.(c) According to the question,
Case 1 :- CI compounded yearly
Rate = 10%
Case 2 :- If CI compounded half-yearly
For equal compound interest
Only option (c) satisfies the given condition .
Effective rate
= 4.88 + 4.88 + $\frac{4.88 \times 4.88}{100} \approx 10\%$

Sol.120.(d)
Amount = principle$(1 + \frac{r}{100})^n$
$\frac{4320}{3000} = (1 + \frac{r}{100})^2$
$(\frac{12}{10})^2 = (1 + \frac{r}{100})^2$
$\frac{r}{100} = \frac{6}{5} - 1 \Rightarrow r = \frac{1}{5} \times 100 \Rightarrow r = 20\%$

Sol.121.(a) If the rate is compounded half yearly then rate will be the half
= $\frac{20\%}{2}$ = 10%
And time will be the 2 times
= 1.5 × 2 = 3 cycle
Principal : amount
$(10)^3 : (11)^3$
1000 : 1331
1000 units (Principal) = 8000 Rs.
1331 units (Amount) = 10648 Rs.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.122.(c) According to question;

$1.96 = (1 + \frac{R}{100})^2$

$(1.4)^2 = (1 + \frac{R}{100})^2 \Rightarrow 1.4 = \frac{100+R}{100}$

$\Rightarrow$ R = 140 – 100 = 40%

Sol.123.(d) Amounts in 2 years = ₹ 6580
Amounts in 3 years = ₹7896

So, Rate of interest = $\frac{7896-6580}{6580} \times 100$

$= \frac{1316}{6580} \times 100 = 20\%$

Sol.124.(b) P = 6500 Rs , R = 5 % (Half-Yearly), T = 2 years = 4 cycle
Amount after 2 yrs

$\rightarrow 6500\{(1 + \frac{10/2}{100})^{2\times2}\}$

$\Rightarrow 6500\{(1 + \frac{5}{100})^4\} \Rightarrow 6500\{(\frac{21}{20})^4\}$

$\Rightarrow 6500 \times \frac{194,481}{160000} \approx$ ₹ 7900

Sol.125.(c) Since interest is compounded semi-annually,

effective rate of interest = $\frac{12}{2}$ = 6% and

effective time period = 2 years = 4 cycle,

Now 6% = $\frac{3}{50}$

Ratio → Principal : Amount

For 4 cycle → $(50)^4 : (53)^4$

Final → 62,50,000 : 78,90,481
Here, 78,90,481 unit = ₹ 10,000
Then,

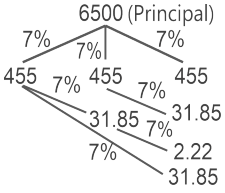
62,50,000 unit = $\frac{10,000}{78,90,481} \times 62,50,000$

$= \frac{625\times10^8}{78,90,481}$ = ₹7,920.94

Sol.126.(c) Let principal = 100%
(CI-SI) on certain sum at 10% for 2 years

$= \frac{10\times10}{100}\%$ = 1% which corresponds to
= ₹250
Then, 100% corresponds to 250 × 100
= ₹25000

Sol.127.(b) Using tree method, we have :



So, the required difference = 31.85 × 3 + 2.22 = 95.55 + 2.22 ≈ ₹97.78

Sol.128.(c) Effective CI rate for 2 years

$= 8 + 8 + \frac{8\times8}{100} = 16 + 0.64 = 16.64\%$

₹6656 corresponds to 16.64%

So, Principal = $\frac{6656\times100}{16.64}$ = ₹40,000

Hence, required SI = $\frac{40000\times8\times2}{100}$
= ₹6,400

Sol.129.(b) Rate = 25% = $\frac{1}{4}$, Time = 3 yrs

Ratio → Principal : Amount

For 3 years → $(4)^3 : (5)^3$

Final → 64 : 125
125 unit = ₹15,625

64 unit = $\frac{15625}{125}$ × 64 = ₹8,000

Sol.130.(a) Let required no of years be n
Rate for 1 year = 30%, rate for 6 months

$= \frac{30}{2} = 15\% = \frac{3}{20}$,

According to the question ,

$1216.70 = 800 \times (1+\frac{3}{20})^{2n}$

$\frac{1216.70}{800} = (\frac{23}{20})^{2n} \Rightarrow (\frac{23}{20})^3 = (\frac{23}{20})^{2n}$

$\Rightarrow 3 = 2n$, $n = \frac{3}{2}$ = 1.5 years

Sol.131.(d)
While calculating on simple interest;
Let the principle be ₹100
After 8 years, amount becomes 2 times,
SI = 200 - 100 = ₹100

Rate of interest (R_1)= $\frac{100\times100}{100\times8} = \frac{25}{2}\%$

While calculating on compound interest;
P = 100,A = 400,T = 2 years

then, $100(1 + \frac{R}{100})^2 = 400$

R_2 = 100%

Now, $\frac{R_1}{R_2} = \frac{25}{2\times100} = \frac{1}{8} = 1:8$

Sol.132.(c) According to the question,
Principle = 15000
If rate of interest being annually
Rate of interest = 20%
If rate of interest being half - yearly

Rate of interest =10 + 10 + $\frac{10\times10}{100}$ = 21%

Difference between rate of interest
= 21 - 20 = 1%
The difference between interests

= 15000 × $\frac{1}{100}$ = ₹150

Sol.133.(c) According to the question,
Aggregate Difference between rate of interest = $\frac{100}{2500}$ × 100 = 4%

Let the rate of interest = x
Aggregate rate of interest for compound interest = $(2x + \frac{x^2}{100})\%$

Aggregate rate of interest for simple interest = 2x%

Difference = $2x + \frac{x^2}{100} - 2x = \frac{x^2}{100}$

Therefore

$\frac{x^2}{100} = 4 \Rightarrow x^2 = 400 \Rightarrow x = \sqrt{400} \Rightarrow 20\%$

Sol.134.(d)

$P(1 + \frac{R}{100})^2 = 14400$..... (1)

$P(1 + \frac{R}{100})^4 = 25920$..... (2)

eq .(2) ÷ (1); $(1 + \frac{R}{100})^2 = \frac{9}{5}$ .....(3)

Put eq(3) in(1)

$\Rightarrow P \times \frac{9}{5} = 14400 \Rightarrow P$ = ₹8000

Sol.135.(b) Rate for half yrs = $\frac{6}{2}$ = 3%

Effective rate of 3% for 2 years = 3 + 3 + $\frac{3\times3}{100}$ = 6 + 0.09 = 6.09 % = 0.0609

Sol.136.(a) Selling price of the house

= 2,00,000 × $\frac{90}{100}$ = 1,80,000

Principle = 1,80,000

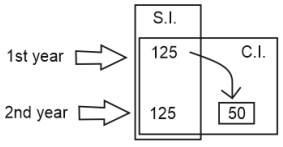
Amount = 1,80,000 × $\frac{120}{100} \times \frac{120}{100}$

= 2,59,200

Sol.137.(c)

S.I. for each year = $\frac{250}{2}$ = ₹125

Since the rate of CI and SI is the same.



So, rate of interest per annum

= $\frac{50}{125}$ × 100 = 40%

Sol.138.(d) Principle = 14,375
Amount = 16,767

$16,767 = 14,375(1 + \frac{r}{100})^2$

$\Rightarrow \frac{16767}{14375} = (1 + \frac{r}{100})^2$

$\Rightarrow \frac{729}{625} = (1 + \frac{r}{100})^2$

$\Rightarrow 1 + \frac{r}{100} = \frac{27}{25} \Rightarrow r = 8\%$

Sol.139.(a) Effective CI rate for two years at 10% = 10 + 10 + $\frac{10\times10}{100}$ = 21%

Effective CI rate for four years

= 21 + 21 + $\frac{21\times21}{100}$ = 42 + 4.41 = 46.41%

According to the question,
46.41% – 21% = 25.41%
25.41% = ₹5,082
1% = 200 Rs.
Principal (100 %) = 20000 Rs.

Sol.140.(c) Let amount deposited for younger daughter = ₹ P

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Amount deposited for the elder daughter = ₹ (52,500 - P)

Amount for the younger daughter at the end of 3 years = $P \times (1 + \frac{10}{11})^3$

Amount for the elder daughter at the end of 2 years = $(52,500 - P) \times (1 + \frac{10}{11})^2$

According to question,

$P \times (1+\frac{10}{100})^3 = (52,500 - P) \times (1+\frac{10}{100})^2$

$P \times (\frac{11}{10})^3 = (52,500 - P) \times (\frac{11}{10})^2$

$P \times \frac{11}{10} = (52,500 - P)$

11P + 10P = 52,5000

$P = \frac{52,5000}{21} = 25,000$

Short trick : $10\% = \frac{1}{10}$,

Principal : Amount

10 : 11

Difference between their ages = 16 - 15 = 1 year

Required ratio of principal invested = $10^1 : 11^1 = 10 : 11$.

Amount of Joseph's younger sister

$= \frac{10}{10+11} \times 52500 = 25000$

Sol.141.(b) Let the sum be P

As for fixed time periods, the sum gets multiplied by the same factor.

In 2 years sum becomes $\frac{17820}{11880}$ of itself.

After 4 years,

$\Rightarrow P \times \frac{17820}{11880} \times \frac{17820}{11880} = 11,880$

$\Rightarrow P \times \frac{3}{2} \times \frac{3}{2} = 11,880$

$\Rightarrow P = \frac{11880 \times 2 \times 2}{3 \times 3} = 5280$

Half of sum $= \frac{1}{2} \times 5280 =$ ₹2640

Sol.142.(d) According to the question,

$\Rightarrow \frac{7056}{6400} = (1 + \frac{R}{100})^2$

$\Rightarrow (\frac{84}{80})^2 = (1 + \frac{R}{100})^2$

$\Rightarrow \frac{84}{80} = 1 + \frac{R}{100} \Rightarrow R = 5\%$

Sol.143.(c) Let the two parts be a and b.

According to question,

$a (1 + \frac{R}{100})^3 = b (1 + \frac{R}{100})^5$

$\Rightarrow a (1 + \frac{5}{100})^3 = b (1 + \frac{5}{100})^5$

$\Rightarrow a = b (1 + \frac{5}{100})^2$

$\Rightarrow a = b (\frac{21}{20})^2 \Rightarrow \frac{a}{b} = \frac{441}{400}$

Difference between two parts

$= \frac{441-400}{441+400} \times 3364 = \frac{41}{841} \times 3364$

= ₹164

Short Trick :- Here , the difference between years is 2.

and Rate is 5 %

Ratio of Amounts :-

1st part : 2nd part

20 : 21

20 : 21

---

400 : 441

total P = (400 + 441) units = 3364 Rs.

Difference b/w 1st part and 2nd part

$\Rightarrow$ 41 units $= \frac{41}{841} \times 3364$ = ₹164

Sol.144.(c) $\frac{16588.80}{13824} = \frac{P(1+\frac{R}{100})^3}{P(1+\frac{R}{100})^2}$

$\Rightarrow 1.2 = (1 + \frac{R}{100}) \Rightarrow R = 20\%$

Amount at the end of 4th year

$= 16588.80 \times \frac{120}{100} = 19906.56 \approx$ ₹19,907

Sol.145.(d)

Effective interest rate for 2 years =

$\frac{25}{2} + \frac{25}{2} + \frac{\frac{25}{2} \times \frac{25}{2}}{100} = \frac{50}{2} + \frac{625}{400}$

$= 25 + \frac{25}{16} = \frac{425}{16}\%$

So, CI $= \frac{425}{16}\%$ of 132000

$= \frac{425}{1600} \times 132000 =$ ₹35,062.5

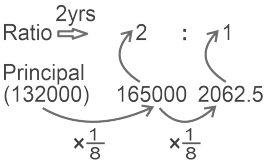
Amount = CI + Principal

= 132000 + 35,062.5 = ₹1,67,062.5

Cost of scooter = 167062.5 – 107062.5

= ₹60,000

Short Trick :- Rate = 12.5% = $\frac{1}{8}$



Amount ⇒ 132000 + (2 × 16500)+2062.5

= 167062.5 Rs.

Cost of scooter = 167062.5 – 107062.5

= ₹60,000

Sol.146.(d) Sum becomes $\frac{5}{2}$ times of itself in 5 years. $\frac{25}{4} = (\frac{5}{2})^2$

so it will take 5 × 2 = 10 years.

Sol.147.(c) Effective rate for 2yrs at C.I.

$= 5 + 5 + \frac{5 \times 5}{100} = 10.25\%$

Effective rate for 2yrs at S.I. ⇒ 10%

So, the Rate difference between CI and SI for 2 years = 10.25 – 10 = 0.25 %

Now, Amount of money Kanika would have saved = 0.25 % of 10000 = Rs.25

Sol.148.(c)

Amount at the end of first year

$= 8000 \times \frac{110}{100}$ = Rs.8800

Remaining amount at the end of first year = 8800 – 2800 = Rs. 6000

Gross Amount at the end of second year

$= 6000 \times \frac{110}{100}$ = Rs.6600

Remaining amount at the end of second year = 6600 – 2600 = Rs.4000

Now at the end of 4th years amount to be paid to clear the debt

$= 4000 \times \frac{11}{10} \times \frac{11}{10}$ = Rs. 4840

Sol.149.(c) Total time = 15 months and 5-monthly is calculated so it has 3 compounding periods

Rate $= \frac{15}{12} \times 5 = 6.25\% = \frac{1}{16}$

Ratio ⇒ Principal : Amount

For 3 yrs. $(16)^3$: $(17)^3$

Final ⇒ 4096 : 4913

Principal(4096) units = 8192 Rs.

1 unit → 2 Rs.

Interest earned (4913 - 4096) units

⇒ 817 units = 817 × 2 = 1634 Rs.

Sol.150.(b) Interest for the third year

= 314928 - 291600 = 23328

Principal for the third year = 291600

Rate of interest $= \frac{23328}{291600} \times 100 = 8\%$

So simple Interest $= \frac{40000 \times 2 \times 8}{100}$

= 6400

Sol.151.(c) Let the Principal = 100 units

Interest in 2 years = 15 × 2 = 30 units

Amount in 2 years = 100 + 30 = 130 units

130 units → 13650 Rs.

(Principal) 100 units → 10500 Rs.

When compounded half yearly

Rate = 7.5% , and

Time = 1 years (2 cycle)

Effective C.I. rate for two years

$\Rightarrow 7.5 + 7.5 + \frac{7.5 \times 7.5}{100} = 15.5625\ \%$

C.I. $= 10500 \times \frac{15.56}{100} \approx 1634$

Amount = 10500 + 1634 = 12134 Rs.

Sol.152.(c) Overall rate percent in 2 years = 2 × 10 = 20%

When compounded semi-annually,

Rate = 5%, time = 4 (cycle)

Effective rate = 21.550625%

Required amount

= 1.550625% of 1,60,000 = 2481

Sol.153.(d) Let the principal = $1000x$

Amount after 1 year $= 1000x \times \frac{11}{10}$

When he pays 4000 in the end 1st year

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

then,

$1000x \times \frac{11}{10} - 4000$

When he pays 7700 in the end of 2nd year then,

$(1100x - 4000) \times \frac{11}{10} - 7700 = 0$

$1100x - 4000 = 7000$

$x = \frac{7000 + 4000}{1100} = 10$

So the principal will be $(1000x)$ = 1000 × 10 = 10,000

Sol.154.(b) Rate % of C.I

$\sqrt[3]{312500} : \sqrt[3]{351520}$

$\sqrt[3]{15625} : \sqrt[3]{17576} = 25 : 26$

Rate = $\frac{1}{25} \times 100 = 4\%$

Simple interest for 3 year on rate (x + 2)%

$= 3125 \times 3 \times \frac{6}{100} = 562.50$

Sol.155.(c) Interest for first two year at 10% per annum = 21% of the Principal

Interest = $30800 \times \frac{21}{100}$ = 6468 Rs.

After payment, loan left

= (30800 + 6468) - 13268 = 24000

Amount at the end of third year

$= 24000 \times \frac{110}{100} = 26400$

Sol.156.(c) Time = 2 years

$\frac{A}{P} = \frac{11495}{9500} = \frac{2299}{1900} = \frac{121}{100}$

For 2 years, R = $\sqrt{\frac{121}{100}} = \frac{11}{10}$

Rate percent = 10%

When rate is doubled, R = 20%

Simple interest = $\frac{9500 \times 20 \times 2}{100} = 3800$

Sol.157.(c)

Total amount = 15000 + 4965 = 19965

$\sqrt[3]{\frac{19965}{15000}} = \sqrt[3]{\frac{1331}{1000}} = \frac{11}{10}$

It means, Rate percent = 10%

Interest = $\frac{10{,}000 \times 3 \times 10}{100} = 3000$

Sol.158.(b) Rate = 12%

Simple interest for 3 years ⇒

(36% of principal) = 6750 Rs.

Principal(100%) = $\frac{6750}{36} \times 100 = 18750$.

Now, new rate = $\frac{20}{2} = 10\%$

Time = 2 × 2 = 4 Cycle

Four year	⇒		Code:
10% of 18750	1875	→	4
10% of 1875	187.5	→	6
10% of 187.5	18.75	→	4
10% of 18.75	1.875	→	1

Total compound interest = (4×1875) + (6 ×187.5) + (4 ×18.75) + 1.875

= 8701.875 = 8702

Sol.159.(c)

Rate = $\sqrt{\frac{2681.28}{2432}} = \sqrt{\frac{441}{400}} = \frac{21}{20} = 5\%$

Rate is double = 10% and Time = $\frac{35}{8}$

Simple Interest = $\frac{P \times R \times T}{100}$

$= \frac{2432 \times 35 \times 10}{800} = 1064$

Sol.160.(c) Let the amount invested at simple interest be A and the amount invested at compound interest be B .

⇒ A × $\frac{120}{100}$ = B × $\frac{121}{100}$ ⇒ $\frac{A}{B} = \frac{121}{120}$

⇒ B = $\frac{120}{121+120} \times 12050$ = 6000

Sol.161.(b) Let , the second part = x ,

first part = 25,000 - x

Rate = 10%

Compound interest in 2 years

$= 10 + 10 + \frac{10 \times 10}{100} = 21\%$

⇒ $\frac{(25000 - x) \times 11 \times 2}{100} + \frac{x \times 21}{100} = 5370$

⇒ 550000 - 22x + 21x = 537000

⇒ x = 13000

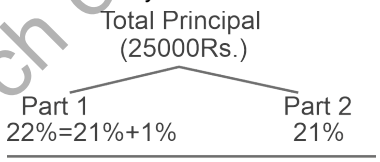
Amount invested on simple interest

= 25000 - 13000 = 12000

Short Tricks:-

Total interest in Part 1 at 11% simple interest for 2 yrs. = 22%

Total interest in Part 2 at 10% compound interest for 2 yrs. = 21%



25000×21%=5250 Rs

But according to Question ,

Total Interest = 5370 Rs.

Difference in interest arise due to increase of 1% interest in Part 1.

1% of Part 1 = 5370 - 5250 = 120 Rs.

100% of Part 1 = 12000 Rs.

Sol.162.(b) Amount at the end of 4 years = 7,562

Amount at the end of 5 years = 8,469.44

Net interest = 907.44

Rate of interest = $\frac{907.44}{7562} \times 100 = 12\%$

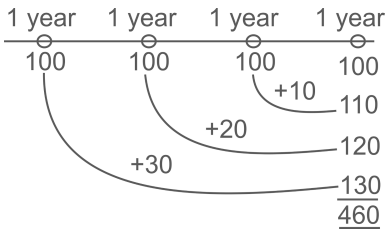
Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Installment

Simple Interest Installments :-

If a sum is paid in 4 years of equal installments of 100 rs at 10% SI
Then



1st installment will clear = 130
2nd installment will clear =120
3rd installment will clear = 110
4th installment will clear = 100

460

Hence total debt clear from four equal installments of 100 rs in four years
= 460

Important Formula

Annual Installment in case of SI

$$= \frac{100A}{100t + \frac{rt(t-1)}{2}}$$

Where, A = Amount borrowed,
t = Time period (number of installment),
r = Interest rate

Example 1 : A computer is available for ₹39,000 on cash payment or ₹19,000 as cash payment followed by five monthly installments of ₹4,200 each. What is the rate of interest per annum under the installment plan?

(a) $20\frac{19}{29}\%$ (b) $20\frac{17}{29}\%$
(c) $20\frac{20}{29}\%$ (d) $20\frac{18}{29}\%$

Solution :-
Remaining amount = 39,000 – 19,000
= 20,000 ₹

Amount $= 20{,}000 + \frac{20{,}000 \times R \times 5}{12 \times 100}$

$= 20{,}000 + \frac{250R}{3}$

Sum of Amounts of these installments =
(4200 + S.I. on 4200 for 4 months) +
(4200 + S.I. on 4200 for 3 months) +
(4200 + S.I. on 4200 for 2 months) +
(4200 + S.I. on 4200 for 1 month) + 4200
= (4200 × 5) + (S.I. on 4200 for 10 months)

$= 21000 + \frac{4200 \times R \times 10}{12 \times 100}$

= 21000 + 35R
Now , equating amount :-

$20{,}000 + \frac{250R}{3} = 21000 + 35R$

$\Rightarrow \frac{145R}{3} = 1{,}000 \Rightarrow R$

$= \frac{3000}{145} = \frac{600}{29} = 20\frac{20}{29}\%$

Example 2 : What annual installment will discharge a debt of ₹5,664 in 4 years at 12% simple interest ?
(a) ₹1,230 (b) ₹1,210
(c) ₹1,200 (d) ₹1,220

Solution: Using formula,

$$x = \frac{100A}{100t + \frac{rt(t-1)}{2}}$$

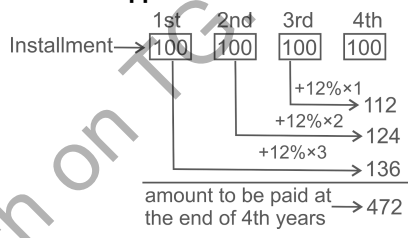
.....(where A = Amount borrowed, r = rate and
t = no. of installments)

$$x = \frac{566400}{100 \times 4 + \frac{12 \times 4(4-1)}{2}}$$

$$= \frac{566400}{100 \times 4 + 72} = \frac{566400}{472}$$

= Rs. 1200

Exam hall Approach:-



According to the question,
472 units = Rs. 5664
Then , 100 units = Rs. 1200

Compound Interest Installment:-

1) Equated monthly installment (EMI) :-

Amount borrowed= $\frac{x}{(1+\frac{R}{100})^n}$,

where x = installment (EMI)

Example:- Find the amount which is needed to be paid each year to clear the debt of ₹2,10,000 in 2 years at 10% compound interest rate.

Solution:- 210000

$$= \frac{x}{(1+\frac{10}{100})^2} + \frac{x}{(1+\frac{10}{100})}$$

$$\Rightarrow 210000 = \frac{x}{(\frac{11}{10})^2} + \frac{x}{(\frac{11}{10})}$$

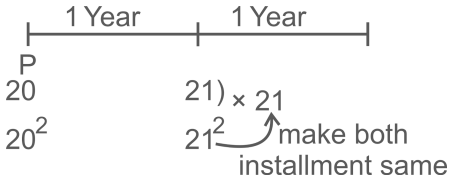
$$\Rightarrow 210000 = \frac{100x}{121} + \frac{10x}{11}$$

$$\Rightarrow 210000 = \frac{100x + 110x}{121}$$

$$\Rightarrow 210000 = \frac{210x}{121} \Rightarrow x = ₹1{,}21{,}000$$

2) Installments of compound interest :-

If a sum is due for two years of two equal installments at 5% compound interest rate then



Example:- Find the amount which is needed to be paid each year to clear the debt of ₹2,10,000 in 2 years at 10% compound interest rate.

Solution:- Given R = 10% = $\frac{1}{10}$

	Principal	:	installment
1st year -	$10_{\times 11}$	:	$11_{\times 11}$
2nd year -	10^2	:	11^2
	210	:	242

Each installment (per year) = 121 unit
Principal(210 unit) = ₹2,10,000
Now, you can calculate the amount needed to be paid each year i.e. 121 unit

$= \frac{210000}{210} \times 121 = ₹1{,}21{,}000$

Practice Questions

SSC CGL 2024 Tier - 1

Q.1. What annual instalment will discharge a debt of ₹26,160 due in 4 years at 6% simple interest p.a .?
SSC CGL 10/09/2024 (2nd Shift)
(a) ₹4,500 (b) ₹5,500
(c) ₹6,000 (d) ₹5,800

Q.2. A cell phone is available for Rs.600 or for Rs.300 cash down payment together with Rs.360 to be paid after two months. Find the rate of interest charged under this scheme.
SSC CGL 24/09/2024 (2nd Shift)
(a) 60% (b) 120% (c) 20% (d) 50%

SSC CHSL 2024 Tier - 1

Q.3. Find the total amount of debt that will be discharged by 5 equal installments of ₹200 each, if the debt is due in 5 years at 5% p.a. at simple interest.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 02/07/2024 (3rd Shift)
(a) ₹1,100 (b) ₹1,200
(c) ₹1,255 (d) ₹1,400

Q.4. A clock is sold for ₹550 cash or in the instalment scheme, for ₹250 cash down payment and ₹310 after one month. Find the rate of interest charged in the installment scheme.
SSC CHSL 04/07/2024 (1st Shift)
(a) 35% (b) 45% (c) 40% (d) 20%

Q.5. Rahna decided to buy a scooty that costs ₹40,000. The shopkeeper agreed to sell the scooty under the condition of ₹25,000 cash down payment of ₹4,000 each month for four months. Find the rate of interest at which the shopkeeper sold the scooty under the installment scheme.
SSC CHSL 04/07/2024 (3rd Shift)
(a) 33% (b) $16\frac{1}{2}$% (c) $18\frac{1}{2}$% (d) $10\frac{1}{3}$%

Q.6. A laptop charger is sold for Rs.2,540 in cash or for a down payment of Rs.1,340 in cash together with Rs.1,205 to be paid after one month. Find the rate of interest charged in the installment scheme.
SSC CHSL 11/07/2024 (1st Shift)
(a) 5% p.a. (b) 10% p.a.
(c) 15% p.a. (d) 20% p.a.

SSC CPO 2024 Tier - 1

Q.7. What annual installment will discharge a debt of ₹10,192 due in 3 years at 10% simple interest?
SSC CPO 27/06/2024 (2nd Shift)
(a) ₹3,144.48 (b) ₹3,044.48
(c) ₹3,088.48 (d) ₹3,188.48

Q.8. Sita takes a loan of Rs.35,000 at an interest rate of 10% compound interest, compounded annually. She agrees to pay two equal instalments in 2 years, one instalment at the end of each year. Find the value of each instalment.(Round off to the nearest integer)
SSC CPO 29/06/2024 (1st Shift)
(a) ₹20,167 (b) ₹40,167
(c) ₹10,167 (d) ₹30,167

SSC Selection Post (Phase - XII)

Q.9. Find the amount of equal annual installment, which will discharge a debt of Rs.40,376 due in 4 years at the rate of 2% p.a. simple interest.
Matriculation Level 20/06/2024 (Shift - 1)
(a) Rs.9,800 (b) Rs.8,758
(c) Rs. 10,250 (d) Rs.8,600

Q.10. What annual installment will discharge a debt of Rs.3,658 due in 4 years at 12% simple interest per annum ?
Higher Secondary 20/06/2024 (Shift - 2)
(a) Rs.825 (b) Rs.725
(c) Rs.750 (d) Rs.775

Q.11. ₹1,380 has to be paid after 4 years. If four equal installments are required with a simple interest of 10% on each installment, then what is the value of each installment ?
Matriculation Level 20/06/2024 (Shift - 4)
(a) ₹200 (b) ₹500 (c) ₹300 (d) ₹400

Q.12. A loan of ₹2,550 is to be paid back in two equal half-yearly installments. How much is each installment if the interest is compounded half-yearly at 8% p.a.?
Matriculation Level 24/06/2024 (Shift - 1)
(a) ₹1,258 (b) ₹1,352
(c) ₹1,745 (d) ₹1,457

Q.13. A man has to discharge a debt of ₹15,600 which is due in 3 years at 4% simple interest per annum. If he pays this amount in equal installments of annual payment, find the amount for annual payment.
Matriculation Level 24/06/2024 (Shift - 4)
(a) ₹5,200 (b) ₹5,100 (c) ₹5,400 (d) ₹5,000

Q.14. The annual installment (in ₹) to discharge a debt of ₹8,432 due in 4 years at 16% simple interest per annum is :
Matriculation Level 24/06/2024 (Shift - 4)
(a) 1,700 (b) 1,527 (c) 2,108 (d) 2,204

Q.15. An annual installment of ₹3,500 will discharge a debt of ₹16,310 due in 4 years at y% simple interest per annum. What is the value of y ? [**Note:** Installments will be paid at the end of Year 1, Year 2, Year 3 and Year 4.
Matriculation Level 25/06/2024 (Shift - 1)
(a) 11.5 (b) 10.5 (c) 16.5 (d) 11

Q.16. The amount of debt that will be discharged by 5 equal monthly installments of ₹1,845 each, at the rate of 48% simple interest per annum, is:
Matriculation Level 25/06/2024 (Shift - 1)
(a) ₹9,936 (b) ₹9,468
(c) ₹9,048 (d) ₹9,963

Q.17. What equal installment of annual payment (in ₹) will discharge a debt that is due as ₹624 at the end of 5 years at 2% per annum simple interest ?
Matriculation Level 26/06/2024 (Shift - 1)
(a) 150 (b) 120 (c) 180 (d) 240

Q.18. What annual installment will discharge a debt of ₹5,460 due in 5 years at 10% simple interest per annum ?
Matriculation Level 26/06/2024 (Shift - 1)
(a) ₹1,200 (b) ₹1,092 (c) ₹910 (d) ₹950

SSC CPO 2023 Tier - 1

Q.19. Anandi bought a smart watch from an electronic store for Rs.4,400. Since she had less money, she paid Rs.2,000 for down payment and the shopkeeper offered her an alternative to pay Rs.2,440 after 1 month. Find the rate of interest being charged at simple interest by the shopkeeper in this installment option?
SSC CPO 04/10/2023 (1st Shift)
(a) 15% (b) 20% (c) 10% (d) 22%

Q.20. What annual installment (in ₹) will discharge a debt of ₹9,429 due in three years at 12.25% simple interest per annum? [Note: Installments will be paid at the end of Year 1, Year 2 and Year 3.]
SSC CPO 05/10/2023 (1st Shift)
(a) 2800 (b) 2700 (c) 2,840 (d) 2760

Q.21. In a store, Arun has two options to buy a mobile phone, either he can pay the full amount of Rs.2,500 or he may buy at an installment scheme, i.e. Rs.520 in down payment and four equal installments, rate of interest being charged at 25% p.a. simple interest. Arun buys a mobile phone on the installment scheme. What is the monthly installment for Arun?
SSC CPO 05/10/2023 (3rd Shift)
(a) Rs.510 (b) Rs.530 (c) Rs.550 (d) Rs.520

SSC CHSL 2023 Tier - 1

Q.22. A computer is available for ₹39,000 on cash payment or ₹19,000 as cash payment followed by five monthly installments of ₹4,200 each. What is the rate of interest per annum under the installment plan?
SSC CHSL 02/08/2023 (2nd Shift)
(a) $20\frac{19}{29}$% (b) $20\frac{17}{29}$%
(c) $20\frac{20}{29}$% (d) $20\frac{18}{29}$%

Q.23. What is the amount (in₹) of debt that will be discharged in 6 equal installments of ₹800 each, if the debt is due in 6 years at 5% per annum ?
SSC CHSL 08/08/2023 (1st Shift)
(a) 6,600 (b) 7,500 (c) 8,000 (d) 5,400

SSC Selection Post (Phase - XI)

Q.24. An item is bought on a condition that three equal installments of ₹3,993 are to be paid at a rate of 10% compound interest, compounded annually. The cost of the item is:

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Matriculation Level 27/06/2023 (Shift - 1)
(a) ₹10,000 (b) ₹9,050
(c) ₹9,590 (d) ₹9,930

Q.25. P borrows ₹5,00,000 from the bank which charges 18% simple interest per annum at the start of the year. He pays 11 equal monthly installments of ₹40,000 and his bike at the end of the year to pay the amount. What is the value of the bike given?
Matriculation Level 27/06/2023 (Shift - 2)
(a) 1,50,000 (b) 1,75,000
(c) 1,25,000 (d) 1,10,000

Q.26. To buy a car, Sahil borrowed some amount at 10% simple interest rate. He has paid some loan amount but ₹1,81,500 is due which he has to pay in 3 years. What will be the annual installment (in ₹) ?
Matriculation Level 28/06/2023 (Shift - 1)
(a) 65,000 (b) 47,000 (c) 55,000 (d) 54,500

Q.27. What annual installment will discharge a debt of Rs.35,455 due in three years at 12% simple interest per annum (Installments will be paid at the end of the years) (Round off to nearest Rupee)?
Matriculation Level 28/06/2023 (Shift - 1)
(a) Rs.10,552 (b) Rs.14,652
(c) Rs.11,804 (d) Rs.12,548

Q.28. Ravi borrowed ₹1,380 from a bank which he repaid in 6 years at the rate of 6% per annum simple interest. If payment was made in six equal installment, then each installment was:
Matriculation Level 28/06/2023 (Shift - 4)
(a) ₹220 (b) ₹200 (c) ₹180 (d) ₹190

Q.29. What annual payment will discharge a debt of ₹1,936 in four annual equal installments at the rate of 14% on simple interest?
Matriculation Level 30/06/2023 (Shift - 4)
(a) ₹500 (b) ₹475 (c) ₹425 (d) ₹400

SSC CGL 2022 Tier - 2

Q.30. Rajnish borrowed ₹1,500 from a bank and repaid the entire amount with interest in two equal annual installments, the first installment being paid a year after Rajnish borrowed from the bank. If the rate of interest was 40% per annum, compounded annually, then what was the value (in ₹) of each installment paid by Rajnish?
SSC CGL Tier II (07/03/2023)
(a) 1125 (b) 1470 (c) 1225 (d) 1350

SSC CGL 2022 Tier - 1

Q.31. A sum of Rs.6,000 is to be paid back in two equal annual installments; each installment is to be paid at the end of every year. How much is each installment if the interest is compounded annually at 2% p.a.? (Rounded off up to two decimal places)
SSC CGL 02/12/2022 (1st Shift)
(a) Rs.2,092.29 (b) Rs.3,090.30
(c) Rs.2,291.29 (d) Rs.3,589.30

Q.32. What annual installment will discharge a debit of ₹5,664 in 4 years at 12% simple interest ?
SSC CGL 02/12/2022 (3rd Shift)
(a) ₹1,230 (b) ₹1,210 (c) ₹1,200 (d) ₹1,220

Q.33. A car with a price of ₹6,50,000 is bought by making some down payment. On the balance, a simple interest of 10% is charged in lump sum and the money is to be paid in 20 equal annual installments of ₹25,000. How much is the down payment?
SSC CGL 06/12/2022 (2nd Shift)
(a) ₹ 1,55,945 (b) ₹ 1,95,455
(c) ₹ 1,94,555 (d) ₹ 1,45,955

Q.34. A person borrows Rs.1,00,000 from a bank at 10% per annum simple interest and clears the debt in five years. If the installment paid at the end of the first, second, third and fourth years to clear the debt are Rs.10,000, Rs.20,000, Rs.30,000 and Rs.40,000, respectively, what amount should be paid at the end of the fifth year to clear the debt?
SSC CGL 12/12/2022 (1st Shift)
(a) Rs.38,250 (b) Rs.39,490
(c) Rs.40,450 (d) Rs.36,450

SSC CPO 2022 Tier - 1

Q.35. A man borrowed Rs.50,000 from a bank at 10% per annum, compounded annually. At the end of every year, he pays Rs.15,000 as part payment of the loan and interest. How much does he still owe to the bank after three such installments ?
SSC CPO 10/11/2022 (Morning)
(a) Rs.16,900 (b) Rs.15,800
(c) Rs.15,200 (d) Rs.16,200

SSC CGL 2021 Tier - 1

Q.36. A sum of money was borrowed and paid back in two equal annual instalments of Rs. 980, allowing 4% compound interest. The sum (in Rs. to the nearest tens) borrowed was:
SSC CGL 11/04/2022 (Evening)
(a) 1,850 (b) 1,960 (c) 1,760 (d) 2,050

SSC CHSL 2020 Tier - 1

Q.37. A mobile phone is available for Rs. 79860 by cash payment or by paying cash of Rs. 60000 as down payment and the remaining amount in three equal annual installments. If the shopkeeper charges interest at the rate of 10% per annum compounded annually, then the amount of each installment (in Rs.) will be:
SSC CHSL 16/04/2021 (Afternoon)
(a) 7986 (b) 6789 (c) 6689 (d) 6000

SSC CGL 2018 Tier - 2

Q.38. A loan has to be returned in two equal yearly installments each of Rs 44,100. If the rate of interest is 5% p.a., compounded annually, then the total interest paid is:
SSC CGL Tier II (12/09/2019)
(a) ₹5840 (b) ₹6000 (c) ₹6200 (d) ₹6280

Q.39. A certain loan was returned in two equal half yearly installments each of Rs 6,760. If the rate of interest was 8% p.a., compounded yearly, how much was the interest paid on the loan?
SSC CGL Tier II (13/09/2019)
(a) ₹ 750 (b) ₹ 810 (c) ₹ 790 (d) ₹ 770

SSC CGL 2018 Tier - 1

Q.40. A sum of Rs x was borrowed and paid back in two equal yearly installments, each of Rs 35,280. If the rate of interest was 5%, compounded annually, then the value of x is:
SSC CGL 07/06/2019 (Afternoon)
(a) 64,400 (b) 65,600
(c) 64,800 (d) 65,400

Answer Key :-

1.(c)	2.(b)	3.(a)	4.(c)
5.(a)	6.(a)	7.(c)	8.(a)
9.(a)	10.(d)	11.(c)	12.(b)
13.(d)	14.(a)	15.(d)	16.(d)
17.(b)	18.(c)	19.(b)	20.(a)
21.(d)	22.(c)	23.(d)	24.(d)
25.(a)	26.(c)	27.(a)	28.(b)
29.(d)	30.(c)	31.(b)	32.(c)
33.(b)	34.(b)	35.(a)	36.(a)
37.(a)	38.(c)	39.(d)	40.(b)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Solutions :-

Sol.1.(c) Rate = 6%
Let the installment = 100 units
Ratio → installment : amount
100 : 100
100 : 106
100 : 112
100 : 118
Total amount = 100 + 106 + 112 + 118
= 436 units
According to the question,
436 units = 26160
100 units = $\frac{26160}{436}$ × 100 = ₹6000

Sol.2.(b) Cash Amount = Rs.600
Total amount paid after two month installment = 300 + 360 = Rs.660
Interest = 660 - 600 = Rs.60
After down payment , remaining amount = 600 - 300 = Rs.300
Rate = $\frac{60 \times 100}{300 \times \frac{2}{12}}$ = 120%

Sol.3.(a) Rate = 5%
Let the installment = 100 units
Ratio - installment : amount
100 : 100
100 : 105
100 : 110
100 : 115
100 : 120
Total amount
= 100 + 105 + 110 + 115 + 120
= 550 units
100 units = 200
550 units = ₹ 1100

Sol.4.(c) Interest = 550 - (250 + 310) = 10
Financed amount = 550 - 250 = 300
Annual rate of interest = $\frac{100 \times 10 \times 12}{300}$
= 40%

Sol.5.(a) Remaining amount
= 40,000 – 25,000 = 15,000 ₹
Amount = 15,000 + $\frac{15,000 \times R \times 4}{12 \times 100}$
= 15,000 + 50R
Sum of Amounts of these installments
= (4000 + S.I. on 4000 for 3 months) + (4000 + S.I. on 4000 for 2 months) + (4000 + S.I. on 4000 for 1 months) + 4000 = (4000 × 4) + (S.I. on 4000 for 6 months)
= 16000 + $\frac{4000 \times R \times 6}{12 \times 100}$ = 16000 + 20R
Now , equating amount :-
15,000 + 50R = 16000 + 20R
⇒ 30R = 1,000 ⇒ R = $\frac{1000}{30}$
= 33.33% or 33%

Sol.6.(a) Amount to be paid
= 2540 - 1340 = ₹1200
SI = 1205 - 1200 = ₹5
SI = $\frac{P \times R \times T}{100}$
5 = $\frac{1200 \times R \times 1}{12 \times 100}$ ⇒ R = 5%

Sol.7.(c) Let each installment be k
⇒ 1st year = [k + $\frac{k \times 10 \times 2}{100}$]
⇒ 2nd year = [k + $\frac{k \times 10 \times 1}{100}$]
⇒ 3rd year = k
Then , [k + $\frac{k \times 10 \times 2}{100}$] + [k + $\frac{k \times 10 \times 1}{100}$]
+ k = 10192
3k + $\frac{3k}{10}$ = 10192 ⇒ 33k = 101920
k = $\frac{101920}{33}$ = Rs. 3088.48
Short trick :-
Ratio - installment : amount
100 : 100
100 : 110
100 : 120
Total amount = 100 + 110 + 120 = 330 units
330units = ₹10192
Each installment (100 units)
= $\frac{10192}{330}$ × 100 = ₹3088.48

Sol.8.(a) Rate = 10% = $\frac{1}{10}$
Principal : Installment
1st yr → 10 : 11) **× 11**
2nd yr → 10^2 : 11^2

Total → 210 : 242
Value of each installment = 121 units
According to the question,
210 units = Rs. 35,000
installment (121 units)
= $\frac{35000 \times 121}{210}$ = $\frac{60500}{3}$
= 20,166.66 ≈ ₹ 20,167

Sol.9.(a) Rate = 2% = $\frac{2 \rightarrow interest}{100 \rightarrow installment}$
Debt = 100 × 4 + 2(3 + 2 + 1) = 400 + 12
= 412 unit
Now, 412 unit = ₹40376
⇒ 100 unit = $\frac{40376}{412}$ × 100 = ₹ 9800

Sol.10.(d) We know ,
Annual installment(I)
= $\frac{100 \times amount}{100\,t + \frac{r\,t\,(t-1)}{2}}$
⇒ Annual installment(I)
= $\frac{100 \times 3658}{100 \times 4 + \frac{12 \times 4\,(4-1)}{2}}$
⇒ I = $\frac{100 \times 3658}{400 + 72}$ = $\frac{365800}{472}$ = 775 Rs.

Sol.11.(c) Here,
P = 1380 ⇒ R = 10% ⇒ T = 4 years
Installment = $\frac{100\,P}{100\,t + \frac{r\,t\,(t-1)}{2}}$
⇒ I = $\frac{100 \times 1380}{100 \times 4 + \frac{10 \times 4\,(4-1)}{2}}$
⇒ I = $\frac{138000}{400 + \frac{10 \times 4 \times 3}{2}}$ ⇒ I = $\frac{138000}{400 + 60}$
⇒ I = $\frac{138000}{460}$ ⇒ I = 300

Sol.12.(b) Rate for $\frac{1}{2}$ yrs = $\frac{8}{2}$ = 4% = $\frac{1}{25}$
Principal : Installment
(25 : 26) **× 26**
650 : 676
25^2 : 26^2

1,275 : 1,352
⇒ 1275 unit = ₹2,550
⇒ 676 unit = $\frac{2550}{1275}$ × 676 = ₹1,352

Sol.13.(d) Rate = 4% = $\frac{1 \rightarrow Interest}{25 \rightarrow Installment}$
Debt = 25 × 3 + 1(2 + 1) = 75 + 3 = 78 unit
Now, 78 unit = ₹15,600
Then, 25 unit = $\frac{15600}{78}$ × 25 = ₹5,000

Sol.14.(a) Rate = 16% = $\frac{4 \rightarrow Interest}{25 \rightarrow Installment}$
Debt = 25 × 4 + 4(3 + 2 + 1) = 100 + 24
= 124 unit
⇒ 124 unit = ₹8,432
⇒ 25 unit = $\frac{8432}{124}$ × 25 = ₹1700

Sol.15.(d)
3500 × 4 + 3500 × y%(3 + 2 + 1) = 16310
3500(4 + 6y%) = 16310
(4 + 6y%) = 4.66 ⇒ 6y% = 0.66
y% = 0.11 ⇒ y = 11

Sol.16.(d) Rate for 1 month = $\frac{48}{12}$ = 4%
Debt = 1845 × 5 +1845 × 4%(4 + 3 + 2 + 1)
= 9,225 + 738 = ₹9963

Sol.17.(b) 2% = $\frac{1 \rightarrow Interest}{50 \rightarrow Installment}$
Debt = 50 × 5 + 1(4 + 3 + 2 + 1)
= 250 + 10 = 260 unit
According to the question,
260 unit = ₹624
Then, 50 unit = $\frac{624}{260}$ × 50 = 120

Sol.18.(c) 10% = $\frac{1 \rightarrow Interest}{10 \rightarrow Installment}$
Debt = 10 × 5 + 1(4 + 3 + 2 + 1) = 50 + 10
= 60 unit
60 unit = ₹5,460
10 unit = $\frac{5460}{60}$ × 10 = ₹910

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.19.(b)
Original price of the watch = Rs. 4400
Rest amount to be paid later
= Rs. 4400 - 2000 = Rs. 2400
Shopkeeper offered installment on Rs. 2440
S.I = 2440 - 2400 = Rs.40
Now, rate percent = $\frac{40 \times 100 \times 12}{2400 \times 1} = 20\%$

Sol.20.(a)
Here, A = 9429 , r = 12.25% , n = 3
Annual installment = $\frac{100A}{100n + \frac{rn(n-1)}{2}}$
$= \frac{942900}{300 + 36.75} = Rs.2800$

Short trick :-
Percentage =12.25 % = $\frac{49}{400}$

Ratio-	Principal		interest
1st year	400	:	49
2nd year	400	:	49
3rd year	400	:	49

Total Amount = 1347 unit
Now,
1347 unit = 9429
1 unit = $\frac{9429}{1347}$ = 7
400 unit = Rs. 2800

Sol.21.(d) Given, P = 2500 , R= 25%
According to question,
2500- 520 = 1980 (interest being charged)
Now let monthly instalment is x
Amount due in 1st month = 1980
Amount due in 2nd month = 1980 - x
Amount due in 3rd month = 1980 - $2x$
Amount due in 4th month = 1980 - $3x$
Hence, total amount due in 1 month
= 1980 + 1980 - x + 1980 - $2x$ + 1980 - $3x$
= 7920 - $6x$
According to question,
4X - 1980 = (7920 - 6X) × $\frac{25}{12} \times \frac{1}{100}$
Hence monthly instalment (x) = 520

Sol.22.(c)
Remaining amount = 39,000 – 19,000
= 20,000 ₹
Amount = 20,000 + $\frac{20,000 \times R \times 5}{12 \times 100}$
= 20,000 + $\frac{250R}{3}$
Sum of Amounts of these installments = (4200 + S.I. on 4200 for 4 months) + (4200 + S.I. on 4200 for 3 months) + (4200 + S.I. on 4200 for 2 months) + (4200 + S.I. on 4200 for 1 month) + 4200
= (4200 × 5) + (S.I. on 4200 for 10 months) = 21000 + $\frac{4200 \times R \times 10}{12 \times 100}$
= 21000 + 35R
Now , equating amount :-
20,000 + $\frac{250R}{3}$ = 21000 + 35R
⇒ $\frac{145R}{3}$ = 1,000 ⇒ R
= $\frac{3000}{145} = \frac{600}{29} = 20\frac{20}{29}$ %

Sol.23.(d)
Installment = $\frac{100A}{100t + \frac{rt(t-1)}{2}}$
800 = $\frac{100A}{100 \times 6 + \frac{5 \times 6(6-1)}{2}}$
8 = $\frac{A}{600 + 75}$ ⇒ A = 5400 ₹

Sol.24.(d)
Ratio → Principal : Installment
1st year → 10 : 11)×11^2
2nd year → 10^2 : 11^2)×11
3rd year → 10^3 : 11^3

Each installment (1331 units) = 3993 Rs.
1 unit = 3 Rs.
Total cost price = (10 × 121) + (100 × 11) + 1000 = 3310 units
3310 units = 3310 × 3 = 9930 Rs.

Sol.25.(a) According to the question,
S.I of 1 year = $\frac{500000 \times 18 \times 1}{100}$
= ₹ 90000
Total Amount after 1 year = ₹ 590000
P pays the amount in 11 months
= 11 × 40000 = ₹ 440000
Amount paid by P after 1 year
= 440000 + Bike
then, The value of bike =
590000 - 440000 = ₹ 150000

Sol.26.(c) Let the installment be Rs. x
According to question,
$x + [x + \frac{x \times 10 \times 1}{100}] + [x + \frac{x \times 10 \times 2}{100}]$
= 181500
$x + 1.1x + 1.2x$ = 181500
$3.3x$ = 181500 ⇒ x = 55000 Rs.

Sol.27.(a) Let the installment be Rs. x
According to question,
$x + [x + \frac{x \times 12 \times 1}{100}] + [x + \frac{x \times 12 \times 2}{100}]$
= 35455
$x + 1.12x + 1.24x$ = 35455
$3.36x$ = 35455 ⇒ x = 10552 Rs. (approx)

Sol.28.(b)
Ratio → Principal : installment
1st year → 100 : 100
2nd year → 100 : 106
3rd year → 100 : 112
4th year → 100 : 118
5th year → 100 : 124
6th year → 100 : 130

Total installment
(100 + 106 + 112 + 118 + 124 + 130)
= 690 units
690 units = 1380 Rs.
Annual payment (100 units) = $\frac{1380}{690} \times 100$
= 200 Rs.

Short Trick :-
Annual installment = $\frac{100A}{100t + \frac{rt(t-1)}{2}}$
= $\frac{100 \times 1380}{100 \times 6 + \frac{6 \times 6(6-1)}{2}}$
= $\frac{138000 \times 2}{1200 + 180} = \frac{276000}{1380}$ = 200 Rs.

Sol.29.(d) Let the amount be x.
According to question,
$x + [x + \frac{x \times 14 \times 3}{100}] + [x + \frac{x \times 14 \times 2}{100}]$
$+ [x + \frac{x \times 14 \times 1}{100}]$ = 1936
$x + 1.42x + 1.28x + 1.14x$ = 1936
⇒ x = Rs. 400

Sol.30.(c) R = 40 % = $\frac{2}{5} = \frac{CI}{Principal}$

Ratio	→	Principal	:	Installment
1st year	→	5	:	7)× **7**
2nd year	→	25	:	49
Final	→	60	:	98

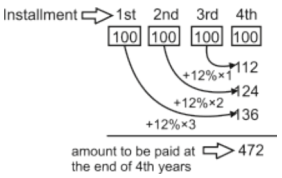
60 units (Principal) = ₹ 1500
49 units (Installment) = ₹ 1225

Sol.31.(b) Rate = 2%
Principal : Installment
1st yr ⇒ 50 : 51) **× 51**
2nd yr ⇒ $(50)^2$: $(51)^2$

Total ⇒ 5050 : 5202
According to the question,
Total principal (5050 units) = Rs.6000
Each installment (2601 units)
= $\frac{6000}{5050} \times 2601$ = Rs. 3090.30

Sol.32.(c) Using formula,
x = $\frac{100A}{100t + \frac{rt(t-1)}{2}}$
.....(where A = Amount borrowed, r = rate and t = no. of installments)
x = $\frac{566400}{100 \times 4 + \frac{12 \times 4(4-1)}{2}}$
= $\frac{566400}{100 \times 4 + 72} = \frac{566400}{472}$ = Rs. 1200

Short Trick :-



Search on Telegram @apna_pdf

According to the question,
472 units ⇒ Rs. 5664
Then , 100 units ⇒ Rs. 1200

Sol.33.(b) Sum of all installment
= 25000 × 20 = Rs. 500000
According to question ,
Rate = 10% ⇒ initial : final = 10 : 11
According to question,
11 units = Rs. 500000
Then , 10 units ~ Rs. 454545
Value of Down payment
= 650000 – 454545 = Rs. 195455

Sol.34.(b) As simple interest is 10% ,
Total amount at the end of 1st year
= 100000 × $\frac{110}{100}$ = Rs.110000
He pays Rs. 10000 at the end of 1st year,
remaining amount = Rs. 100000
Now, amount at end of 2nd year
= 100000 × $\frac{110}{100}$ = Rs. 110000
He pays Rs. 20000 at the end of 2nd year
, remaining amount = Rs. 90000
Now, amount at end of 3rd year
= 90000 × $\frac{110}{100}$ = Rs. 99000
He pays Rs. 30000 at the end of 3rd year
, remaining amount = Rs. 69000
Now, amount at end of 4th year
= 69000 × $\frac{110}{100}$ = Rs. 75900
He pays Rs. 40000 at the end of 4th year
, remaining amount = Rs. 35900
Now, amount at end of 5th year
= 35900 × $\frac{110}{100}$ = Rs. 39490

Sol.35.(a)
Left amount at the end of 1st year
= (50,000 × $\frac{11}{10}$) – 15,000 = ₹40,000
Left amount at the end of 2nd year
= (40,000 × $\frac{11}{10}$) - 15,000 = ₹29,000
Now, left amount at the end of 3rd year
= (29,000 × $\frac{11}{10}$) - 15,000 = ₹16,900

Sol.36.(a) Rate ⇒ 4%

	Principal	:	Installment	
1st yr →	25	:	26	**) × 26**
2nd yr →	25^2	:	26^2	

Total →1275 : 1352
According to the question,
676 units = 980 Rs.
Sum borrowed (1275 units)
= $\frac{980 \times 1275}{676}$
= 1848.37 ≈ ₹1,850 (nearest to tens)

Sol.37.(a) Remaining amount
= 79860 - 60000 = 19860
Rate = 10% = $\frac{1}{10}$

	Principal	:	Installment	
1st yr →	10	:	11	**)×121**
2nd yr →	10^2	:	11^2	**)×11**
3rd yr →	10^3	:	11^3	

Total Principal =
(10×121)+(100×11)+(1000) = 3310 unit .
3310 unit = 19860 Rs.
1 unit = 6 Rs.
Each installment (11^3) = 1331 units
1331 units = 1331 × 6 = 7986 Rs.

Sol.38.(c) Rate ⇒ 5% = $\frac{1}{20}$

	Principal	:	Installment	
1st yr ⇒	20	:	21	) × 21
2nd yr ⇒	20^2	:	21^2	

Total ⇒ 820 : 882
According to the question ,
Each installment (441 units) = 44100
Interest paid (62 units) = 6200 Rs.

Sol.39.(d) Effective Rate = $\frac{8}{2}$ % = 4%

	Principal	:	Installment	
1st yr →	25	:	26	**)×26**
2nd yr →	25^2	:	26^2	

Total → 1275 : 1352
According to the question ,
Each installment (676 units) = 6760
Interest paid (77 units) = 770 Rs.

Sol.40.(b) Rate ⇒ 5% = $\frac{1}{20}$

	Principal	:	Installment	
1st yr ⇒	20	:	21	)×21
2nd yr ⇒	20^2	:	21^2	

Total ⇒ 820 : 882
According to the question ,
Each installment (441 units) = 35280
1 unit = 80 Rs.
Principal (820 units) = 65600 Rs.

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Average

Key Points:

1) An average or arithmetic mean of given data is the sum of the given observations divided by the number of observations.

For example : If we have to find out the average of 10, 15, 25 and 30, then required average will be equal to:

$\frac{10+15+25+30}{4} = \frac{80}{4} = 20$

Therefore, we can say, Average (A) = $\frac{Sum\ of\ the\ given\ observations\ (S)}{Number\ of\ Observations\ (N)}$

2) If all the numbers increase by 'a' then the average of the numbers will also increase by 'a'.

3) If all the numbers decrease by 'a' then the average of the numbers will also decrease by 'a'.

4) If all the numbers are multiplied by 'a' then their average must also be multiplied by 'a'.

5) If all the numbers are divided by 'a' then their average must also be divided by 'a'.

6) Average of first n natural numbers

$= \left(\frac{n+1}{2}\right)$

7) Average of first n even numbers

$= (n+1)$

8) Average of first n odd numbers = n

9) Average of consecutive numbers

$= \frac{First\ number + Last\ number}{2}$

10) Average of 1 to n odd numbers

$= \frac{Last\ odd\ number\ +1}{2}$

11) Average of 1 to n even numbers

$= \frac{Last\ even\ number + 2}{2}$

12) Average of squares of first n natural numbers = $\frac{(n+1)(2n+1)}{6}$

13) Average of cubes of first n natural numbers = $\frac{n(n+1)^2}{4}$

14) Average of n multiples of any number

$= \frac{number\ \times (n+1)}{2}$

15) Combined mean or combined average :

If the mean of n_1 and n_2 observations are $\overline{x_1}$ and $\overline{x_2}$ respectively then,

Combined mean = $\frac{n_1\overline{x_1} + n_2\overline{x_2}}{n_1+n_2}$

Ex : If the average marks of 30 boys is 50 and 40 girls is 60, then find the combined average marks of the whole class.

Soln : Combined average marks of whole class = $\frac{30\times 50 + 40\times 60}{30+40}$

$= \frac{1500+2400}{70} = \frac{3900}{70}$ = 55.71 marks

16) Basically the term Run Rate means how many runs have been scored in one over of a cricket match. Higher run rate is good for batsmen.

Run rate = $\frac{Total\ runs\ scored}{Number\ of\ overs\ played}$

Ex : If the batsman has scored 225 runs in 9 overs, find his run rate.

Soln : Run rate = $\frac{225}{9}$ = 25 runs/over

17) Bowling Average

$= \frac{Total\ runs\ allowed}{Total\ number\ of\ wickets\ taken}$

Lower Bowling average is good for bowlers.

Ex : If the bowler has taken 3 wickets allowing 120 runs, find his bowling average.

Bowling Average = $\frac{120}{3}$ = 40 runs/wicket

18) If the average is x and a number having value greater than x is added then the new average will be greater than x. Similarly, if a number having value less than x is added then the new average will be less than x.

Ex 1. The average of the first five natural numbers is 3. Find a new average after adding 6.

Soln : The first five natural numbers are : 1, 2, 3, 4, 5.

Sum of first five natural numbers

$= 3 \times 5 = 15$

As number 6 is greater than the old average, the new average is going to be greater than the old average.

So, new average = $\frac{15+6}{5+1} = \frac{21}{6}$ = 3.5

which is greater than 3.

Ex 2. The average of the first five natural numbers is 3. Find a new average after adding 2.

Soln : The first five natural numbers are : 1, 2, 3, 4, 5.

Sum of first five natural numbers

$= 3 \times 5 = 15$

As number 2 is less than the old average, the new average is going to be less than the old average.

So, new average = $\frac{15+2}{5+1} = \frac{17}{6}$ = 2.83

which is less than 3.

19) If the average is x and a number having value less than x is removed then the new average will be greater than x. Similarly, if a number having value greater than x is removed then the new average will be less than x.

Ex 1. The average of the first five natural numbers is 3. Find a new average after removing 2.

Soln : The first five natural numbers are : 1, 2, 3, 4, 5.

Sum of first five natural numbers

$= 3 \times 5 = 15$

As number 2 is less than the old average, the new average is going to be greater than the old average.

So, new average = $\frac{15-2}{5-1} = \frac{13}{4}$ = 3.25

which is greater than 3.

Ex 2. The average of the first five natural numbers is 3. Find a new average after removing 4.

Soln : The first five natural numbers are : 1, 2, 3, 4, 5.

Sum of first five natural numbers

$= 3 \times 5 = 15$

As number 4 is greater than the old average, the new average is going to be less than the old average.

So, new average = $\frac{15-4}{5-1} = \frac{11}{4}$ = 2.75

which is less than 3.

Variety Questions

Q.1. A park has an average number of 420 visitors on Sunday and 120 on other days. The average number of visitors per day in a month of 30 days beginning with Sunday, is:

SSC MTS 14/11/2024 (Morning)

(a) 160 (b) 150 (c) 270 (d) 170

Q.2. Which of the following is true about average ?

SSC MTS 16/10/2024 (Morning)

(a) The average of six consecutive even integers is an even natural number

(b) The average of six consecutive odd integers is an odd integer.

(c) The average of six consecutive odd integers is an even integer.

(d) The average of six consecutive odd integers is an odd natural number.

Q.3. The average weight of a certain number of apples in a basket was 0.5 kg. If 10 apples with an average weight of 0.7 kg are removed from the basket and 5 apples with an average weight of 0.6 kg are added to the basket, then the average weight of the apples in the basket decreases by 0.1 kg. What was the initial number of apples in the basket ?

SSC MTS 15/10/2024 (Afternoon)

(a) 21 (b) 20 (c) 19 (d) 18

Q.4. The average weight of three friends

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Ram, Ramesh and Shyam is 76 kg. Somesh joins them and the average weight of the four friends becomes 74 kg. If Mohan, whose weight is 2 kg more than that of Somesh replaces Ramesh, the average weight of Ram, Shyam, Somesh and Mohan becomes 68 kg. Find the weight of Ramesh.
SSC MTS 08/10/2024 (Afternoon)
(a) 89 kg (b) 94 kg (c) 75 kg (d) 84 kg

Q.5. In the first 5 overs of a T-20 international cricket match, the run rate was only 5.6. What should be the run rate (approximately) in the remaining 15 overs to reach a target of 185 runs?
SSC MTS 30/09/2024 (Afternoon)
(a) 10.46 (b) 10.25 (c) 9.55 (d) 11.15

Q.6. A stock portfolio consists of four stocks. Stock A represents 20% of the portfolio and has a return of 6%. Stock B represents 30% of the portfolio and has a return of 8%. Stock C represents 20% of the portfolio and has a return of 4%. Stock D represents the remaining 30% of the portfolio and has a negative-return of 5%. What is the average return of the portfolio?
SSC CGL 09/09/2024 (3rd Shift)
(a) 2.9% (b) 2.6% (c) 3.2% (d) 3.4%

Q.7. In a class with a certain number of students, if one student weighing 30 kg is added, then the average weight of the class increases by 1 kg. If one more student weighing 30 kg is added, then the average weight of the class increases by 1.5 kg over the original average. What is the original average weight (in kg) of the class ?
SSC CHSL 09/07/2024 (4th Shift)
(a) 26.5 (b) 25.5 (c) 27 (d) 24

Q.8. Rajender is working as a delivery boy in a multinational company. The company is paying him ₹90 per delivery. In a fortnight comprising 15 consecutive working days, his average earnings per day was ₹540. If his average earnings of the first 7 days was ₹519 per day and that of the last 7 days was ₹546 per day, then at was his earning on the 8th day of the fortnight?
SSC CHSL 07/08/2023 (3rd Shift)
(a) ₹571 (b) ₹681 (c) ₹661 (d) ₹645

Q.9. The average weight of a group of 12 children is 66 kg. If 2 children, X and Y, replace A and B, the new average weight becomes 65 kg. The weight of A= weight of B and the weight of X = weight of Y. Another child, C, is included in the group, and the new average weight remains 65 kg. Weight of C= weight of X. Find the weight of A.
SSC CHSL 04/08/2023 (3rd Shift)
(a) 69 kg (b) 72 kg (c) 71 kg (d) 67 kg

Q.10. Sudesh is the owner of a multipurpose shop. For a specific month, his profits are detailed below.

Category	**Profit earned in ₹**
Groceries	50,000
Cosmetics	20,000
Ladies' dresses	10,000

In order to estimate the expected profit for the next month, he assigns the weights of 6, 5 and 8 to the different categories in the same order. What will be the weighted average of his profits?
SSC CHSL 03/08/2023 (2nd Shift)
(a) ₹25,265.18 (nearly)
(b) ₹24,863.16 (nearly)
(c) ₹25,163.16 (nearly)
(d) ₹25,263.16 (nearly)

Q.11. During a school excursion each student of junior school was charged ₹325 and each student of senior school was charged ₹400. If there were 80 students from junior school and the combined average amount charged per student was ₹352, then how many students from senior school went for the excursion?
SSC CGL 24/07/2023 (1st shift)
(a) 55 (b) 45 (c) 50 (d) 40

Q.12. In ₹150, B buys 10 pens for ₹8 each, 10 erasers for ₹5 each and some sharpeners for ₹4 each. What is the average price per item in ₹?
SSC CGL 19/07/2023 (3rd shift)
(a) 8 (b) 7 (c) 10 (d) 6

Q.13. 20 students of a college went to a hotel. 19 of them spent ₹175 each on their meal and the 20th student spent ₹19 more than the average of all the 20. Find the total money spent by them.
SSC CGL 17/07/2023 (4th shift)
(a) ₹3,490 (b) ₹3,540
(c) ₹3,520 (d) ₹3,500

Q.14. The average score in a test for 50 students is 44. Out of the total students, 40% of the students are girls and the rest are boys. The average score of boys is 20% less than that of girls. What is the average score of girls?
Higher Secondary 27/06/2023 (Shift - 3)
(a) 50 (b) 54 (c) 48 (d) 52

Q.15. A is the average of 10 given numbers. B is the average after 2 of the numbers were replaced by 3 other different numbers. The average of the removed numbers is 48 and the average of the newly included numbers is 56. If A + B = 438, then the value of A - B is:
Matriculation Level 27/06/2023 (Shift - 2)
(a) 21 (b) 14 (c) 12 (d) 26

Q.16. The average of 8 numbers is 44. The average of the first three numbers is 50 and the average of the next two numbers is 52. If the sixth number is 6 and 8 less than the seventh and eighth number respectively, then what is the value of the eighth number?
SSC MTS 16/05/2023 (Morning)
(a) 36 (b) 32 (c) 40 (d) 56

Q.17. Eleven friends spent Rs. 18 each on a tour and the twelfth friend spent Rs. 11 less than the average expenditure of all twelve of them. What is the total money spent by twelve friends
SSC MTS 02/05/2023 (Afternoon)
(a) Rs.204 (b) Rs.215
(c) Rs.212 (d) Rs.208

Q.18. Sonali applied for a job of Science teacher in a school. In the test for job, she scored 8 in physics, 8 in chemistry, 6 in biology, and 6.5 in the interview. For calculating the final score, weightage of 2, 3, 3, and 4 were assigned to Physics, Chemistry, Biology and interview, respectively. What is the weighted average score of Sonali ?
SSC CGL 06/12/2022 (1st Shift)
(a) 7 (b) 8.4 (c) 7.2 (d) 21

Q.19. The batting average for 27 innings of a cricket player is 47 runs. His highest score in an innings exceeds his lowest score by 157 runs. If these two innings are excluded, the average score of the remaining 25 innings is 42 runs. Find his highest score in an innings.
SSC CGL 01/12/2022 (1st Shift)
(a) 176 (b) 188 (c) 186 (d) 174

Q.20. In an office, 80% workers are men while 20% are women. The average age of the men is 30 and the average age of the women is 40. What is the average age of all the workers in that office?
Graduate Level 04/08/2022 (Shift - 2)
(a) 50 (b) 32 (c) 30 (d) 35

Q.21. The average age of a husband and his wife 3 years ago was 39 years. The average age of the husband, wife and their child 2 years hence will be 34 years. Find the present age of the child.
SSC MTS 11/07/2022 (Afternoon)
(a) 12 years (b) 16 years
(c) 15 years (d) 18 years

Q.22. In a family of six males and a few females, the average monthly consumption of grain head is 14.4 kg. If the average monthly consumption per

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

head is 20 kg in the case of males and 6 kg in the case of females. Find the number of females in the family?
SSC MTS 11/07/2022 (Morning)
(a) 8 (b) 4 (c) 6 (d) 7

Q.23. A is the average marks of a group of 10 students in a class and A+8 is the average of a group of 15 students which includes the group of 10 students as given. The total marks obtained by the group of 10 students is X and the total marks obtained by the group of 15 students is Y. If X : Y = 3 : 5, then the value of A + X + Y is _____.
SSC CHSL 30/05/2022 (Afternoon)
(a) 1964 (b) 1845 (c) 2012 (d) 1992

Q.24. A retailer opens her outlet on all seven days of the week. It is observed that her average sales for Saturdays and Sundays combined is ₹ 300, and ₹ 200 for the remaining five days combined. For a month starting on saturday, it was found that the total sales were ₹7,000. Which among the following months it could be
SSC MTS 05/10/2021 (Morning)
(a) March (b) April (c) Jan (d) Feb

Q.25. Consider ten consecutive odd numbers starting from 5. Multiply each of them, except the first and the second, with three. What will be the average of the ten numbers so formed?
SSC MTS 5/10/2021 (Morning)
(a) 39.6 (b) 39 (c) 42 (d) 38.4

Q.26. What is the average of numbers from 1 to 50 which are multiples of 2 or 5? (correct to one decimal place)
SSC CGL 24/8/2021 (Evening)
(a) 25.4 (b) 25.9 (c) 26.4 (d) 25.8

Q.27. The average weight of students of section A and B having 40 students each is 45.5 kg and 44.2 kg respectively. Two students of section A having average weight 48.75 kg were shifted to B and 2 students of section B were shifted to section A, making the average weight of both the sections equal. What is the average weight (in kg) of the students who were shifted from section B to section A?
SSC CGL 23/8/2021 (Afternoon)
(a) 34.5 (b) 35 (c) 35.75 (d) 34.25

Q.28. In an examination, the average score of a student was 67.6. If he would have got 27 more marks in Mathematics, 10 more marks in Computer Science, 18 more marks in History and retained the same marks in other subjects, then his average score would have been 72.6. How many papers were there in the examination?
SSC CGL 23/8/2021 (Morning)
(a) 11 (b) 10 (c) 12 (d) 9

Q.29. The average monthly salary of 60 employees of a factory is Rs.29900. If two officers are getting Rs.90,000 each and the average salary of 8 supervisors is Rs.65,000, then what is the average salary (in Rs.) of the remaining employees?
SSC CGL 20/8/2021 (Afternoon)
(a) 21080 (b) 22680 (c) 29080 (d) 21880

Q.30. What is the ratio of the average of first eight prime numbers to the average of first ten even natural numbers?
SSC CGL 16/8/2021 (Afternoon)
(a) 1 : 7 (b) 7 : 80 (c) 8 : 70 (d) 7 : 8

Q.31. x, y and z are three positive numbers such that y is $\frac{4}{5}$ times of x and z is $\frac{5}{8}$ times of y. If the average of reciprocals of the numbers x, y and z is $\frac{17}{240}$, then the average of 3 times of x and 5 times of y will be:
SSC CHSL 10/8/2021 (Afternoon)
(a) 70 (b) 60 (c) 40 (d) 45

Q.32. The numbers 2, 3, 4 and 5 occur (2 + 5k), (5k - 7), (2k - 3) and (k + 2) times, respectively. The average of the number is 2.85. Later on, the number 2 was replaced by 6 in all the places. What is the average of the new numbers?
SSC CHSL 5/8/2021 (Evening)
(a) 2.4 (b) 5.25 (c) 3.85 (d) 4.75

Q.33. If the average of the 3-digit numbers 335, 2x5, x35, 63x and 406 is 411, then what will be the average of (x - 1), (x - 3), (x + 3) and (x + 5) ?
SSC CHSL 16/4/2021 (Afternoon)
(a) 6 (b) 3 (c) 5 (d) 4

Q.34. The average of the numbers a, b, c and d is 2d + 4, Also, the averages of the numbers a and b, b and c, c and d are 8, 5 and 4, respectively. If e = a + d + 1, then what is the average of the numbers d and e ?
SSC CHSL 13/4/2021 (Evening)
(a) 8 (b) 8.5 (c) 3 (d) 7

Q.35. The average of four consecutive odd natural numbers is eight less than the average of three consecutive even natural numbers. If the sum of these even numbers is equal to the sum of above four odd numbers, then the average of four original odd numbers is:
SSC CHSL 20/10/2020 (Afternoon)
(a) 36 (b) 24 (c) 18 (d) 32

Q.36. The average of nine 2 digit numbers is decreased by 6 when the digits of one of the 2 digit numbers is interchanged. Find the difference between the digits of that number.
SSC CHSL 20/10/2020 (Morning)
(a) 6 (b) 4 (c) 2 (d) 8

Q.37. The numbers 24, 45, a, 35, 59, 83, 46, b, 29, 74 are serially numbered as they appear in the sequence. When each number is added to its serial number, then the average of the new numbers formed is 55. The average of the missing numbers (a and b) is:
SSC CHSL 13/10/2020 (Afternoon)
(a) 38 (b) 58 (c) 62 (d) 50

Q.38. The average of 35 consecutive natural numbers is N. Dropping the first 10 numbers and including the next 10 numbers, the average is changed to M. If the value of $M^2 - N^2 = 600$, then the average of 3M and 5N is:
SSC CHSL 13/10/2020 (Morning)
(a) 90 (b) 120 (c) 100 (d) 115

Q.39. A batsman in his 11th innings makes a score of 77 runs, thereby increasing his average scores by 3. What is his average score after the 11th innings?
SSC CHSL 17/03/2020 (Morning)
(a) 46 (b) 49 (c) 47 (d) 48

Q.40. The average age of husband, wife and child 7 years ago was 42 years and that of wife and child 9 years ago was 36 years. The present age of the husband is:
SSC CPO 12/12/2019(Evening)
(a) 50 (b) 55 (c) 48 (d) 57

Q.41. The average age of 120 students in a group is 13.56 years, 35% of the number of students are girls and the rest are boys. If the ratio of the average age of boys and girls is 6:5, then what is the average age (in years) of the girls?
SSC CGL Tier II (13/09/2019)
(a) 12 (b) 11.6 (c) 10 (d) 14.4

Q.42. The average of 18 numbers is 37.5. If six numbers of average x are added to them, then the average of all the numbers increases by one. The value of x is : :
SSC CGL Tier II (13/09/2019)
(a) 40 (b) 41.5 (c) 42 (d) 38.5

Q.43. The average weight of a certain number of students in a group is 72 kg. If 10 students having an average weight of 78 kg leave and 4 students having an average weight of 80 kg join the group, the average weight of the students in the

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

group decreases by 0.7 kg. The number of students initially in the group is :
SSC CGL Tier II (12/09/2019)
(a) 56 (b) 46 (c) 44 (d) 54

Q.44. The average of 33 numbers is 74. The average of the first 17 numbers is 72.8 and that of the last 17 numbers is 77.2. If the 17th number is excluded, then what will be the average of the remaining numbers (correct to one decimal place)?
SSC CGL Tier II (12/09/2019)
(a) 72.9 (b) 73.4 (c) 71.6 (d) 70.8

Q.45. The owner of a bike buys petrol at the rate of Rs. 64, Rs. 80 and Rs. 320 per litre for three consecutive years. If he spends Rs. 32000 on petrol every year, then what is the average price (Rs.) of petrol per litre ?
SSC MTS 16/08/2019 (Evening)
(a) 120 (b) 84 (c) 108 (d) 96

Q.46. An art exhibition was held in the month of November. The numbers of visitors on weekdays and on weekends were 450 and 750 respectively. If the first day of the month was Monday, then what was the average number of visitors in the month ?
SSC MTS 16/08/2019 (Evening)
(a) 520 (b) 530 (c) 510 (d) 540

Q.47. A person was asked to guess his own weight. He estimated his weight to be over 70 kg but less than 80 kg. His friend estimated his weight to be more than 74 kg but less than 84 kg. His mother said that his weight is less than 78 kg. Assuming that the weights are a whole number and that the three had correctly guessed, then what is the average of the possible weights(in Kg)?
SSC MTS 14/08/2019 (Morning)
(a) 76.5 (b) 76 (c) 77 (d) 75

Q.48. Out of four numbers the average of the first three is 16 and that of the last three is 15. If the last number is 21 then the first number is:
SSC MTS 13/08/2019 (Evening)
(a) 28 (b) 22 (c) 21 (d) 24

Q.49. The average of all the prime and composite numbers upto 100 is:
SSC MTS 9/08/2019 (Morning)
(a) 51 (b) 50 (c) 50.5 (d) 49.5

Q.50. What is the average of the first 15 whole numbers?
SSC MTS 08/08/2019 (Morning)
(a) 8 (b) 7 (c) 9 (d) 10

Q.51. What is the average of the first 8 multiples of 6 among the natural numbers?
SSC MTS 07/08/2019 (Evening)
(a) 24 (b) 26 (c) 27 (d) 28

Q.52. The average of a and b is 36. The average of b and c is 42. What is the difference between c and a ?
SSC MTS 6/08/2019 (Afternoon)
(a) 18 (b) 12 (c) 16 (d) 14

Q.53. The average of 1088 real numbers is zero. At most how many of them can be negative?
SSC CHSL 11/07/2019 (Morning)
(a) 100 (b) 88 (c) 544 (d) 1087

Q.54. The difference between the average of first ten prime numbers and the first ten prime numbers of two digits is:
SSC CHSL 10/07/2019 (Evening)
(a) 14.5 (b) 16.5 (c) 12.5 (d) 13.5

Q.55. The average of the first 101 _____ numbers is equal to 102.
SSC CHSL 10/07/2019 (Afternoon)
(a) natural (b) odd
(c) even (d) perfect square

Q.56. The average of the first 1234 _____ numbers is equal to 1234.
SSC CHSL 10/07/2019 (Morning)
(a) odd (b) even (c) prime (d) natural

Q.57. The average of a number and its reciprocal is 4. The average of its cube and cube of its reciprocal is equal to:
SSC CHSL 9/07/2019 (Evening)
(a) 256 (b) 142 (c) 288 (d) 244

Q.58. 10 years ago, the average age of a family of five members was 38 years. Now, two new members join, whose age difference is 8 years. If the present average age of the family is the same as it was 10 years ago, what is the age (in years) of the new younger member?
SSC CHSL 4/07/2019 (Afternoon)
(a) 15 (b) 9 (c) 10 (d) 17

Q.59. The average of n number is 36. If each of 75% of the numbers is increased by 6 and each of the remaining numbers is decreased by 9, then the new average of the numbers is:
SSC CHSL 4/07/2019 (Morning)
(a) 37.125 (b) 33.75 (c) 38.25 (d) 36.25

Q.60. The average weight of the students in a group was 75.4 kg. Later on, four students having weights, 72.9 kg, 73.8 kg, 79.5 kg and 87.4 kg joined the group. As a result, the average weight of all the students in the group increased by 0.24 kg. What was the number of students in the group, initially ?
SSC CHSL 3/07/2019 (Morning)
(a) 46 (b) 36 (c) 50 (d) 48

Q.61. In a class of 80 students, 60% participate in games and the rest do not. The average weight of the former group is 5% more than that of the latter. If the average weight of all the students is 51 $\frac{1}{2}$kg, then what is the average weight (in kg) of the former group?
SSC CHSL 2/07/2019 (Afternoon)
(a) 57.6 (b) 54.5 (c) 60 (d) 52.5

Q.62. The average of 27 numbers is zero. Out of them, how many may be greater than zero, at the most?
SSC CGL 13/06/2019 (Evening)
(a) 0 (b) 15 (c) 26 (d) 20

Q.63. The average marks of 40 students was found to be 68. If the marks of two students were incorrectly entered as 48 and 64 instead of 84 and 46 respectively, then what is the correct average?
SSC CGL 10/06/2019 (Afternoon)
(a) 68.25 (b) 68.15 (c) 68.45 (d) 68.35

Q.64. Four different positive numbers are written in ascending order. One-third of the average of all the four numbers is 19 less than the greatest of these numbers. If the average of the first three numbers is 12, the greatest number among the given numbers is:
SSC CGL 7/06/2019 (Evening)
(a) 25 (b) 22 (c) 24 (d) 21

Q.65. The total number of students in section A and B of a class is 110. The number of students in section A is 10 more than that of section B. The average score of the students in B, in a test, is 20% more than that of students in A. If the average score of all the students in the class is 72, then what is the average score of the students in A?
SSC CGL 7/06/2019 (Afternoon)
(a) 66 (b) 68 (c) 63 (d) 70

Q.66. Three numbers are such that if the average of any two of them is added to the third number, the sums obtained are 168, 174 and 180 respectively. What is the average of the original three numbers?
SSC CGL 4/06/2019 (Evening)
(a) 86 (b) 87 (c) 89 (d) 84

Practice Questions

SSC CHSL 2024 Tier - 2

Q.67. The weights (in kg) of 7 cousins in a family are 54, 62, 65, 70, 60, 59, 55. Find the median weight.
SSC CHSL Tier II (18/11/2024)
(a) 70 kg (b) 61.5 kg

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(c) 61 kg (d) 60 kg

Q.68. The average of five integers is 48. The average of the first four integers is 50% of the 5th integer. The 5th integer is:
SSC CHSL Tier II (18/11/2024)
(a) 74 (b) 80 (c) 82 (d) 78

Q.69. The average of 11 results is 60 and that of the first 10 is 59. The 11th result is?
SSC CHSL Tier II (18/11/2024)
(a) 69 (b) 70 (c) 60 (d) 59

SSC MTS 2024 Tier - 1

Q.70. The average monthly expenditure of a family was ₹8,600 during the first three months, ₹9,750 during the next four months and ₹9,920 during the last five months of a year. If the total savings during the year was ₹65,300, the average monthly income (in ₹) of the family was:
SSC MTS 30/09/2024 (Morning)
(a) 14,975 (b) 15,794
(c) 15,479 (d) 14,597

Q.71. The average monthly income of A and B is ₹3,590. The average monthly income of B and C is ₹4,250. The average monthly income of A and C is ₹6,500. What is the monthly income of C ?
SSC MTS 30/09/2024 (Morning)
(a) ₹7,545 (b) ₹6,984
(c) ₹8,190 (d) ₹7,160

Q.72. The average of the sales of an electronics shop in the years 1991, 1992, 1993 and 1994 is 2000, and that for the years 1992, 1993, 1994 and 1995 is 2200. If the sales in 1995 are 1800, find the sales in 1991.
SSC MTS 30/09/2024 (Afternoon)
(a) 800 (b) 1200 (c) 1000 (d) 500

Q.73. The average of the numbers 253, 245, 325, 120 and 115+2K is 212. Find the average of the numbers 353, 354, 225, 220 and 110+3K.
SSC MTS 30/09/2024 (Evening)
(a) 252 (b) 250 (c) 253 (d) 251

Q.74. The average score obtained by 64 boys and a certain number of girls in a test is 59.15, while the average score obtained by the boys is 55.25. If the average score of the girls is 68.75, then how many girls appeared for the test ?
SSC MTS 30/09/2024 (Evening)
(a) 27 (b) 28 (c) 25 (d) 26

Q.75. The average weight of a certain number of students in a group was 72 kg. If 11 students, with an average weight of 76 kg each, leave the group, and 5 students, each with an average weight of 79 kg, join the group, the average weight of the students in the group decreases by 0.6 kg. The number of students initially in the group was:
SSC MTS 01/10/2024 (Morning)
(a) 21 (b) 25 (c) 17 (d) 19

Q.76. The average weight of a group of 20 women was calculated as 58.5 kg and it was later discovered that the weight of one of the women was read as 35 kg, whereas her actual weight was 65 kg. What is the actual average weight of the group of 20 women ?
SSC MTS 01/10/2024 (Afternoon)
(a) 70 kg (b) 40 kg (c) 60 kg (d) 50 kg

Q.77. The average of seven consecutive numbers is 95. Find the middle number in the series of seven consecutive numbers.
SSC MTS 07/10/2024 (Afternoon)
(a) 98 (b) 96 (c) 92 (d) 95

Q.78. The average age of 11 players of a cricket team is increased by 2 months, when two of them aged 20 years and 21 years, respectively, are replaced by two new players. Find the average age of the two new players (in years).
SSC MTS 08/10/2024 (Morning)
(a) $18\frac{5}{12}$ (b) $21\frac{5}{12}$ (c) $18\frac{1}{4}$ (d) $20\frac{1}{2}$

Q.79. A tunnel elevator can carry a maximum of 15 passengers with an average weight of 81 kg. However, four persons beyond the maximum capacity entered the elevator, resulting in an average weight of 82 kg and causing it to be overloaded. Find the average weight (in kg) of the additional four persons.
SSC MTS 08/10/2024 (Afternoon)
(a) 90.41 (b) 100 (c) 102.37 (d) 85.75

Q.80. The mean of marks secured by 3 students in grade A of class XI is 83, that of 4 students of grade B is 76 and that of 5 students of grade C is 85. What will be the mean of marks of the students of three grades of Class XI ?
SSC MTS 08/10/2024 (Evening)
(a) 80.5 (b) 81 (c) 80 (d) 81.5

Q.81. A commodity is made of two metals, A and B, which cost ₹35 per kg and ₹40 per kg, respectively, in the ratio of 2 : 3. What is the cost (in ₹) of 12 kilograms of this commodity ?
SSC MTS 09/10/2024 (Morning)
(a) 228 (b) 152 (c) 456 (d) 38

Q.82. In a school, the average salary of 12 teachers was ₹71,400. If the average salary of the teachers, principal and vice principal was ₹89,500, then what was the average salary of the principal and vice principal (in ₹) ?
SSC MTS 14/10/2024 (Morning)
(a) 1,76,800 (b) 2,11,000
(c) 1,98,100 (d) 1,18,900

Q.83. The average age of a class of 65 boys is 14 years. The average age of 20 of them is 14 years,and the average age of another 15 boys is 12 years. What will be the average age (in years) of the remaining boys ?
SSC MTS 14/10/2024 (Evening)
(a) 15 (b) 14 (c) 16 (d) 17

Q.84. The batting average of a cricket player for 40 innings is 60 runs. His highest score in an innings exceeds his lowest score by 110 runs. If these two innings are excluded, the average score of the remaining 38 innings is 58 runs. Find his highest score.
SSC MTS 15/10/2024 (Morning)
(a) 290 (b) 153 (c) 220 (d) 310

Q.85. The average of some natural numbers is 27. If 69 is added to the first number and 12 is subtracted from the last number, the average becomes 32.7, then the number of natural numbers is:
SSC MTS 18/10/2024 (Morning)
(a) 8 (b) 7 (c) 5 (d) 10

Q.86. Eight person went to a restaurant for lunch. Seven of them spent ₹80 each on their meals, while the eighth person spent ₹70 more than the average expenditure of all eight persons. What was the total amount spent by all the individuals ?
SSC MTS 18/10/2024 (Evening)
(a) ₹640 (b) ₹560 (c) ₹780 (d) ₹720

Q.87. If the average of 53 consecutive even numbers is 1280. Find the difference between the smallest and the largest number.
SSC MTS 21/10/2024 (Afternoon)
(a) 24 (b) 34 (c) 124 (d) 104

Q.88. The average age of a husband and wife, and their child 3 years ago, was 27 years, and that of the wife and the child 5 years ago was 20 years. The present age of the husband is:
SSC MTS 21/10/2024 (Evening)
(a) 35 years (b) 45 years
(c) 50 years (d) 40 years

Q.89. John has scored 60% in statistics and 70% in mathematics. A weightage of 2 is given to statistics and a weightage of 4 is given to mathematics. Which of the following expressions represents the weighted average of the two scores ?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC MTS 22/10/2024 (Afternoon)

(a) $\frac{2+60\% \times 4+70\%}{2+4}$

(b) $\frac{2 \times 60\% \times 40 \times 70\%}{2 \times 4}$

(c) $\frac{2 \times 60\% + 4 \times 70\%}{2 \times 4}$

(d) $\frac{2 \times 60\% + 4 \times 70\%}{2+4}$

Q.90. A family of seven minors and some adults has an average wheat consumption of 11.10 kg. The average consumption for minors is 5.5 kg per person, and for adults, it is 16 kg per person. Find the number of adults in the family.
SSC MTS 28/10/2024 (Morning)
(a) 5 (b) 6 (c) 10 (d) 8

Q.91. What is the difference between the average of prime numbers between 30 and 50 and the average of multiples of 3 between 20 and 50?
SSC MTS 05/11/2024 (Afternoon)
(a) 5.3 (b) 3.2 (c) 4.5 (d) 2.6

Q.92. The average age of a mother and her daughter is 42 years. The ratio of their ages is 9 : 5, respectively. Find the daughter's age (in years).
SSC MTS 12/11/2024 (Afternoon)
(a) 30 (b) 35 (c) 20 (d) 25

Q.93. The average of the first, second and third observations is 39, while the average of the second, third and fourth observations is 35. If the fourth observation is $\frac{3}{5}$ times that of the first, then the value of the fourth observation is:
SSC MTS 12/11/2024 (Afternoon)
(a) 18 (b) 27 (c) 45 (d) 36

Q.94. The average score of 30 students (boys and girls only) in a class test was 16.2 and that of 18 boys in the same test was 16. The average score of girls in the same test was:
SSC MTS 12/11/2024 (Evening)
(a) 16.3 (b) 16.5 (c) 16.1 (d) 16.7

Q.95. The average of 7 numbers is 55. If the first 4 numbers are 48, 62, 135 and 74, then what will be the average of the remaining numbers ?
SSC MTS 13/11/2024 (Morning)
(a) 22 (b) 31 (c) 25 (d) 19

Q.96. The average age of the 28 boys in a class is 16 years and that of the 26 girls is 15 years. The approximate average age (in years) for the whole class is:
SSC MTS 13/11/2024 (Afternoon)
(a) $14\frac{3}{4}$ (b) 15 (c) $15\frac{1}{2}$ (d) $14\frac{1}{2}$

Q.97. Among three numbers, the second number is half of the first number and the third number is 4 less than the second number. If the average of the first and third numbers is 16, what is the second number ?
SSC MTS 14/11/2024 (Morning)
(a) 16 (b) 12 (c) 10 (d) 18

SSC CGL 2024 Tier - 1

Q.98. Seven years ago, Prachi was four times as old as her daughter was at that time. Four years from now, Prachi will be two- and-a-half times as old as her daughter would then be. Find the sum of the present ages (in years) of Prachi and her daughter.
SSC CGL 09/09/2024 (2nd Shift)
(a) 69 (b) 77 (c) 49 (d) 72

Q.99. The average temperature of a city for the first sixteen days of January is 22°C, and the average temperature for the last sixteen days of the same month is 26°C. If the average temperature for the entire month is 24°C, what is the temperature on the sixteenth day?
SSC CGL 09/09/2024 (2nd Shift)
(a) 24°C (b) 25°C (c) 23°C (d) 22°C

Q.100. The average of the squares of the first 45 natural numbers is
SSC CGL 10/09/2024 (3rd Shift)
(a) 698.67 (b) 699.67
(c) 697.67 (d) 696.67

Q.101. A group of 30 students appeared in a test. The average score of 12 students is 62, and that of the rest is 62. What is the average score of the group?
SSC CGL 11/09/2024 (1st Shift)
(a) 62 (b) 63 (c) 60 (d) 61

Q.102. Find the average of the prime numbers lying between 50 and 76.
SSC CGL 11/09/2024 (2nd Shift)
(a) 66 (b) 60 (c) 62 (d) 64

Q.103. A class of 30 students appeared in a test. The average score of 12 students is 62, and that of the rest is 74. What is the average score of the class?
SSC CGL 11/09/2024 (3rd Shift)
(a) 70.2 (b) 69.2 (c) 68.2 (d) 67.2

Q.104. The average of 12 numbers is 48. The average of the first 5 numbers is 45 and the average of next 4 numbers is 52. If the 10th number is 10 less than the 11th number and is 5 more than the 12th number, then the average of the 11th and 12th numbers is:
SSC CGL 12/09/2024 (1st Shift)
(a) 50.5 (b) 46.5 (c) 47.5 (d) 48.5

Q.105. The average of the squares of the first 47 natural numbers is
SSC CGL 17/09/2024 (1st Shift)
(a) 760 (b) 761 (c) 759 (d) 762

Q.106. The average weight of 10 students is increased by half a kg when one of the students weighing 51 kg is replaced by a new student. Find the weight of the new student.
SSC CGL 18/09/2024 (2nd Shift)
(a) 56 kg (b) 75 kg (c) 45 kg (d) 66 kg

Q.107. The average score of a batsman in twenty matches is 15 and in twenty-five other matches is 24. Find the average score in all the forty-five matches.
SSC CGL 19/09/2024 (2nd Shift)
(a) 21 (b) 20 (c) 19.5 (d) 22

Q.108. In a team of seven members, the average age of six of the members is 42 years while the age of the seventh member of the team is 36 years more than the average age of all the seven members taken together. Find the age (in years) of the seventh member of the team.
SSC CGL 23/09/2024 (3rd Shift)
(a) 90 (b) 84 (c) 80 (d) 78

Q.109. A class of 30 students appeared in a test. The average score of 12 students is 62, and that of the rest is 60. What is the average score of the class?
SSC CGL 23/09/2024 (3rd Shift)
(a) 58.8 (b) 61.8 (c) 60.8 (d) 59.8

Q.110. In the 8th class, consisting of 30 students, a Mathematics test was taken. 10 students had an average score of 90. The other students had an average score of 75. What is the average score of the whole class?
SSC CGL 25/09/2024 (2nd Shift)
(a) 78 (b) 80 (c) 76 (d) 74

Q.111. A class of 30 students appeared in a test. The average score of 12 students is 60, and that of the rest is 80. What is the average score of the class?
SSC CGL 25/09/2024 (3rd Shift)
(a) 73 (b) 70 (c) 71 (d) 72

Q.112. In a class of 150 students (boys and girls only), the girls are 60. The average weight of boys is 52 kg and that of girls is 48 kg. What is the average weight (in kg) of the whole class?
SSC CGL 26/09/2024 (1st Shift)
(a) 50.4 (b) 48.8 (c) 49.6 (d) 51.2

Search on TG @apna_pdf

Search on Telegram @apna_pdf

SSC CHSL 2024 Tier - 1

Q.113. The average monthly expenditure of a family was ₹2,500 during the first 4 months, ₹2,750 during the next 5 months and ₹3,550 during the last 3 months of a year. If the total saving during the year was ₹5,500, what was the average monthly income of the family?
SSC CHSL 02/07/2024 (2nd Shift)
(a) ₹5,790 (b) ₹7,355 (c) ₹4,375 (d) ₹3,325

Q.114. In June, Rohit's bank account balance is ₹5,000 for 25 days, ₹20,000 for 2 days and ₹1,500 for 3 days. What is the average balance (in ₹) in Rohit's bank account in June?
SSC CHSL 02/07/2024 (4th Shift)
(a) 5650 (b) 5575 (c) 6000 (d) 5200

Q.115. The salaries of T in twelve months of a year are: ₹12,000, ₹12,000, ₹12,000, ₹15,000, ₹15,000, ₹15,000, ₹21,000, ₹21,000, ₹21,000, ₹30,000, ₹30,000, ₹30,000. The average salary of T per month in ₹ is _____ .
SSC CHSL 03/07/2024 (2nd Shift)
(a) 19500 (b) 18500 (c) 18000 (d) 19000

Q.116. If the average of 50 numbers N_1, N_2, _____ N_{50} is M. Then the average of the numbers N_1-100, N_2-100, _____ N_{50} - 100 will be:
SSC CHSL 03/07/2024 (3rd Shift)
(a) 50M (b) M-100 (c) 100M (d) M-50

Q.117. In a college, the average weight of 40 boys in a section among 72 students is 33 kg and that of the remaining students is 15 kg. What is the average weight of all the students in the section?
SSC CHSL 04/07/2024 (2nd Shift)
(a) 24 kg (b) 25 kg (c) 22 kg (d) 18 kg

Q.118. If the average of a number and its reciprocal is 2, then the average of its cube and its reciprocal is equal to:
SSC CHSL 04/07/2024 (3rd Shift)
(a) 36 (b) 48 (c) 28 (d) 26

Q.119. A man bought 4 books for ₹50 each, 5 books for ₹60 each and 6 books for ₹70 each. The average cost of a book for the man is (round up to two decimal places):
SSC CHSL 04/07/2024 (4th Shift)
(a) ₹61.33 (b) ₹50.33
(c) ₹60.33 (d) ₹36.33

Q.120. Abhishek's marks in Mathematics were incorrectly entered as 93 instead of 63. Due to this, the average marks of the class in Mathematics got increased by 0.5. How many students were there in the class?
SSC CHSL 05/07/2024 (1st Shift)
(a) 55 (b) 60 (c) 50 (d) 45

Q.121. The weight of the Five friends are 67 kg, 85 kg, 70 kg, 90 kg, and 103 kg. Find the average of their weights in kg.
SSC CHSL 08/07/2024 (1st Shift)
(a) 90 (b) 80 (c) 83 (d) 87

Q.122. The average weight of 35 students in a class is 40 kgs. Five of the students of this class whose average weight is 42 kgs left the class. Find the average weight of the remaining 30 students.
SSC CHSL 08/07/2024 (4th Shift)
(a) $39\frac{2}{3}$ kgs (b) $29\frac{2}{3}$ kgs
(c) $49\frac{2}{3}$ kgs (d) $19\frac{2}{3}$ kgs

Q.123. The average salary of a group of 12 employees in an institution is ₹3,950 per month and that of another group of employees is ₹1,850. If the average salary of all employees is ₹2,150, then the total number of employees is:
SSC CHSL 09/07/2024 (2nd Shift)
(a) 84 (b) 100 (c) 88 (d) 72

Q.124. A public library has an average attendance of 410 on Sundays and 230 for the remaining days. The average attendance per day of a month of 30 days beginning with Sunday would be:
SSC CHSL 10/07/2024 (3rd Shift)
(a) 230 (b) 254 (c) 260 (d) 320

Q.125. In two successive years, 75 and 50 employees of a company appeared at the departmental examination. Respectively, 84% and 52% of them passed. The average rate of pass percentage is:
SSC CHSL 11/07/2024 (3rd Shift)
(a) 71% (b) 41% (c) $71\frac{1}{5}$% (d) $41\frac{1}{5}$%

Q.126. The average of 50 numbers is 23. If each number is multiplied by 13, then the new average is :
SSC CHSL 11/07/2024 (4th Shift)
(a) 88 (b) 299 (c) 650 (d) 219

SSC CPO 2024 Tier - 1

Q.127. Three boys, on an average, are 25 years old, and their age are in the ratio of 3 : 5 : 7. What is the age of youngest boy?
SSC CPO 27/06/2024 (2nd Shift)
(a) 12 years (b) 15 years
(c) 21 years (d) 24 years

Q.128. Anwesha's marks in a class text of Sanskrit were incorrectly entered as 99 instead of 66. If there are 55 students in the class, then what is the increment in the average marks of the class in Sanskrit because of this typing error ?
SSC CPO 28/06/2024 (1st Shift)
(a) 0.2 (b) 0.8 (c) 0.4 (d) 0.6

Q.129. In a class, there are 60 students. The average weight of the entire class is 42 kg. If there are 36 boys in the class and the average weight of all the boys is 50 kg, then what is the average weight (in kg) of all the girls?
SSC CPO 28/06/2024 (2nd Shift)
(a) 30 (b) 32 (c) 36 (d) 34

SSC Selection Post (Phase - XII)

Q.130. Find the average of 642, 253, 834 and 303.
Matriculation Level 20/06/2024 (Shift - 1)
(a) 508 (b) 509 (c) 512 (d) 452

Q.131. The average age of all the students in a class is 18 years. The average age of the boys of the class is 19 years and of the girls is 14 years. If the number of girls in the class is 30, then what is the number of boys in the class?
Matriculation Level 20/06/2024 (Shift - 4)
(a) 100 (b) 120 (c) 140 (d) 110

Q.132. The average of v numbers is w^2 and that of w numbers is v^2 Then the average of all the numbers is:
Matriculation Level 20/06/2024 (Shift - 4)
(a) vw^2 (b) v + w (c) vw (d) $v^2 + w^2$

Q.133. At a fitness club, 70% of the members are men and 30% of the members are women. If the average age of the men is 30 years and that of the women is 40 years, then what is the average age of all the members?
Matriculation Level 21/06/2024 (Shift - 1)
(a) 38 years (b) 33 years
(c) 35 years (d) 30 years

Q.134. The average of runs of a cricket player in 12 innings was 42. How many runs must he make in his next innings to increase his average of runs by 2?
Matriculation Level 21/06/2024 (Shift - 4)
(a) 64 (b) 68 (c) 72 (d) 78

Q.135. The average weight of 4 persons is increased by 14 kg when one of them whose weight is 55 kg, is replaced by another person. What is the weight (in kg) of the new person?
Matriculation Level 24/06/2024 (Shift - 1)
(a) 111 (b) 85 (c) 56 (d) 98

Q.136. A packet has to consist of three types of jellies - orange, mango and strawberry. The price per unit of orange, mango and strawberry jelly is ₹2.00,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

₹3.00 and ₹3.50, respectively. In a packet, there are 80 orange jellies, 50 mango jellies and 120 strawberry jellies. What is the average cost (in ₹) of a jelly in a mixed packet ?
Matriculation Level 24/06/2024 (Shift - 4)
(a) 2.80 (b) 2.96 (c) 2.92 (d) 3.02

Q.137. The average cost of a pencil is ₹8 and the average cost of an eraser is ₹4. The cost of 8 erasers, 4 pencils and 12 sharpeners are ₹148. The average cost of a sharpener is ₹_____
Matriculation Level 24/06/2024 (Shift - 4)
(a) 6.5 (b) 6 (c) 7 (d) 6.66

Q.138. In nine games, A wins five games with score differences of 12, 3, 8, 4 and 1, while in the remaining four games, he loses with score differences of -4, -1, -2 and -3. The average score difference of A in all the nine games is:
Matriculation Level 26/06/2024 (Shift - 1)
(a) 2 (b) 3 (c) 4 (d) 1

Q.139. The average temperature of a city for the first four days of the week is 25°C, and the average temperature for the last four days is 30°C. If the average temperature for the entire week is 27°C, then what is the temperature on the fourth day?
Higher Secondary 24/06/2024 (Shift - 2)
(a) 29°C (b) 31°C (c) 30°C (d) 28°C

Q.140. The average weight of 5 boys is increased by 9 kg when one of them, whose weight is 39 kg, is replaced by another boy. What is the weight (in kg) of the new boy?
Higher Secondary 24/06/2024 (Shift - 2)
(a) 69 (b) 65 (c) 70 (d) 84

Q.141. John buys 20 kg of wheat at ₹30 per kg and 30 kg of wheat at ₹50 per kg. Find his average price.
Higher Secondary 25/06/2024 (Shift - 2)
(a) ₹40 per kg (b) ₹20 per kg
(c) ₹42 per kg (d) ₹21 per kg

Q.142. Class X has 45 students scoring average marks of 30 and class Y has 35 students scoring average marks of 18. Find the average marks of the students of both classes together.
Higher Secondary 25/06/2024 (Shift - 2)
(a) 25 (b) 24.75 (c) 28.50 (d) 30

Q.143. The average weight of 10 persons is increased by 3.5 kg, when one of them whose weight is 45.5 kg is replaced by a new man. The weight (in kg) of the new man is ___.
Higher Secondary 26/06/2024 (Shift - 2)
(a) 75.5 (b) 70.5 (c) 80.5 (d) 85.5

Q.144. The average of 12 numbers is 47. The average of the first 5 numbers is 45 and the average of the next 4 numbers is 52. If the 10th number is 10 less than the 11th number and is 5 more than the 12th number, then what is the average value of the 11th and 12th numbers?
Graduate Level 20/06/2024 (Shift - 3)
(a) 44.5 (b) 42.5 (c) 46.5 (d) 47.5

Q.145. A fruit seller has 10 kg of apples and 5 kg of grapes. The price of 1 kg of apples is ₹94.50 and that of grapes is ₹105. He sold all the fruits with him. What is the average amount (in ₹) received by the fruit seller ?
Graduate Level 21/06/2024 (Shift - 3)
(a) 97.50 (b) 101.50 (c) 98 (d) 100

Q.146. The university has 750 faculty (male and female only) out of which the females are 60%. The average height of females is 162 cm and that of males is 168 cm. What is the average height of the faculty (in cm) of the university ?
Graduate Level 21/06/2024 (Shift - 3)
(a) 161.4 (b) 166.4 (c) 163.4 (d) 164.4

Q.147. The average weight of a group of 15 students is 70 kg. Five more students of weight 65 kg, 68 kg, 45 kg, 77 kg and 62 kg join the group. What is the change in the average weight (rounded off to the nearest integer) of the group?
Graduate Level 24/06/2024 (Shift - 3)
(a) Increases by 1 kg
(b) Increases by 2 kg
(c) Decreases by 1 kg
(d) Decreases by 2 kg

Q.148. The average weight of Rohan and his three friends is 62 kg. If Rohan's weight is 8 kg more than the average weight of his three friends, what is Rohan's weight (in kg)?
Graduate Level 25/06/2024 (Shift - 3)
(a) 60 (b) 65 (c) 68 (d) 72

Q.149. The average monthly income of A and B is ₹5,050, the average monthly income of B and C is ₹6,250, and the average monthly income of A and C is ₹5,200. What is the sum of the monthly incomes (in ₹) of A, B and C?
Graduate Level 25/06/2024 (Shift - 3)
(a) 18000 (b) 16500
(c) 19500 (d) 11000

Q.150. If the average score of a cricketer in three matches is 38 and in two other matches is 23, then what is the average score in all five matches?
Graduate Level 26/06/2024 (Shift - 3)
(a) 32 (b) 30 (c) 34 (d) 36]

SSC CHSL 2023 Tier - 2

Q.151. At a Yoga center, 60% of the members are men and 40% of the members are women. If the average age of the men is 55 years and the average age of the women is 45 years, then what is the average age (in years) of all the members ?
SSC CHSL Tier II 02/11/2023
(a) 51 (b) 48 (c) 50 (d) 49

Q.152. The average weight of 40 students of a school is 52 kg. If the weight of the teacher is included, the average weight rises by 500 grams. Find the weight (in kg) of the teacher.
SSC CHSL Tier II 02/11/2023
(a) 72.5 (b) 74.5 (c) 73.5 (d) 71.5

Q.153. The average salary of all 40 employees, including 35 non-teaching staff members, of a school is ₹4,000. If the average salary of the non-teaching staff members is ₹4,200, find the average salary of the remaining staff of the school.
SSC CHSL Tier II 10/01/2024
(a) ₹3,600 (b) ₹2,600
(c) ₹2,800 (d) ₹2,300

Q.154. Find the average of the prime numbers lying between 69 and 92.
SSC CHSL Tier II 10/01/2024
(a) 79 (b) 82 (c) 80 (d) 81

SSC CGL 2023 Tier - 2

Q.155. The average weight of the first thirteen persons among fourteen persons is 78 kg. The weight of the 14th person is 39 kg more than the average weight of all the fourteen persons. Find the weight of the 14th person.
SSC CGL Tier II (26/10/2023)
(a) 118 kg (b) 98 kg (c) 110 kg (d) 120 kg

SSC CPO 2023 Tier - 1

Q.156. The average weight of 15 people increases by 3.2 kg when a new person comes in place of one of them weighing 52 kg. The weight of the new person is:
SSC CPO 03/10/2023 (3rd Shift)
(a) 96 kg (b) 100 kg (c) 52 kg (d) 48 kg

Q.157. The average of 45 numbers was found to be 39. Later on, it was detected that a number 65 was misread as 56. Find the correct average of the given numbers.
SSC CPO 05/10/2023 (2nd Shift)
(a) 36.2 (b) 37.2 (c) 38.2 (d) 39.2

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.158. Rakesh runs a coaching institute having 50 faculty members. The average monthly salary of 35 faculty members is ₹37,500. What will be the average monthly salary (in ₹) of the other 15 faculty members, if the average monthly salary of all the 50 faculty members is found to be ₹30,000?
SSC CPO 05/10/2023 (3rd Shift)
(a) 12,000 (b) 13,000
(c) 12,500 (d) 13,500

SSC MTS 2023 Tier - 1

Q.159. In a class of 37 students, there are 22 girls. The average weight of these girls is 46 kg and the average weight of the whole class is 50 kg. What is the average weight (in kg) of the boys in that class ? (Rounded off to 2 decimal places)
SSC MTS 01/09/2023 (1st Shift)
(a) 60.74 (b) 55.87 (c) 61.35 (d) 58.25

Q.160. Student gets 62, 58, 72, 58 and 83 marks in Sanskrit, English, Mathematics, Social and Computer Science, respectively. His average marks in Mathematics, Social and Computer Science are _____ more than the average marks in Sanskrit, English and Mathematics.
SSC MTS 01/09/2023 (2nd Shift)
(a) 9 (b) 8 (c) 6 (d) 7

Q.161. The average of the first 69 natural numbers is:
SSC MTS 04/09/2023 (1st Shift)
(a) 34 (b) 35 (c) 33 (d) 36

Q.162. The average age of a family of three members (mother, father and Son) is 44 years. After the son's marriage, the average age of the family becomes 39 years. What is the age of the daughter-in-law ?
SSC MTS 05/09/2023 (2nd Shift)
(a) 24 years (b) 25 years
(c) 23 years (d) 22 years

Q.163. A batsman makes 96 runs in the 13th innings and thus his average increases by 3. Find his average after 13 innings.
SSC MTS 06/09/2023 (1st Shift)
(a) 65 (b) 50 (c) 70 (d) 60

Q.164. The average of four consecutive odd numbers is 58. What is the lowest number ?
SSC MTS 06/09/2023 (2nd Shift)
(a) 51 (b) 57 (c) 55 (d) 53

Q.165. In April, Mr. Khan observed that his balance in his bank account is ₹5,600 for the first 24 days, ₹12,000 for the next two days and ₹37,500 in the last 4 days of the month. What is his daily average balance for April ?
SSC MTS 06/09/2023 (3rd Shift)
(a) ₹10,280 (b) ₹15,280
(c) ₹10,480 (d) ₹14,280

Q.166. The speed of a bus from station A to B is 55 km/h, and while coming back from station B to A, the speed of the bus is 95 km/h. The average speed (in km/h) of the bus during the whole journey is :
SSC MTS 08/09/2023 (2nd Shift)
(a) $72\frac{1}{3}$ (b) $67\frac{1}{3}$ (c) $62\frac{2}{3}$ (d) $69\frac{2}{3}$

Q.167. A student's marks were incorrectly entered as 44 instead of 86. Due to this, the average of the class got decreased by $\frac{3}{2}$. What is the number of students in the class ?
SSC MTS 08/09/2023 (3rd Shift)
(a) 24 (b) 28 (c) 36 (d) 30

Q.168. The average weight of some students in class 12th was 56 kg. When seven students whose average weight was 58 kg joined the class, the average weight of all the students increased by 200 gm. Find the number of students in the class in the beginning?
SSC MTS 11/09/2023 (1st Shift)
(a) 56 (b) 77 (c) 49 (d) 63

Q.169. There are 75 students in the hostel. Due to new admissions, 15 new students join the mess, and the daily expenses of the mess increased by ₹240, while the average expenditure per head diminished by ₹5. What was the original expenditure (in ₹) of the mess?
SSC MTS 12/09/2023 (1st Shift)
(a) 3,450 (b) 4,530 (c) 3,540 (d) 4,350

Q.170. The average age of the boys in the class was 16 years. When 4 boys whose average age was 13 years are admitted to the class, the average age of the class was reduced by 6 months. How many boys were there initially in the class ?
SSC MTS 12/09/2023 (1st Shift)
(a) 22 (b) 20 (c) 18 (d) 25

Q.171. In a school, the average height of the students of the tenth standard is 100 cm. The average height of boys is 118 cm, whereas the average height of girls is 95 cm. What is the number of girls in the class if there are 20 boys?
SSC MTS 12/09/2023 (1st Shift)
(a) 72 (b) 63 (c) 54 (d) 36

Q.172. Sandeep drives a distance of 500 metres to a store in 175 seconds. Then he drives 400 metres to another store in 125 seconds. What is his average speed (in m/s)?
SSC MTS 12/09/2023 (2nd Shift)
(a) 3.5 (b) 3 (c) 2 (d) 2.5

Q.173. In a subject, there are 40 marks for practical and 110 marks for theory. In another subject, the practical marks are 60 and the theory marks are 40. If R gets an average mark of 40 in practical and an average mark of 60 in theory, then his average marks per subject are _____ .
SSC MTS 12/09/2023 (3rd Shift)
(a) 80 (b) 60 (c) 100 (d) 40

Q.174. While calculating the average marks of a class, the score increased by 0.5 when the marks of one student is wrongly entered as 54 instead of 45. The number of students in the class is:
SSC MTS 13/09/2023 (2nd Shift)
(a) 36 (b) 18 (c) 45 (d) 54

Q.175. S gets 65, 74, 62, 68 and 68 marks in Hindi, English, Mathematics, Physics and Chemistry, respectively. His average marks in Mathematics, Hindi and English are _____ more than the average marks in Mathematics, Physics and Chemistry.
SSC MTS 14/09/2023 (2nd Shift)
(a) 0.5 (b) 1.33 (c) 1.67 (d) 1

SSC CHSL 2023 Tier - 1

Q.176. The average weight of the group of 12 players increases by 1.5 kg when a player who weighs 63 kg is replaced by a new player. What is the weight of the new player?
SSC CHSL 02/08/2023 (3rd Shift)
(a) 84 kg (b) 81 kg (c) 83 kg (d) 79 kg

Q.177. The average monthly salary of workers in a factory is ₹6,000. The average monthly salary of 100 technicians is ₹12,000, and the average monthly salary of non-technicians is ₹4,000. Find the total number of workers in the factory.
SSC CHSL 03/08/2023 (1st Shift)
(a) 400 (b) 300 (c) 250 (d) 450

Q.178. The average age of 25 students in a class is 14 years. Five new students with an average age of 14.6 years join this class. What is the average age of 30 students in the class ?
SSC CHSL 07/08/2023 (3rd Shift)
(a) 13.1 years (b) 14.1 years
(c) 15.1 years (d) 16.1 years

Q.179. The average number of runs

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

scored by a cricketer in 42 innings is 30. The difference between his maximum and minimum scores in an inning is 100. If these two innings are not taken into consideration, then the average score of the remaining 40 innings is 28. What are the maximum runs scored by him in an inning?
SSC CHSL 08/08/2023 (3rd Shift)
(a) 120 (b) 105 (c) 115 (d) 110

SSC CGL 2023 Tier - 1

Q.180. According to Raghav, his weight is more than 64 kg but less than 74 kg. His sister does not agree with Raghv and she thinks that his weight is more than 60 kg but less than 69 kg. His mother's view is that his weight cannot be more than 68 kg. His father's view is that his weight cannot be more than 67 kg. If all are them are correct in their estimation, then what is the average of different probable weights of Raghav measures (in kg)?
SSC CGL 18/07/2023 (3rd shift)
(a) 66 (b) 67 (c) 68 (d) 65

Q.181. In an examination of 7 papers of 100 marks each, there were 3 mathematics papers, 2 English papers and 2 Hindi papers. D gets average marks of 45, 55 and 60 in mathematics, English and Hindi, respectively. What are the average marks per paper?
SSC CGL 26/07/2023 (4th shift)
(a) 56.5 (b) 52.1 (c) 55.6 (d) 54.1

SSC Selection Post (Phase - XI)

Q.182. The average weight of 30 students in a class is 60 kg. If the weight of the class teacher is included, the average increases by 0.5 kg. The weight (in kg) of the teacher is:
Graduate Level 27/06/2023 (Shift - 4)
(a) 76.5 (b) 75.5 (c) 72.5 (d) 74.5

Q.183. In a company, the total customer calls on Monday, Wednesday and Friday are 15,500 and the total calls on Tuesday and Thursday are 12,500. The average calls on Saturday and Sunday are 7,000. What are the average calls per day in a week?
Matriculation Level 28/06/2023 (Shift - 1)
(a) 6500 (b) 7500 (c) 7000 (d) 6000

Q.184. A class of 40 students took a mathematics test. 18 students had an average score of 75. The other students had an average score of 62. What is the average score of the entire class?
Matriculation Level 30/06/2023 (Shift - 3)
(a) 67.85 (b) 72.52 (c) 68.50 (d) 69.85

Q.185. What is the average marks of all the students if the average marks of three batches of 55, 60, and 45 students is 50, 55, and 60, respectively ?
Matriculation Level 30/06/2023 (Shift - 4)
(a) 51.23 (b) 55.98 (c) 57.42 (d) 54.68

SSC CHSL 2022 Tier - 2

Q.186. The average of the square of first five even natural numbers is:
SSC CHSL Tier II (26/06/2023)
(a) 40 (b) 44 (c) 42 (d) 46

SSC MTS 2022 Tier - 1

Q.187. Average marks obtained by 19 boys of a college is 48. If the highest marks and lowest marks obtained are removed, then the average reduces by 4. What is the average of the highest and lowest marks obtained ?
SSC MTS 03/05/2023 (Afternoon)
(a) 76 (b) 80 (c) 84 (d) 82

Q.188. The average of 24 numbers is 43. If we subtract a number 'M' from each number, then the average becomes 38. What was the value of M?
SSC MTS 04/05/2023 (Morning)
(a) 12 (b) 5 (c) 7 (d) 10

Q.189. The average expenditure of Raman for 5 days is Rs. 160. If his expenditure for the first 4 days is Rs. 90, Rs. 135, Rs. 75 and Rs. 180 respectively, then what is his expenditure on the 5th day ?
SSC MTS 10/05/2023 (Morning)
(a) Rs.360 (b) Rs.320
(c) Rs.280 (d) Rs.250

Q.190. Average of 4 numbers is 45. Average of first two numbers is thrice the Average of other two numbers. What is the sum of first two numbers?
SSC MTS 10/05/2023 (Afternoon)
(a) 122 (b) 105 (c) 125 (d) 135

Q.191. The average height of 40 sticks is 156 cm. Some sticks of average height 162 cm are taken out. If the new average height is 150 cm, then how many sticks are remaining?
SSC MTS 10/05/2023 (Afternoon)
(a) 25 (b) 20 (c) 16 (d) 32

Q.192. Among four students sitting in a row, average age of last three students is 48 years and the average age of first three students is 50 years. If the age of first student is 56 years, then what is the age of the last student?
SSC MTS 15/05/2023 (Afternoon)
(a) 30 (b) 40 (c) 50 (d) 60

Q.193. A group of students has an average weight of 42 kg. One student of weight 48 kg leaves the group and another student of weight 44 kg joins the group. If the new average weight becomes 41.6 kg, then how many students are there in the group?
SSC MTS 13/06/2023 (Afternoon)
(a) 15 (b) 10 (c) 8 (d) 12

Q.194. The average of 7 consecutive odd numbers is A. If next 3 and previous 2 odd numbers to these 7 odd numbers are also included, then what is the new average of these 12 consecutive odd numbers?
SSC MTS 16/06/2023 (Morning)
(a) A + 1 (b) A - 2 (c) A + 2 (d) A + 3

Q.195. The average of marks obtained by S1 and S2 is 30 more than the average marks obtained by S2 and S3. If the marks obtained by S3 is 50, then what are the marks obtained by S1?
SSC MTS 19/06/2023 (Morning)
(a) 80 (b) 105 (c) 95 (d) 110

SSC CHSL 2022 Tier - 1

Q.196. The average age of 120 members of a society is 62.5 years. By addition of 30 new members, the average age becomes 58.2 years. What is the average age of newly joined members?
SSC CHSL 09/03/2023 (2nd Shift)
(a) 40 years (b) 41 years
(c) 39 years (d) 42 years

Q.197. The average age of a class of 6 girls is x years. Four new girls having ages x- 2, x + 4, x + 8 and x + 10 joins the class. What is the new average age of the class?
SSC CHSL 09/03/2023 (3rd Shift)
(a) x - 2 (b) x + 2 (c) x + 5 (d) x +1

Q.198. Average of 9 consecutive odd numbers is 27. If the previous and next odd number to these 9 odd numbers are also included, then what will be the new average?
SSC CHSL 09/03/2023 (4th Shift)
(a) 32 (b) 28 (c) 29 (d) 27

Q.199. The average of 10 consecutive integers is $\frac{33}{2}$ What is the average of first three integers?
SSC CHSL 13/03/2023 (1st Shift)
(a) 12 (b) 13 (c) 15 (d) 11

Q.200. 2 years ago the average age of husband, wife and child was 28 years,

Search on Tg: @apna_pdf

Search on Telegram @apna_pdf

and 5 years ago the average age of husband and child was 21 years. What is the present age of the wife?
SSC CHSL 13/03/2023 (3rd Shift)
(a) 38 years (b) 40 years
(c) 36 years (d) 42 years

Q.201. Average of the marks of 132 students of a college is 50. If the average of the marks of the passed students is 55 and the average of the marks of the failed students is 35, then what will be the respective ratio of the total marks of passed students and the total marks of failed students?
SSC CHSL 14/03/2023 (1st Shift)
(a) 1 : 3 (b) 11 : 7 (c) 33 : 7 (d) 21 : 8

Q.202. 10 Consecutive numbers are given. If the average of the two numbers given in the middle is 13.5, then what is the sum of the first 6 numbers?
SSC CHSL 14/03/2023 (3rd Shift)
(a) 58 (b) 55 (c) 67 (d) 69

Q.203. Average of 6 consecutive even numbers is 35. What will be the sum of smallest and largest even number among these 6 numbers?
SSC CHSL 14/03/2023 (4th Shift)
(a) 68 (b) 72 (c) 70 (d) 66

Q.204. The average age of 5 children of a family is 15 years. Average age of children together with their father and mother is 25 years. If the father is older than the mother by 4 years, then find the age of mother (in years).
SSC CHSL 15/03/2023 (1st Shift)
(a) 44 (b) 48 (c) 46 (d) 52

Q.205. What will be the average of the first 8 positive even numbers divisible by 9?
SSC CHSL 16/03/2023 (2nd Shift)
(a) 45 (b) 72 (c) 81 (d) 63

Q.206. The average age of Ram and Shyam is 28 years. If Rahim replaces Ram, then the average age will become 26 years. If Rahim replaces Shyam, then the average age will become 30 years. What are the respective ages of Ram, Shyam and Rahim?
SSC CHSL 17/03/2023 (4th Shift)
(a) 32 years, 24 years and 28 years
(b) 34 years, 40 years and 30 years
(c) 48 years, 40 years and 26 years
(d) 38 years, 44 years and 36 years

Q.207. A man spends Rs.2,300 monthly on average for the first four months and Rs.1,800 monthly for the next eight months and saves Rs. 12,400 a year. Find his monthly income.
SSC CHSL 20/03/2023 (3rd Shift)
(a) Rs.3,000 (b) Rs.2,400
(c) Rs.2,200 (d) Rs.2,100

Q.208. The average age of Abhay, his wife and their child 6 years ago was 42 years and that of his wife and their child 8 years ago was 30 years, Find the present age of Abhay.
SSC CHSL 20/03/2023 (4th Shift)
(a) 68 years (b) 63 years
(c) 64 years (d) 66 years

Q.209. There are 5 numbers, where the first number is double of the second number and two-third of the third number. The average of 5 numbers is 60. If the sum of the remaining two numbers is 120, then find the value of the 3rd number.
SSC CHSL 21/03/2023 (1st Shift)
(a) 120 (b) 90 (c) 80 (d) 60

Q.210. The average of 5 consecutive even numbers is A. If the next 5 even numbers are also included, then what is the average of these 10 numbers?
SSC CHSL 21/03/2023 (2nd Shift)
(a) A + 7 (b) A + 2 (c) A + 9 (d) A + 5

Q.211. The average of marks obtained by X and Y is 35 less than the average marks obtained by Y and Z. If the marks obtained by Z is 85, what is the marks obtained by X?
SSC CHSL 21/03/2023 (3rd Shift)
(a) 155 (b) 15 (c) 35 (d) 25

SSC CGL 2022 Tier - 2

Q.212. Find the average of the cubes of the first five natural numbers.
SSC CGL Tier II (02/03/2023)
(a) 35 (b) 40 (c) 45 (d) 50

Q.213. The average of 20 numbers is 32. If two numbers are 29 and 31, then what is the average of the remaining numbers (correct up to two decimals)?
SSC CGL Tier II (03/03/2023)
(a) 31.24 (b) 30.22 (c) 34.44 (d) 32.22

SSC CGL 2022 Tier - 1

Q.214. The average of the marks of 25 students in a class, in an examination was calculated to be 19. Later, the teacher realized that the marks of two students were taken as 18 and 19 respectively, instead of 14 and 15. Find the new actual average marks of the class.
SSC CGL 01/12/2022 (2nd Shift)
(a) 17.43 (b) 16.56 (c) 18.68 (d) 17.65

Q.215. A company employed 700 men and 300 women and the average wage was Rs.450 per day. If a man got Rs.50 more than a woman, then the daily wage of the woman is:
SSC CGL 03/12/2022 (3rd Shift)
(a) Rs.350 (b) Rs.375
(c) Rs.415 (d) Rs.435

Q.216. The average of eight consecutive odd numbers is 48. Find the sum of the fifth and seventh numbers.
SSC CGL 06/12/2022 (3rd Shift)
(a)102 (b) 86 (c) 89 (d) 90

Q.217. The average weight of apples in a basket is 50 kg. 6 more apples with the average weight of 60 kg are added in the basket. If the average weight of the basket is increased by 5 kg, then find the number of apples in the basket originally.
SSC CGL 07/12/2022 (4th Shift)
(a) 4 (b) 6 (c) 2 (d) 8

Q.218. A student's marks were wrongly entered as 65 instead of 45. Due to this, the average marks for the class got increased by $\frac{1}{3}$. The number of students in the class is:
SSC CGL 08/12/2022 (3rd Shift)
(a) 40 (b) 20 (c) 60 (d) 30

Q.219. If the average of s numbers is r^4 and the average of r numbers is s^4 then find the average of all r + s numbers?
SSC CGL 09/12/2022 (4th Shift)
(a) $rs(r^2 + s^2 - rs)$ (b) rs
(c) $r^2 + s^2$ (d) $rs(r^2 + s^2)$

Q.220. The average age of a man and his son is 55 years. The ratio of their ages is 7 : 4, respectively. What will be the ratio of their ages after 6 years?
SSC CGL 12/12/2022 (2nd Shift)
(a) 1 : 2 (b) 12 : 7 (c) 25 : 17 (d) 38 : 23

Q.221. Ram, Shyam, Rohan, Reeta and Mukesh are five members of a family who are weighed consecutively and their average weight is calculated after each member is weighed. If the average weight increases by 2 kg each time, how much heavier is Mukesh than Ram?
SSC CGL 13/12/2022 (1st Shift)
(a) 14 kg (b) 18 kg (c) 16 kg (d) 12 kg

SSC CPO 2022 Tier - 1

Q.222. The average salary of all the employees in a company is Rs.14,000. The average salary of 5 technicians is Rs.18,000 and the average salary of the rest is Rs.13,200. The total number of employees in the company is:
SSC CPO 09/11/2022 (Morning)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

(a) 28 (b) 30 (c) 29 (d) 27

Q.223. Class 10, consisting of 40 students, took a science test. 30 students had an average score of 95. The other students had an average score of 85. What is the average score of the whole class?
SSC CPO 09/11/2022 (Afternoon)
(a) 92.3 (b) 92.5 (c) 92.4 (d) 92.2

Q.224. There are six baskets — Green, Red, Blue, Yellow, Black and White. Each basket has some rings in it. The average number of rings in all the six baskets is 38. If the blue basket is removed, the average number of rings in the remaining baskets is 34. How many rings are there in the blue basket?
SSC CPO 09/11/2022 (Evening)
(a) 22 (b) 45 (c) 37 (d) 58

Q.225. The average age of 10 students and their class teacher is 17 years. If the age of the class teacher is excluded, the average age of the 10 students is reduced by 2 years. What is the age (years) of the class teacher?
SSC CPO 11/11/2022 (Afternoon)
(a) 38 (b) 36 (c) 37 (d) 35

Q.226. The average score in an English exam of a class of 45 students in a coaching centre is 52. A group of 6 boys having an average score of 40 leave the class and another group of eight boys having an average score of 43 join the class. What is the new average score of the class?
SSC CPO 11/11/2022 (Evening)
(a) 48 (b) 53 (c) 49.5 (d) 52

SSC CGL 2021 Tier - 2

Q.227. What is the difference between the average of first 148 even positive numbers and the average of first 129 odd positive numbers?
SSC CGL Tier II (08/08/2022)
(a) 21 (b) 20 (c) 23 (d) 19

Q.228. Average age of 7 students of a class is 28 years. Average age of first three students is 30 years. Age of fourth student is 4 years less than the age of fifth student. Ages of last two students is same and is 5 more than the average age of first three students. What is the average age of fourth and fifth student?
SSC CGL Tier II (08/08/2022)
(a) 20 years (b) 36 years
(c) 16 years (d) 18 years

SSC Selection Post (Phase - X)

Q.229. In a company, the average salary of all the employees is ₹20,000. The average salary of group-A employees is ₹32,000 while the average salary of group-B employees is ₹18,000. What is the number of employees in group-A if there are 72 employees in group-B?
Graduate Level 02/08/2022 (Shift - 3)
(a) 9 (b) 12 (c) 6 (d) 8

Q.230. In a school there are 15 boys and 10 girls in class X. The average age of the boys is 16, while the average age of the girls is 15. Find the average age of the students in the class.
Graduate Level 03/08/2022 (Shift - 3)
(a) 15.8 (b) 15.6 (c) 15.7 (d) 15.5

Q.231. Find the average of 3^{20} , 3^{30} , 3^{40}.
Graduate Level 03/08/2022 (Shift - 3)
(a) $(3^{20} + 3^{10} + 3^{40}$ (b) 3^{30}
(c) $(3^{20} + 3^{30} + 3^{40})$ (d) $(3^{19} + 3^{29} + 3^{39})$

Q.232. For the past five months, a merchant has made sales of Rs.6,435, Rs.6,927, Rs.6,855, Rs.7,230 and Rs.6,562. What amount of sales does he need in the sixth month to achieve an average sale of Rs.6,500?
Higher Secondary 01/08/2022 (Shift - 3)
(a) Rs.4,781 (b) Rs.4,991
(c) Rs.4,810 (d) Rs.5,021

Q.233. A student obtained 72 marks in Biology, 84 marks in Hindi, 91 marks in Mathematics,80 marks in Science and 73 marks in English (out of 100). Find his average marks.
Higher Secondary 03/08/2022 (Shift - 4)
(a) 65 (b) 70 (c) 60 (d) 80

SSC MTS 2021 Tier - 1

Q.234. The average of X and Y is 10X. What is the value of Y?
SSC MTS 05/07/2022 (Afternoon)
(a) 16X (b) 9X (c) 18X (d) 19X

Q.235. The average of six consecutive odd numbers is 26. Find the difference between the largest and the smallest of these numbers.
SSC MTS 05/07/2022 (Evening)
(a) 8 (b) 16 (c) 10 (d) 12

Q.236. The average of a set of 20 numbers is P. If one of the numbers from the set is replaced with 58, then the average becomes (P - 2). What is the value of the number that is replaced?
SSC MTS 06/07/2022 (Morning)
(a) 98 (b) 94 (c) 60 (d) 104

Q.237. The average of the runs scored by 8 players in an innings is 55. If the runs scored by 7 of these players in the innings are 25, 35, 45, 60, 65, 60 and 80, then how many runs are scored by the 8th player in that innings?
SSC MTS 06/07/2022 (Afternoon)
(a) 65 (b) 80 (c) 75 (d) 70

Q.238. The current average age of a family of five members is 24. If the present age of the youngest member in the family is 8 years, what was the average age of the family members just before the birth of this youngest member?
SSC MTS 07/07/2022 (Morning)
(a) 24 years (b) 20 years
(c) 28 years (d) 16 years

Q.239. The average of 47 consecutive natural numbers is 99. What is the largest number among these numbers?
SSC MTS 07/07/2022 (Afternoon)
(a) 122 (b) 123 (c) 121 (d) 124

Q.240. The average of 5 consecutive odd numbers is 33. What is the product of the smallest and the largest of these five numbers?
SSC MTS 07/07/2022 (Evening)
(a) 1147 (b) 1237 (c) 957 (d) 1073

Q.241. There are four people in a family. The average age of these four members is 32 years. The father's age is 50 years, the mother's age is 46 years, and the daughter's age is 20 years. Find the age of the only son in the family.
SSC MTS 07/07/2022 (Evening)
(a) 18 years (b) 16 years
(c) 14 years (d) 12 years

Q.242. The average of four consecutive odd numbers is 8. If the next odd number is also considered, then what will be the new average of these five numbers?
SSC MTS 08/07/2022 (Morning)
(a) 9 (b) 7 (c) 10 (d) 11

Q.243. Ravi buys 5 pens at ₹150 each, 2 pencils at ₹100 each, and 3 notebooks at ₹250 each. What is the average expenditure incurred by Ravi per article?
SSC MTS 08/07/2022 (Afternoon)
(a) ₹180 (b) ₹160 (c) ₹170 (d) ₹165

Q.244. The average weight of all the 200 employees in an office is 68.2 kg, where $\frac{2}{5}$ of the employees are ladies and the ratio of the average weight of a man to that of a woman is 7 : 5. Find the average weight of the female employees.
SSC MTS 08/07/2022 (Evening)
(a) 60 kg (b) 54 kg (c) 55 kg (d) 59 kg

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Q.245. The average age of eight girls is Y years. 5 new girls having ages (in years) given by y + 3,y – 6,y + 15,y + 8, and y + 6, join the class. What is the new average age of the class?
SSC MTS 11/07/2022 (Morning)
(a) (y + 2) years (b) (y + 6) years
(c) (y + 3) years (d) (y + 1) years

Q.246. There are two numbers such that the first number is four times of the second number. If their average is 65, then what is the second number ?
SSC MTS 12/07/2022 (Morning)
(a) 26 (b) 14 (c) 24 (d) 28

Q.247. 8 years ago, the average age of Rahul's family consisting of 6 members was 35 years. One year ago a new baby was born in this family. What will be the average age of the family four years hence?
SSC MTS 12/07/2022 (Afternoon)
(a) 41 years (b) 37 years
(c) 40 years (d) 43 years

Q.248. The average marks obtained in a test by three students is x. If the marks of a new student is also considered, then the average marks increases by 2. What's the marks secured by the new student in the test?
SSC MTS 13/07/2022 (Morning)
(a) x + 4 (b) x + 6 (c) x + 8 (d) x + 2

Q.249. The average of T_1 and T_2 is 15. The average of T_3 and T_4 is 35. What is the average of T_1, T_2, T_3 and T_4 ?
SSC MTS 13/07/2022 (Afternoon)
(a) 24 (b) 30 (c) 28 (d) 25

Q.250. The mean of five numbers is 45. If a sixth number is also included the mean becomes 48. Find the sixth number.
SSC MTS 13/07/2022 (Afternoon)
(a) 73 (b) 63 (c) 43 (d) 53

Q.251. The average of eight consecutive odd numbers is 16. If the odd number which is immediately preceding the smallest of the given eight odd numbers is also included, then what will be the new average?
SSC MTS 14/07/2022 (Afternoon)
(a) 15 (b) 14 (c) 9 (d) 13

Q.252. There are two numbers such that the first number is 5 times of the second number. If the difference between the first and the second numbers is 120, then what is the average of these two numbers?
SSC MTS 14/07/2022 (Evening)
(a) 90 (b) 80 (c) 95 (d) 85

Q.253. The average of a set of 15 numbers is 41. Five numbers 21, 24, 39, 47 and 97 are removed from the above set. What will be the average of the remaining 10 numbers?
SSC MTS 15/07/2022 (Morning)
(a) 39.2 (b) 37.6 (c) 38.7 (d) 36.4

Q.254. In the first 20 overs of a cricket game, the run rate was only 2.4 per over. What should be the run rate in the remaining 30 overs be to reach a target of 308 runs?[Give your answer correct to one decimal place]
SSC MTS 15/07/2022 (Afternoon)
(a) 5.8 (b) 7.2 (c) 6.4 (d) 8.7

Q.255. There are two numbers such that the first number is twice the second number. If their average is 30, then what is the positive difference between the two numbers?
SSC MTS 18/07/2022 (Afternoon)
(a) 20 (b) 10 (c) 15 (d) 25

Q.256. Visitors to a show were charged ₹10 each on the first day, ₹5 on the second day and ₹2 on the third day and the total attendance on the three days was in the ratio 15 : 2 : 3.What is the average charge per person for the visitors to the show on the three days taken together ?
SSC MTS 19/07/2022 (Afternoon)
(a) ₹8.30 (b) ₹6.30 (c) ₹7.50 (d) ₹20.00

Q.257. The average of 12 numbers is M and the average of 8 of these numbers is P. If the average of remaining numbers is N. Then which of the following options is correct?
SSC MTS 20/07/2022 (Morning)
(a) 3M=2P+N (b) 4M=2P+3N
(c) 6M=3P+2N (d) 6M=2P+3N

Q.258. Out of a total of 9 books arranged in a particular order, the mean of the number of pages in the first 5 books is 430, the mean of the number of pages in the last 5 books is 380 and the number of pages in all the 9 books is 400. Find the number of pages in the fifth book.
SSC MTS 20/07/2022 (Afternoon)
(a) 450 (b) 420 (c) 430 (d) 440

Q.259. The average of 8 consecutive integers is $\frac{27}{2}$. What is the average of the largest four of these integers?
SSC MTS 20/07/2022 (Afternoon)
(a) 16.5 (b) 15 (c) 14.5 (d) 15.5

Q.260. The average marks scored by F_1 and F_2 is 40 more than the average marks scored by F_2 and F_3. If the marks scored by F_3 is 90, then what is the marks obtained by F_1 ?
SSC MTS 20/07/2022 (Evening)
(a) 130 (b) 140 (c) 160 (d) 170

Q.261. The average of nine consecutive even numbers is 24. What is the average of the smallest three of these 9 given numbers?
SSC MTS 21/07/2022 (Evening)
(a) 21 (b) 20 (c) 18 (d) 19

Q.262. The average marks of a group of 16 students in a test are reduced by 4 when the topper, who scored 92 marks, is replaced by a new student. What are the marks scored by the new student?
SSC MTS 22/07/2022 (Afternoon)
(a) 18 (b) 28 (c) 32 (d) 22

Q.263. The average weight of A,B,C and D is 33 kg. C is 12 kg lighter than A, while B is 6 kg heavier than C. D's weight is 10 kg less than that of C. What is the average weight of A and D?
SSC MTS 25/07/2022 (Morning)
(a) 34 kg (b) 33 kg (c) 35 kg (d) 32 kg

Q.264. The average of a certain set of 'b' numbers is 'a', and the average of a certain set of 'a' numbers is 'b'. What is the average of all the numbers taken together?
SSC MTS 25/07/2022 (Morning)
(a) 2b ÷ (a + b) (b) 2ab ÷ (a + b)
(c) (a + b) ÷ 2ab (d) 2a ÷ (a + b)

Q.265. The average marks scored by 8 boys is 72. If the scores of three girls are also included, the average marks increases by 3. The average marks scored by the three girls is:
SSC MTS 25/07/2022 (Afternoon)
(a) 95 (b) 83 (c) 78 (d) 68

Q.266. P_1 is the average of all prime numbers below 12 and P_2 is the average of all prime numbers between 12 and 30. What is the value of $5P_1 - P_2$?
SSC MTS 25/07/2022 (Afternoon)
(a) 7.8 (b) 8.6 (c) 9.8 (d) 7.5

Q.267. The average of P1 , P2 and P3 is 50. If the value of P1 is half of the average, then what is the average of P2 and P3?
SSC MTS 26/07/2022 (Morning)
(a) 55 (b) 57.5 (c) 63.5 (d) 62.5

Q.268. The average marks of a student in six subjects was initially 110. After re-valuation, in one subject the marks obtained was reduced from 148 to 112 , while in the rest of the subjects the marks remained unchanged. What is the new average marks?

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC MTS 26/07/2022 (Evening)
(a) 102 (b) 108 (c) 106 (d) 104

SSC CHSL 2021 Tier - 1

Q.269. The average age of a group is increased by 4 years when a person of whose age is 32 years was replaced by a person whose age is 56. Find the number of people in the group.
SSC CHSL 24/05/2022 (Morning)
(a) 6 (b) 7 (c) 8 (d) 9

Q.270. In the class, there are 29 boys and 21 girls. The average score of boys in Maths is 89, whereas the average score of girls in maths is 91. What is the average of the whole class in maths?
SSC CHSL 24/05/2022 (Morning)
(a) 91 (b) 89 (c) 91.8 (d) 89.84

Q.271. In a test, the average score of 50 students is 66. Out of the total students, 40% are girls and the rest are boys. The average score of the boys is 20% less than that of the girls. What is the average score of the girls ?
SSC CHSL 24/05/2022 (Afternoon)
(a) 70 (b) 80 (c) 75 (d) 65

Q.272. In a company there are only two types of employees, workers and officers. 35% of the employees are officers and the average monthly salary of an officer is ₹39,000 more than the combined average monthly salary of an employee. What is the difference between the average monthly salaries of an officer and a worker?
SSC CHSL 25/05/2022 (Afternoon)
(a) ₹52,650 (b) ₹50,700
(c) ₹64,350 (d) ₹60,000

Q.273. If the average of n quantities is P and the average of m quantities is Q, then the average of (m + n) quantities is:
SSC CHSL 25/05/2022 (Evening)
(a) $\frac{nP+mQ}{m-n}$ (b) $\frac{mP+nQ}{m+n}$
(c) $\frac{nP+mQ}{P+Q}$ (d) $\frac{nP+mQ}{m+n}$

Q.274. The mean of three numbers $\frac{a}{3}$, b and c is the same as the mean of the numbers $\frac{b}{3}$, $\frac{c}{3}$ and x. The value of 3x is (where a, b, c are positive numbers) :
SSC CHSL 26/05/2022 (Afternoon)
(a) b + c (b) a + 2b + 2c
(c) a (d) a + 3b + 3c

Q.275. In a class of 45 students, there are 20 girls who scored an average of 42 marks in a test of 50 marks. If the class average is 36, what are the average marks of the boys ?
SSC CHSL 27/05/2022 (Morning)
(a) 32.50 (b) 32.10 (c) 30.8 (d) 31.20

Q.276. The first number is one-third of the second number. The second number is 1.5 times of the third number. The third number is three times the fourth number. If the average of the four numbers is 10, find the largest of the number.
SSC CHSL 27/05/2022 (Evening)
(a) 12 (b) 18 (c) 16 (d) 15

Q.277. A family consists of two grandparents, two parents and four grandchildren. The average age of the grandparents is 67 years, that of the parents is 35 years and that of the grandchildren is 9 years. What is the average age of the family?
SSC CHSL 30/05/2022 (Morning)
(a) 40 (b) 30 (c) 36 (d) 45

Q.278. The average of the natural numbers divisible by 5 from the integers −10 to 35
SSC CHSL 30/05/2022 (Afternoon)
(a) −13.88 (b) 17.5 (c) 15 (d) 20

Q.279. In a company, there are only two types of employees: workers and officers. The average monthly salary of an officer is ₹78,000 more than the combined average monthly salary of an employee, while the combined average monthly salary of an employee is ₹42,000 more than the average monthly salary of a worker. What percentage of all the employees are officers?
SSC CHSL 30/05/2022 (Evening)
(a) 28% (b) 35% (c) 30% (d) 32%

Q.280. The average weight of a family of 4 members is 45 kg. The grandfather and the grandmother come to visit the family. Now the average weight of the 6 members of the family is 48 kg. Find the average weight of the grandparents.
SSC CHSL 31/05/2022 (Afternoon)
(a) 53 (b) 52 (c) 51 (d) 54

Q.281. During his entire school life, John's average marks in science was 80% and his average marks in mathematics was 90%. If his combined average marks in science and mathematics was 84%, while the total marks obtained by him in science was 54,000, what was John's total marks obtained in mathematics were?
SSC CHSL 02/06/2022 (Evening)
(a) 90000 (b) 81000 (c) 36000 (d) 60000

Q.282. A group of 36 students has an average present age of 14 years. When the age of the teacher is included, the average age rises by one. Calculate the teacher's age (in years).
SSC CHSL 03/06/2022 (Morning)
(a) 53 (b) 54 (c) 52 (d) 51

Q.283. The average score of a cricket team (of ten players and one captain) is 32. The scores of ten players are: 22, 11, 5, 34, 21, 32, 0, 28, 9 and 53. What is the score of the captain?
SSC CHSL 06/06/2022 (Morning)
(a) 129 (b) 137 (c) 115 (d) 121

Q.284. The average of five numbers, given in a particular order, is 32. The average of the first three numbers is 28, while that of the last three numbers is 34. What is the average of the first two numbers?
SSC CHSL 07/06/2022 (Afternoon)
(a) 29 (b) 30 (c) 27 (d) 28

Q.285. The average salary per head of all the workers in a workshop is ₹8,850. If the average salary per head of 9 technicians is ₹10,000, and the average salary per head of the rest is ₹7,780, find the total number of workers in the workshop.(Consider integral part only)
SSC CHSL 07/06/2022 (Afternoon)
(a) 18 (b) 22 (c) 24 (d) 16

Q.286. The average monthly expenditure of a family for the first four months is ₹13,750, for the next three months is ₹11,750 and for the last five months is ₹31,750. If the family saves ₹15,550 during the whole year, find the average monthly income of the family during the year. (Consider integral part only)
SSC CHSL 10/06/2022 (Afternoon)
(a) 21,055 (b) 22,045
(c) 23,040 (d) 22,000

SSC CGL 2021 Tier - 1

Q.287. The average weight of P and his three friends is 55 kg. If P is 4 kg more than the average weight of his three friends, what is P's weight (in kg)?
SSC CGL 11/04/2022 (Morning)
(a) 54 (b) 58 (c) 62 (d) 60

Q.288. The average of sixteen numbers is 48. The average of the first six of these numbers is 45 and that of the last seven numbers is 53. The seventh and the eighth numbers are, respectively, 3 and 7 greater than the ninth number. What is the average of the ninth and seventh numbers?
SSC CGL 13/04/2022 (Afternoon)
(a) 41.5 (b) 40.5 (c) 42 (d) 39

Q.289. A invested 30% more than B. B

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

invested 40% less than C, who invested Rs. 8,000. The average of the total amount invested by all of them together (to the nearest Rs.) is:
SSC CGL 19/4/2022 (Morning)
(a) 6,347 (b) 6,417 (c) 6,215 (d) 6,143

Q.290. The average of eleven consecutive positive integers is d. If the last two numbers are excluded, by how much will the average increase or decrease ?
SSC CGL 20/04/2022 (Morning)
(a) Will decrease by 1
(b) Will increase by 2
(c) Will decrease by 2
(d) Will increase by 1

Q.291. In the month of March, Dalip earned on an average ₹501 per day. For the first 18 days , his average earning was ₹495 and for the last 15 days , his average earning was ₹505 . On 18th March , he earned ₹50 more than that earned 17th March. How much (in ₹) did he earn on 18th March?
SSC CGL 21/04/2022 (Afternoon)
(a) 502 (b) 498 (c) 501 (d) 500

SSC CGL 2020 Tier - 2

Q.292. The numbers of students in section A and section B of a class are 50 and 62, respectively. The average score in mathematics of all the students is 75. If the average score of students in section A is 20% more than that of students in section B, then what is the average score of students in section A (correct to one decimal place)?
SSC CGL Tier II (29/01/2022)
(a) 85.7 (b) 87.5 (c) 84.3 (d) 82.6

Q.293. The number of students in a class is 45, out of which $33\frac{1}{3}$% are boys and the rest are girls. The average score of girls in Science is $66\frac{2}{3}$% more than that of boys. If the average score of all the students is 78, then the average score of girls is:
SSC CGL Tier II (03/02/2022)
(a) 78 (b) 54 (c) 90 (d) 65

SSC MTS 2020 Tier - 1

Q.294. The average of the 2-digit numbers 37, 45, 6x and x6 is 48. What is the average of (4x + 3) and (x + 7)?
SSC MTS 05/10/2021(Afternoon)
(a) 12.5 (b) 15 (c) 17.5 (d) 20

Q.295. In a class of 92 students, the ratio of the number of boys to that of girls is 12 : 11. The average score of girls, in a test, is $33\frac{1}{3}$% more than that of boys. If the average score of all students is 80, then what is the average score of girls?
SSC MTS 5/10/2021 (Evening)
(a) 88 (b) 84 (c) 92 (d) 96

Q.296. The average of 18 numbers is 65. The average of the first 10 numbers is 72 and that of the last 9 numbers is 58. If the 10th number is excluded, then what is the average of the remaining numbers (correct to one decimal place)?
SSC MTS 6/10/2021 (Evening)
(a) 64.6 (b) 66.6 (c) 65.2 (d) 65.4

Q.297. The total number of students in class A and B is 92. The number of students in A is 30% more than that of B. The average weight(in kg) of students in B is 50% more than that of students in A. If the average weight of all the students in A and B is 56 kg, then what is the average weight(in kg) of students in B?
SSC MTS 7/10/2021 (Afternoon)
(a) 46 (b) 40 (c) 69 (d) 52

Q.298. There are three positive numbers. If the average of any two of them is added to the third number, the resulting sums are 154, 148 and 132. The sum of the original three numbers is:
SSC MTS 7/10/2021 (Evening)
(a) 222 (b) 231 (c) 246 (d) 217

Q.299. There were 1200 students in a hostel. If the number of students is increased by 300, then the expenses of the mess increase by ₹5,000 per day, while the average expenditure per head diminishes by ₹5. The original expenditure of the mess, per day, is:
SSC MTS 11/10/2021 (Evening)
(a) ₹52,000 (b) ₹45,000
(c) ₹50,000 (d) ₹55,000

Q.300. The average of 40% of a number and 33% of the same number is 73. The average of $\frac{1}{5}$th and $\frac{1}{4}$th of that number
SSC MTS 12/10/2021 (Evening)
(a) 40 (b) 45 (c) 42 (d) 50

Q.301. The average time taken by 7 athletes in a race is 2 minutes 10 seconds. If the winner completed the race in 1 minute 40 seconds, then the average time taken by the other athletes:
SSC MTS 13/10/2021 (Afternoon)
(a) 2 minutes 35 seconds
(b) 2 minutes 45 seconds
(c) 2 minutes 15 seconds
(d) 2 minutes 25 seconds

Q.302. The average age of a group of students in a class is 15.5 years. 15 new students with an average age of 14.5 years join the group, due to which the average age of students in the class becomes 15 years. The number of students initially present in the class is :
SSC MTS 13/10/2021 (Evening)
(a) 18 (b) 12 (c) 14 (d) 15

Q.303. The average of a, b and c is 8 less than d. If the average of a, b, c and d is 42, then what is the average of (3d - 2) and (d + 5)?
SSC MTS 14/10/2021 (Afternoon)
(a) 96.5 (b) 97.5 (c) 99.5 (d) 98.5

Q.304. The average weight of 30 boys is more than average weight of 20 girls by 5 kg. If the total weight of 30 boys is 1050 kg, then the total weight(kg) of 20 girls is:
SSC MTS 18/10/2021 (Morning)
(a) 400 (b) 550 (c) 650 (d) 600

Q.305. While listing N consecutive even numbers for determining their average, the last number by mistake, got replaced by the next odd number and thereby the average turned out to be more than the desired value by 0.0125. What is the value of N?
SSC MTS 18/10/2021 (Evening)
(a) 80 (b) 40 (c) 50 (d) 100

Q.306. The average of a number and its reciprocal is 1. What is the average of its square, cube and fourth power?
SSC MTS 18/10/2021 (Evening)
(a) 2 (b) 1 (c) 1.33 (d) 2.67

Q.307. The average of $\frac{1}{4}$ of A and $\frac{1}{3}$ of B is 5, and the average of $\frac{1}{2}$ of A and $\frac{1}{2}$ of B is 9. The average of 2A and 3B is :
SSC MTS 22/10/2021 (Afternoon)
(a) 42 (b) 46 (c) 32 (d) 40

Q.308. In a group of 108 persons, the ratio of the number of males and females is 5 : 4. The average height of the males is 158.7 cm and that of females is x cm. If the average height of all the persons in the group is 155.5 cm, then the value of x is:
SSC MTS 27/10/2021(Afternoon)
(a) 151.5 (b) 150.8 (c) 152.2 (d) 153.4

Q.309. Let x and y be two positive numbers such that x > y. The average of 50% of x and 30% of y is 34.5. If the difference between x and y is 10, then the average of x and y is:
SSC MTS 27/10/2021 (Evening)
(a) 85 (b) 80 (c) 75 (d) 64

Q.310. The average of ten numbers is A. If c is subtracted from each number,

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

except the tenth and (c - 1) is subtracted from the tenth number, then what will be the new average?
SSC MTS 2/11/2021 (Evening)
(a) A - c + 0.1 (b) A - c
(c) A - c + 1 (d) A - (0.1)c + 0.1

SSC CGL 2020 Tier - 1

Q.311. The average of 8 consecutive even numbers written in ascending order is 17. What is the average of the last three numbers, 36 and 53?
SSC CGL 17/8/2021 (Morning)
(a) 32.2 (b) 29.8 (c) 31.6 (d) 31

Q.312. The average of x occurring 5 times and y occurring 7 times is 37. Also, the average of x occurring 7 times and y occurring 5 times is 35. The value of y is:
SSC CGL 18/08/2021 (Morning)
(a) 30 (b) 27 (c) 42 (d) 45

Q.313. The average daily production of toys in a factory in the month of December is 512. If the average production during the first 20 days is 515 and that of the last 13 days is 510, then what is the average of production on 19 and 20 December?
SSC CGL 18/08/2021 (Evening)
(a) 1058 (b) 529 (c) 513 (d) 512

Q.314. The average weight of a certain number of students in a class is 55.5 kg. If 4 students with average weight 60 kg join the class, then the average weight of all students in the class increases by 360 gm. The number of students in the class, initially, is: SSC CGL 20/8/2021 (Evening)
(a) 41 (b) 31 (c) 36 (d) 46

Q.315. There are some children in a camp and their average weight is 40 kg. If 5 children with average weight 36 kg join the camp or if 5 children with average weight 43.2 kg leave the camp, the average weight of children in both cases is equal. How many children are there in the camp, initially?
SSC CGL 23/8/2021 (Evening)
(a) 35 (b) 45 (c) 40 (d) 50

Q.316. What is the product of the average of first ten positive odd numbers and the average of first fifteen positive even numbers?
SSC CGL 24/8/2021 (Afternoon)
(a) 85.25 (b) 44 (c) 160 (d) 150

SSC CHSL 2020 Tier - 1

Q.317. The average height of a certain number of students in a group is 155.6 cm. If 12 students having an average height of 150.5 cm join the group and 7 students having an average height of 159 cm leave the group, the average height of the students in the group will decrease by 34 mm. What is the number of students, initially, in the group?
SSC CHSL 5/8/2021 (Morning)
(a) 30 (b) 25 (c) 40 (d) 20

Q.318. The average of the squares of four consecutive odd natural numbers is 201. The average of 7 times of the largest number and 3 times of the smallest number is :
SSC CHSL 6/8/2021 (Evening)
(a) 72 (b) 78 (c) 76 (d) 66

Q.319. There are 3 groups of person- male, female and children. There are 20 males and the number of females and children taken together is 4 more than that of the males. The average weight of the males is 54 kg, that of females is 49 kg and that of children is 30 kg. If the average weight of the whole group is 48.25 kg, then what is the difference between the number of females and the number of children?
SSC CHSL 10/8/2021 (Morning)
(a) 17 (b) 10 (c) 7 (d) 14

Q.320. A, B and C are three positive numbers such that the average of three-fifth of A and 30% of B is 13.5 and the average of $\frac{3}{8}$ times of B and 25% of C is 15. If A is equal to $\frac{5}{12}$ times of C, then the sum of all three numbers A, B and C is:
SSC CHSL 11/8/2021 (Afternoon)
(a) 125 (b) 135 (c) 145 (d) 120

Q.321. The average age of 7 members of a family is 35 years. If the youngest members are twins and they are 15 years old, then what was the average age (in years) of the family members at the time of the birth of the twins?
SSC CHSL 12/8/2021 (Afternoon)
(a) 28 (b) 27 (c) 30 (d) 25

Q.322. The average weight of 30 persons of group A is 3 kg more than the average weight of 25 persons of group B. The average weight of 25 persons of group B is 2.5 kg more than the average weight of 20 persons of group C. If the total weight of 30 persons of group A is 1725 kg, then what will be the average weight of the persons of group A and group C taken together?
SSC CHSL 12/04/2021 (Morning)
(a) 55.3 (b) 55.4 (c) 55.1 (d) 55

Q.323. The average of the squares of four consecutive even natural numbers is 126. The average of 8 times of the greatest number and 5 times of the smallest number is:
SSC CHSL 15/4/2021 (Evening)
(a) 66 (b) 76 (c) 68 (d) 74

SSC CPO 2020 Tier - 1

Q.324. The average weight of a group of 3 people A, B and C is 70 kg. When D joins this group, the average becomes 60 kg. One man E whose weight is 5 kg more than that of D, replaces A and the average weight of B, C, D and E now becomes 59 kg A's weight (in kg) is:
SSC CPO 23/11/2020 (Evening)
(a) 50 (b) 40 (c) 39 (d) 59

Q.325. The average temperature for monday, wednesday and friday was 41°C. The average for wednesday, thursday and friday was 42°C, If the temperature on Thursday was 43°C, then the temperature on monday was:
SSC CPO 24/11/2020 (Evening)
(a) 42°C (b) 40°C (c) 43°C (d) 41°C

SSC CGL 2019 Tier - 2

Q.326. The average of three numbers a, b and c is 2 more than c. The average of a and b is 48. If d is 10 less than c then the average of c and d is:
SSC CGL Tier II (15/11/2020)
(a) 36 (b) 40 (c) 35 (d) 38

Q.327. The number of students in section A and section B of the class are 40 and 52, respectively. The average score in mathematics of all the students is 75. If the average score of the students in A is 20%,more than that of students in B, then what is the average score of students in B?
SSC CGL Tier II (16/11/2020)
(a) 65 (b) 63 (c) 71 (d) 69

Answer Key :-

1.(d)	2.(c)	3.(b)	4.(b)
5.(a)	6.(a)	7.(c)	8.(d)
9.(c)	10.(d)	11.(b)	12.(d)
13.(c)	14.(a)	15.(b)	16.(a)
17.(a)	18.(a)	19.(b)	20.(b)
21.(a)	22.(b)	23.(d)	24.(b)
25.(a)	26.(d)	27.(c)	28.(a)
29.(d)	30.(d)	31.(a)	32.(b)
33.(c)	34.(a)	35.(b)	36.(a)
37.(d)	38.(d)	39.(c)	40.(d)
41.(a)	42.(b)	43.(b)	44.(a)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

45.(d)	46.(b)	47.(b)	48.(d)
49.(a)	50.(b)	51.(c)	52.(b)
53.(d)	54.(d)	55.(c)	56.(a)
57.(d)	58.(b)	59.(c)	60.(a)
61.(d)	62.(c)	63.(c)	64.(c)
65.(a)	66.(b)	67.(d)	68.(b)
69.(b)	70.(a)	71.(d)	72.(c)
73.(c)	74.(d)	75.(a)	76.(c)
77.(d)	78.(b)	79.(d)	80.(d)
81.(c)	82.(c)	83.(a)	84.(b)
85.(d)	86.(d)	87.(d)	88.(d)
89.(d)	90.(d)	91.(a)	92.(a)
93.(a)	94.(b)	95.(a)	96.(c)
97.(b)	98.(a)	99.(a)	100.(c)
101.(a)	102.(d)	103.(b)	104.(d)
105.(a)	106.(a)	107.(b)	108.(b)
109.(c)	110.(b)	111.(d)	112.(a)
113.(d)	114.(a)	115.(a)	116.(b)
117.(b)	118.(d)	119.(a)	120.(b)
121.(c)	122.(a)	123.(a)	124.(c)
125.(c)	126.(b)	127.(b)	128.(d)
129.(a)	130.(a)	131.(b)	132.(c)
133.(b)	134.(b)	135.(a)	136.(c)
137.(c)	138.(a)	139.(b)	140.(d)
141.(c)	142.(b)	143.(c)	144.(a)
145.(c)	146.(d)	147.(d)	148.(c)
149.(b)	150.(a)	151.(a)	152.(a)
153.(b)	154.(a)	155.(d)	156.(b)
157.(d)	158.(c)	159.(b)	160.(d)
161.(b)	162.(a)	163.(d)	164.(c)
165.(a)	166.(d)	167.(b)	168.(d)
169.(a)	170.(b)	171.(a)	172.(b)
173.(c)	174.(b)	175.(d)	176.(b)
177.(a)	178.(b)	179.(a)	180.(a)
181.(b)	182.(b)	183.(d)	184.(a)
185.(d)	186.(b)	187.(d)	188.(b)
189.(b)	190.(d)	191.(b)	192.(c)
193.(b)	194.(a)	195.(d)	196.(b)
197.(b)	198.(d)	199.(b)	200.(a)
201.(c)	202.(d)	203.(c)	204.(b)
205.(c)	206.(a)	207.(a)	208.(a)
209.(b)	210.(d)	211.(b)	212.(c)
213.(d)	214.(c)	215.(c)	216.(a)
217.(b)	218.(c)	219.(a)	220.(d)
221.(c)	222.(b)	223.(b)	224.(d)
225.(c)	226.(d)	227.(b)	228.(d)

229.(b)	230.(b)	231.(d)	232.(b)
233.(d)	234.(d)	235.(c)	236.(a)
237.(d)	238.(b)	239.(a)	240.(d)
241.(d)	242.(a)	243.(c)	244.(c)
245.(a)	246.(a)	247.(a)	248.(c)
249.(d)	250.(b)	251.(a)	252.(a)
253.(c)	254.(d)	255.(a)	256.(a)
257.(a)	258.(a)	259.(d)	260.(d)
261.(c)	262.(b)	263.(d)	264.(b)
265.(b)	266.(a)	267.(d)	268.(d)
269.(a)	270.(d)	271.(c)	272.(d)
273.(d)	274.(b)	275.(d)	276.(b)
277.(b)	278.(d)	279.(b)	280.(d)
281.(c)	282.(d)	283.(b)	284.(a)
285.(a)	286.(b)	287.(b)	288.(b)
289.(a)	290.(a)	291.(a)	292.(d)
293.(c)	294.(b)	295.(c)	296.(a)
297.(c)	298.(d)	299.(c)	300.(b)
301.(c)	302.(d)	303.(b)	304.(d)
305.(a)	306.(b)	307.(a)	308.(a)
309.(a)	310.(a)	311.(d)	312.(c)
313.(b)	314.(d)	315.(b)	316.(c)
317.(d)	318.(c)	319.(b)	320.(a)
321.(a)	322.(a)	323.(b)	324.(c)
325.(b)	326.(b)	327.(d)	

Solutions :-

Sol.1.(d) Total sunday = 5
Days other than Sunday = 25
Average per day = $\frac{5 \times 420 + 25 \times 120}{30}$
$= \frac{2100 + 3000}{30} = \frac{5100}{30} = 170$

Sol.2.(c) The average of six consecutive odd integers is an even integer.

Sol.3.(b) Let total number of apples in the basket = x
Total weight of x number of apples = 0.5 × x = 0.5x kg
Now according to question ,
$\Rightarrow \frac{0.5x - 7 + 3}{x - 10 + 5} = 0.5 - 0.1$
⇒ 0.5x - 4 = 0.4 (x - 5)
⇒ 0.5x - 4 = 0.4x - 2
⇒ 0.1x = 2 ⇒ x = 20

Sol.4.(b) Total weight of (Ram + Ramesh + Shyam) = 76 × 3 = 228 kg --------(i)
Total weight of Ram + Ramesh + Shyam + Somesh = 74 × 4 = 296 kg
Weight of Somesh = 296 - 228 = 68 kg
Weight of Mohan = 68 + 2 = 70kg
Now, weight of Ram + Shyam + Somesh + Mohan = 68 × 4 = 272 kg
Ram + Shyam + (68 + 70) = 272
Weight of (Ram + Shyam) = 272 - 138 = 134kg
Then, weight of Ramesh = 228 - 134 = 94 kg [from equation (i)]

Sol.5.(a) Let the run rate in the remaining 15 overs be x
According to question,
⇒ 5 × 5.6 + 15 × x = 185
⇒ 15 × x = 185 - 28
$\Rightarrow x = \frac{157}{15} = 10.46$

Sol.6.(a) Let value of portfolio = 100
Average return of the portfolio = $\frac{6\% \times 20 + 8\% \times 30 + 4\% \times 20 + (-5\%) \times 30}{100}$
$= \frac{120\% + 240\% + 80\% - 150\%}{100}$
$= \frac{290\%}{100} = 2.9\%$

Sol.7.(c) Let number of student be n and their average weight be x kg
According to the question,
one student weighing 30 kg is added, then the average weight of the class increases by 1 kg
$\frac{nx + 30}{n + 1} = x + 1$
$nx + 30 = nx + x + n + 1$
$x + n = 29$
$n = 29 - x$ -----(i)
and, If one more student weighing 30 kg is added, then the average weight of the class increases by 1.5 kg over the original average
$\frac{nx + 60}{n + 2} = x + 1.5$
$nx + 60 = nx + 2x + 1.5n + 3$
$1.5n + 2x = 57$------(ii)
Putting the value of n from equation (i) to (ii) we get;
$1.5(29 - x) + 2x = 57$
$43.5 + 0.5x = 57$
$x = 27$ kg
Hence, original average weight of class = 27 kg

Sol.8.(d) His earning on 8th day
= 540 + {(+ 21) × 7} + {(− 6) × 7}
= 540 + 105 = 645 ₹

Sol.9.(c) After replacement , av. weight reduced to 65 kg.
It means , changes in total weight = 12 kg.
Weight of C = Weight of X = Weight of Y = 65 kg.
Weight of A = Weight of B
$= 66 + \frac{(12) - (1 + 1)}{2} = 71$ kg.

Sol.10.(d) Weighted average of his profit

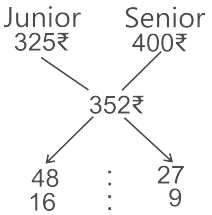
Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{50,000 \times 6 + 20,000 \times 5 + 10,000 \times 8}{6+5+8}$

$= \frac{4,80,000}{19}$ = ₹ 25263.16

Sol.11.(b) Let the total number of senior students be x.
According to question,
$\frac{(325 \times 80) + (400 \times x)}{(80 + x)} = 352$
$26000 + 400x = 28160 + 352x$
$48x = 2160 \rightarrow x = 45$
Short trick :-



16 units = 80 junior students
9 units = $\frac{80}{16} \times 9$ = 45 senior students

Sol.12.(d)
Total price for 10 pens = 10 × 8 = 80 Rs.
Total price for 10 erasers = 10×5 = 50 Rs.
Remaining amount = 150 − 130 = 20 Rs.
Number of sharpeners bought = $\frac{20}{4}$ = 5
Now , Average price per item
$= \frac{150}{10+10+5} = \frac{150}{25}$ = 6 Rs/item

Sol.13.(c)
Let , the average of all students = x
According to the question,
$19 \times 175 + x + 19 = 20x$
$3325 + 19 = 20x - x \Rightarrow x = \frac{3344}{19}$
Total money spent $(20x) = \frac{3344 \times 20}{19}$
= Rs. 3520

Sol.14.(a)
Total score in test = 44 × 50 = 2200
Number of girls = $50 \times \frac{40}{100}$ = 20
Number of boys = 50 − 20 = 30
According to question,
$\frac{Average\ score\ of\ girls}{Average\ Score\ of\ boys} = \frac{5}{4}$
Average score of girls be $5x$ and $4x$.
$(5x \times 20) + (4x \times 30) = 2200$
$100x + 120x = 2200 \Rightarrow x = 10$
Average score of girls $(5x) = 10 \times 5 = 50$

Sol.15.(b) Total sum of 10 number = 10A
According to the question,
⇒ (−48 × 2) + (3 × 56) +
(sum of rest of number) = 11B
Then,
11B - 10A = 72 .....(i)
Given that,
A + B = 438 .....(ii)
Solving on Eq (i) and Eq(ii) we get,
B = 212 and A = 226
So, **A - B = 14**

Sol.16.(a) Sum of total 8 numbers
= 44 × 8 = 352
Sum of first five numbers
= (50 × 3) + (52 × 2) = 254
Let the 6th number be x.
Then, 7th and 8th number
= $(x + 6)$ and $(x + 8)$ respectively
Here,
$x + (x + 6) + (x + 8) = 352 - 254$
$3x = 84 \Rightarrow x = 28$
Therefore, value of 8th number = $(x + 8)$
= (28 + 8) = 36

Sol.17.(a) Let the amount spend by 12th friends = ₹ x
Total amount spend by 12 friends
= (18 ×11) + x
According to the question,
$x = \frac{(18 \times 11) + x}{12} - 11$
$12x = 198 + x - 132 \Rightarrow x = \frac{66}{11}$ = ₹ 6
Total amount spend by 12 friends
= (18 × 11) + x = 198 + 6 = ₹ 204

Sol.18.(a)

subject	score	Weightage	Final score
physics	8	2	8 × 2=16
chemistry	8	3	8 × 3=24
biology	6	3	6 × 3=18
Interview	6.5	4	6.5 × 4=26
total		12	84

Weighted average score
$= \frac{sum\ of\ final\ score}{sum\ of\ weightage} = \frac{84}{12} = 7$

Sol.19.(b) Let highest score = X runs , and lowest score = Y runs
According to question ,
X - Y = 157 .....eqn(1)
Average of 27 innings = 47
Highest and lowest inning excluded then average of 25 innings = 42
(because the average of 25 innings are decreased by 5 runs i.e. 125 runs so 125 runs are increased in X and Y innings though X and Y innings already have 94 runs)
Then ,
X + Y=(25 × 5) + (2 × 47)= 219 .....eqn(2)
On solving eqn(1) and eqn(2) , we get
X = 188 runs

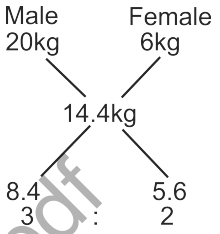
Sol.20.(b)

	Men	:	Women
No of workers →	4	:	1
Average →	30	:	40

Net average age = $\frac{4 \times 30 + 1 \times 40}{4 + 1}$
$= \frac{120 + 40}{5} = \frac{160}{5} = 32$

Sol.21.(a) Average age of husband and wife 3 year ago= 39 years
Present average age of husband and wife= 39 + 3 = 42 years
Average age of husband , wife and child after 2 year= 34 years
Present average age of husband, wife and child= 34 - 2 = 32 years
So, Child's present age is
= 32 × 3 - 42 × 2 ⇒ 96 - 84 = 12 years

Sol.22.(b) according to the question,
Average consumption for male = 20 kg
Average consumption for female = 6 kg
Total average consumption = 14.4 kg
By allegation,



3 → 6
So 1 → 2
Therefore, number of female = 2 × 2 = 4

Sol.23.(d)
Total marks of 10 students = X = 10A
Total marks of 15 students
= Y = (A + 8) × 15 = 15A + 120
According to the question,
$\frac{X}{Y} = \frac{10A}{15A + 120} \Rightarrow \frac{3}{5} = \frac{10A}{15A + 120}$
45A + 360 = 50A ⇒ 5A = 360
A = 72 ; So, X = 10A = 10(72) = 720
Y = 15A + 120 = 15(72) + 120
= 1080 + 120 = 1200
So, A + X + Y = 72 + 720 + 1200 = 1992

Sol.24.(b) Total sales in 7 days of the week = 300 × 2 + 200 × 5 = ₹1600
Total sales in 28 days = ₹1600 × 4 = 6400
Sales on next 2 days = 300 × 2 = ₹600
(as the month starts with saturday)
Total sales in 30 days = ₹6400 + ₹600
= ₹7000
So, the month must have 30 days which in option can only be April.

Sol.25.(a) Ten consecutive odd numbers starting from 5 :-
5, 7, 9, 11, 13, 15, 17, 19, 21, 23
According to question,
Average of ten numbers after applying direction given in question =
$\frac{5 + 7 + (9 + 11 + 13 + 15 + 17 + 19 + 21 + 23) \times 3}{10}$
$= \frac{12 + (128) \times 3}{10} = \frac{12 + 384}{10}$
$= \frac{396}{10}$ = 39.6

Sol.26.(d) Multiple of 2 = 2, 4, 6, ...50 (total 25 numbers)
Multiple of 5 other than multiple of 2

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

= 5, 15, 25, 35, 45 (total 5 numbers)
Sum of multiples of 2 = n(n + 1) = 25 × 26 = 650
Sum of multiples of 5 = 125
Total sum = 775 ; Average = $\frac{775}{30} \approx 25.8$

Sol.27.(c) Difference in the average weight of the students = 45.5 - 44.2 = 1.3
Total difference of the weight
= 1.3 × 40 = 52
So 26 kg is needed to be transfer from section A to B
If two students are transferred then the difference in the weight = 13
So, the average weight of the students transferred from B to A
A = 48.75 - 13 = 35.75

Sol.28.(a) Extra number
= 27 + 10 + 18 = 55
Let the total number of subject = x
Difference in average = 72.6 - 67.6 = 5
$\frac{55}{x}$ = 5 ⇒ x = 11

Sol.29.(d) Total salary of 60 employees
= 60 × 29900 = 1794000
Salary of two officers = 180000
Salary of 8 supervisors
= 8 × 65000 = 520000
Salary of remaining employees
= 1794000 - (520000 + 180000)
= 1094000
Remaining employees = 50
Average of remaining employees
= $\frac{1094000}{50}$ = 21880

Short trick :-
Net Deviation =2 × (90000- 29900) + 8 × (65000 -29900) = 2 × 60100 + 8 × 35100
= 120200 + 280800 = 401000
Average salary of remaining employees
= 29900 - $\frac{401000}{50}$
= 29900 - 8020 = 21880

Sol.30.(d) Sum of First 8 prime numbers
= 2 + 3 + 5 + 7 + 11 + 13 + 17 + 19 = 77
Average = $\frac{77}{8}$
sum of first 10 even numbers= n(n+1)
= 10 × 11 = 110
Average = $\frac{110}{10}$= 11
Required ratio = $\frac{77}{8}$: 11 = 7 : 8

Sol.31.(a)
y = $\frac{4}{5}$ x, z = $\frac{5}{8}$ y , $\frac{y}{x} = \frac{4}{5}$, $\frac{z}{y} = \frac{5}{8}$
$\frac{y}{x} = \frac{8}{10}$, $\frac{z}{y} = \frac{5}{8}$
x = 10 k, y = 8 k, z = 5 k
Reciprocal of the number
= $\frac{1}{10k}, \frac{1}{8k}, \frac{1}{5k}$
Average = $\frac{\frac{1}{10k} + \frac{1}{8k} + \frac{1}{5k}}{3} = \frac{17}{240}$
⇒ $\frac{17}{40k \times 3} = \frac{17}{240}$ ⇒ k = 2
x = 20, y = 16, z = 10
Required average = $\frac{3 \times 20 + 5 \times 16}{2}$ = 70

Sol.32.(b) 2(2 + 5k) + 3(5k - 7) + 4(2k - 3) + 5(k + 2) = (13k - 6) × 2.85
⇒ 4 + 10k + 15k - 21 + 8k - 12 + 5k + 10 = 37.05k - 17.1
⇒ 38k - 19 = 37.05k - 17.1
⇒ 0.95k = 1.9 ⇒ K = 2
No. of times 2 occurred = (2 + 5k) = 12
Total number = (2 + 5k) + (5k - 7) + (2k - 3) + (k + 2) = 20
When 2 is replaced by 6, 12 number is increased by 4
Total increment = 12 × 4 = 48
Increase in average = $\frac{48}{20}$ = 2.4
Final average = 2.85 + 2.4 = 5.25

Sol.33.(c) To solve this problem check the unit digit of the sum and the average multiplied by the total numbers (5)
So unit digit of the sum = 5 + 5 + 5 + x + 6
= 21 + x or x + 1
Unit digit from the average = 411 × 5 = 5
Comparing unit digit = 5 = 1 + x
So x = 4
So, required average
= $\frac{x-1+x-3+x+3+x+5}{4} = \frac{4x+4}{4}$
= $x + 1 = 4 + 1 = 5$

Sol.34.(a) $\frac{a+b+c+d}{4}$ = 2d + 4
a + b + c + d = 8d + 16
a + b= 16, b + c = 10, c + d = 8
(a + b) + (c + d) = 8d + 16
24 = 8d +16 ⇒ d = 1
c =7, b = 3, a = 13
e = 13 + 1 + 1= 15
Average of d and e = $\frac{15+1}{2}$ = 8

Sol.35.(b) Let the average of 4 consecutive odd numbers = x
Average of 3 consecutive even number = y
Sum of four consecutive odd number= 4x
Sum of 3 consecutive even number = 3y
According to the question
y - x = 8
And 4x =3y
Solving both the equation gives ; x = 24

Sol.36.(a) Let us consider by mistake he writes 9th number with its digit interchanged
$\frac{(10x+y)-(10y+x)}{9}$ = 6
9x - 9y = 54 ⇒ x - y = 6

Sol.37.(d) When serial number is added to each number then average = 55
Old average = 55 - $\frac{(1+2+3+.....+10)}{10}$
= 49.5
$\frac{24+45+a+35+59+83+46+b+29+74}{10}$
= 49.5 ⇒ a + b = 100
Average of a + b = 50

Sol.38.(d) Average of 35 consecutive natural numbers = N
Dropping the first 10 numbers and including the next 10 numbers, the average changed to M,
So we can say that the difference between M and N is 10.
M - N = 10.....(1)
$M^2 - N^2$ = 600 ⇒ (M + N)(M - N) = 600
(M + N) = 600/10 = 60.....(2)
Now we can get, from eq(1) and (2)
M = 35, N = 25
the average of 3M and 5N = $\frac{3M+5N}{2}$
= $\frac{3 \times 35 + 5 \times 25}{2}$ = 115

Sol.39.(c) Let the average score of a batsman for 10 innings = A
According to question:-
10×A + 77 = 11×(A + 3)
⇒10 × A + 77 = 11 × A + 11 × 3
⇒ 11 × A - 10 × A = 77 - 33 = 44
⇒ A = 44
Average after 11 innings = 44 + 3 = 47

Sol.40.(d) Before 7 years
Husband age(H) + Child's age (C) + Wife's age (W) = 42 × 3 = 126
After 7 years ,
The sum of their ages
= 126 + (7 × 3) = 147
9 years before
W + C = 36 × 2 =72 yrs
9 years after
W + C = 72 + 18 = 90 yrs.
Husband's age = 147 - 90 = 57 yrs.

Sol.41.(a) Percentage of girls = 35
⇒ percentage of boys = 65
⇒ Boys : Girls = 13 : 7
Let the average age of boys = 6k and the average age of girls = 5k
According to the question
⇒13(6k) + 7(5k) = (13 + 7) × 13.56
⇒ k = $\frac{12}{5}$
Average age of girls (5k) = 5 × $\frac{12}{5}$= 12

Sol.42.(b) Sum of the numbers = 18 × 37.5 = 675
According to the question

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$\frac{675+6x}{18+6}$ = 38.5 ⇒ 675 + 6x = 924
⇒ x = 41.5

Short-trick:
Total increase = (18 + 6) × 1 = 24
This increase will be managed by added six new numbers.
average increase per number
= $\frac{24}{6}$ = 4 ⇒ x = 37.5 + 4 = 41.5

Sol.43.(b) Let the initial number of students = k
According to the question
$\frac{72k-10(78)+4(80)}{k-10+4}$ = 71.3
72k - 460 = 71.3k - 427.8
0.7k = 32.2 ⇒ k = 46

Short-trick:
Let the initial number of students = k
Weight of the students who left is more than the average weight by 6kg and weight of the students who joined is more than the average weight by 8 kg.
Total change in total weight = 4 × 8 - 10 × 6 = - 28 kg.
Here, the negative sign shows that the weight is decreasing.
According to the question
28 = (k - 6) × 0.7 ⇒ 40 = k - 6 ⇒ k = 46

Sol.44.(a) Sum of the numbers
= 33 × 74 = 2442
Sum of first 17 numbers
= 17 × 72.8 = 1237.6
Sum of last 17 numbers
= 17 × 77.2 = 1312.4
⇒17th number
= 1312.4 + 1237.6 - 2442 = 108
Desired average = $\frac{2442-108}{32}$ = 72.9

Short-trick:
Average of first 17 numbers is less than total numbers = 1.2
Sum of first 17 numbers is less than sum of total numbers = 17 × 1.2 = 20.4
Average of last 17 numbers is more than total numbers = 3.2
Sum of last 17 numbers is more than sum of total numbers = 17 × 3.2 = 54.4
final increase = 54.4 - 20.4 = 34
This increase will be adjusted by rest 32 numbers
Average increase = $\frac{34}{32}$ = 1.0625
Average of rest 32 numbers
= 74 - 1.0625 = 72.9375

Sol.45.(d) Total amount spent in three years = 3 x 32000 = 96000
Total petrol purchased in three years = $\frac{32000}{64}+\frac{32000}{80}+\frac{32000}{320}$ = 1000 litres
Average price of petrol per litre
= $\frac{96000}{1000}$ = 96

Sol.46.(b) Month is started with monday so total weekends = 2 × 4 = 8
Total number of visitors on weekends
= 750 × 8 = 6000
Total number of visitors on weekdays
= 450 × 22 = 9900
Desired average = $\frac{6000+9900}{30}$ = 530

Sol.47.(b) As per given data, it can be deduced that the average weight lies from 75kg to 77 kg.
Therefore, Average of possible weight
= $\frac{75+76+77}{3}$ = $\frac{228}{3}$ = 76 kg

Sol.48.(d) Sum of first three numbers
= 3 × 16 = 48
Sum of last three = 3 × 15 = 45
⇒ First term - Last term= 48 - 45 = 3
⇒ First term = 3 + 21 = 24

Sol.49.(a) Sum of numbers from 1 to 100
= $\frac{100(100+1)}{2}$ = 5050
Now, excluding the number 1 each and every number beginning from 2 to 100 are prime or either composite.
Sum of all the prime and composite numbers upto 100 = 5050 - 1 = 5049
Desired average = $\frac{5049}{99}$ = 51

Sol.50.(b) First 15 whole numbers are 0,1,2,3,4 14
Sum of the numbers from 1 to 14
= $\frac{n}{2}$[2a + (n - 1)d]
$\frac{14}{2}$[2(1) + (14 - 1)1] = 105
Desired average = $\frac{105}{15}$ = 7

Sol.51.(c) Sum of first 8 multiples of six
= 6 (1 + 2 + 3 + 4 + 5 + 6 + 7 + 8) = 216
Desired average = $\frac{216}{8}$ = 27

Sol.52.(b) Sum of a and b = 2 × 36 = 72
Sum of b and c = 2 × 42 = 84
Desired difference = 84 - 72 = 12

Sol.53.(d) Average of 1088 numbers is zero, clearly the sum of 1088 numbers is equal to zero. So there can be total 1087 number less than zero and the 1088th number will be equal to the sum of 1087 numbers but with the positive sign.{(i.e 1088th number = (sum of 1087 numbers)}

Sol.54.(d) First 10 prime numbers
= 2,3,5,7,11,13,17,19,23,29
First 10, 2 digit prime numbers
= 11,13,17,19,23,29,31,37,41,43
Desired average
= $\frac{(31+37+41+43)-(2+3+5+7)}{10}$
= 13.5

Sol.55.(c) Average of n even numbers is always (n + 1).

Sol.56.(a) Average of n odd numbers is always n.

Sol.57.(d) Let the number = k
Its reciprocal = $\frac{1}{k}$
According to the question
$\frac{k+\frac{1}{k}}{2}$ = 4 ⇒ k + $\frac{1}{k}$ = 8
⇒ $k^3+\frac{1}{k^3}=8^3-3(8)$ = 488
Desired average = $\frac{488}{2}$ = 244

Sol.58.(b) Let the age of the younger member = k.
According to the question
$\frac{(38\times5)+(10\times5)+(k+k+8)}{7}$ = 38
⇒ 2k + 8 = 38(7 - 5) - 50 ⇒ k = 9
Age of the younger member = 9 years

Sol.59.(c) 75% = $\frac{3}{4}$
Let n = 4
Total increase / decrease in the sum of numbers = (3 × 6) - (1 × 9) = 9
Note : The difference is positive means the total sum is increasing.
Increase in average = $\frac{9}{4}$ = 2.25
Desired average = 36 + 2.25 = 38.25

Sol.60.(a) Let the initial number of students = k
According to the question
75.4k + 72.9 + 73.8 + 79.5 + 87.4 = 75.64 (k + 4)
75.4k + 313.6 = 75.64k + 302.56 ⇒ k = 46

Short-trick:
The Weight of 4 new students is 2.5 kg less, 1.6 kg less, 4.1 kg more and 12 kg more than the average weight of students while the average weight of the class increases by 0.24 kg. All this will be managed by the new students' weight.
According to the question
(0.24)(k + 4) = - 2.5 - 1.6 + 4.1 + 12
0.24k + 0.96 = 12 ⇒ k = 46

Sol.61.(d) Ratio of number of students who take part in games to the students who do not participate = 60 : 40 = 3 : 2
5% = $\frac{1}{20}$
Average weight of students who take part in games = 21k

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Average weight of students who do not take part in games = 20k
According to the question
$5 \times 51\frac{1}{2} = (3 \times 21k) + (2 \times 20k)$
$\Rightarrow 257.5 = 103k \Rightarrow k = 2.5$
the average weight (in kg) of the former group = 21 × 2.5 = 52.5

Sol.62.(c) Average of 27 numbers is zero, clearly the sum of 27 numbers is equal to zero.So there can be total 26 number more than zero and the 27th number will be equal to the sum of 26 numbers but with the negative sign.{(i.e 27th number = -(sum of 26 numbers)}

Sol.63.(c) Total marks of the students
= 68 × 40 = 2720
Actual total marks of the students
= 2720 - 48 - 64 + 84 + 46 = 2738
Desired average = $\frac{2738}{40}$ = 68.45
Short-trick :
Increase in total marks
= 84 + 46 - 48 - 64 = 18
Increase in average = $\frac{18}{40}$ = 0.45
Desired average = 68 + 0.45 = 68.45

Sol.64.(c) Let the average of all the four numbers = A and the last number = k
According to the question
$\frac{A}{3}$ = k - 19 ⇒ A = 3k - 57
3k - A = 57 .....(1)
And Sum of first three numbers
= 12 × 3 = 36
$\Rightarrow \frac{36+k}{4}$=A
4A - k = 36 .....(2)
Multiply equation (1) by 4 and add in equation (2)
⇒12k - 4A + 4A - k = 228 + 36 ⇒ k = 24

Sol.65.(a) Let the number of students in class B = k
⇒ k + k + 10 = 110 ⇒ k = 50
20% = $\frac{1}{5}$
Let the average score of the students of class A = 5k and the average score of the students of class B = 6k
According to the question
60(5k) + 50(6k) = 110 × 72
⇒ 300k + 300k = 7920 ⇒ k = 13.2
the average score of the students of class A = 5 × 13.2 = 66

Sol.66.(b) Let the numbers are a, b and c.
According to the question
$\{(\frac{a+b}{2}) + c\} + \{(\frac{b+c}{2}) + a\} +$
$\{(\frac{a+c}{2}) + b\}$ = 168 + 174 +180
⇒ a + b + c =261
Desired average = $\frac{261}{3}$ = 87

Sol.67.(d)
Weights : 54 , 62 , 65 , 70 , 60 , 59 , 55
Arrange this data in ascending order
54 , 55 , 59 , 60 , 62 , 65 , 70
There are 7 observations, i.e.
odd number
Median = $(\frac{n+1}{2})^{th}$ = $(\frac{7+1}{2})^{th}$ = 4th observation
Hence, Median Weight = 60 kg

Sol.68.(b)
Let five integers be a, b, c, d and e
Average of five integers = 48
Then, (a + b + c + d + e) = 48 × 5 = 240 .....(i)
According to question,
$\Rightarrow \frac{a+b+c+d}{4} = e \times \frac{50}{100}$
$\Rightarrow a + b + c + d = 2e$
Now put the value of in $(a + b + c + d)$ eq . (i)
$\Rightarrow (2e + e) = 240 \Rightarrow e = 80$
Hence, 5th integer will be 80

Sol.69.(b)
Sum of 11 results = 60 × 11 = 660
Sum of first 10 results = 59 × 10 = 590
∴ 11th result = 660 - 590 = 70

Sol.70.(a)
Yearly expenditure of family = 8600 × 3 + 9750 × 4 + 9920 × 5 = ₹1,14,400
Yearly savings of family = ₹65,300
Income = Expenditure + Savings
Yearly Income of family = 1,14,400 + 65,300 = ₹1,79,700
Hence, average monthly income
= $\frac{179700}{12}$ = ₹14,975

Sol.71.(d)
Monthly income of C = monthly income of (A + B + C) - Monthly income of (A + B)
⇒ (3590 + 4250 + 6500) - 2 × 3590
= 14340 - 7180 = ₹7,160

Sol.72.(c) Sum of Sales of an electronics shop in the years (1991, 1992, 1993 and 1994)
= 2000 × 4 = 8000 ...(i)
Sum of Sales of an electronics shops in the years (1992, 1993, 1994 and 1995) = 2200 × 4 = 8800 ....(ii)
On subtracting eq . (i) from eq . (ii),
⇒ 1995 yr - 1991 yr = 8800 - 8000 = 800
⇒ 1800 - 1991 yr = 800 (given 1995 yr = 1800)
⇒ 1991 yr = 1000
Hence, the sales of electronics shop in the year 1991 = 1000

Sol.73.(c) According to question , Sum of given numbers is
⇒ 253 + 245 + 325 + 120 + (115 + 2k)
= 5 × 212
⇒1058 + 2k = 1060 ⇒ 2k = 2
⇒ k = 1
∴ Average of the numbers
= $\frac{353+354+225+220+113}{5}$
= $\frac{1265}{5}$ = 253

Sol.74.(d)

	Boys	Girls
Average →	55.25	68.75
	59.15	
Number →	9.6	3.9
	32 :	13

⇒ 32 unit = 64
⇒ 1 unit = 2
⇒ 13 unit = 26
∴ Number of girls appeared for the test = 26

Sol.75.(a) Average weight of some students = 72 kg
Deviation of weight of 11 students who leave the class = (76 - 72) × 11 = 44 kg
Deviation of weight of 5 students who join the class = (79 - 72) × 5 = 35 kg
Let the number of students after be x then,
⇒ 0.6 × x = 44 - 35
$\Rightarrow x = \frac{9}{0.6} = \frac{90}{6} = 15$
So, Number of students was initially = 15 + 11 - 5 = 21

Sol.76.(c) The average weight of 20 women = 58.5 kg
It was discovered that the weight of one of the women was read as 35 kg instead of 65 kg
Then, net deviation = $\frac{35-65}{20}$ = -1.5
So, Actual weight of the 20 women
= 58.5 + 1.5 = 60 kg

Sol.77.(d) Let the seven consecutive numbers be x, $(x + 1)$, $(x + 2)$, $(x + 3)$, $(x + 4)$, $(x + 5)$ and $(x + 6)$
Average =
$\frac{x+(x+1)+(x+2)+(x+3)+(x+4)+(x+5)+(x+6)}{7}$
95 = $\frac{7x+21}{7}$
95 = x + 3 ⇒ x = 92
Hence, the middle number of the series
= x + 3 = 92 + 3 = 95

Sol.78.(b) Total age of 2 players who left = 20 + 21 = 41years
Now , after replacing these 2 person by another 2
Total increment in the age of 11 players
= 11 × 2 = 22month

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

So , age of 2 person who joined = 41 + 1yr10month = 42yr10month
Average age of the two new players
$= \frac{42\frac{10}{12}}{2} = \frac{514}{12 \times 2} = \frac{257}{12} = 21\frac{5}{12}$yr

Sol.79.(d) Weight of 4 persons
= 81 × 4 + (15 + 4) × 1 = 343 Kg
So, average weight of these 4 persons
$= \frac{343}{4}$ = 85.75 kg

Sol.80.(d) Sum of the marks grade A of class XI = 83 × 3 = 249
Sum of the marks grade B of class XI
= 76 × 4 = 304
Sum of the marks grade C of class XI
= 85 × 5 = 425
Mean of marks of the three grade
$= \frac{249 + 304 + 425}{12}$ = 81.5

Sol.81.(c) Per kg cost of metals
$= \frac{35 \times 2 + 40 \times 3}{2 + 3} = \frac{190}{5}$ = ₹38
So, cost of 12kg of commodity = 12 × 38 = ₹456

Sol.82.(c)
Ratio - teachers : overall
12 : 12 + 2 = 6 : 7
Required average salary
= $7 \times 89500 - 6 \times 71400$ = 626500 - 428400 = ₹198100

Sol.83.(a)
No. of Boys → 65 = 20 + 15 + 30
Ratio → 13 = 4 + 3 + 6
Average → 14 = 14 + 12 + x

Total → 13 × 14 = 14 × 4 + 12 × 3 + 6x
182 = 56 + 36 + 6x
Required average age (x)
$= \frac{182 - 92}{6} = \frac{90}{6}$ = 15 year

Sol.84.(b) Let the highest score be x
⇒ His lowest score = x - 110
According to question,
Total runs scored by player = 40 × 60
= 2400
Total runs scored in the remaining 38 matches = 38 × 58 = 2204
Now,
Highest score + lowest score
= 2400 - 2204
⇒ $x + x$ - 110 = 196
⇒ 2x = 306 ⇒ x = 153
Hence, the highest score will be 153

Sol.85.(d) Let the natural number be x
According to question,
⇒ 27x + 69 - 12 = 32.7x
⇒ 57 = 5.7x ⇒ x = 10

Sol.86.(d) let average of 8 men = x
According to question,
7 × 80 + (x + 70) = 8x
560 + 70 + x = 8x
7x = 630 ⇒ x = 90
Total amount spent = 8x = 8 × 90 = ₹720

Sol.87.(d) Average of 53 consecutive even number = 1280
Then, middle term = 27th no. = 1280
Smallest no. = 1280 - 2 × (26) = 1228
Greatest no. = 1280 + 2 × (26) = 1332
Required difference = 1332 - 1228 = 104

Sol.88.(d) Sum of ages before 3 years -
H + W + S = 27 × 3 = 81 years
Sum of present ages of (H + W + S) = 81 + 9 = 90 years
Sum of ages before 5 years -
W + S = 20 × 2 = 40 years
Sum of present ages (W + S) = 40 + 10
= 50 years
Present Age of husband = 90 - 50
= 40 years

Sol.89.(d) Weighted Average
$= \frac{2 \times 60\% + 4 \times 70\%}{2 + 4}$
Hence, Option (d) is the correct answer.

Sol.90.(d) Let no. of adults = x
According to the question,
7 × 5.5 + 16x = (x + 7) × 11.10
38.5 + 16x = 11.10x + 77.70
16x - 11.10x = 77.70 - 38.5
4.9x = 39.20
$x = \frac{39.20}{4.9}$ = 8

Sol.91.(a) Average of prime number between 30 and 50
$= \frac{31 + 37 + 41 + 43 + 47}{5}$ = 39.8
Numbers between 20 and 50 which are multiple of 3 = 21, 24 , 27 , 30 , 33 , 36 , 39 , 42 , 45 , 48
Sum = $\frac{n}{2}$ (2a + (n -1)d)
Sum = $\frac{10}{2}$ (2 × 21 + (10 -1)3) = 5 × 69
= 345
Average = $\frac{345}{10}$ = 34.5
Required difference = 39.8 - 34.5 = 5.3

Sol.92.(a)
Ratio → Daughter : Mother
5 : 9
Average = $\frac{5 + 9}{2}$ = 7 unit
7 unit = 42 years
Daughter's age (5 unit) = $\frac{42}{7} \times 5$
= 30 years

Sol.93.(a) $a + b + c$ = 117 ... (i)
$b + c + d$ = 105 ... (ii)
$d = \frac{3}{5}a$ ... (given) ... (iii)
From (i) and (ii)
$a - d$ = 117 - 105 = 12
$a - \frac{3}{5}a$ = 12 ... from (iii)
2a = 60 ⇒ a = 30
then, fourth number (d) = $\frac{3}{5}a$
$= \frac{3}{5} \times 30$ = 18

Sol.94.(b) Average score of girls
$= 16.2 + \frac{(Deviation) \times 18}{no.\ of\ girls}$
$= 16.2 + \frac{0.2 \times 18}{12}$
$= 16.2 + \frac{3.6}{12}$
= 16.2 + 0.3 = 16.5

Sol.95.(a)
Deviation = 55 - 79.75 = (-24.75×4) = -99
Average of first 4 no. = 79.75 | Average of next 3 no.= 55 - $\frac{99}{3}$ = 22
Average of 7 numbers = 55

Sol.96.(c) Let Average age of whole class = 15 years
Deviation of average of 28 boys
= (15 - 16) × 28 = -28
Deviation of average of 26 girls
= (15 - 15) × 26 = 0
Net deviation = $\frac{-28 + 0}{54}$
$= \frac{-14}{27} \approx -\frac{1}{2}$
Average age of the class = 15 + $\frac{1}{2}$
$= 15\frac{1}{2}$

Sol.97.(b) Let 1st no. = 2x, then 2nd no. = x and 3rd no. = $x - 4$
According to question
$\frac{2x + x - 4}{2}$ = 16
3x − 4 = 32 ⇒ $x = \frac{36}{3}$ = 12
Hence, 2nd no. = 12

Sol.98.(a) Let the present age of Prachi be x and her daughter be y
According to the question,
Seven years ago-
(x - 7) = 4(y - 7)
x - 4y = - 21 -------(i)
After four years -
(x + 4) = 2.5(y + 4)
x - 2.5y = 6 -------(ii)
Subtract eq . (i) from (ii) we get;
1.5y = 27 ⇒ y = 18
Putting y = 18 in equation (i) we get;
x - 4 × 18 = - 21 ⇒ x = 72 - 21 = 51
So, sum of present age of Prachi and her daughter ($x + y$) = 51 + 18 = 69 years

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.99.(a) Temp. on 16th day
= 16 × (22 + 26) - 31 × 24
= 768 - 744 = 24°C

Sol.100.(c) First 45 natural numbers
= 1,2,3, ----------, 44,45
Average of Square of natural numbers
$= \frac{n(n+1)(2n+1)}{6}$
$= \frac{45(45+1)(2\times45+1)}{6}$
$= \frac{45\times46\times91}{6}$ = 31395
Now, average = $\frac{31395}{45}$ = 697.67

Sol.101.(a) Since both groups of 12 and 18 students have the same average score of 62, the total sum of their scores will also result in an average of 62 for the entire group.

Sol.102.(d) Prime no's lying between 50 & 76 = 53, 59, 61, 67, 71, 73
Required average
$= \frac{53+59+61+67+71+73}{6} = \frac{384}{6}$ = 64

Sol.103.(b)
No of students 12 : 18 = 2 : 3
Average score 62 62 + 12
Average score of the class
$= 62 + \frac{12\times3}{2+3}$ = 62 + 7.2 = 69.2

Sol.104.(d) Sum of last three numbers
= 12 × 48 - 5 × 45 - 4 × 52 = 143
10th number = x + 5
11th number = x + 15
12th number = x
⇒ x + 5 + x + 15 + x = 143
⇒ 3x + 20 = 143 ⇒ x = 41
Hence, average of 11th and 12th number
$= \frac{2(41)+15}{2}$ = 48.5

Sol.105.(a) Sum of square of first 47 natural number = $\frac{n}{6}$(n + 1)(2n + 1)
= $\frac{47}{6}$(47 + 1)(2 × 47 + 1) = $\frac{47}{6}$(48)(95)
= 47 × 8 × 95 = 35720
Average of square of first 47 natural numbers = $\frac{35720}{47}$ = 760

Sol.106.(a) Increase average
= 10 × 0.5 = 5 kg
So, new student weight = 51 + 5 = 56 kg

Sol.107.(b) Total Score in twenty matches = 15 × 20 = 300
Total Score in twenty - five other matches
= 24 × 25 = 600
average score in all the forty-five matches = $\frac{300+600}{45}$ = 20

Sol.108.(b) Let the average age of seven member be x
sum of the age of the six members
= 42 × 6 = 252
According to the question,
7x = (36 + x) + 252 ⇒ 6x = 288 ⇒ x = 48
Age of the seventh member
= 48 × 7 - 252 = 84 years

Sol.109.(c)
Let the average of 30 student be 61
12 students average = 62
Deviation = (62 - 61)12 = +12
18 students average = 60
Deviation = (60 - 61) × 18 = -18
Net deviation = 12 -18 = -6
Now,
Average of 30 students
= 60 + $\frac{-6}{30}$ = 61 - 0.2 = 60.8

Sol.110.(b) Total students = 30
Average score of 10 students = 90
Average score of 20 students = 75
Average score of 30 students
$= \frac{10\times90+20\times75}{30} = \frac{900+1500}{30}$
$= \frac{2400}{30}$ = 80 marks

Sol.111.(d)
Average score of 12 students = 60
Average score of 18 students = 80
Average score of class
$= \frac{12\times60+18\times80}{30} = \frac{720+1440}{30}$
$= \frac{2160}{30}$ = 72

Sol.112.(a) Total = 150 , Girls = 60
Boys = 150 - 60 = 90
Average weight of whole class
$= \frac{90\times52+60\times48}{150} = \frac{3\times52+2\times48}{5}$
$= \frac{156+96}{5} = \frac{252}{5}$ = 50.4

Sol.113.(d)
Total expenditure of the family =
2500 × 4 + 2750 × 5 + 3550 × 3 = 34400
Total saving of family = 5500
Now, income = expenditure + savings
income = 34400 + 5500 = Rs. 39900
Hence, average monthly income of family
$= \frac{39900}{12}$ = Rs. 3325

Sol.114.(a) Average balance =
$\frac{(25\times5000)+(2\times20000)+(3\times1500)}{25+2+3}$ = 5650

Sol.115.(a)
Total salary of T in one year =
3000(12 + 15 + 21 + 30) = 234000
Average salary of T = $\frac{234000}{12}$ = 19,500

Sol.116.(b) average of 50 numbers N_1, N_2, _____ N_{50} is M
M = $\frac{N_1+N_2+___+N_{50}}{50}$
$N_1 + N_2 + ___ + N_{50}$ = 50M------(i)
Now, numbers N_1-100, N_2-100, ------N_{50} -100
Average =
$\frac{(N_1-100)+(N_2-100)___(N_{50}-100)}{50}$
$= \frac{(50M-100\times50)}{50}$ = M - 100
Hence, required average = M - 100

Sol.117.(b) Sum of 40 students weight = 40 × 33 = 1320 kg
Sum of 32 students weight
= 32 × 15 = 480 kg
Average of total students
$= \frac{1320+480}{72}$ = 25 kg

Short tricks:- 40 : 32 = 5 : 4
Ratio - 5 : 4
33 : 15

Final - 165 : 60
Required average = $\frac{165+60}{5+4}$ = 25 kg

Sol.118.(d) Let number be x
According to the question,
$x + \frac{1}{x}$ = 4
if $x + \frac{1}{x}$ = a then, $x^3 + \frac{1}{x^3}$ = a^3 - 3a
$x^3 + \frac{1}{x^3}$ = 4^3 - 3 × 4 = 52
Hence, required average = $\frac{52}{2}$ = 26

Sol.119.(a)
Cost of 4 books = 4 × 50 = 200
Cost of 5 books = 5 × 60 = 300
Cost of 6 books = 6 × 70 = 420
Average cost = $\frac{200+300+420}{4+5+6}$ = 61.33

Sol.120.(b)
Let take total number of students be x
According to question,
Total increase marks = x × 0.5 = $\frac{x}{2}$
So, $\frac{x}{2}$ = 93 - 63
⇒ x = 30 × 2 = 60

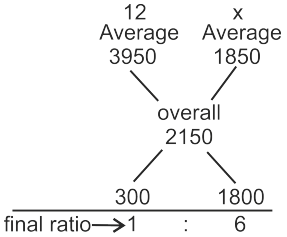
Sol.121.(c) Average weight =
$\frac{67+85+70+90+103}{5} = \frac{415}{5}$ = 83 kg

Sol.122.(a)
Average weight of remaining 30 student
= 40 - 5 × $\frac{(42-40)}{35-5}$ = 40 - $\frac{1}{3}$ = 39$\frac{2}{3}$kgs

Sol.123.(a)

Search on TG: @apna_pdf

Search on Telegram @apna_pdf



$\frac{12}{x} = \frac{1}{6}$ ⇒ x = 72

Total employees = (x + 12) = 84

Sol.124.(c)

As we know, no. of Sunday in the month of 30 days beginning with sunday = 5

	Sunday		Remaining days
No of days	5	:	25 = 1 : 5
Average	410		230

Overall average = $\frac{410 \times 1 + 230 \times 5}{1+5}$

= $\frac{410 + 1150}{6} = \frac{1560}{6}$ = 260

Sol.125.(c) Average rate of pass % =

$\frac{\frac{84}{100} \times 75 + \frac{52}{100} \times 50}{75 + 50} \times 100$

= $\frac{21 \times 3 + 26}{125} \times 100$

= $\frac{63 + 26}{125} \times 100 = \frac{89}{5} \times 4 = 71\frac{1}{5}$

Sol.126.(b) Average of 50 numbers = 23

New average when each number is multiplied by 13 = average × 13

= 23 × 13 = 299

Sol.127.(b)

Sum of the ages of boys = 25 × 3 = 75 yrs

ATQ,

(3 + 5 + 7) = 15 unit ---------- 75

Then, 3 unit ---------- $\frac{75}{15}$ × 3 = 15 yrs

So, the age of the youngest boy = 15 yrs

Sol.128.(d) Increment in average

= $\frac{99 - 66}{55} = \frac{33}{55}$ = 0.6

Sol.129.(a) Total weight of 60 students = 60 × 42 = 2520

Total weight of boys = 36 × 50 = 1800

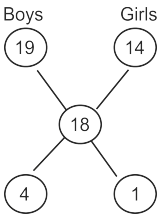
Total weight of girls = 2520 - 1800 = 720

Average weight of girls = $\frac{720}{24}$ = 30

Sol.130.(a) Required average

= $\frac{642 + 253 + 834 + 303}{4} = \frac{2032}{4}$ = 508

Sol.131.(b)



Ratio → Boys : Girls

4 : 1

Given total number of girls = 30

⇒ total number of boys = 30 × 4 = 120

Sol.132.(c)

The average of v numbers = w^2

⇒ sum of v numbers = v.w^2

And Average of w numbers = v^2

⇒ sum of w numbers = w.v^2

Now, Average of all numbers

= $\frac{sum\ of\ all\ numbers}{total\ numbers}$

⇒ A = $\frac{v.w^2 + w.v^2}{v + w}$ ⇒ A = v.w

Sol.133.(b) Let total members = 100x

⇒ total men = 70x

And total women = 30x

Average age of men = 30 years

⇒ total age of men

= 70x × 30 = 2100x years

And average age of women = 40 years

⇒ total age of women

= 30x × 40 = 1200x years

Now, Average age of all members(A)

= $\frac{total\ age\ of\ all\ members}{total\ members}$

⇒ A = $\frac{2100\,x + 1200\,x}{100\,x}$

⇒ A = $\frac{3300\,x}{100\,x}$ = 33 years

Sol.134.(b)

Let the total run in next innings be x

12 × 42 + x = 44 ×13

504 + x = 572 ⇒ x = 572 - 504 = 68

Sol.135.(a) Weight of the new person

= 55 + 14 × 4 = 55+ 56 = 111 kg

Sol.136.(c)

	Orange		Mango		Strawberry
Quantity	80	:	50	:	120
	= 8	:	5	:	12
Price/unit	2		3		3.50

Average cost = $\frac{8 \times 2 + 5 \times 3 + 12 \times 3.50}{8 + 5 + 12}$

= $\frac{16 + 15 + 42}{25} = \frac{73}{25}$ = ₹2.92

Sol.137.(c)

Let the average cost of sharpener be S

According to the question,

8 × 4 + 4 × 8 + 12S = 148

32 + 32 + 12S = 148

64 + 12S = 148

12S = 84 ⇒ S = $\frac{84}{12}$ = ₹7

Sol.138.(a) The average score difference of A in all the nine games

= $\frac{12 + 3 + 8 + 4 + 1 - 4 - 1 - 2 - 3}{9}$

= $\frac{18}{9}$ = 2

Sol.139.(b).

Total temperature of a city for the first four days of the week = 100°C

Total temperature of a city for the last four days of the week = 120°C

Total temperature of a city for eight days of the week = 100 + 120 = 220°C

Total temperature for the seven days of the week = 27 × 7 = 189°C

⇒ the temperature on the fourth day

= 220 - 189 =31°C

Sol.140.(d) Total number of boys = 5

Let average weight of 5 boys = A

⇒ Total weight = 5A

Let the weight of new boy = x years

Given, 5 (A + 9) = 5A - 39 + x

⇒ 5 A + 45 = 5A - 39 + x ⇒ x = 84 years

Sol.141.(c) Total Price = 20 × 30 + 30 × 50 = 600 + 1500 = 2100 ₹

Now, Average price = $\frac{Total\ price}{total\ weight}$

= $\frac{2100}{50}$ = ₹42 per kg

Sol.142.(b)

Total marks of class X = 45 × 30 = 1350

Total marks of class Y = 35 × 18 = 630

Hence,

average marks of the students of both classes = $\frac{total\ marks}{total\ number\ of\ students}$

= $\frac{1350 + 630}{45 + 35} = \frac{1980}{80}$ = 24.75

Sol.143.(c)

Let the average weight of 10 persons = A

⇒ Total weight = 10 A

Let the weight of new person = x kg

Given

10 (A + 3.5) = 10 A - 45.5 + x

⇒ 10A + 35 = 10 A - 45.5 + x

⇒ x = 45.5 + 35 ⇒ x = 80.5 kg

Sol.144.(a) Sum of the deviation of first 5 no from the overall average = (45 - 47) × 5 = -2 × 5 = -10

Sum of the deviation of next 4 no from the overall average

= (52 - 47) × 4 = + 5 × 4 = +20

Net deviation = 20 - 10 = +10

Let 10th no be x.

Then,

11th no = (x+10) and 12th no = (x- 5)

According to the question,

x + (x + 10) + (x - 5) = 47 × 3 -10 (since net deviation should be zero)

3x + 5 = 131 ⇒ 3x = 131 - 5 = 126

x = $\frac{126}{3}$ = 42

So, the average of 11th and 12th no

= $\frac{x + 10 + x - 5}{2} = \frac{2x + 5}{2}$

= $\frac{2 \times 42 + 5}{2} = \frac{89}{2}$ = 44.5

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.145.(c) Apples Grapes
No of fruits 10 : 5 = 2 : 1
Price /kg 94.50 105
Average amount received by the fruit seller = $\frac{2 \times 94.50 + 1 \times 105}{2+1}$
= $\frac{189+105}{3}$ = $\frac{294}{3}$ = ₹98

Sol.146.(d) Male : Female
No of students → 40 : 60
2 : 3
Average height → (162 + 6) : 162
Average height of the faculty of the university = 162 + $\frac{6 \times 2}{2+3}$ = 162 + $\frac{12}{5}$
= 162 + 2.4 = 164.4 cm

Sol.147.(d)
Average weight of 15 students = 70 kg
Deviation in the average weight of 5 students
= -5 + (-2) + (-25) + 7 + (-8) = -33 kg
Change in the average weight
= $\frac{-33}{15+5}$ = $\frac{-33}{20}$ = -1.65 ≈ - 2 kg
(-ve) sign means decrease so weight decrease by 2 kg

Sol.148.(c)
No of Student 1 : 3
Average weight $(x+8)$ x
Net average weight = $\frac{1 \times (x+8) + 3x}{1+3}$ = $\frac{4x+8}{4}$ = $x + 2 \Rightarrow 62 = x + 2 \Rightarrow x = 60$
Weight of Rohan = 60 + 8 = 68 kg

Sol.149.(b) According to question, we have ;
A + B = 5050 × 2 ---------- (1)
B + C = 6,250 × 2 ---------- (2)
C + A = 5,200 × 2 ---------- (3)
Adding eqn(1), (2) & (3) we have ;
2(A + B + C) = 2(5050 + 6250 + 5200)
A + B + C = ₹16,500

Sol.150.(a)
No of matches 3 : 2
Average score 23 + 15 23
Overall average score = 23 + $\frac{15 \times 3}{3+2}$
= 23 + 9 = 32

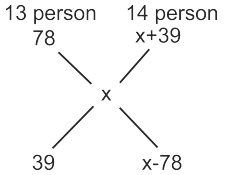
Sol.151.(a)
Ratio of Men and Women = 60 : 40 = 3 : 2
Average age of Men = 55 years
Average age of Women = 45 years
∴ Average age of all Members =
$\frac{55 \times 3 + 45 \times 2}{5}$ = 51 years

Sol.152.(a)
Average weight of 40 students = 52 kg
∴ Total weight of 40 students
= 52 × 40 = 2080
Now, Total weight including teacher =
52.5 × 41 = 2152.5 kg
∴ Weight of teacher
= 2152.5 - 2080 =72.5 kg

Sol.153.(b)
Let the average salary of remaining staff = x
Ratio of teaching and non-teaching staff
= 5 : 35 = 1 : 7
According to question,
$1 \times x + 7 \times 4200 = 8 \times 4000$
$x = 32000 - 29400 =$ ₹2600

Sol.154.(a)
All prime numbers between 69 and 92
= (71, 73, 79, 83, 89)
∴ Average = $\frac{71+73+79+83+89}{5}$ = 79

Sol.155.(d) Let the average weight of 14 persons be x



ATQ,
$\frac{39}{x-78} = \frac{13}{1}$
3 = x - 78 ⇒ x = 81 kg
So, the weight of 14th person
= 81 + 39 = 120 kg

Sol.156.(b)
Let the average of 15 people = x
According to question,
Weight of the new person = 15 × 3.2 + 52
= 48 + 52 = 100 kg

Sol.157.(d) According to the question,
Correct average = 39 + $\frac{65-56}{45}$ = 39.2

Sol.158.(c)
Average salary of 50 faculty = 30,000
Average salary of 35 faculty = 37,500
Net deviation = $\frac{(37,500 - 30,000) \times 35}{15}$
= 17,500
Average salary of 15 faculty
= 30,000 - 17,500 = 12,500

Sol.159.(b) According to the question,
Total weight of the class = 37 × 50
= 1850 kg
Total weight of the girls = 46 × 22
= 1012 kg
Average weight of the boys
= $\frac{1850-1012}{37-22}$ = 55.87 kg

Sol.160.(d) Average marks in Mathematics, Social and Computer science
= $\frac{72+58+83}{3}$ = 71
Average marks in Sanskrit , English and Mathematics = $\frac{62+58+72}{3}$ = 64
Required difference = 71 − 64 = 7

Sol.161.(b) Average of first n natural numbers = $\frac{(n+1)}{2}$
Required average = $\frac{(69+1)}{2}$ = 35

Sol.162.(a) According to the question,
Sum of Total age of the family = 44 × 3
= 132 years
Sum of total age of the family after the marriage of son = 39 × 4 = 156 years
Age of the daughter-in-law = 156 - 132
= 24 years

Sol.163.(d) Short trick :-
Average after 13th innings
= 96 − (13 − 1) × 3 = 60

Sol.164.(c) Let four consecutive odd numbers = x , $x + 2$, $x + 4$ and $x + 6$
Average = $\frac{x + x + 2 + x + 4 + x + 6}{4}$ = 58
$4x$ + 12 = 232 , x = 55
Lowest number (x) = 55

Sol.165.(a)
Required per day average balance
= $\frac{5600 \times 24 + 12000 \times 2 + 37500 \times 4}{30}$
= $\frac{308400}{30}$ = ₹10,280

Sol.166.(d) Average speed = $\frac{2xy}{x+y}$
= $\frac{2 \times 55 \times 95}{55+95}$ = $69\frac{2}{3}$

Sol.167.(b)
Let the total number of students are x and their average marks is y
Total marks of the students in the class = xy
According to the question,
$\frac{xy-42}{x} = y - 1.5$
$\Rightarrow xy - 42 = xy - 1.5x \Rightarrow x = \frac{42}{1.5} = 28$

Sol.168.(d)
Let the initial number of students be x
According to the question,
$(x + 7) \times 56.2 = (7 \times 58) + (x \times 56)$
$0.2x = 7 \times (58 - 56.2)$
$0.2x = 12.6 \Rightarrow x = 63$

Sol.169.(a)
Let the average expenditure = x
Total expenditure = $75x$
According to the question,
$90(x - 5) = 75x + 240$
$90x - 450 = 75x + 240$

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$x = \frac{240 + 450}{15} = 46$

Original expenditure of hostel

= 75 × 46 = Rs. 3450

Sol.170.(b) Let the numbers of the students in class = x

New average = 16 - 0.5 = 15.5 years

According to the question,

⇒ $(x \times 16) + (13 \times 4) = 15.5(x + 4)$

⇒ $16x + 52 = 15.5x + 62$

⇒ $0.5x = 10 \Rightarrow x = 20$

Sol.171.(a)

Boy's height Girl's height

118 95

Average height ⟶ 100

{5} : {18}

5 units = 20 boys

18 units = $\frac{20}{5} \times 18$ = 72 girls

Sol.172.(b) Average speed

$= \frac{500 + 400}{175 + 125} = \frac{900}{300}$ = 3 m/sec

Sol.173.(c) Required average

$= \frac{2 \times 40 + 2 \times 60}{2} = \frac{200}{2} = 100$

Sol.174.(b) Let the number of students = n

Difference between numbers = 54 - 45 = 9

According to the question,

$0.5 = \frac{9}{n}$

(Number of students) n = 18

Sol.175.(d) Average marks of math, hindi and english = $\frac{62 + 65 + 74}{3} = 67$

Average marks of math, physics And chemistry = $\frac{62 + 68 + 68}{3} = 66$

Required difference = 67 - 66 = 1

Sol.176.(b) Weight of new player

= 63 + (12×1.5) = 81 kg.

Sol.177.(a)

Tech. Non-Tech.

12000 4000

6000

2 : 6

2 unit = 100

Then , 8 units (total) = 400 workers

Sol.178.(b) Required new average

$= 14 + \frac{(14.6 - 14) \times 5}{30}$

= 14 + 0.1 = 14.1 years

Sol.179.(a) Sum of min. and max. score

= (30 + 30) + $\{(30 - 28)\, m \times 40\}$

= 140 runs

max. runs − min. runs = 100 runs

So , min. runs = 20 and max. runs = 120

Sol.180.(a) Raghav's opinion

= 64 < x < 74 (65 to 73)

His sister's opinion

= 60 < x < 69 (61 to 68)

His mother's opinion = x ≤ 68

His fathers's opinion = x ≤ 67

Here , possible values are 65 , 66 , 67

So, required average = 66 kg.

Sol.181.(b) According to question,

Required Average

$= \frac{(45 \times 3) + (55 \times 2) + (60 \times 2)}{7}$

= 52.1 marks

Sol.182.(b) Using deviation method ,

Weight of teacher = 60 + (31 × 0.5)

= 75.5 kg.

Sol.183.(d) According to question,

Required Average

$= \frac{15500 + 12500 + (7000 \times 2)}{7}$ = 6000

Sol.184.(a) Using weighted average :-

Overall average score

$= 62 + \frac{(75 - 62) \times 18}{40}$

$= 62 + \frac{234}{40}$ = 67.85 marks

Sol.185.(d) According to question,

Required average

$= \frac{(55 \times 50) + (60 \times 55) + (45 \times 60)}{55 + 60 + 45}$

$= \frac{2750 + 3300 + 2700}{160}$ = 54.68

Sol.186.(b) Required average

$= \frac{(2)^2 + (4)^2 + (6)^2 + (8)^2 + (10)^2}{5}$

$= \frac{4 + 16 + 36 + 64 + 100}{5} = \frac{220}{5}$ = 44

Sol.187.(d) Total Marks obtain by 19 boys = 19 × 48 = 912

Marks when highest and lowest marks removed = 17 × 44 = 748

Average of highest and lowest marks

$= \frac{912 - 748}{2}$ = 82

Sol.188.(b) Average of 24 number = 43

After subtracting 'M' from each number, then new average will be ⇒ 43 − M = 38

So, value of 'M' = 43 − 38 = 5

Sol.189.(b) Total expenditure of 5 days

= 160 × 5 = ₹ 800

Total expenditure of 4 days

= 90 +135 +75 +180 = ₹ 480

Expenditure of 5th day = 800 - 480 = ₹320

Sol.190.(d) According to the question,

a + b + c + d = 180

$\frac{a + b}{2} = 3\left(\frac{c + d}{2}\right)$

a + b = 3c + 3d ⇒ 4c + 4d = 180

c + d = 45 ⇒ a + b = 3 × 45 =135

Sol.191.(b) According to the question,

$156 = \frac{162x + 150(40 - x)}{40}$

⇒ $6240 - 6000 = 162x - 150x$

$12x = 240$ ⇒ remaining sticks (x) = 20

Sol.192.(c) According to question,

Total age of 2 students

= (50 × 3) − 56 = 94 years

Age of Last student

= (48 × 3) − 94 = 50 years

Sol.193.(b) Let the number of student = x

Decrement in the average weight

= 42 - 41.6 = 0.4 kg

Total decrement in the weight = $0.4x$ kg

Average weight decreased = (48 - 44) = 4 kg

According to the question, $0.4x = 4$

(Total student) $x = 10$

Sol.194.(a) Average remains the same , when we add the next 2 and previous 2 odd numbers in a series of given 7 consecutive odd numbers.

According to the question ,

Next 3 odd numbers and 2 previous odd numbers is added ,

So , average increase = + 1

New average = (A + 1)

Sol.195.(d) According to the question,

$\frac{S1 + S2}{2} = 30 + \frac{S2 + 50}{2}$

$\frac{S1}{2} = 30 + 25 \Rightarrow S1 = 55 \times 2 = 110$

Sol.196.(b) Average of 120 members of the society = 62.5years

After addition of 30 new members, decrement in the overall average

= 62.5 - 58.2 = 4.3 years

therefore , the average age of 30 new members = $62.5 - \frac{4.3 \times 150}{30}$

= 62.5 - 21.5 = 41 years

Sol.197.(b) According to the question,

age of the 6 girls = 6x

Total age of the four new girls

= (x- 2 + x + 4 + x + 8 + x + 10) = 4x +20

So, the new average of the class

$= \frac{6x + 4x + 20}{10}$ = x + 2

Sol.198.(d) Let the 9 consecutive odd number = x, x + 2, x + 4, x + 6, x + 8, x + 10, x + 12, x + 14, x + 16

According to the question,

Average (5th term) → (x + 8) = 27 ⇒ x = 19

Then, the consecutive odd numbers

= 19, 21, 23, 25, 27, 29, 31, 33, 35,

Search on TG: @apna_pdf

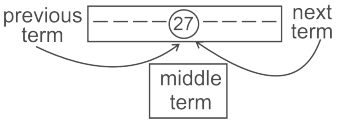
Search on Telegram @apna_pdf

After adding previous odd number(17) and next odd number (37) , then the new average (6th term) = 27.

Short Tricks:-

Average of 9 consecutive odd number = 5th term

Now, Average of 11 consecutive odd number = 6th term



Sol.199.(b)

Let the first three integers = x , x+1, x+2

Average of 10 consecutive integers

$(\frac{5th\ term + 6th\ term}{2}) = \frac{2x+9}{2} = \frac{33}{2}$

⇒ x = 12

Therefore, average of first three integers

$= \frac{3x+3}{3} = \frac{3 \times 12 + 3}{3} = 13$

Sol.200.(a) Let the current ages of husband, the wife and the child = x,y, and z respectively

According to the question,

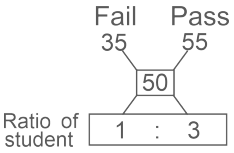
x + y + z = 90----------(1)

And x + z = 52---------(2)

By eq . 1st and 2nd

Present age of wife(y) = 38 years

Sol.201.(c)



the ratio of marks of pass students to the total marks of fail students

= 55 × 3 : 35 × 1 ⇒ 33 : 7

Sol.202.(d) Average of two numbers of the middle = 13.5

So , their sum = 27 and the numbers are 13 and 14.

First six numbers of the series are

= 9 , 10 , 11 , 12 , 13 and 14

Required sum

= 9 + 10 + 11 +12 +13 +14 = 69

Sol.203.(c) Let , 6 consecutive numbers are → x , x + 2 , x + 4 , x + 6 , x + 8 and x + 10

Average of 6 consecutive even numbers $(x + 5)$ = 35

Average = x + 5 = 35 , ⇒ x = 30

Required sum = $x + (x + 10)$ = 70

Sol.204.(b) The sum of the children's age = 15 × 5 = 75

The sum of the family's age

= 25 × 7 = 175

The sum of mother and father's age

= 175 – 75 = 100

Let the mother's age = x

father's age = x + 4

According to the question,

2x + 4 = 100 ⇒ x = 48

Sol.205.(c) Sum of first 8 positive even no. divisible by 9 ,

9 (2 + 4 + 6 + 8 + 10 +12 +14 + 16)

= 9 × 72 = 648

Required average = $\frac{648}{8}$ = 81

Sol.206.(a) Let age of ram be a years , age of Shyam be b years and age of Rahim be c years

a + b = 56 -------e.q .(1)

c + b = 52 -------e.q .(2)

a + c = 60 -------e.q .(3)

On subtracting e.q .(2) from e.q .(1); we get

a - c = 4 -------e.q .(4)

On adding e.q .(3) and e.q .(4); we get

a = 32

⇒ b = 24 and c = 28

Sol.207.(a) Man spends money in First 4 months = 2300 × 4= Rs. 9200

He spends money in next 8 months

= 1800 × 8 = Rs. 14400

Yearly money spent by him

= 14400 + 9200 = 23600

And he saves money in 1 year

= Rs. 12400

His monthly income

$= \frac{12400 + 23600}{12} = Rs.\ 3000$

Sol.208.(a) 6 years before sum of family's age = 42 × 3 =126

Family's present age = 126 + 18 = 144

Age of wife and children before 8 years

= 30 × 2 = 60

Wife and children's present age

= 60+16 = 76

Present age of abhay

= 144 – 76 = 68 years

Sol.209.(b) Let 1st number be x.

The sum of 5 numbers = 60 × 5 = 300

The sum of 4th and 5th numbers = 120

The sum of 1st, 2nd and 3rd numbers

= 300 – 120 = 180

$x + \frac{1}{2}x + \frac{3}{2}x$ = 180 = x = 60

So, 3rd number = $\frac{3}{2}x = \frac{3}{2} \times 60$ = 90

Sol.210.(d) Let the first 5 consecutive even numbers = x , x + 2 , x + 4 , x + 6 , x + 8

Their average = $\frac{5x+20}{5}$ = A ⇒ x + 4 = A

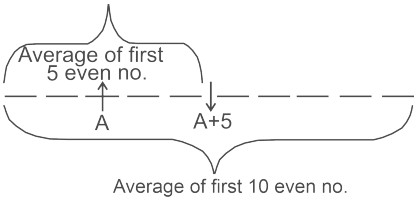
If the next 5 even numbers (x + 10 , x + 12 , x + 14 , x + 16 , x + 18) be included

Then, average = $\frac{10x+90}{10}$ = x + 9

⇒ A + 5

Therefore, the average of these 10 consecutive even numbers = A + 5

Short Tricks :-



Sol.211.(b) $\frac{(X+Y)}{2}$ + 35 = $\frac{(Y+Z)}{2}$

$X + Y$ + 70 = Y + 85 = X = 15

Sol.212.(c)

First five natural numbers → 1, 2, 3, 4, 5

Required average

$= \frac{1^3 + 2^3 + 3^3 + 4^3 + 5^3}{5} = \frac{225}{5}$ = 45

Sol.213.(d) Sum of numbers = Average of numbers × No . of observations

Sum of numbers = 32 × 20 = 640

If number 29 and 31 are excluded then,

Sum of remaining numbers = 640 – 60 = 580

New Average = $\frac{580}{18}$ = 32.22

Sol.214.(c) Total marks of 25 students = 25 × 19 = 475

The marks of two student were taken as 18 and 19 respectively instead of 14 and 15

Difference = (18 + 19) - (14 + 15)

= 8 mark extra

Accurate mark = 475 - 8 = 467

Required average = $\frac{467}{25}$ = 18.68

Short Tricks:- In this type of question , always focus on changes made by mistake ,

Difference = (18 +19) - (14 + 15)

= 8 mark extra

Now, divide this in total number of student = $\frac{8}{25}$ = 0.32

Now, the average affects by 0.32 marks .

Required average

= 19 - 0.32 = 18.68 marks

Sol.215.(c) Let the daily wages of women be Rs x Then the daily wages of men is Rs (x + 50)

Total daily wages of man and woman

= 450 × (700 + 300) = Rs. 450000

According to the question,

700 × (x + 50) + 300 × (x) = 450000

35000 + 700x + 300 x = 450000

1000x = 450000 - 35000 = 415000

$x = \frac{415000}{1000}$ = ₹415

Sol.216.(a) Average of eight consecutive odd no. (n)= 48

Then , 4th And 5th no. are (n - 1) = 47 and (n + 1) = 49

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

And seventh number = 49 + 4 = 53
Now, required sum = 49 + 53 = 102

Sol.217.(b) Let the number of apples in the basket be x.
$50x + 360 = 55(x + 6)$
$\Rightarrow 55x - 50x = 360 - 330$
$\Rightarrow 5x = 30 \Rightarrow x = 6$
So, the number of apples in the basket was 6.

Sol.218.(c) Total no of students in the class = $\frac{65-45}{\frac{1}{3}}$ = 20 × 3 = 60

Sol.219.(a) The total sum of s no's = sr^4
The total sum of r no's = rs^4
So, the average of r and s = $\frac{sr^4+rs^4}{r+s}$
= $\frac{rs(r^3+s^3)}{r+s}$ = $\frac{rs(r+s)(r^2+s^2-rs)}{r+s}$
= rs(r^2+ s^2- rs)

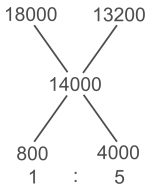
Sol.220.(d) Let the age of man and his son be 7x and 4x
ATQ,
7x + 4x = 55 × 2 = 110
11x = 110 ⇒ x =10
The ratio of their ages after 6 years
= (10 × 7) + 6 : (4 × 10) + 6
= 76 : 46 =38:23

Sol.221.(c) Let the weight of Ram be x

No of perosns	Average	sum
1(Ram)	x	x
2	x + 2	2x + 4
3	x + 4	3x + 12
4	x + 6	4x + 24
5 (Mukesh)	x + 8	5x + 40

Difference in sum
= 5x + 40 - 4x -24 = x + 16
Clearly , we can see that Mukesh is 16 kg heavier than Ram.

Sol.222.(b)



The no of employees having average salary of ₹18,000 = 1 unit which corresponds to 5
Then, the no of employees in the company = 6 unit = 6 × 5 = 30

Sol.223.(b)
No of students → 30 : 10 = 3 : 1
Average → 95 : 85
Average score of the whole class
= $\frac{3\times95+1\times85}{3+1}$ = $\frac{285+85}{4}$ = $\frac{370}{4}$
= 92.5

Sol.224.(d) The average of rings in all the six baskets = 38
Then, the total no of rings in the blue basket = 38 + 4 × 5 = 38 + 20 = 58

Sol.225.(c) Average age of 10 students and 1 teacher = 17
Total sum of the ages of the 10 students and 1 teacher = 187
Sum of the ages of 10 students
= 10 × 15 = 150
So, age of the teacher = 187 - 150
= 37 years

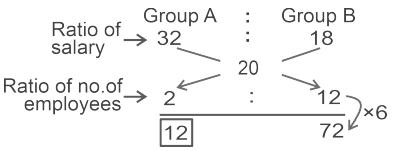
Sol.226.(d)
Sum of the total marks of 45 students
= 45 × 52 = 2340
Sum of the marks of 6 boys who left
= 40 × 6 = 240
Sum of the marks of the 8 boys who join
= 43 × 8 = 344
New average of the class
= $\frac{2340-240+344}{45-6+8}$ = $\frac{2444}{47}$ = 52

Sol.227.(b) Average of first 148 even positive numbers = 148 + 1 = 149
Average of first 129 odd positive numbers = 129
So, the required difference
= 149 - 129 = 20

Sol.228.(d)
Let the age of fifth student be x
Then, the age of fourth student = x - 4
The age of last two students
= 30 + 5 = 35 yrs
Average age of 7 students of the class
= 28 yrs
Average of first three students = 30 yrs
Total deviation in the average
= (+ 2) × 3 = + 6
As we know that net deviation should be zero then we have,
x + (x - 4) + 35 × 2 = 28 × 4 - 6
2x - 4 + 70 = 112 - 6
2x + 66 = 106 ⇒ 2x = 106 - 66 = 40
⇒ x = $\frac{40}{2}$ = 20
Now, the average age of fourth and fifth student = $\frac{2x-4}{2}$ = x - 2 = 20 - 2
= 18 years

Sol.229.(b) Let the number of employees in group- A be x.
ATQ,
$20,000(72+x)$
$= 32{,}000x + 18{,}000 \times 72$
$\Rightarrow 1440000 + 20000x = 32000x + 1296000$
$\Rightarrow 12000x = 1440000 - 1296000$
$\Rightarrow 12000x = 144000 \Rightarrow x = 12$
Hence, the number of employees in group-A is 12.

Short Trick :-



Sol.230.(b) Sum of the total ages of the 15 boys = 16 × 15 = 240
Sum of the total ages of the 10 girls
= 15 × 10 = 150
Now, the average of the students in the class = $\frac{240+150}{25} = 15.6$

Sol.231.(d) Average of $3^{20}, 3^{30}$ *and* 3^{40}
= $\frac{3^{20}+3^{30}+3^{40}}{3}$ = $\frac{3(3^{19}+3^{29}+3^{39})}{3}$
= (3^{19} + 3^{29} + 3^{39})

Sol.232.(b) 5 months sales of a merchant = 6435 + 6927 + 6855 + 7230 + 6562 = Rs.34009
Average sale of merchant in 6 months
= Rs. 6500
So, Total sale during 6 months
= 6500 × 6 = Rs.39000
6th Month sale
= 39000 - 34009 = Rs.4991

Sol.233.(d) Average marks of students
= $\frac{72+84+91+80+73}{5}$ = $\frac{400}{5}$ = 80

Sol.234.(d) ATQ,
X + Y = 10X × 2 = 20X ⇒ X + Y = 20X
Y = 19X

Sol.235.(c)
Average of six consecutive odd no's = 26
So, the average of middle no i.e. $\frac{3rd+4th}{2}$ = 26. Then, 3rd no = 25 and 4th no = 27
Now, the largest no
= 27 + 2 × 2 = 27 + 4 = 31
And the smallest no
= 25 - 2 × 2 = 25 - 4 = 21
Required difference = 31 - 21 = 10

Sol.236.(a) The no. that is replaced in a set of 20 no's = 58 + 2 × 20 = 58 + 40 = 98

Sol.237.(d) Let the run scored by the 8th player in an innings = x
Sum of the run scored by 8 players
= 55 × 8 = 440
ATQ,
25 + 35 + 45 + 60 + 65 + 60 + 80 + x = 440
⇒ 370 + x = 440
⇒ x = 440 - 370 = 70
So, the run scored by the 8th player = 70

Sol.238.(b) The sum of the current age of a family = 24 × 5 = 120
Total age 8 years ago = 120 - 5 × 8

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

= 120 - 40 = 80 yrs

So, the required average = $\frac{80}{4}$ = 20 yrs

Sol.239.(a) Average of 47 consecutive natural no's = 99
So, the 24th no must be 99
Therefore, the largest no = 99 + 23 = 122

Sol.240.(d) The average of 5 consecutive odd no = 33
So, the 3rd no must be 33
Largest no = 33 + 2 × 2 = 33 + 4 = 37
Smaller no = 33 - 2 × 2 = 33 - 4 = 29
Required product = 37 × 29 = 1073

Sol.241.(d) Let the age of the only son in the family be x
The sum of the age of the family
= 32 × 4 = 128 yrs
ATQ,
50 + 46 + 20 + x = 128 ⇒ 116 + x = 128
x = 128 - 116 = 12 yrs
So, the age of the son = 12 yrs

Sol.242.(a) The average of four consecutive odd no = 8
Then adding 1 extra odd no , average is also increased by 1
So, the required average = 8 + 1 = 9

Sol.243.(c)
Price of 5 pens = 5 × 150 = ₹750
Price of 2 pencils = 2 × 100 = ₹200
Price of3 notebook = 3 × 250 = ₹750
Average expenditure of per article
$= \frac{price\ of\ all\ items}{number\ of\ items} = \frac{750+200+750}{5+2+3}$
$= \frac{1700}{10}$ = ₹170

Sol.244.(c)
Average of all 200 employees = 68.2 kg
Number of female employees
$= 200 \times \frac{2}{5} = 80$
Number of male employees = 200 - 80
= 120
Ratio of average weight of man and woman = 7 : 5
Average weight = $\frac{sum\ of\ age}{number\ of\ employees}$
$\Rightarrow 68.2 = \frac{120 \times 7x + 80 \times 5x}{200}$
$\Rightarrow 68.2 = \frac{6 \times 7x + 4 \times 5x}{10}$
682 = 42x + 20x ⇒ x = $\frac{682}{62}$ = 11
Therefore average weight of the female
⇒ 5x = 5 × 11 = 55

Sol.245.(a) According to the question,
Average of 8 girls = y
Sum of age = 8y
Average age after adding 5 new girls having age y + 3, y - 6 , y + 15 , y + 8 and y + 6
$= \frac{8y+y+3+y-6+y+15+y+8+y+6}{13}$
$= \frac{13y+26}{13}$ = y + 2

Short trick:
If we add 5 girls having age of Y year of each
Average will not change obviously sum of age will not be changed
But the sum will change here having age y + 3, y - 6 , y + 15 , y + 8 and y + 6
Change in the sum of age
= +3 - 6 + 15 + 8 + 6 = +26
Then average will change = $\frac{+26}{13} = +2$
So average will be, y +2 years

Sol.246.(a) According to the question
First number is 4x and second number is x
Average = $\frac{4x+x}{2}$ = 65 = 5x = 130
Second number = $\frac{130}{5}$ = 26

Sol.247.(a) 8 year ago the average age of a family is 35 so today the average age of a family is 35 + 8 = 43 years
Sum of age of family of 6 members and 1 child = 6 × 43 + 1 = 258 + 1 = 259
Now today average age of family is
$= \frac{259}{7}$ = 37
After 4 years average age of family is
= 37 + 4 = 41 years

Sol.248.(c) Let marks of four candidates be a , b, c ,d
Sum of marks of first three candidates
= 3x
Now according to the question
a + b + c + d = 3x + d = 4(x + 2)
3x + d = 4x + 8 = d = x + 8

Sol.249.(d) $\frac{T_1+T_2}{2}$ = 15
⇒ $T_1 + T_2 = 30$
$\frac{T_3+T_4}{2} = 35 \Rightarrow T_3 + T_4 = 70$
$\frac{T_1+T_2+T_3+T_4}{4} = \frac{30+70}{4} = 25$

Sol.250.(b) Let 6 numbers be a,b,c,d,e,f.
Sum of 5 numbers = 5×45=225
Sum of 6 numbers = 5×45 + f = 6×48
225 + f = 288 = f = 63

Sol.251.(a) Let the first odd number be x.
$\frac{x+x+2+x+4+x+6+x+8+x+10+x+12+x+14}{8}$
$= 16 \Rightarrow x = 9$
Now, odd number just before 9 is 7,
So, $\frac{7+9+11+13+15+17+19+21+23}{9} = 15$

Sol.252.(a) Let the second number be x then first number is $5x$
$5x - x = 120$
$4x = 120 = x = 30$
Average = $\frac{30+150}{2}$ = 90

Sol.253.(c) Sum of all 15 numbers
= 15 × 41= 615
New average of 10 numbers
$= \frac{615-(21+24+39+47+97)}{10} = \frac{387}{10}$
$= 38.7$

Sol.254.(d) Total runs in first 20 overs
= 20 × 2.4 = 48 runs
For the next 30 overs, remaining runs
= 308 - 48 = 260 runs
Run rate = $\frac{260}{30} = 8.66\ or\ 8.7$

Sol.255.(a)
First number = 2x, second number = x
$\frac{3x}{2} = 30 \Rightarrow$ x = 20
Then, difference = 40 - 20 = 20

Sol.256.(a) According to the question,
Ratio of visitors in three days = 15 : 2 : 3
Then the collection of three days
= 15 × 10 + 2 × 5 + 3 × 2
⇒ 150 + 10 + 6 = 166
Therefore average = $\frac{166}{20}$ = ₹8.30

Sol.257.(a) Sum of 12 numbers = 12 × M
Sum of 8 numbers = 8 × P
And sum of remaining 4 numbers = 4 × N
Here,
12M = 8P + 4N ⇒ 3M = 2P + N

Sol.258.(a) Given,
Average of papers of all books = 400
Average of first 5 = 430
Average of last 5 = 380
Then the number of papers of fifth book
⇒ 430 × 5 + 380 × 5 - 9 × 400
⇒ 2150 + 1900 - 3600
= 4050 - 3600 = 450
Short trick :
Average. of 9 → 400
Average. of first 5 → 430 (difference of sum = 30 × 5 = +150)
Average. of last 5 → 380 (difference of sum = -20 × 5 = -100)
Then the papers of fifth book
= 400 + 150 - 100 = 450

Sol.259.(d) Let the smallest integer = X
Therefore , last = X + 7
So last four = X + 4 , X + 5 , X + 6 and X + 7
Average of consecutive integers
$= \frac{first\ term + last\ term}{2}$
$= \frac{X+X+7}{2} = \frac{27}{2} \Rightarrow$ 2X + 7 = 27
So, X = 10
Then average of last four integers

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{14+17}{2} = 15.5$

Sol.260.(d)
Let Average marks of F_1 and F_2 = X
Then $F_1 + F_2$ = 2X (eq . 1)
So average marks of F_2 and F_3 = X - 40
⇒ $F_2 + F_3$ = 2X - 80
⇒ F_2 = 2X - 80 - 90
(F_3 = 90 given,)
By putting value of F_2 in eq . (1)
F_1 + 2X - 170 = 2X
Therefore,
F_1 = 170

Sol.261.(c) Let the first even number be x
$\frac{x+x+2+x+4+x+6+x+8}{9} + \frac{x+10+x+12+x+14+x+16}{9} = 24$
$\Rightarrow x = 16$
Average = $\frac{16+18+20}{3} = \frac{54}{3} = 18$

Sol.262.(b)
Total marks reduced = 16 × 4 = 64
Marks of new student = 92 - 64 = 28

Sol.263.(d)
Sum of A, B, C and D = 33 × 4 = 132
C = A - 12 ⇒ B = (A - 12) + 6
D = (A - 12) - 10
A + A - 12 + 6 + A - 12 + A - 12 - 10 = 132
⇒ 4A - 40 = 132 ⇒ 4A = 172 ⇒ A = 43
⇒ D = (43 - 12) - 10 = 21
Average of A and D = $\frac{43+21}{2}$ = 32

Sol.264.(b) Average = $\frac{2 \times a \times b}{a+b} = \frac{2ab}{a+b}$

Sol.265.(b)
Sum of marks of 8 boys = 8 × 72 = 576
Sum of marks of 11 students = 11 × 75 = 825
Total marks of three girls = 825 - 576 = 249
Average = $\frac{249}{3}$ = 83

Sol.266.(a) Average of all prime number below 12 = $\frac{2+3+5+7+11}{5}$ = 5.6
Average of all prime number between 12 and 30 = $\frac{13+17+19+23+29}{5}$ = 20.2
$5P_1 - P_2$ = 5(5.6) - 20.2 = 7.8

Sol.267.(d) P1 + P2 + P3 = 3 × 50 = 150
Value of P1 = 25
Sum of P2 and P3 = 150 - 25 = 125
Average = $\frac{125}{2}$ = 62.5

Sol.268.(d)
Sum of six subjects = 110 × 6 = 660
After re-evaluation = 660 - 148 + 112 = 624
Average = $\frac{624}{6}$ = 104

Sol.269.(a) Increased sum of the ages of the people = 56 - 32 = 24
Average = $\frac{sum\ of\ ages}{no\ of\ people}$
Since average age of group is increased by 4
So, No of people = $\frac{24}{4}$ = 6

Sol.270.(d)

		Boys	:	Girls
No of students	→	29	:	21
Average score	→	89	:	89 + 2

Average of whole class = 89 + $\frac{21 \times 2}{29+21}$
= 89 + $\frac{42}{50}$ = 89 + 0.84 = 89.84

Sol.271.(c) Let the total student and total average score be 100 unit

		Boys	:	Girls
No of students	→	3	:	2
Average	→	4	:	5

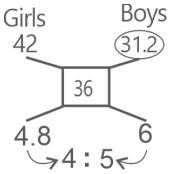
Average score of whole student
= $\frac{3 \times 4 + 2 \times 5}{3+2} = \frac{22}{5}$ unit
$\frac{22}{5}$ unit = 66 (Given)
⇒ 1 unit = 15 ⇒ 5 unit = 15 × 5 = 75
So, Average score of girls = 75

Sol.272.(d) Let total number of employees in a company = 100
So, number of employees who are officers = 35 and number of employees who are workers = 65
Let the average monthly salary of officers and workers be $\bar{x}$ and $\bar{y}$ respectively.
According to the question,
$\bar{x} = \frac{35 \times \bar{x} + 65 \times \bar{y}}{35+65}$ + 39000
⇒ $\bar{x} = \frac{35\bar{x} + 65\bar{y}}{100}$ + 39000
⇒ $100\bar{x} = 35\bar{x} + 65\bar{y}$ + 3900000
⇒ $65\bar{x} = 65\bar{y}$ + 3900000 ⇒ $\bar{x} - \bar{y}$ = 60000
So, the difference between average monthly salaries of an officer and a worker = ₹60,000

Sol.273.(d) Average of n quantities = P
Sum of n quantities = nP
Average of m quantities = Q
Sum of m quantities = mQ
Required average = $\frac{nP+mQ}{m+n}$

Sol.274.(b) ATQ,
Mean of three no's $\frac{a}{3}$, b and c
= $\frac{\frac{a}{3}+b+c}{3} = \frac{a+3b+3c}{9}$
Mean of three no's $\frac{b}{3}$, $\frac{c}{3}$ and x
= $\frac{\frac{b}{3}+\frac{c}{3}+x}{3} = \frac{b+c+3x}{9}$
ATQ,
$\frac{a+3b+3c}{9} = \frac{b+c+3x}{9}$
⇒ 3x = (a + 3b + 3c) - (b + c) = a + 2b + 2c

Sol.275.(d)
Ratio of girls to boys = 20 : 25 or 4 : 5



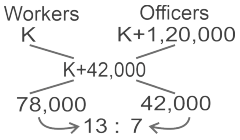
So, the average marks of the boys = 31.20

Sol.276.(b) Let the fourth no be 12 unit
Third no = 12 × 3 = 36 unit
Second no = 1.5 × 36 = 54 unit
First no = 54 × $\frac{1}{3}$ = 18 unit
Average of 4 no = $\frac{12+36+54+18}{4}$
= $\frac{120}{4}$ = 30 unit ⇒ 30 unit → 10
54 unit → $\frac{10}{30}$ × 54 = 18
So, the largest no = 18

Sol.277.(b) Let the average age of the family be 50 yrs
Average age of the family
= 50 + $\frac{17\times2 - 15\times2 - 41\times4}{8}$ =
50 - $\frac{160}{8}$ = 50 - 20 = 30

Sol.278.(d) Natural numbers from integers -10 to 35 which are divisible by 5 are : 5, 10, 15, 20, 25, 30 and 35. So, n = 7
Required average
= $\frac{5+10+15+20+25+30+35}{7}$
= $\frac{140}{7}$ = 20

Sol.279.(b) Let the average monthly salary of workers be K



So, the percentage of officers
= $\frac{7}{20}$ × 100 = 35%

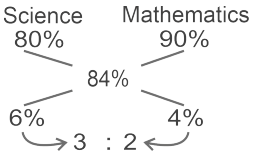
Sol.280.(d) Average weight of the 4 family members = 45 kg
Since there is an increase in the average of family members due to the joining of 2 members. so, the weight of grandparents = 45 × 2 + 3 × 6

Search on Tg: @apna_pdf

Search on Telegram @apna_pdf

= 90 + 18 = 108 kg
Average weight of the grandparents
$= \frac{108}{2} = 54$ kg

Sol.281.(c)



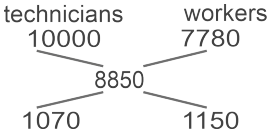
3 unit = 54000
∴ 2 unit $= \frac{54000}{3} \times 2 = 36000$

Sol.282.(d)
Average of 36 students = 14 yrs
Deviation in the average of 36 student
= - 1 × 36 = -36
Since the age of teacher is included, average is increased by 1 i.e. 15 years
Teacher's age = 15 + 36 = 51

Sol.283.(b) Average score of a cricket team = 32
Deviation in the scores of each of the players = - 10 - 21 - 27 + 2 - 11 + 0 - 32 - 4 - 23 + 21 = - 105
Score of captain = 32 + 105 = 137

Sol.284.(a) Sum of 5 no's = 32 × 5 = 160
Sum of first three numbers = 28 × 3 = 84
Sum of last three numbers = 34 × 3 = 102
Middle term = 102 + 84 - 160 = 26
Average of first two numbers $= \frac{84-26}{2}$
$= \frac{58}{2} = 29$

Sol.285.(a)



1070 units → 9
(1150 + 1070) units → $\frac{9}{1070} \times 2220$
= 18.67 ≈ 18

Sol.286.(b) Total expenditure during year
= 13750 × 4 + 11750 × 3 + 31750 × 5
= 55000 + 35250 + 158750 = ₹2,49,000
Average monthly income of family
$= \frac{Total\ Exps + Total\ Savings}{12}$
$= \frac{249000 + 15550}{12} = \frac{264550}{12}$
= 22045.83 ≈ ₹22,045

Sol.287.(b) Let , the average weight of three friends = a
So total weight of three friends = 3a
And weight of P = a + 4
According to the question,
$55 = \frac{(a+4)+3a}{4}$
⇒ 4a + 4 = 220 ⇒ 4a = 216 ⇒ a = 54
P's weight = a + 4 = 54 + 4 = 58 kg

Sol.288.(b) Let the ninth number be "x"
Seventh number = x + 3, eighth number = x + 7.

16	=	6 +	7 +	3
↓		↓	↓	↓
48		45	53	48−a

0×16 = (-3)×6 + 5×7 −3a
3a = 17 ⇒ a = $\frac{17}{3}$
Sum of three numbers
$= 3 \times (48 - \frac{17}{3}) = 127$
Now, x + x + 3 + x + 7 = 127
⇒ 3x + 10 = 127
⇒ 3x = 117, ⇒ x = 39
Now average of 7th and 9th number
$= \frac{x+x+3}{2}$ = x + 1.5 = 39 + 1.5 = 40.5

Sol.289.(a) 30% = $\frac{3}{10}$, 40% = $\frac{2}{5}$
According to the question

A	:	B	:	C
13	:	10		
		3	:	5
39	:	30	:	50

C (50 units) = Rs 8000
⇒ 1 unit = Rs 160
Average of A , B and C = $\frac{39+30+50}{3}$
$= \frac{119}{3}$ units $= \frac{119}{3} \times 160$
= 6346.66 ≈ 6347

Sol.290.(a)
Average $= \frac{sum}{n} = \frac{\frac{n(n+1)}{2}}{n} = \frac{n+1}{2}$
...(n = number of first n integers)
Take average of first 11 consecutive integers $= \frac{11+1}{2} = 6$
Take average of first 9 consecutive integers $= \frac{9+1}{2} = 5$
Hence the average will decrease by 1

Sol.291.(a) Days in march = 31
Total earning in march = 31 × 501
= Rs 15531
Earning in first 18 days = 18 × 495
= Rs 8910
Earning in last 15 days = 15 × 505
= Rs 7575
Now if we add 18 days and 15 days total days becomes 33, so here is 2 common days
That is 17th and 18th day
18th day + 17th day = (8910 + 7575) - (15531) = Rs 954 .....(1)
18th day - 17th day = Rs 50.....(2)
Solving (1) and (2) we get
18th day earning = Rs 502

Sol.292.(d) Let the average Score of section B = 5x,
Average score of section A = 6x.
Weighted average $= \frac{50 \times 6x + 62 \times 5x}{50+62}$
$\Rightarrow 75 = \frac{305x}{56} \Rightarrow x = \frac{75 \times 56}{305}$
Required average = 6x
$= 6 \times \frac{75 \times 56}{305} = 82.6$

Sol.293.(c) Number of boys $= \frac{1}{3} \times 45$
= 15 and number of girls = 45 − 15 = 30
Average score of girls : Average score of boys = 5 : 3
Let the average score of girls and boys be 5x and 3x respectively.
According to the question,
$78 = \frac{15(3x) + 30(5x)}{45}$
⇒ 3510 = 45x + 150x ⇒ 3510 = 195x
⇒ x = 18
So, average score of girls
= 5x = 5(18) = 90

Sol.294.(b) According to question,
$\frac{37 + 45 + 6x + x6}{4} = 48$
$\Rightarrow 6x + x6 = 192 - 82$
$\Rightarrow 6x + x6 = 110$
In $6x + x6 = 110$, for getting 0 at unit place, it is necessary that 6 + x = 10, so x = 4
Now, average $= \frac{(4x+3)+(x+7)}{2}$
$= \frac{[4(4)+3]+[4+7]}{2} = \frac{[19]+[11]}{2}$
$= \frac{30}{2} = 15$

Sol.295.(c) Number of boys
$= \frac{12}{23} \times 92 = 48$
and number of girls $= \frac{11}{23} \times 92 = 44$
Let the average score of boys = 3x and the average score of girls = 4x
According to the question,
$80 = \frac{48\,(3x) + 44\,(4x)}{92}$
⇒ 7360 = 144x + 176x ⇒ 7360 = 320x
⇒ x = 23
Average score of girls = 4x = 4 × 23 = 92

Sol.296.(a) Sum of the total numbers
= 18 × 65 =1170
Sum of first 10 numbers = 10 × 72 =720
Sum of last 9 numbers = 9 × 58 = 522
10th number = 720 + 522 - 1170 = 72
Desired average $= \frac{1170-72}{17} = 64.6$

Sol.297.(c) A $= \frac{130}{100}$ B ⇒ A : B = 13 : 10
Number of students in class A

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

$= \frac{13}{23} \times 92 = 52$

Number of students in class B

$= \frac{10}{23} \times 92 = 40$

Let the average weight of students of class A = 2x,

so average weight of students of class B = 150% of 2x = 3x

According to question,

$56 = \frac{52(2x) + 40(3x)}{92}$

⇒ 5152 = 104x + 120x ⇒ 5152 = 224x

⇒ x = 23

Average weight of students in class B = 3x = 3(23) = 69 kg

Sol.298.(d)

Let the three numbers be a, b and c.

According to question,

$\frac{a+b}{2} + c = 154$

⇒ a + b + 2c = 308 .....(1)

$\frac{b+c}{2} + a = 148$

⇒ b + c + 2a = 296 .....(2)

$\frac{a+c}{2} + b = 132$

⇒ a + c + 2b = 264.....(3)

Adding eqn (1), (2) and (3), we get

4(a + b + c) = 308 + 296 + 264

⇒ 4(a + b + c) = 868 ⇒ a + b + c = 217

Short trick :-

Sum of numbers = $\frac{154 + 148 + 132}{2}$

$= \frac{434}{2} = 217$

Sol.299.(c) Let the average per head expenditure = x,

so total expenditure per day = 1200x

$x - 5 = \frac{1200x + 5000}{1200 + 300}$

$\Rightarrow x - 5 = \frac{1200x + 5000}{1500}$

⇒ 1500x − 7500 = 1200x + 5000

⇒ 300x = 12500 ⇒ $x = \frac{125}{3}$

So, original expenditure per day = 1200x

$= 1200 \times \frac{125}{3}$ = ₹50,000

Sol.300.(b) Let the number = $100x$

According to the question,

$73 = \frac{40x + 33x}{2}$

⇒ 146 = $73x \Rightarrow x = 2$

So, required average = $\frac{\frac{100x}{5} + \frac{100x}{4}}{2}$

$= \frac{\frac{900x}{20}}{2} = \frac{45x}{2} = \frac{45 \times 2}{2} = 45$

Sol.301.(c) Total time taken by 7 athletes = 7 × (2 minutes 10 seconds)

= 7 × 130 seconds = 910 seconds

Average time taken by other athletes

$= \frac{910 - time\ taken\ by\ winner}{7 - 1}$

$= \frac{910 - 100}{6} = \frac{810}{6}$ = 135 seconds

= 2 minutes 15 seconds.

Sol.302.(d) Let the number of students = n

Sum of ages of n students = 15.5n years

Sum of ages of 15 new students

= 15 × 14.5 = 217.5 years

According to the question,

$15 = \frac{15.5n + 217.5}{n + 15}$

⇒ 15n + 225 = 15.5n + 217.5

⇒ 0.5 n = 7.5 ⇒ n = 15

Sol.303.(b) $\frac{a+b+c}{3}$ = d − 8

⇒ a + b + c = 3d − 24 .....(1)

$\frac{a+b+c+d}{4} = 42$

⇒ a + b + c + d = 168 .....(2)

Putting the value of a + b + c = 3d − 24 in eqn (2), we get

3d − 24 + d = 168 ⇒ 4d = 192 ⇒ d = 48

Required Average = $\frac{(3d-2) + (d+5)}{2}$

$= \frac{4d+3}{2} = \frac{4(48)+3}{2} = \frac{195}{2} = 97.5$

Sol.304.(d)

The total weight of 30 boys = 1050 kg

Average weight of 30 boys = $\frac{1050}{30}$ = 35 kg

∴ Average weight of 20 girls = 35 - 5 = 30 kg

Total weight of 20 girls = 30 × 20 = 600 kg

Sol.305.(a) Let the last even number be 2x, according to the question it got replaced by 2x + 1.

Increase in value = 1.

According to question,

N × 0.0125 = 1 ⇒ N = $\frac{1}{0.0125}$ = 80

Sol.306.(b) $\frac{x + \frac{1}{x}}{2}$ = 1, so $x + \frac{1}{x} = 2$

⇒ $x^2 + 1 = 2x \Rightarrow x^2 - 2x + 1 = 0$

⇒ $(x - 1)^2 = 0$ so x = 1.

the average of its square, cube and fourth power = $\frac{x^2 + x^3 + x^4}{3} = \frac{3}{3} = 1$.

(Note: $x + \frac{1}{x} = 2$ always implies x = 1)

Sol.307.(a)

$\frac{\frac{A}{4} + \frac{B}{3}}{2} = 5$ ⇒ 3A + 4B = 120 ....(1)

$\frac{\frac{A}{2} + \frac{B}{2}}{2} = 9$ ⇒ A + B = 36 .....(2)

On solving (1) and (2), we get

B = 12 and A = 24

So , Required Average = $\frac{2A + 3B}{2}$

$= \frac{2(24) + 3(12)}{2} = \frac{48 + 36}{2} = \frac{84}{2} = 42$

Sol.308.(a) Total persons = 108, so male = 60 and female = 48

Sum of height of all males

= 158.7 × 60 = 9522

Average height of all persons = 155.5

So, $155.5 = \frac{9522 + 48x}{108}$

⇒ 16794 = 9522 + 48x ⇒ 48x = 7272

⇒ x = 151.5 cm

Sol.309.(a) $\frac{\frac{50}{100} \times x + \frac{30}{100} \times y}{2} = 34.5$

⇒ 5x + 3y = 690 .....(1)

and x − y = 10 .....(2)

On solving eqn (1) and (2) we get,

x = 90 and y = 80

Avg = $\frac{90 + 80}{2} = \frac{170}{2} = 85$

Sol.310.(a)

Sum of ten numbers = 10 × A = 10A.

New sum after subtracting

= 10A - 9c - (c -1) ⇒ 10A - 10c + 1

New average

$= \frac{10A - 10c + 1}{10} = A - c + 0.1$

Sol.311.(d) Average of 8 consecutive even numbers = 17

Here given numbers are even numbers so,

8 consecutive even numbers are

= 10, 12, 14, 16, 18, 20, 22, 24

Required Average

$= \frac{20 + 22 + 24 + 36 + 53}{5} = 31$

Sol.312.(c) 5x + 7y = 12 × 37.....(i) (×7)

7x + 5y = 12 × 35.....(ii) (×5)

From (i) - (ii)

24y = 1008 ⇒ y = 42

Sol.313.(b) Total production of toys in December = 512 × 31 = 15872

Production of toys in first 20 days

= 20 × 515 = 10300

Production of toys in the last 13 days

= 13 × 510 = 6630

Production on 19th and 20th december is common in both the first 20 days and last 13 days.

Production on 19 and 20 December

= 10300 + 6630 - 15872 = 1058

So, Average of production on 19 and 20 December = $\frac{1058}{2}$ = 529

Sol.314.(d) Difference in average weight = 60 - 55.5 = 4.5

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Extra weight = 4×4.5 = 18 kg

Number of students = $\frac{18000}{360}$ = 50

Initial number of students

= 50 - 4 = 46 students

Sol.315.(b) Let number of children = x

$\frac{40x+5\times 36}{x+5} = \frac{40x-5\times 43.2}{x-5}$

$\Rightarrow (x-5)(40x+180)$

$= (x+5)(40x-216)$

$\Rightarrow 40x^2 + 180x - 200x - 900$

$= 40x^2 - 216x + 200x - 1080$

$\Rightarrow 4x = 180 \Rightarrow x = 45$

Sol.316.(c) Sum of first 10 positive odd numbers = 10^2 = 100

∴ Average of first 10 positive odd numbers = 10

Sum of first 15 even numbers = n(n + 1)

= 15 × 16 = 240

∴ Average of the first even 15 numbers = 16

So, Product of the average = 10 × 16 = 160

Sol.317.(d) 34 mm = 3.4 cm

Let the number of students = n

A/Q,

$12\times 150.5 - 7\times 159 = 693$

$n\times 155.6 + 693 = (n+5)\times 152.2$

$n\times 155.6 + 693 = 152.2n + 761$

$\Rightarrow 3.4n + 693 = 761 \Rightarrow n = 20$

Sol.318.(c) Let four consecutive odd natural number are (a - 4), (a - 2), a,(a + 2)

A/Q,

$(a-4)^2 + (a-2)^2 + a^2 + (a+2)^2$

= 201 × 4

$\Rightarrow 4a^2 - 8a + 24 = 804 \Rightarrow a^2 - 2a - 195 = 0$

$\Rightarrow a^2 - 15a + 13a - 195 = 0 \Rightarrow a = -13, +15$

Negative number is not possible. So a = 15

Largest number = 15 + 2 = 17

Smallest number = 15 - 4 = 11

Average = $\frac{7\times 17 + 3\times 11}{2}$ = 76

Sol.319.(b) Let, No. of Male = M = 20

No, of females = F

No, of children = C

F + C = 24

Total weight of male = 54 × 20 = 1080

Total weight of group = 44 × 48.25

= 2123

Total weight of female and children

= 2123 - 1080 = 1043

A/Q

(F × 49) + (C × 30) = 1043

⇒ (F × 49) + [(24 - F) × 30] = 1043

⇒ 19 F = 1043 - 720 = 323⇒ F = 17

So, C = 7 , Difference = F - C = 17 - 7 = 10

Sol.320.(a) $\frac{3}{5}$A + 30% of B = 13.5 × 2

$\frac{6A+3B}{10}$ = 27

6A + 3B = 270 ------- (1)

$\frac{3}{8}$B + 25% of C = 15 × 2

$\frac{3B+2C}{8}$ = 30

3B + 2C = 240 ------- (2)

A = $\frac{5}{12}$C

12A = 5C ------ (3)

Multiply eq (1) *by* 2 and subtract eq (3)

12A + 6B - 12A = 540 - 5C

6B + 5C = 540 ----- (4)

Multiply eq (2) *by* 2 and subtract it from eq (4)

C = 60

A = $\frac{5}{12}$ × 60 = 25

3B + 2C = 240 ⇒ B = 40

A + B + C = 25 + 60 + 40 = 125

Sol.321.(a) Average age 15 years ago

= 35 - 15 = 20

And total age = 20 × 7 = 140

But there were 5 members so average

= $\frac{140}{5}$ = 28

Sol.322.(a) Total weight of 30 persons of group A = 1725

Average weight = $\frac{1725}{30}$ = 57.5 kg

Average weight of Group B = 57.5 - 3

= 54.5 kg

Average weight of Group C = 54.5 - 2.5

= 52 kg

Total weight of Group C = 52×20 = 1040

Required Average = $\frac{1725+1040}{30+20}$ = 55.3

Sol.323.(b) Let the numbers are (a - 3), (a - 1), (a + 1) and (a + 3).

ATQ, $(a-3)^2 + (a-1)^2 + (a+1)^2 + (a+3)^2 = 4\times 126$

$a^2 + 9 + a^2 + 1 + a^2 + 1 + a^2 + 9$

= 504

$\Rightarrow a^2 = 121 \Rightarrow a = 11$

Now, $\frac{8(a+3)+5(a-3)}{2}$

= $\frac{8\times 14 + 5\times 8}{2}$ = 76

Sol.324.(c) Average weight of A, B and C is 70kgs(given)

A + B + C = 210

Average weight of A, B, C and D is 60 kgs(given)

A + B + C + D = 240

So, D = 30kg ; And E = 35kgs

Average weight of B, C, D and E is 59 kgs(given)

B + C + D + E = 236 kgs

B + C = 236 - 30 - 35 = 171 kgs

So A = 210 - 171 = 39 kg

Sol.325.(b)

temperature on Thursday = 43°C

Sum of temperatures on wednesday, thursday and friday = 42° × 3 = 126°C

Sum of temperatures on wednesday and friday =126° - 43° = 83°C

Sum of temperatures on monday wednesday and friday = 41° × 3 = 123°C

Temperature on monday

= 123°C - 83°C = 40°C

Sol.326.(b) $\frac{a+b+c}{3}$ = 2 + c -------(i)

$\frac{a+b}{2}$ = 48 ⇒ a + b = 96 -------(ii)

from eq (i) and (ii),

$\frac{96+c}{3}$ = 2 + c

⇒ 96 + c = 6 + 3c ⇒ c = 45

∴ d = 35

Average of c and d = $\frac{45+35}{2}$ = 40

Sol.327.(d) Let the average score of student in B = x

Theen, the average score of student in A = 1.2x

According to the question

40 × 1.2x + 52x = 75×92

⇒ 100x = 6900, ⇒ x = 69

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Data Interpretation

It is the act of organizing and interpreting data to get meaningful information . In Data interpretation, a large volume of data is organized and is represented into a compact and precise form which is easier to interpret than the raw data.
Basic tools to solve Data Interpretation includes :

- Calculation
- Average
- Ratio
- Percentage

Some Important Formulae :-

- Percentage increase
  $= \frac{Final\ value - Initial\ value}{Initial\ value} \times 100$
- Percentage decrease
  $= \frac{Initial\ value - Final\ value}{Initial\ value} \times 100$
- Quantity I is how much percentage of Quantity II
  $= \frac{QuantityI}{QuantityII} \times 100$
- Quantity I is how much percentage less than Quantity II
  $= \frac{QuantityII - QuantityI}{QuantityII} \times 100$
- Quantity I is how much percentage more than Quantity II
  $= \frac{QuantityI - QuantityII}{QuantityII} \times 100$
- Central angle of component
  $= \frac{Value\ of\ component}{Total\ value} \times 100$

Practice Questions

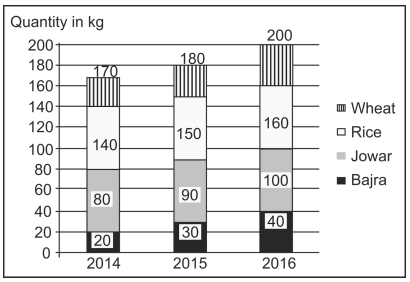
SSC MTS 2024 Tier - 1

Q.1. The following table shows the number of mobile phones (in thousands) manufactured by three companies A, B and C from the year 2007 to 2011.

Year/Company Name	A	B	C
2007	450	650	540
2008	310	820	950
2009	1090	1080	1150
2010	1675	1700	1500
2011	2532	2120	2420

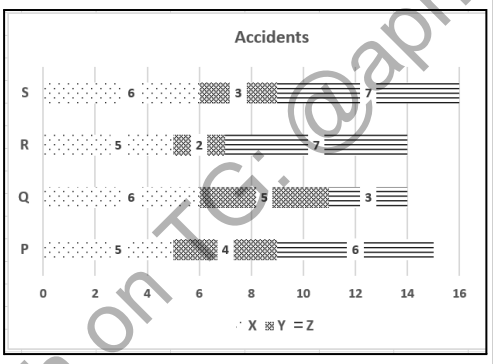
Which company manufactured the maximum number of mobile phones as compared to all other companies, and in which year ?
SSC MTS 07/10/2024 (Morning)
(a) Company C, in 2011
(b) Company A, in 2010
(c) Company B, in 2009
(d) Company A, in 2011

Q.2. The following bar graph represents the quantity of grains produced in a state in the years 2014, 2015 and 2016. Study the given bar graph and answer the question that follows.



What is the difference in the percentage of wheat production in the year 2014 to the percentage of wheat production in the year 2016? (Round up to two decimal places)
SSC MTS 21/10/2024 (Evening)
(a) 2.35% (b) 1.92% (c) 3.45% (d) 4.23%

Q.3. The graph shows the data of the number of accidents by three types of vehicles: X, Y and Z in four cities: P, Q, R and S. Study the given graph and answer the question that follows.



The correct increasing order of the cities as per the total number of accidents by all types of vehicles is:
SSC MTS 13/11/2024 (Morning)
(a) R, P, Q, S (b) S, R, Q, P
(c) R, Q, P, S (d) S, R, P, Q

SSC CGL 2024 Tier - 1

Q.4. Read the given information and answer the question that follows.
The following table gives the percentage of marks obtained by seven students in six different subjects in an examination. The number in the brackets give the maximum marks in each subject.

Student	Subject (Max. Marks)					
	Maths (150)	Chemistry (130)	Physics (120)	Geography (100)	History (60)	Computer Science (40)
Ayush	90	50	90	60	70	80
Aman	100	80	80	40	80	70
Sajal	90	60	70	70	90	70
Rohit	80	65	80	80	60	60
Muskan	80	65	85	95	50	90
Tanvi	70	75	65	85	40	60
Tarun	65	35	50	77	80	80

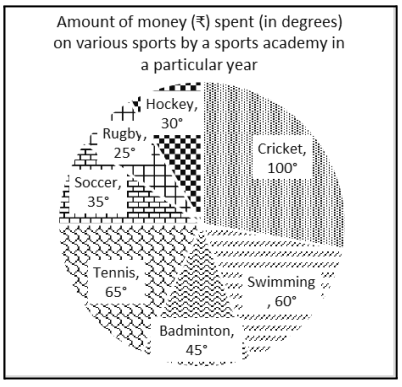
If someone secured all the highest scores that have been obtained by some student or the other in the six subjects as given in the table above, what would be the exact overall percentage score obtained by that student ?
SSC CGL 09/09/2024 (1st Shift)
(a) $91\frac{1}{6}$% (b) 95.16 %
(c) 91% (d) $90\frac{5}{6}$%

Q.5. Study the given table and answer the question that follows.
The given table shows the number of candidates who appeared (both male and female) in a Public Examination and the percentage of those who qualified in the examination from two states X and Z. Few values are missing in the table (indicated by ------). You will be required to fill them up according to the question.

Year	State X		State Z	
	Number of appeared candidates	Percentage of qualified candidates	Number of appeared candidates	Percentage of qualified candidates
2008	480	70%	.....	70%
2009	560	75%	500	80%
2010	.....	60%	650	50%
2011	450	89%	720	72%
2012	790	.....	660	.....

Out of the number of qualified candidates from State X in 2010, the ratio of male to female candidates is 5 : 7. If the number of female qualified candidates from State X in 2010 is 168, what is the number of appeared candidates (both male and female) from State X in 2010 ?
SSC CGL 11/09/2024 (1st Shift)
(a) 360 (b) 480 (c) 640 (d) 540

Q.6. The given pie chart shows the amount of money (₹) spent (in degrees) on various sports by a sports ac ademy in a particular year. Study the pie chart and answer the question that follows.



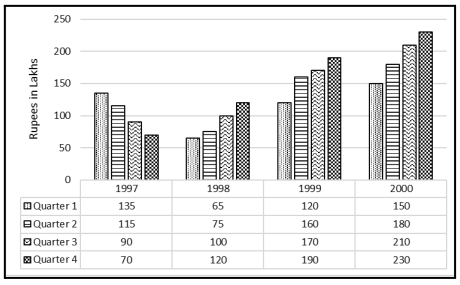
If ₹42,000 were spent on Soccer, then the money spent on Badminton, Tennis and

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Rugby taken together is what percentage (rounded off to 2 decimal places) more/less than the money spent on Cricket, Swimming and Hockey taken together ?
SSC CGL 18/09/2024 (2nd Shift)
(a) Less, 34.87% (b) More, 28.95%
(c) More, 34.87% (d) Less, 28.95%

Q.7. Study the given bar graph and answer the question that follows.
The following bar graph shows the quarterly profit (in lakhs) of a departmental store from 1997 to 2000.



What was the percentage increase in annual profit of the departmental store from 1997 to 2000 ?
SSC CGL 19/09/2024 (2nd Shift)
(a) $85\frac{33}{41}\%$ (b) $84\frac{33}{41}\%$
(c) $87\frac{33}{41}\%$ (d) $83\frac{33}{41}\%$

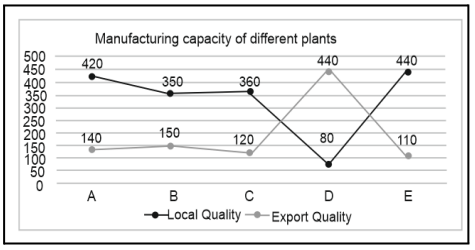
Q.8. Study the given table and answer the question that follows.
The given table shows the number of candidates who appeared (both male and female) in a Public Examination and the percentage of those who qualified in the examination from two states X and Z. Few values are missing in the table (indicated by ------). You will be required to fill them up according to the question.

Year	State X		State Z	
	Number of appeared candidates	Percentage of qualified candidates	Number of appeared candidates	Percentage of qualified candidates
2008	480	70%	____	70%
2009	560	75%	____	80%
2010	____	60%	650	50%
2011	450	89%	720	72%
2012	790	____	660	____

The number of appeared candidates from State Z increased by 100% from 2008 to 2009. If the total number of qualified candidates from State Z in 2008 and 2009 together is 552, what is the number of appeared candidates from State Z in 2009 ?
SSC CGL 19/09/2024 (3rd Shift)
(a) 360 (b) 240 (c) 480 (d) 600

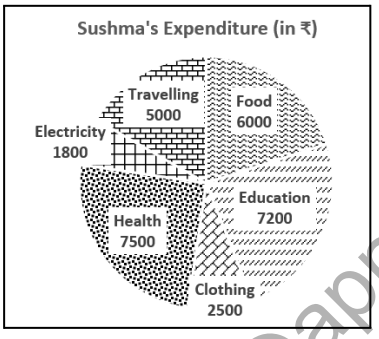
SSC CHSL 2024 Tier - 1

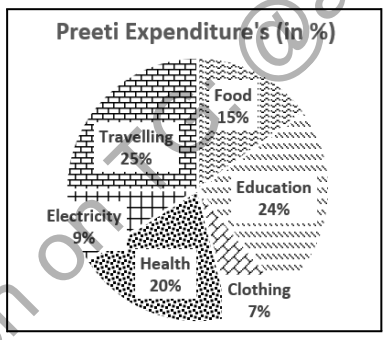
Q.9. A company has five plants for manufacturing spare parts. Each plantmanufactures local quality and export quality. What is the ratio of the production of local quality and export quality units of the highest manufacturing plant ?



SSC CHSL 01/07/2024 (1st Shift)
(a) 4 : 1 (b) 3 : 1 (c) 2 : 11 (d) 7 : 3

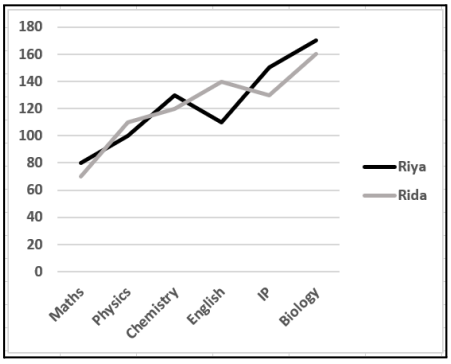
Q.10. Following Pie chart presents monthly expenditure by Sushma and Preeti in different heads. Sushma and Preeti make equal expenditure every month.





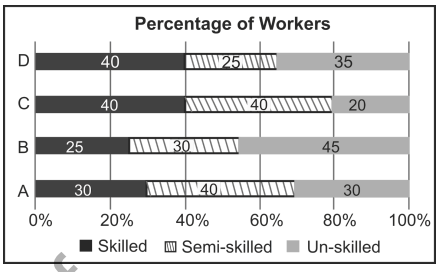
What is the difference between the expenditure (in ₹) done on Food by Sushma and Preeti?
SSC CHSL 01/07/2024 (3rd Shift)
(a) 1500 (b) 500 (c) 1000 (d) 750

Q.11. Study the following line graph carefully and answer the question below.
Given graph represents marks obtained by Riya and Rida in six subjects of 12th exam of CBSE. Maximum marks in Maths Physics and Chemistry is 140 whereas maximum marks in English, IP and Biology is 180.



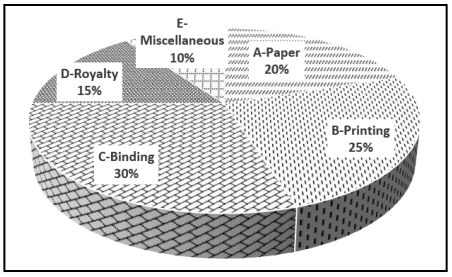
What are the percentage marks obtained by Rida in PCM (Maths, Physics and Chemistry) ?
SSC CHSL 02/07/2024 (1st Shift)
(a) 81.32% (b) 50% (c) 78.57% (d) 71.43%

Q.12. Study the given graph and select the most appropriate option to fill in the blanks. Consider the percentage of workers in three categories. Skilled, Semi-skilled and Un-skilled in four companies, A, B, C and D in the graph below.



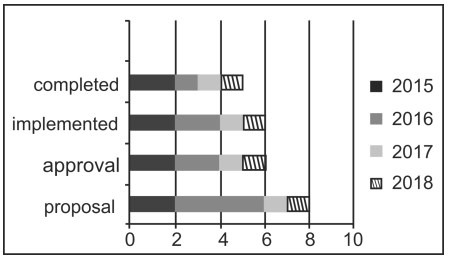
If all the companies have same number of total workers, then the company _____ has the highest number of Un - skilled workers and the company _____ has the lowest number of Skilled workers.
SSC CHSL 02/07/2024 (1st Shift)
(a) B ; C (b) B ; B (c) C ; C (d) C ; B

Q.13. The given pie-diagram shows the expenditure incurred on the preparation of a book by a publisher, under various heads. Study the pie-diagram and answer the question that follows.
Various Expenditures (in percentage) incurred in Publishing a Book



The marked price of a book is 20% more than the CP. If the marked price of the book is ₹30, then what is the cost of paper used in a single copy of the book ?
SSC CHSL 08/07/2024 (1st Shift)
(a) ₹6.50 (b) ₹4.50 (c) ₹5 (d) ₹6

Q.14.



A company starts constructing buildings for a college. The constructions have 4 stages.
I. buildings proposals 2. proposals

Search on Telegram @apna_pdf

approval 3. constructions implemented 4. Buildings completed

The above 3D-bar graph indicates the status of constructions for 4 years 2015 to 2018.

The X-axis scale 0, 2, 4, 6, 8,10 indicates 0, 20%, 40%, 60%, 80%, 100%.

Study the bar graph carefully and answer the following questions.

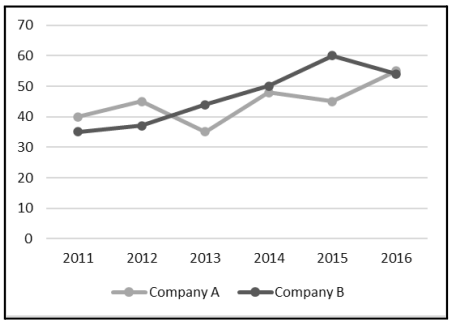
Find the ratio of proposals to buildings completed for the year 2016.

SSC CHSL 09/07/2024 (3rd Shift)

(a) 3 : 1 (b) 2 : 1 (c) 4 : 1 (d) 2 : 3

Q.15. Study the given graph and answer the question that follows.

The graph shows the profit percentage earned by two companies - A and B over a period of six years.



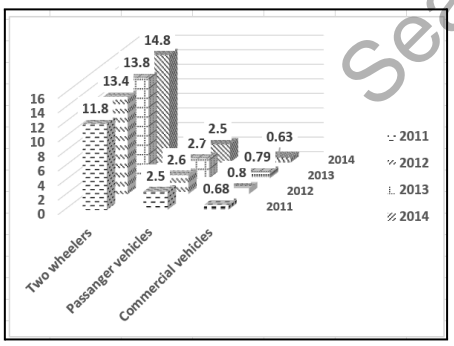
If the income of the company A in the year 2012 was ₹6.425 lakh, what was its expenditure in that year?

SSC CHSL 10/07/2024 (2nd Shift)

(a) ₹4.5 lakh (b) ₹5.2 lakh

(c) ₹4.7 lakh (d) ₹4.43 lakh

Q.16. The given chart represents the sales of automobiles in India (by type, in million units) from the year 2011 to 2014. Study the chart and answer the question that follows.



The percentage increase in the sales in 2013 over the previous year was the maximum for which of the categories of vehicles?

SSC CHSL 11/07/2024 (4th Shift)

(a) Two wheelers and Passenger vehicles

(b) Commercial vehicles

(c) Two wheelers

(d) Passenger vehicles

SSC CPO 2024 Tier - 1

Q.17. Study the given table (pictograph) and answer the question that follows.

The table (pictograph) shows the number of scouts in a school.

Class / Number of Scouts	☺ = 15 scouts
IV	☺☺☺☺☺☺
V	☺☺
VI	☺☺☺☺☺☺☺☺
VII	☺☺☺☺
VIII	☺☺☺

What is the total number of scouts in classes VI to VIII?

SSC CPO 27/06/2024 (1st Shift)

(a) 200 (b) 320 (c) 195 (d) 225

Q.18. The following table shows the number of delivery partners (in thousands) who joined five different companies during six different years.

Year	Companies				
	Emazon	Clipkart	Twiggy	Tomato	Pyntra
2016	2.4	4.5	1.2	0.9	4.2
2017	1.8	5.4	1.5	1.2	5.6
2018	3.2	7.2	2.4	2.1	6.3
2019	3.9	5.6	2.8	2.7	6.5
2020	4.2	6.4	3.2	3.3	7.0
2021	5.0	7.2	3.6	3.6	7.2

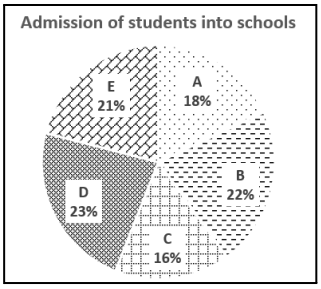
If Emazon decides to give an average salary of a ₹21,000 to the delivery partners and allocates ₹13.44 crore for the same in 2022, find the percentage increase in the number of delivery partners from 2021 to 2022.

SSC CPO 27/06/2024 (3rd Shift)

(a) 22.5% (b) 28% (c) 25% (d) 20%

SSC Selection Post (Phase - XII)

Q.19. The given pie-chart shows the number of students admitted into various schools, A, B,C, D, E, in a town. The total number of students is 6500. The number of boys in each school is given by the table. Study the pie-chart and the table carefully and answer the question that follows.



Schools	A	B	C	D	E
Number of boys	800	850	600	700	765

The total number of boys in schools A, C, D is what percentage of the total number of girls in schools B, C, E (rounded to 2 decimal places)?

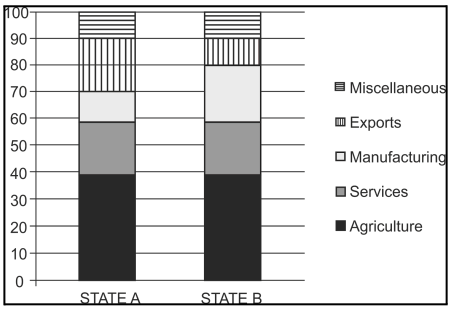
Higher Secondary 24/06/2024 (Shift - 2)

(a) 1.2662 (b) 1.2963

(c) 1.2863 (d) 1.2062

Q.20. Study the given bar-graph and answer the question that follows.

The bar-graph shows the percentage revenue allocation by two states in various sectors.



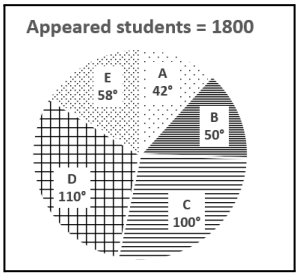
If the amount of money allocated to the two states is ₹20 billion each, then how much more (in rupees) does State A spend on Exports than on Manufacturing ?

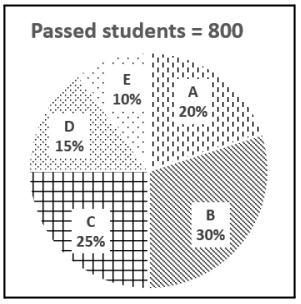
Higher Secondary 26/06/2024 (Shift - 2)

(a) 2.5 billion (b) 1.5 billion

(c) 2 billion (d) 3 billion

Q.21. The following pie charts show the data of the number of appeared and passed students of class 12 in sections A,B,C,D and E.





Find the difference between the number of students who appeared for the exam in sections A and B

Graduate Level 24/06/2024 (Shift - 3)

(a) 30 (b) 60 (c) 50 (d) 40

Q.22. Which of the following recorded the highest growth rate in manufacturing units from the year 2021 to the year 2022?

Plant	Units manufactured in	
	2021	2022
A	150	175
B	225	269
C	300	315
D	130	169

Search on TG: @apna_pdf

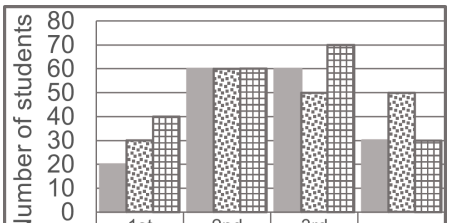
Search on Telegram @apna_pdf

E	150	172

Graduate Level 26/06/2024 (Shift - 4)
(a) D (b) A (c) B (d) E

SSC CPO 2023 Tier - 1

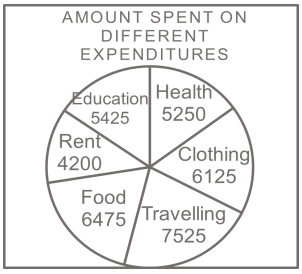
Q.23. Study the given bar - graph and answer the question that follows.
The bar - graph shows the higher secondary students of a school for the years 2008, 2009 and 2010.



	1st division	2nd division	3rd division	fail
2008	20	60	60	30
2009	30	60	50	50
2010	40	60	70	30

The percentage of students who passed in the second division in the year 2010 was :
SSC CPO 03/10/2023 (1st Shift)
(a) 28% (b) 32% (c) 25% (d) 30%

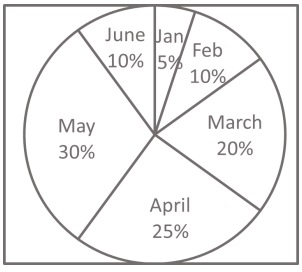
Q.24. What is the central angle corresponding to the expenditure spent on Education in the given figure?



SSC CPO 03/10/2023 (1st Shift)
(a) 42° (b) 52° (c) 55.2° (d) 55.8°

Q.25. Darjeeling gets tourists from two countries A and B. Percentage wise distribution of the influx is given below for the first six months of the year.

Total number of tourists = 60000	
Month	Ratio (A : B)
Jan	5 : 7
Feb	6 : 7
Mar	3 : 2
April	8 : 7
May	4 : 5
June	3 : 4



Find the ratio of tourists from country A coming in during March and April.
SSC CPO 03/10/2023 (1st Shift)
(a) 3 : 7 (b) 4 : 7 (c) 7 : 10 (d) 9 : 10

Q.26. The table given below shows the number of products sold by 4 shopkeepers A, B, C and D on four different days.

person→ Days↓	A	B	C	D
Monday	1000	800	-	750
Tuesday	500	-	900	650
Wednesday	800	1000	700	-
Thursday	-	1200	800	900

If the total products sold by A and B, including all four days, is 3000 and 3500, respectively, the products sold by B on Tuesday is how many more or less than the products sold by A on Thursday?
SSC CPO 03/10/2023 (2nd Shift)
(a) 200 less (b) 200 more
(c) 300 more (d) 300 less

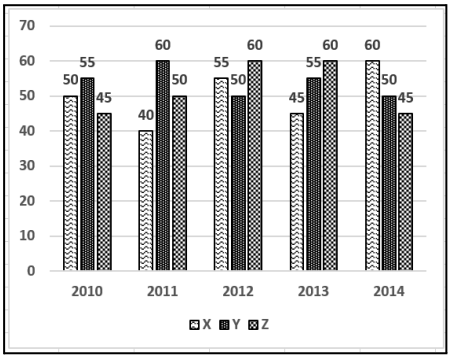
Q.27. The following table shows the percentage population of four towns below poverty line and the proportion of males and females :

Town	Percentage of population below poverty line	Below poverty line	Above poverty line
		Male : Female	Male : Female
A	10	1 : 3	3 : 2
B	15	3 : 4	1 : 2
C	20	2 : 3	5 : 3
D	25	4 : 5	5 : 4

If the total population of town C is 8000 then what is the number of females above the poverty line in town C ?
SSC CPO 04/10/2023 (2nd Shift)
(a) 2600 (b) 2400 (c) 2200 (d) 2000

SSC MTS 2023 Tier - 1

Q.28. The graph shows the production of tyres (in Lakhs) by three different companies X, Y and Z over the years. Directions: Study the following graph carefully to answer the question given below it.



What is the difference between the average production per year of the company with the highest average production and that of the company with the lowest average production in Lakhs ?
SSC MTS 01/09/2023 (1st Shift)
(a) 2 (b) 6 (c) 8 (d) 4

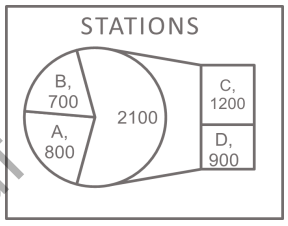
Q.29. A person jogged daily as per the given table:

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Distance Jogged (In kms)	4.5	3.5	2.5	3.0	2.0	4.0	1.5

What is the mean distance jogged by the person in a week ?
SSC MTS 11/09/2023 (2nd Shift)
(a) 2 (b) 3.5 (c) 2.5 (d) 3

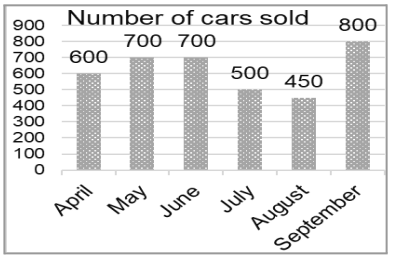
SSC CHSL 2023 Tier - 1

Q.30. The number of stations in four different cities A, B, C and D are given below.



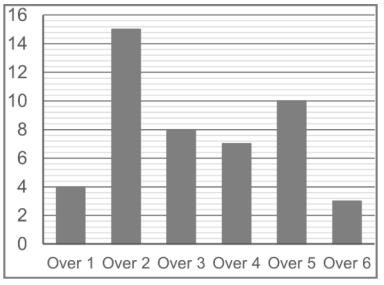
The angles made by the cities C and D on pie chart are _____ degrees and _____ degrees, respectively.
SSC CHSL 02/08/2023 (2nd Shift)
(a) 150, 70 (b) 70, 150
(c) 90, 120 (d) 120, 90

Q.31. Bar Graph showing number of cars sold by a reputed company during different months of a year. Look at the following bar graph and answer the question that follows:



In which month was the sale highest and was what percent of the total sale of 6 months ?
SSC CHSL 04/08/2023 (2nd Shift)
(a) September 21.3% nearly
(b) September 18.7% nearly
(c) July 21.3% nearly
(d) May 18.7% nearly

Q.32. The bar graph below gives the runs scored by Team A in the first six overs of a cricket match.

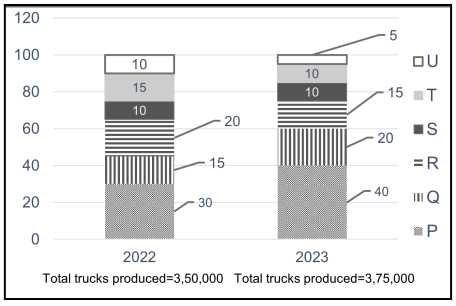


Search on TG: @apna_pdf

Search on Telegram @apna_pdf

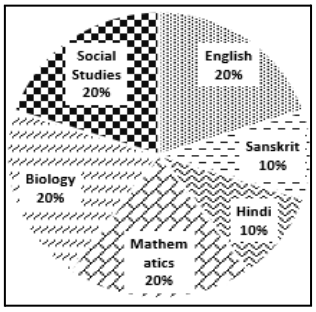
The runs scored by Team A in the 7th over was 5 more than the runs scored by them in the 8th over, but 6 less than the runs scored by them in the 9th over. If the average runs scored per over by Team A in the first nine overs of the match was 9, how many runs did the team score in the 8th over ?
SSC CHSL 10/08/2023 (4th Shift)
(a) 5 (b) 7 (c) 6 (d) 8

Q.33. Percentage distribution of Six different types of Trucks manufactured by a Company over Two Years is shown below:



How much more is the actual distribution of Truck Q in the year 2023 as compared to 2022 ?
SSC CHSL 14/08/2023 (4th Shift)
(a) 23500 (b) 22500 (c) 20400 (d)19800

Q.34. Study the given pie-chart and answer the question that follows.



Percentage-wise distribution of teachers in six different subjects in a school is given in the pie-chart. The total number of teachers is 600. The ratio of male and female teachers is 3 : 1.
Find the ratio of teachers in English, Sanskrit and Hindi to teachers in Mathematics, Biology and Social Studies.
SSC CHSL 17/08/2023 (4th Shift)
(a) 2 : 5 (b) 1 : 2 (c) 2 : 3 (d) 1 : 5

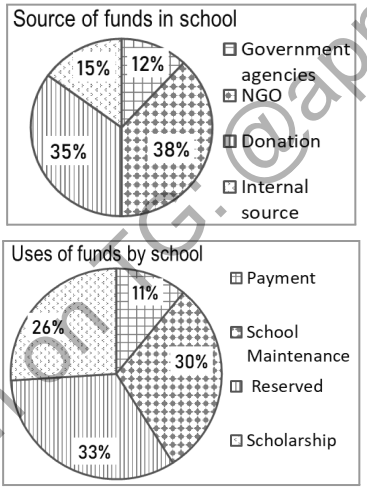
SSC CGL 2023 Tier - 1

Q.35. Study the given table carefully and answer the following question.
The table shows the percentage of students of four departments - Mechanical, Civil, Computer Science and Applied - with each student being in only one department. The table also shows the number of students of these four departments in five different colleges, with the total number of students being 2080.

College	No. of students	Mechanical	Civil	Computer Science	Applied
IIT Delhi	430	-	20%	-	10%
IIT Kanpur	350	20%	-	25%	-
IIT Bombay	-	20%	18%	-	32%
IIT Madras	-	-	25%	18%	35%
IIT Guwahati	400	20%	22%	-	20%

If the number of students in IIT Bombay is 20% less than the number of students in IIT Madras, then the number of students in IIT Bombay is:
SSC CGL 14/07/2023 (3rd shift)
(a) 300 (b) 500 (c) 200 (d) 400

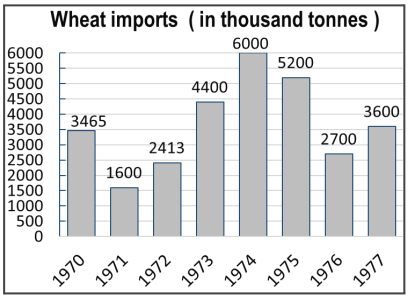
Q.36. Study the given pie - chart carefully and answer the following question.
What amount (in Rs.) of the fund is acquired by the school from internal sources ?
The entire fund that school gets from different sources is equal to Rs.10 lakh



SSC CGL 27/07/2023 (2nd shift)
(a) 1,45, 000 (b) 1,50,000
(c) 1,32,000 (d) 1,60,000

SSC Selection Post (Phase - XI)

Q.37. Study the graph carefully.



In which year did the imports register the highest increase over its preceding years?
Higher Secondary 28/06/2023 (Shift - 2)
(a) 1973 (b) 1972 (c) 1974 (d) 1975

SSC MTS 2022 Tier - 1

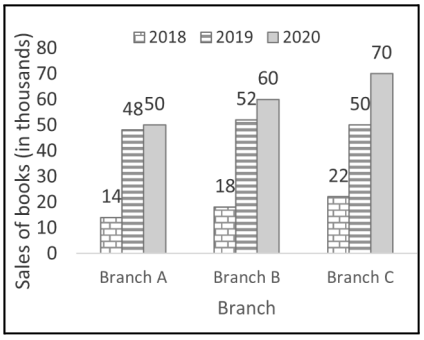
Q.38. The following table shows the expenditure of a family in the year 2018 and 2019.

Articles	Expenditure (in Rs.)	
	2018	2019
Education	24000	30000
Housing	40000	48000
Entertainment	4000	3600
Food	15000	15500
Clothing	5600	3800

What is the percent increase or decrease in the total expenditure in 2019 from 2018 ?
SSC MTS 04/05/2023 (Morning)
(a) 20.33% increase (b) 11.44 % decrease
(c) 13.88% increase (d) 12.11% decrease

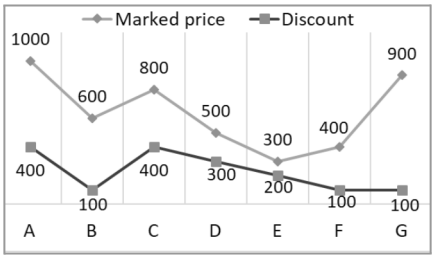
SSC CHSL 2022 Tier - 1

Q.39. The following bar graph shows the sales of books (in thousands) from 3 branches of a company in three consecutive 'years 2018, 2019 and 2020, What is the ratio of the total sales of branch A for the year 2018 to the total sales of branch C for the year 2020 ?



SSC CHSL 09/03/2023 (3rd Shift)
(a) 1 : 1 (b) 5 : 1 (c) 4 : 3 (d) 1 : 5

Q.40. The line chart given below shows the marked price and value of discount of 7 articles A, B, C, D, E, F and G.



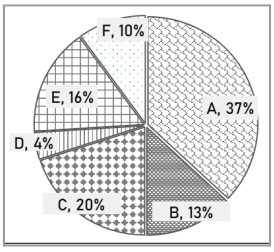
Selling price = Marked price - Discount
Which of the following sequences is correct about the selling price of article A, B, C, D, E, F and G ?
SSC CHSL 20/03/2023 (1st Shift)
(a) G > A > B > C > F > E > D
(b) A > G > B > C > F > D > E
(c) G > A > B > C > F > D > E
(d) A > G > B > C > F > E > D

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

SSC CGL 2022 Tier - 1

Q.41. The pie chart given below shows the production of 6 different factories. The total production of all these 6 factories are 22000. The production of a particular factory is shown as a percent of total production of all these 6 factories.



P1 = The value of average production of A, C, D and F.
P2 = The difference between the production of B and E.
What is the value of (P1 + P2) ?
SSC CGL 01/12/2022 (4th Shift)
(a) 2525 (b) 6545 (c) 3525 (d) 4565

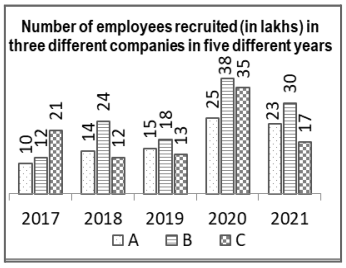
Q.42. The given table shows the number of new employees who joined different categories of employees in an organisation and also the number of employees from these categories who left the organisation every year since the foundation of the organisation in 2015. Study the table and answer the questions that follow.

Year	Business Analysts		Accountants		Sales Representatives		Peons	
	Joined	Left	Joined	Left	Joined	Left	Joined	Left
2015	80	0	35	0	50	0	73	0
2016	63	21	26	16	46	20	34	23
2017	78	28	15	5	38	15	48	29
2018	42	39	20	38	34	0	14	12
2019	67	44	14	24	22	30	21	30

What was the total number of accountants working in the organisation in the year 2019 ?
SSC CGL 05/12/2022 (3rd Shift)
(a) 27 (b) 193 (c) 110 (d) 83

SSC CPO 2022 Tier - 1

Q.43. Study the given bar-graph and answer the question that follows.
The bar - graph shows the number of employees recruited (in lakhs) by three different companies in five different years.



The number of employees recruited in company B in the year 2019 was what percentage of the number of employees recruited in company C in the year 2021 (correct up to 2 decimal places)?
SSC CPO 09/11/2022 (Evening)
(a) 88.85% (b) 85.25%
(c) 105.88% (d) 102.35%

Answer Key :-

1.(d)	2.(a)	3.(c)	4.(a)
5.(b)	6.(d)	7.(c)	8.(c)
9.(b)	10.(a)	11.(d)	12.(b)
13.(c)	14.(c)	15.(d)	16.(d)
17.(d)	18.(b)	19.(b)	20.(c)
21.(d)	22.(a)	23.(d)	24.(d)
25.(d)	26.(a)	27.(b)	28.(d)
29.(d)	30.(d)	31.(a)	32.(c)
33.(b)	34.(c)	35.(d)	36.(b)
37.(a)	38.(c)	39.(d)	40.(c)
41.(d)	42.(a)	43.(c)	

Solutions :-

Sol.1.(d) According to the given data we can say that company A manufactured the maximum number of mobile phones as compared to all other companies in 2011 .

Sol.2.(a) Percentage of wheat production in 2014 = $\frac{30}{170} \times 100$
= 17.647%
Percentage of wheat production in 2016
= $\frac{40}{200} \times 100 = 20\%$
Required percentage = 20 - 17.647≃ 2.35

Sol.3.(c)
Accidents In city P = 5 + 4 + 6 = 15
Accidents in city Q = 6 + 5 + 3 = 14
Accidents in city R = 5 + 2 + 7 = 14
Accidents in city S = 6 + 3 + 7 = 16
Cities in increasing order of accidents - R, Q, P, S or Q, R, P, S
Hence, only option (c) satisfies.

Sol.4.(a) Highest marks in maths
= $150 \times \frac{100}{100} = 150$
Highest marks in chemistry
= $130 \times \frac{80}{100} = 104$
Highest marks in Physics
= $120 \times \frac{90}{100} = 108$
Highest marks in Geography
= $100 \times \frac{95}{100} = 95$
Highest marks in History
= $60 \times \frac{90}{100} = 54$
Highest marks in Computer science
= $40 \times \frac{90}{100} = 36$
Required percentage
= $\frac{150+104+108+95+54+36}{150+130+120+100+60+40} \times 100$
= $\frac{547}{600} \times 100 = \frac{547}{6} = 91\frac{1}{6}\%$

Sol.5.(b) No. of female qualified candidates from state X in 2010 (7) unit = 168
1 unit = 24
No. of (male + female) candidates qualified from state X in 2010 (12) unit = 12 × 24 = 288
So, required appeared candidates
= $288 \times \frac{100}{60} = 480$

Sol.6.(d) According to the question,
Spend money on Badminton, tennis, and Rugby = 45 + 65 + 25 = 135°
Spend money on Cricket, Swimming and Hockey = 100 + 60 + 30 = 190°
Required less % = $\frac{190-135}{190} \times 100$
= $\frac{55}{190} \times 100 \approx 28.95\%$

Sol.7.(c) Annual profit in 1997 = 135 + 115 + 90 + 70 = 410
Annual profit in 2000 = 150 + 180 + 210 + 230 = 770
percentage increase in annual profit of the departmental store from 1997 to 2000
= $\frac{770-410}{410} \times 100 = \frac{3600}{41} = 87\frac{33}{41}\%$

Sol.8.(c) Let the no. of appeared candidates in 2008 be 100 unit.
Then, no. of appeared candidates in 2009
= $100 \times \frac{200}{100} = 200$ unit
According to the question,
Qualified candidates in the years 2008
= 100 × 70% = 70 unit
Qualified candidates in the years 2009
= 200 × 80% = 160 unit
Now,
⇒ (70 + 160) unit = 552 ⇒ 230 unit = 552
⇒ 200 unit = $\frac{552}{230} \times 200 = 480$

Sol.9.(b) Total production of Plant A
= 420 + 140 = 560
Total production of Plant B
= 350 + 150 = 500
Total production of Plant C
= 360 + 120 = 480
Total production of Plant D
= 440 + 80 = 520

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Total production of Plant E
= 440 + 110 = 550
We can see that the highest manufacturing plant is A
So Required ratio = 420 : 140 = 3 : 1

Sol.10.(a) Expenditure of sushma
= expenditure of preeti
Total expenditure of sushma = 1800 + 5000 + 6000 + 7200 + 2500 + 7500
= 30000
100% = 30000 (preeti's expenditure on food) 15% = 300 × 15 = 4500
Expenditure of sushma on food = 6000
Required difference = 6000 - 4500 = 1500

Sol.11.(d)
Total marks in Maths, Physics and Chemistry = 3 × 140 = 420
Number of marks obtained by Rida in PCM = (70 + 110 + 120) = 300
Hence, required % = $\frac{300}{420}$ × 100 = 71.43%

Sol.12.(b) Clearly from the graph that company B has highest number of unskilled workers (45%) and also lowest number of skilled workers (25%)

Sol.13.(c)
Ratio - CP : MP
5 : 6
(MP) 6 units = ₹ 30
(CP) 5 units = ₹ 25
cost of paper used in a single copy of the book = 25 × 20% = ₹ 5

Sol.14.(c)
The number of building proposal = 4
The number of building completed = 1
Now,
Required ratio = 4 : 1

Sol.15.(d) As we know :-
profit = income - expenditure
Profit% = $\frac{Income - expenditure}{expenditure}$ × 100
45 = $\frac{6.425 - x}{x}$ × 100
0.45x = $6.425 - x$
1.45x = 6.425
x = $\frac{6.425}{1.45}$ = ₹4.43 lakh
Hence, expenditure (x) = ₹4.43 lakh

Sol.16.(d)
% increase in 2013 from 2012 for two wheeler = $\frac{13.8 - 13.4}{13.4}$× 100
= $\frac{0.4}{13.4}$ ×100 = 2.98 %
% increase in 2013 from 2012 for Passenger vehicle = $\frac{2.7 - 2.6}{2.6}$ × 100
= $\frac{0.1}{2.6}$×100 = 3.84 %
% increase in 2013 from 2012 for commercial vehicle = $\frac{0.79 - 0.8}{0.8}$× 100
= $\frac{-0.1}{0.8}$ × 100 = -1.25 %
Hence, maximum % increase was of passenger vehicle

Sol.17.(d) Total number of scouts in classes VI to VIII = (8 + 4 + 3) × 15
= 15 × 15 = 225

Sol.18.(b) Delivery partner in 2021 of Emazon = 5000
Delivery partner in 2022 of Emazon
= $\frac{134400000}{21000}$ = 6,400
% increase = $\frac{6400 - 5000}{5000}$ × 100
= $\frac{1400}{50}$ = 28%

Sol.19.(b) Total number of boys in A,C and D = 800 + 600 + 700 = 2100
Number of students in B
= 6500 × $\frac{22}{100}$ = 1430
Number of students in C
= 6500 × $\frac{16}{100}$ = 1040
Number of students in E
= 6500 × $\frac{21}{100}$ = 1365
⇒ Number of girls in B
= 1430 - 850 = 580
Number of girls in C = 1040 - 600 = 440
Number of girls in E = 1365 - 765 = 600
Total number of girls in B, C and E
= 580 + 440 + 600 = 1620
Required % = $\frac{2100}{1620}$ × 100 = 1.2963

Sol.20.(c) State A spend on Exports
= 20% of 20 billion = 4 billion
State A spend on Manufacturing = 10% of 20 billion = 2 billion
⇒ required difference = (4 - 2) billion
= 2 billion

Sol.21.(d) Required difference
= $\frac{1800}{360°}$ × (50 - 42)° = $\frac{1800}{360°}$ × 8° = 40

Sol.22.(a) Growth rate in manufacturing unit from the year 2021 to 2022 in D
= $\frac{169 - 130}{130}$ × 100 = 30%
Growth rate in manufacturing unit from the year 2021 to 2022 in A
= $\frac{175 - 150}{150}$×100 = 20%
Growth rate in manufacturing unit from the year 2021 to 2022 in B
= $\frac{269 - 225}{225}$ × 100 = 17.25%
Growth rate in manufacturing unit from the year 2021 to 2022 in E
= $\frac{172 - 150}{150}$ × 100 = 14.67%
Therefore, manufacturing unit D has the highest increase.

Sol.23.(d)
Total number of students in 2010
= 40 + 60 + 70 + 30 = 200
Students who passed from second division = 60
Required % = $\frac{60}{200} \times 100 = 30\%$

Sol.24.(d) Central angle corresponding to expenditure spent on Education
= $\frac{5425}{35000}$ × 360° = 55.8°

Sol.25.(d) Number of tourist from country A in March = 60000 × $\frac{1}{5}$ × $\frac{3}{5}$
$= 7200$
Number of tourist from country A in April
= 60000 × $\frac{1}{4}$ × $\frac{8}{15} = 8000$
Required ratio = 7200 : 8000 or 9 : 10

Sol.26.(a) According to the question,
Products sold by B on tuesday
= 3500 - (800 + 1000 + 1200) = 500
Products sold by A on thursday
= 3000 - (1000 + 500 + 800) = 700
Required value = 700 - 500 = 200 (less)

Sol.27.(b) Required number of females
= 8000 × $\frac{80}{100}$ × $\frac{3}{(5+3)}$ = 2400

Sol.28.(d)
Average production of company X
= $\frac{50 + 40 + 55 + 45 + 60}{5}$ = 50
Average production of company Y
= $\frac{55 + 60 + 50 + 55 + 50}{5}$ = 54
Average production of company Z
= $\frac{45 + 50 + 60 + 60 + 45}{5}$ = 52
Required difference = 54 - 50 = 4 lakhs

Sol.29.(d) Mean distance
= $\frac{4.5 + 3.5 + 2.5 + 3 + 2 + 4 + 1.5}{7}$ = 3

Sol.30.(d)
Angle made by C = $\frac{1200}{3600}$ × 360° = 120°
Angle made by D = $\frac{900}{3600}$ × 360° = 90°

Sol.31.(a) Highest sale is in the month of September .
Required %
= $\frac{800}{600 + 700 + 700 + 500 + 450 + 800}$ ×100
= 21.33%

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Sol.32.(c)
Let run scored in 8th over = x then
run scored in 7th over = $x + 5$ and
run scored in 9th over = $x + 11$
Now ,
4 + 15 + 8 + 7 + 10 + 3 + $(3x + 16)$ = 9 × 9
$3x$ = 81 − 63 ⇒ x = 6

Sol.33.(b) According to the question,
In 2022 = $\frac{350000}{100}$ × 15 = 52500
In 2023 = $\frac{375000}{100}$ × 20 = 75000
Required difference = 75000 − 52500
= 22500

Sol.34.(c) Teachers in english , sanskrit and hindi = 20 + 10 + 10 = 40%
Teachers in mathematics , biology and social studies = 20 + 20 + 20 = 60%
Hence, required ratio = 40 : 60 = 2 : 3

Sol.35.(d)
$\frac{no.\ of\ students\ in\ IIT\ Bombay}{no.\ of\ students\ in\ IIT\ Madras}$ = $\frac{4}{5}$
Total students in IIT Madras and Bombay
= 2080 − $(430 + 350 + 400)$ = 900
9 units = 900 Then ,
Students in IIT Bombay (4 units) = 400

Sol.36.(b) Fund acquired by the school from internal sources = $\frac{15}{100}$ × 10,00,000
= ₹1,50,000

Sol.37.(a) % increase in 1973
= $\frac{4400 - 2413}{2413} \times 100$ = 82.34%
% increase in 1972
= $\frac{2413 - 1600}{1600} \times 100$ = 50.81%
% increase in 1974
= $\frac{6000 - 4400}{4400} \times 100$ = 36.36%
In 1975 there is a decrease.
Clearly , In 1973 there was a maximum increase over its preceding years.

Sol.38.(c)
Total expenditure in 2018 = 88600
Total expenditure in 2019 = 100900
Increase in expenditure
= 100900 − 88600 = 12300
Required % = $\frac{12300}{88600} \times 100$ = 13.88%

Sol.39.(d) Total sales of branch A for the year 2018 = 14
total sales of branch C for the year 2020 = 70
so , ratio of the total sales of branch A for the year 2018 to the total sales of branch C for the year 2020 = $\frac{14}{70}$ = 1 : 5

Sol.40.(c) Selling price of A , B , C , D , E , F , and G is 600 , 500 , 400 , 200 , 100 , 300 , 800 respectively
Therefore , correct order of selling price of articles ⇒ G > A > B > C > F > D > E

Sol.41.(d)
$(P1)$ = Average production of A , C , D and F
= $\frac{37 + 20 + 4 + 10}{4}$ = $\frac{71}{4}$% = 17.75%
$(P2)$ = difference between production of B and E = 16 - 13 = 3%
Now, value of $(P1 + P2)$
= 22000 × 20.75% = 4565

Sol.42.(a) Number of accountant working in organization in the year 2019,
Working accountant = total joined - total left Working accountant
= $(35 + 26 + 15 + 20 + 14)$ - $(16 + 5 + 38 + 24)$ = 27

Sol.43.(c) The no of employees recruited in company B in 2019 = 18
The no of employees recruited in company C in 2021 = 17
Required % = $\frac{18}{17}$ × 100 = 105.88%

Important QR Codes

Data Interpretation questions asked in SSC Exams.

scan the QR code given below:

Download Pinnacle Exam Preparation Mobile App

Join Pinnacle Youtube Channel

Join Pinnacle Telegram Channel

Search on TG: @apna_pdf

Search on Telegram @apna_pdf

Mean, Median & Mode

Key - points :

1. Mean :
The mean is the sum of the values, divided by the total number of values. The symbol $\overline{X}$ represents the sample mean.

Mean for raw or ungrouped data :

$$\overline{X} = \frac{X_1 + X_2 + X_3 + ...X_n}{n} = \frac{\Sigma X}{n}$$

where n represents the total no of values in the sample.

Mean for discrete frequency distribution:

$$\overline{X} = \frac{Sum\ of\ all\ observations}{Total\ number\ of\ observations} = \frac{\Sigma f_i x_i}{\Sigma f_i}$$

Short cut - method :

$$\overline{X} = A + \frac{\Sigma f_i d_i}{n} \times c$$

where, A = assumed mean,
$\Sigma f_i d_i = f_1 d_1 + f_2 d_2 + ... + f_k d_k$
n = total number of observations
$d_i = \frac{x_i - A}{c}$ and c = common factor of deviation

<u>Mean for continuous frequency distribution :</u>

$$\overline{X} = A + \frac{\Sigma f_i d_i}{n} \times c$$

where c = class length

• **Weighted Mean :** Weighted mean of a variable x by multiplying each value by its corresponding weight and dividing the sum of the products by the sum of the weights.

$$\overline{X} = \frac{w_1 x_1 + w_2 x_2 + ...w_n x_n}{w_1 + w_2 + ...w_n} = \frac{\Sigma w_i x_i}{\Sigma w_i}$$

• **Combined mean :** If we know the means of two or more groups of observations, we can find mean of the combined group. Such a value is called Combined mean. It is denoted by $\overline{X}_c$.

Suppose $\overline{X}_1$, $\overline{X}_2$, ..., $\overline{X}_k$ are means of k groups having n_1, n_2,....., n_k observations respectively. The formula for combined mean is as follows :

$$\overline{X}_c = \frac{n_1\overline{X}_1 + n_2\overline{X}_2 + ... + n_k\overline{X}_k}{n_1 + n_2 + ... + n_k}$$

2. Median :
Median is defined as the value of middlemost observations when the data are arranged in either ascending or descending order. It is denoted by M. In other words, 50% of values of observations in the data are above median and 50% observations have value less than the median.

Median for raw data :
For n observations x_1, x_2, x_3, ..., x_n median is found as follows :

M = value of the $\left(\frac{n+1}{2}\right)^{th}$ observation

where, n = total number of observations
For example, if we have 15 observations, the value of the $\left(\frac{15+1}{2}\right)^{th}$ that is 8th observation will be exactly the central value, which is called median.

Median for discrete frequency distribution :
Suppose x_1, x_2, x_3, ..., x_k are the values of a variable with frequencies f_1, f_2, f_3, ..., f_k respectively.
A frequency distribution generally shows the observations arranged in ascending order. We shall use cumulative frequencies to find the median for a frequency distribution where observations are arranged in ascending order.

Median M = value of the $\left(\frac{n+1}{2}\right)^{th}$ observation
where, n = total number of observations

Median for continuous frequency distribution :
A continuous frequency gives the values of the variable in the form of class intervals and they are generally arranged in ascending order. In such cases, we will use the cumulative frequencies to find the median. These cumulative frequencies will show us the class containing the median. For this, we take Median class = class containing the $\left(\frac{n}{2}\right)^{th}$ observations

where, n = total number of observations

$$\text{Median } M = L + \frac{\frac{n}{2} - cf}{f} \times c$$

where, L = lower boundary point of median class
cf = cumulative frequency of the class prior to median class
f = frequency of the median class
c = length of median class
Note : When no prior class is there, then in that case cf = 0

3. Mode :
The value which gets repeated the maximum number of times or the value occurring with maximum frequency in the given data is called mode. It is denoted by M_0. Example : The mode of the given data : 4, 4, 9, 9, 9, 5, 5, 5, 5, 5 is 5, as 5 is repeated the maximum number of times.

Mode for raw data and for discrete frequency distribution :
In these cases the mode can be found simply by inspection. We can find the mode as a value among the observations which is repeated maximum number of times or the one which has maximum frequency.

Mode for continuous frequency distribution :
The class having the maximum frequency is called as modal class of the frequency distribution.

$$\text{Mode } M_0 = L + \frac{f_m - f_1}{2f_m - f_1 - f_2} \times c$$

where, L = lower boundary point of the modal class
f_m = frequency of the modal class
f_1 = frequency of the class prior to modal class
f_2 = frequency of the class succeeding to modal class
c = class length of the modal class

Note : The above formula can be used only if the distribution has classes of equal class length. Moreover, the formula can be used only in those cases where the maximum frequency is only for one class.

Relation between mean , mode and Median :-
Mode = 3 (Median) – 2 (Mean)
This written in notations as :
$M_0 = 3M - 2\overline{X}$

4. Range :
The range is the difference between two extreme observations of the distributions. For eg. if A and B are the greatest and smallest values respectively of observations in a distribution, then its range is A – B.
Range = Highest observation – Lowest observation

Variety Questions

Q.1. The runs scored by 11 players in the cricket match are as follows.
7, 16, 121, 51, 101, 81, 1, 16, 9, 11, 16
Calculate the median of the data.
SSC CHSL Tier II (10/01/2024)
(a) 51 (b) 11 (c) 22 (d) 16

Search on Telegram @apna_pdf

Q.2. A set of data presented in the form of a frequency distribution table with class intervals and their respective frequencies had a mode of 48.5. The lower boundary of the modal class was 46.5; the frequency of the modal class was 34; the frequency of the class interval just preceding the modal class was 32 and the frequency of the class interval just succeeding the modal class was 25. What was the width of the modal class?
SSC CGL Tier II (26/10/2023)
(a) 12 (b) 10.5 (c) 11 (d) 10

Q.3. Calculate the mean from the following table.

Scores	Frequencies
0 - 10	2
10 - 20	4
20 - 30	12
30 - 40	21
40 - 50	6
50 - 60	3
60 - 70	2

SSC CPO 10/11/2022 (Evening)
(a) 33.4 (b) 32.6 (c) 35.8 (d) 34.2

Q.4. Let x be the median of data: 33, 42, 28, 49, 32, 37, 52, 57, 35, 41. If 32 is replaced by 36 and 41 by 63, then the median of the data, so obtained, is y. What is the value of (x + y) ?
SSC MTS 19/08/2019 (Evening)
(a) 78 (b) 78.5 (c) 79.5 (d) 79

Q.5. A set of data is given. The mean of the set is 35 while the median is set as 60. Find the mode of the data.
SSC MTS 14/08/2019 (Morning)
(a) 25 (b) 30 (c) 20 (d) 110

Q.6. The marks of Nine students in ascending order for a test are given below with Median as 34, the value of k is: 12, 16, k, 28, k + 5, 32, 39, 47, 53.
SSC MTS 09/08/2019 (Afternoon)
(a) 29 (b) 27 (c) 30 (d) 32

Q.7. What is the difference of mean and median of the given data?
4, 13, 8, 15, 9, 21, 18, 23, 35, 1?
SSC MTS 08/08/2019 (Morning)
(a) 0.7 (b) 1.7 (c) 1.2 (d) 2.1

Q.8. The data below shows the number of wickets taken by each bowler and the number of bowlers who took them.

No. of Wickets per bowler	No. of Bowlers
5	2
4	3
3	4
2	5
1	9

What is the median of the number of wickets?
SSC MTS 07/08/2019 (Afternoon)
(a) 3 (b) 2 (c) 4 (d) 2.5

Q.9. In the data given below, the number of sixes and the batsmen who hit them, has been shown.

Number of Sixes	Number of batsmen
1	2
2	3
3	1
4	3
5	2

What is the median of the number of sixes ?
SSC MTS 06/08/2019 (Morning)
(a) 3 (b) 5 (c) 4 (d) 4.5

Q.10. What is the mode of the given data
4, 3, 4, 3, 2, 2, 2, 5, 5, 3, 4, 6, 4, 3, 3
SSC MTS 05/08/2019 (Afternoon)
(a) 4 (b) 3 (c) 2 (d) 5

Q.11. Given below is the data of the age of the various children.

Age (years)	Number of children
6	17
7	16
8	16
9	17
10	19
11	15

What is the difference between the mean and mode of the ages?
SSC MTS 05/08/2019 (Morning)
(a) 1.5 (b) 1 (c) 2.5 (d) 2

Q.12. What is the median of 6, 9, 13, 8, 3, 2, 5, 7 and 11 ?
SSC MTS 02/08/2019 (Evening)
(a) 7 (b) 6.5 (c) 8 (d) 6

Q.13. The median date of the year 2019, given in the form of DD.MM, is :
SSC MTS 2/08/2019 (Afternoon)
(a) 01.07 (b) 30.06 (c) 02.07 (d) 03.07

Q.14. The table given below shows the number of students having obtained different marks

Marks	Number of Students
9 - 11	6
11 - 13	5
13 - 15	2
15 - 17	2
17 - 19	5

What is the mean marks per student ?
SSC MTS 02/08/2019 (Morning)
(a) 13.5 (b) 12.25 (c) 15.5 (d) 14.25

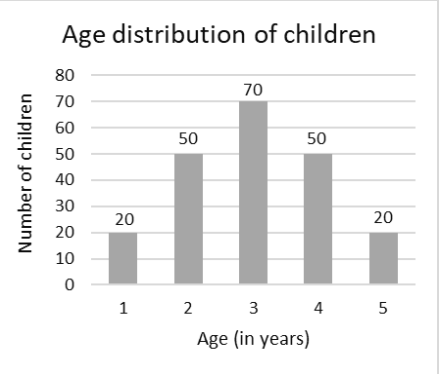
Practice Questions

SSC CHSL 2024 Tier - 2

Q.15. If 88 is replaced by 93 and 41 is replaced by 47 in the following observations, 46, 48, 63, 76, 88, 41, 35, 55, 90, 56, 92, then what would be the difference between the new median and the previous median ?
SSC CHSL Tier II (18/11/2024)
(a) 0 (b) 3 (c) 2 (d) 1

SSC CGL 2024 Tier - 1

Q.16. The given graph represents the data on the ages of various children.
Study the given graph and answer the question that follows.



What is the difference between the mean and mode of the ages?
SSC CGL 13/09/2024 (2nd Shift)
(a) 2 (b) 0.5 (c) 1 (d) 0

SSC CHSL 2024 Tier - 1

Direction :- [Q .17. to Q .18.] Given below is the observed data of the ages of various children.

Age in years	Number of children
6	8
7	3
8	7
9	2
10	20

Q.17. What is the difference between the mean and mode of the ages ?
SSC CHSL 01/07/2024 (3rd Shift)
(a) 1.425 years (b) 4.425 years
(c) 3.425 years (d) 2.425 years

Q.18. What is the mean of the ages of the children ?
SSC CHSL 04/07/2024 (1st Shift)
(a) 7.575 years (b) 6.575 years
(c) 8.575 years (d) 5.575 years

Search on Telegram @apna_pdf

SSC Selection Post (Phase - XII)

Q.19. Which of the following statements is true ?
Matriculation Level 25/06/2024 (Shift - 1)
(a) The sum of the squared deviations of the items from the arithmetic mean is maximum.
(b) Arithmetic mean is the sum of deviations from the mid value.
(c) The sum of deviations of the items from the arithmetic mean is always one.
(d) The sum of deviations of the items from the arithmetic mean is always zero

SSC CHSL 2023 Tier - 2

Q.20. Calculate the mode from the following data.

Days of confinement	6	7	8	9	10
Number of patients	4	6	7	5	3

SSC CHSL Tier II (02/11/2023)
(a) 7 (b) 5 (c) 6 (d) 8

Q.21. Find the mode of the given data.
21, 15, 16, 48, 6, 15, 44, 16, 6, 5, 15, 16, 21, 6, 15 and 43
SSC CHSL Tier II (02/11/2023)
(a) 16 (b) 21 (c) 6 (d) 15

Q.22. The distribution of 100 workmen employed in a factory according to their monthly salary, showed an average salary of ₹4,500 per month. If the median salary is found to be ₹4,900, find the mode salary.
SSC CHSL Tier II (10/01/2024)
(a) ₹5,600 (b) ₹5,500
(c) ₹5,700 (d) ₹5,800

SSC CGL 2023 Tier - 2

Q.23. The marks obtained by 15 students out of a maximum of 25 in a test are given as 13, 11, 16, 15, 18, 12, 13, 14, 10, 22, 15, 21, 20, 17 and 24. Find the product of the modes of this set of data.
SSC CGL Tier II (26/10/2023)
(a) 192 (b) 210 (c) 182 (d) 195

SSC MTS 2023 Tier - 1

Q.24. The mean of 23 observations is 36. If the mean of the first 12 observations is 32 and that of the last 12 observations is 39, find the 12th observation.
SSC MTS 11/09/2023 (2nd Shift)
(a) 26 (b) 23 (c) 24 (d) 25

SSC CHSL 2023 Tier - 1

Q.25. Given below is the observed data of the age of various boys. Study the table carefully and answer the question that follows.
Calculate the mean age of the boys.

Age in years	Number of children (Boys)
5	8
6	3
7	7
8	2
9	20

SSC CHSL 11/08/2023 (2nd Shift)
(a) 6.57 (b) 9.57 (c) 7.57 (d) 8.57

SSC CHSL 2022 Tier - 2

Q.26. Find the median of the following data.
15, 30, 20, 10, 25, 35, 18, 21, 28
SSC CHSL Tier II (26/06/2023)
(a) 30 (b) 18 (c) 25 (d) 21

Q.27. Find the median of the following data. 129.75, 116.6, 12.3, 114.1, 136.6, 118.7, 13.5, 121.3
SSC CHSL Tier II (26/06/2023)
(a) 116.60 (b) 117.65
(c) 118.75 (d) 127.80

SSC CGL 2022 Tier - 2

Q.28. Find the mode for the given distribution (rounded off to two decimal places).

Class Interval	5 -10	10 -15	15 -20	20 -25	25 - 30	30 - 35
Frequency	8	7	6	9	11	10

SSC CGL Tier II (02/03/2023)
(a) 35.25 (b) 40.25 (c) 30.33 (d) 28.33

Q.29. Find the standard deviation of the following data (rounded off to two decimal places).
5, 3, 4, 7
SSC CGL Tier II (03/03/2023)
(a) 1.48 (b) 3.21 (c) 4.12 (d) 2.45

Q.30. For a sample data, mean = 60 and median = 48. For this distribution, the mode is:
SSC CGL Tier II (06/03/2023)
(a) 18 (b) 48 (c) 36 (d) 24

Q.31. The median of a set of 11 distinct observations is 73.2. If each of the largest five observations of the set is increased by 3, then the median of the new set:
SSC CGL Tier II (07/03/2023)
(a) is 3 times that of the original set
(b) is increased by 3
(c) remains the same as that of the original set
(d) is decreased by 3

SSC CGL 2022 Tier - 1

Q.32. Find the weighted arithmetic mean of the first 'n' natural numbers, the weights being the corresponding numbers.
SSC CGL 02/12/2022 (2nd Shift)
(a) $\frac{\{n(n+1)\,(2n+1)\}}{6}$ (b) $\frac{\{n(n+1)\}}{2}$
(c) $\frac{(2n+1)}{3}$ (d) n

SSC CPO 2022 Tier - 1

Q.33. Marks scored by a student in different subjects are given in the table below

Subjects	Marks obtained out of 100
English	55
Hindi	90
Mathematics	75
Science	80
Foreign language	90

Five marks are to be deducted from each subject due to shortage of attendance. The net average of the mean, median and mode of the marks obtained is _____.
SSC CPO 09/11/2022 (Morning)
(a) 79.33 (b) 77.67 (c) 82.66 (d) 73

SSC CHSL 2021 Tier - 1

Q.34. A dice is thrown 1,000 times with the frequencies for the outcome 1, 2, 3, 4, 5 and 6 as given in the following table. How many times is the number appearing on the die greater than or equal to 5 ?

Outcome	Frequency
1	179
2	150
3	157
4	149
5	175
6	190

SSC CHSL 03/06/2022 (Morning)
(a) 365 (b) 535 (c) 190 (d) 356

Q.35. A dice is thrown 150 times, with the frequencies for the outcomes 1, 2, 3, 4, 5 and 6 being as given in the following table. How many times is the number appearing on the dice a prime number?

Outcome	1	2	3	4	5	6
Frequency	23	43	33	13	10	28

SSC CHSL 06/06/2022 (Evening)
(a) 88 (b) 109 (c) 86 (d) 66

Search on Telegram @apna_pdf

SSC MTS 2020 Tier - 1

Q.36. What is the mean of the median and the mode of the data:
19, 20, 14, 15, 19, 16, 17, 15, 14, 13, 18, 19, 17, 13
SSC MTS 05/10/2021 (Afternoon)
(a) 17 (b) 18 (c) 17.75 (d) 17.25

Q.37. What is the mean of the range and median of the given data?
11, 16, 14, 7, 11, 23, 10, 30, 20, 33, 19, 12, 17, 14
SSC MTS 06/10/2021 (Evening)
(a) 20.5 (b) 25.5 (c) 24 (d) 19

Q.38. The value of the mode and median are 7.52 and 9.06, respectively, in a moderately asymmetrical distribution. The mean of the distribution is:
SSC MTS 07/10/2021 (Afternoon)
(a) 9.83 (b) 8.67 (c) 10.23 (d) 9.5

Q.39. A raw data is in ascending order, i.e. 3, 4, 7, x, x+1, 12, 13, 15. If the median of this data is 9.5, then x is equal to :
SSC MTS 07/10/2021 (Evening)
(a) 7.5 (b) 8.5 (c) 8 (d) 9

Q.40. The numbers 5, 7, 8, 10, 12, 13 and N are arranged in ascending order. If the mean of the numbers is equal to the median, the value of N is :
SSC MTS 08/10/2021 (Morning)
(a) 16 (b) 25 (c) 15 (d) 14

Q.41. If the mean of the distribution is 24.6, then the value of *x* is:

Class	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
Freq .	6	12	15	x	5

SSC MTS 08/10/2021 (Afternoon)
(a) 10 (b) 9 (c) 12 (d) 13

Q.42. Study the given data and answer the question that follows.

Marks	No. of students
0 - 10	3
10 - 20	18
20 - 30	5
30 - 40	7
40 - 50	16

If *x* is the lower limit of the median class and *y* is the upper limit of the modal class, then the value of (3x + 2y) is:
SSC MTS 08/10/2021 (Evening)
(a) 80 (b) 90 (c) 70 (d) 100

Q.43. If the mode of the following data is 11, then find the value of *k* .
11, 8, 9, (2k - 1), 11, 12, 12, 18, 14, 16
SSC MTS 11/10/2021 (Morning)
(a) 5 (b) 6 (c) 7 (d) 4

Q.44. If the ratio of the mode and median of a certain data is 9 : 8, then the ratio of its mean and median is:
SSC MTS 11/10/2021 (Afternoon)
(a) 15 : 17 (b) 13 : 15 (c) 15 : 16 (d) 11 : 15

Q.45. The mean of 100 items is 47. It was discovered that three items which should have been 60, 70, 80 were wrongly read as 40, 20, 50, respectively. The correct mean is:
SSC MTS 12/10/2021 (Morning)
(a) 48 (b) 47 (c) 50 (d) 51

Q.46. The numbers 25, 34, 46, 48, 2x + 1, 4x + 3, 105, 110, 114, 122 are written in ascending order and their median is 77. The value of x is:
SSC MTS 12/10/2021 (Evening)
(a) 22 (b) 24 (c) 28 (d) 25

Q.47. The median of a set of 11 distinct observations is 17.5. If each of the largest 5 observations of the set is increased by 3, then the median of the new set is:
SSC MTS 13/10/2021 (Morning)
(a) is three times of the original number
(b) is decreased by 3
(c) is increased by 3
(d) remains the same as that of the original set

Q.48. If a, b and c are the median, mode and range, respectively, of the data: 8, 5, 4, 3, 2, 7, 3, 10, 9, 17, 12, 3, 8, 4, then what is the value of (3a – 2b + c)
SSC MTS 14/10/2021 (Evening)
(a) 29 (b) 30 (c) 26 (d) 27

Q.49. If mode of the following data is 14, then what is the value of k ?
11, k, 8, 9, (k – 1), 11, 12, 12, 15, (k – 1), 14
SSC MTS 20/10/2021 (Morning)
(a) 13 (b) 11 (c) 15 (d) 12

Q.50. If the variance of 5 values is 0.81, then what is its standard deviation?
SSC MTS 26/10/2021 (Morning)
(a) 0.09 (b) 0.9 (c) 2.7 (d) .027

Q.51. What is the mean of the mode and median of the given data ?
5, 4, 6, 9, 3, 2, 5, 6, 7, 8, 9, 5, 7, 3
SSC MTS 26/10/2021 (Afternoon)
(a) 5 (b) 5.25 (c) 5.50 (d) 6

Q.52. In a week, the prices of a bag of tea were ₹350, ₹280, ₹340, ₹270, ₹360, ₹310, and ₹300. The range (in ₹) is :
SSC MTS 02/11/2021 (Afternoon)
(a) 100 (b) 80 (c) 70 (d) 90

Q.53. What is the range of the distribution of a variable which takes ten values :
17, 18, 27, 11, 24, 21, 34, 21, 17, 32?
SSC MTS 02/11/2021 (Evening)
(a) 23 (b) 17 (c) 21 (d) 15

Answer Key :-

1.(d)	2.(c)	3.(a)	4.(b)
5.(d)	6.(a)	7.(a)	8.(b)
9.(a)	10.(b)	11.(a)	12.(a)
13.(c)	14.(a)	15.(a)	16.(d)
17.(a)	18.(c)	19.(d)	20.(d)
21.(d)	22.(c)	23.(d)	24.(c)
25.(c)	26.(d)	27.(b)	28.(d)
29.(a)	30.(d)	31.(c)	32.(c)
33.(b)	34.(a)	35.(c)	36.(c)
37.(a)	38.(a)	39.(d)	40.(c)
41.(c)	42.(d)	43.(b)	44.(c)
45.(a)	46.(d)	47.(d)	48.(d)
49.(c)	50.(b)	51.(b)	52.(d)
53.(a)			

Solutions :-

Sol.1.(d) Given data = 7, 16, 121, 51, 101, 81, 1, 16, 9, 77, 16
After arranging these data in ascending order
1, 7, 9, 16, 16, 16, 51, 77, 81, 101, 121
Median is the middle terms of given all terms
∴ Median = $\frac{11+1}{2}$th terms = $6th$ terms
Median = 16

Sol.2.(c) Mode = 48.5
f_1 = frequency of the modal class = 34
f_0 = frequency of class just preceding the modal class = 32
f_2 = frequency of class just succeeding the modal class = 25
l = lower limit of the modal class = 46.5
h = width of the class interval

Mode = l + $(\frac{f_1-f_0}{2f_1-f_0-f_2})$h

48.5 = 46.5+ $(\frac{34-32}{2\times 34-32-25})$h

2 = $(\frac{2}{68-57})$h ⇒ h = 11

Sol.3.(a)

Class-interval	Midpoint (x)	Frequencies (f)	fx
0 - 10	5	2	10
10 - 20	15	4	60
20 - 30	25	12	300
30 - 40	35	21	735
40 - 50	45	6	270
50 - 60	55	3	165
60 - 70	65	2	130
Total		50	1670

Search on Telegram @apna_pdf

Required Mean = $\frac{\Sigma f(x)}{\Sigma f}$ = $\frac{1670}{50}$ = 33.4

Sol.4.(b) Ascending order of the data
= 28, 32, 33, 35, 37, 41, 42, 49, 52, 57
Middle numbers are 37 and 41.
Median of the data = x = $\frac{37+41}{2}$ = 39
Ascending order of modified data
= 28, 33, 35, 36, 37, 42, 49, 52, 57, 63
Middle numbers are 37 and 42.
Median of the data = y = $\frac{37+42}{2}$ = 39.5
$\Rightarrow x + y = 39 + 39.5 = 78.5$

Sol.5.(d) Mode = 3(Median) – 2(Mean)
= 3(60) – 2(35) = 110

Sol.6.(a) Given data is in ascending order.
The middle value of data = Median
= k + 5
According to the Question ,
k + 5 = 34 $\Rightarrow k = 34 - 5 = 29$

Sol.7.(a) Mean = $\frac{Sum\ of\ data}{Number\ of\ data}$
= $\frac{4+13+8+15+9+21+18+23+35+1}{10}$
= 14.7
Ascending order of the data
= 1, 4, 8, 9, 13, 15, 18, 21, 23, 35
Middle values are 13 and 15
Median = $\frac{13+15}{2}$ = 14
Required difference = 14.7 – 14 = 0.7

Sol.8.(b)

No. of Wickets (x_i)	No. of bowlers (f_i)	Cumulative frequency (cf)
5	2	2
4	3	2 + 3 = 5
3	4	5 + 4 = 9
2	5	9 + 5 = 14
1	9	14 + 9 = 23
	Cumulative Mean =	$\frac{23}{2}$ = 11.5

Since, 11.5 lies in the 14th cumulative frequency zone.
Hence, median of number of wickets = 2

Sol.9.(a)

Number of Sixes (x_i)	Number of batsman (f_i)	Cumulative frequency (cf)
1	2	2
2	3	2 + 3 = 5
3	1	5 + 1 = 6
4	3	6 + 3 = 9
5	2	9 + 2 = 11
	Cumulative mean =	$\frac{11}{2}$ = 5.5

Since, 5.5 lies in the 6th cumulative frequency zone. Hence, Median of sixes will be 3.

Sol.10.(b) The mode is the number that is repeated most often. Here 3 is repeated the maximum number of times (5) so the mode will be 3.

Sol.11.(a)

Age(x_i)	NO. of children (f_i)	
6	17	102
7	16	112
8	16	128
9	17	153
10	19	190
11	15	165
	Σf_i = 100	$\Sigma f_i x_i$ = 850

Mean age = $\frac{850}{100}$ = 8.5
The number of students shows that 10 is the most common age.
So mode of the data = 10.
Required difference = 10 – 8.5 = 1.5

Sol.12.(a) Arrange the data in ascending order 6, 9, 13, 8, 3, 2, 5, 7 and 11
$\Rightarrow 2, 3, 5, 6, 7, 8, 9, 11, 13$
The median will be the middle value of this order which is 7.

Sol.13.(c)
Total number of days in 2019 = 365
Median will be the 183th day of the year which is 2 july or 02.07

Sol.14.(a)

Marks	Number of Students(f_i)	x_i	$f_i x_i$
9 - 11	6	$\frac{9+11}{2}$ = 10	60
11 - 13	5	$\frac{11+13}{2}$ =12	60
13 - 15	2	$\frac{13+15}{2}$ =14	28
15 - 17	2	$\frac{15+17}{2}$ =16	32
17 - 19	5	$\frac{17+19}{2}$ =18	90
	Σf_i = 20		$\Sigma f_i x_i$ =270

the mean marks per student = $\frac{\Sigma f_i x_i}{\Sigma f_i}$
= $\frac{270}{20}$ = 13.5

Sol.15.(a) Given observations are 46 , 48 , 63 , 76 , 88 , 41 , 35 , 55 , 90 , 56 , 92
Arrange this observations in ascending order
35 , 41 , 46 , 48 , 55 , 56 , 63 , 76 , 88 , 90 , 92
There is odd number observations i.e. 11
Median = $(\frac{n+1}{2})^{th} = (\frac{11+1}{2})^{th}$
= 6th term = 56
After interchanging 88 by 93 and 41 by 47, we get
35 , 46 , 47 , 48 , 55 , 56 , 63 , 76 , 90 , 92 , 93
New Median = 6th term = 56
∴ Required difference = 56 - 56 = 0

Sol.16.(d)

age(x_i)	**No. of children (f_i)**	$x_i f_i$
1	**20**	**20**
2	**50**	**100**
3	**70**	**210**
4	**50**	**200**
5	**20**	**100**
	Σf_i = 210	**$\Sigma x_i f_i$ = 630**

Mean = $\frac{\Sigma x_i f_i}{\Sigma f_i}$ = $\frac{630}{210}$ = 3
Mode is the age having highest no. of children
Hence, mode = 3
Required difference = 3 - 3 = 0

Sol.17.(a) Mean of the ages =
$\frac{(6\times8)+(7\times3)+(8\times7)+(9\times2)+(10\times20)}{8+3+7+2+20}$
= $\frac{48+21+56+18+200}{40}$
= $\frac{343}{40}$ = 8.575
Mode = 10
Required difference = 10 - 8.575
= 1.425 years

Sol.18.(c) Sum of age of children = (6 × 8) + (7 × 3) + (8 × 7) + (9 × 2) + (10 × 20)
= 48 + 21 + 56 + 18 + 200 = 343
Required mean = $\frac{343}{6+7+8+9+10}$
= $\frac{343}{40}$ = 8.575 year

Sol.19.(d)
The sum of deviations of the items from the arithmetic mean is always zero
Example:
Let 1,2, 3, 4, 5 are no. of observation.
Mean = 3
Deviation = -2, -1 , 0, +1, +2 = 0

Sol.20.(d) Mode is the highest frequency number of given data.
In the question, Number of patients is highest on the 8th day.
So, Mode = 8

Sol.21.(d) Mode is the highest frequency number of given data.
In the question, we can see that 15 came the highest times i.e. 4 times.
∴ Mode of given data = 15

Search on Telegram @apna_pdf

Sol.22.(c)
Mean(average) = 4500, Median = 4900
We know that,
Mode = 3 × Median - 2 × Mean
Mode = 3 × 4900 - 2 × 4500
Mode = 5700

Sol.23.(d) As we know, mode is the value that appears most frequently.
So, modes of this set of data = 15(occurs 2 times) and 13 (occurs 2 times)
Then, required product = 15 × 13 = 195

Sol.24.(c) According to the question,
Sum of 23 observations = 23 × 36 = 828
Sum of first 12 observations
= 12 × 32 =384
Sum of last 12 observations
= 12 × 39 = 468
12th observation =(384 + 468) - 828 = 24

Sol.25.(c) Mean age of boys
$= \frac{5\times8+6\times3+7\times7+8\times2+9\times20}{8+3+7+2+20}$
$= \frac{40+18+49+16+180}{40}$
$= \frac{303}{40}$ = 7.57 years

Sol.26.(d) Arrange the given series in ascending order →
10 , 15 , 18 , 20 , 21 , 25 , 28 , 30 and 35
Total no. of term = 9
So , median = $(\frac{9+1}{2})th\ term$
Median (5th term) = 21

Sol.27.(b) Arrange the given series in ascending order →
12.3 , 13.5 , 114.1 , 116.6 , 118.7 , 121.3 , 129.75 , and 136.6
Total no. of term = 8
So , median = $(\frac{4th\ +5th\ term}{2})$
Median = $\frac{116.6+118.7}{2}$ = 117.65

Sol.28.(d)

Class Interval	5 -10	10 -15	15 -20	20 -25	25 - 30	30 - 35
Frequency	8	7	6	9	11	10

Mode = L + $\{\frac{f_1-f_0}{2.f_1-f_0-f_2}\}\times h$
Where, L = Lower limit of modal class
f_1 = Frequency of modal class
f_0 = Frequency of previous modal class
f_2 = Frequency of next modal class
h = Class size
By formula,
Mode = 25 + $\{\frac{11-9}{2(11)-9-10}\}\times 5$
$= 25 + \{\frac{2}{22-19}\}\times 5$
$= 25 + \frac{10}{3} = \frac{85}{3}$ = 28.33

Sol.29.(a)
Mean of the data = $\frac{5+3+4+7}{4}$ = 4.75
Deviation about mean = 0.25 , - 1.75 , - 0.75 and 2.25
Their square = 0.0625 , 3.0625 , 0.5625 and 5.0625
Now , Variance
$= \frac{0.0625+3.0625+0.5625+5.0625}{4}$
= 2.1875
Standard deviation = $\sqrt{variance}$
= $\sqrt{2.1875}$ = 1.48

Sol.30.(d) Mode = 3 Median – 2 Mean
Mode = 3 × 48 – 2 × 60
Mode = 24

Sol.31.(c) Given : The median of a set of 11 distinct observations is 73.2.
Concept used : median of a set
= $[\frac{(n+1)}{2}]^{th}$ observation
$[\frac{(11+1)}{2}]^{th}$ observation
= 6th observation
The sixth observation is not changed , when each of the largest observations of the sets is increased by 3.
∴ So , Median remains the same as that of the original set .

Sol.32.(c)

Number (n)	Weighted factor(w)	n × w
1	1	1= 1^2
2	2	4 = 2^2
3	3	9 = 3^2
4	4	16 = 4^2 .....
n	n	n^2

Weighted average
$= \frac{sum\ of\ (number\times weighted\ factor)}{sum\ of\ all\ weighted\ factor}$
$= \frac{1^2+2^2+3^2+.....+n^2}{1+2+3+.....+n}$
Weighted average
$= \frac{\frac{1}{6}(n)(n+1)(2n+1)}{\frac{1}{2}(n)(n+1)} = \frac{(2n+1)}{3}$

Sol.33.(b)

Subjects	After deduction
English	50
Hindi	85
Mathematics	70
Science	75
Foreign language	85

Mean = $\frac{50+85\ +70+75+85}{5}$
$= \frac{365}{5}$ = 73
Mode = 85 (as it is repeated 2 times)
Arranging it in ascending order, we have.
50, 70, 75, 85, 85.
Since, there are 5 values . so, the middle value i.e.75 is median
Net average of mean, median, mode
$= \frac{73+75+85}{3} = \frac{233}{3}$ = 77.67

Sol.34.(a) Total frequency for the outcome of 5 or greater than 5
= 190 + 175 = 365

Sol.35.(c) Total frequency of the prime number appearing on the dice
= 43 + 33 + 10 = 86

Sol.36.(c) On arranging the given observations in ascending order, we get
13, 13, 14, 14, 15, 15, 16, 17, 17, 18, 19, 19, 19, 20
Mode = 19 (most repeated observation)
Here
total number of observations = 14 (even)
Median =
$\frac{\frac{14}{2}th\ observation+(\frac{14}{2}+1)th\ observation}{2}$
$= \frac{7th\ observation+8th\ observation}{2}$
$= \frac{16+17}{2} = \frac{33}{2}$ = 16.5
Required Mean = $\frac{Median+Mode}{2}$
$= \frac{16.5+19}{2} = \frac{35.5}{2}$ = 17.75

Sol.37.(a) Arranging the given data in ascending order, we get:
7, 10, 11, 11, 12, 14, 14, 16, 17, 19, 20, 23, 30, 33
Range of the data = highest term – lowest term ⇒ 33 – 7 = 26
Here number of terms of data is 14(even)
median =
$\frac{1}{2}[\frac{14}{2}^{th}term+(\frac{14}{2}+1)^{th}term]$
$= \frac{1}{2}[7^{th}term+8^{th}term]$
$= \frac{1}{2}$ [14 + 16] = 15
Mean of Range and Median
$= \frac{26+15}{2}$ = 20.5

Sol.38.(a) For asymmetrical distribution,
Mode = 3(Median) – 2(Mean)
7.52 = 3(9.06) – 2(Mean)
7.52 = 27.18 – 2(Mean)
2(Mean) = 19.66 ⇒ Mean = 9.83

Sol.39.(d)

Search on Telegram @apna_pdf

Total number of terms = 8 (even)

Median =

$$\frac{\frac{n}{2}th\ observation + (\frac{n}{2}+1)th\ observation}{2}$$

9.5 =

$$\frac{\frac{8}{2}th\ observation + (\frac{8}{2}+1)th\ observation}{2}$$

9.5 = $\frac{4th\ observation + 5th\ observation}{2}$

9.5 = $\frac{(x)+(x+1)}{2}$ ⇒ 19 = 2x +1

⇒ 18 = 2x ⇒ x = 9

Sol.40.(c) 5, 7, 8, 10, 12, 13 and N

Here total number of terms = n = 7 which is odd. So median for odd number of terms = $\frac{n+1}{2}$ = $\frac{7+1}{2}$ = $\frac{8}{2}$ = 4th observation = 10

So, mean = median = 10

Mean = $\frac{5+7+8+10+12+13+N}{7}$

10 = $\frac{55+N}{7}$ ⇒ N = 70 − 55 = 15

Sol.41.(c)

class	Freq .	midpoint	$f_i x_i$
0 - 10	6	5	30
10 - 20	12	15	180
20 - 30	15	25	375
30 - 40	x	35	35x
40 - 50	5	45	225
Total	38 + x	-	810 + 35x

Mean = $\frac{\Sigma f_i x_i}{\Sigma f_i}$; 24.6 = $\frac{810+35x}{38+x}$

934.8 + 24.6x = 810 + 35x

⇒ 10.4x = 124.8 ⇒ x = 12

Sol.42.(d) Here in the given question, maximum number of students

= 18 which corresponds to class 10 – 20.

So Modal class = 10 – 20,

so upper limit of modal class = y = 20.

Marks	0–10	10–20	20–30	30–40	40–50	Total
No. of students	3	18	5	7	16	n = 49
Cumulative frequency	3	21	26	33	49	–

Median class = 20 - 30 as the cf just greater than $\frac{n}{2}$ = $\frac{49}{2}$ = 24.5 is 26 which lies between 20 - 30.

So, lower limit of median class = x = 20

So, 3x + 2y = 3(20) + 2(20) = 60 + 40

= 100

Sol.43.(b) Here in given data, 12 is repeated 2 times, and 11 is also repeated 2 times,

so in order to make 11 as the mode of given data we need to repeat 11 three times which is possible only when

2k – 1 = 11.

So, 2k – 1 = 11 ⇒ 2k = 12, so k = 6

Sol.44.(c) Mode = 3(Median) – 2(Mean)

9 = 3(8) – 2(Mean) ⇒ 2(Mean) = 24 – 9

2(Mean) = 15 ⇒ Mean = $\frac{15}{2}$

Mean : Median = $\frac{15}{2}$: 8 = 15 : 16

Sol.45.(a)

Sum of observations = 100 × 47 = 4700

Corrected sum of observations

= 4700 – (40 + 20 + 50) + (60 + 70 + 80)

= 4700 – 110 + 210 = 4800

Correct mean = $\frac{4800}{100}$ = 48

Sol.46.(d) Here total number of observations = 10 (even)

Median =

$$\frac{(\frac{10}{2})th\ observation + (\frac{10}{2}+1)th\ observation}{2}$$

= $\frac{5th\ observation + 6th\ observation}{2}$

77 = $\frac{(2x+1)+(4x+3)}{2}$

154 = 6x + 4 ⇒ 150 = 6x ⇒ x = 25

Sol.47.(d) Median of odd number of observations = $(\frac{n+1}{2})^{th}$ term

Median = $(\frac{11+1}{2})^{th}$ term = 6th term

So there is no impact on the median if the last 5 terms are changed.

Sol.48.(d) Arranging the given numbers in ascending order we get,

2, 3, 3, 3, 4, 4, 5, 7, 8, 8, 9, 10, 12, 17

So mode = b = 3 (most repeated observation)

Range = c = Highest observation – Lowest observation = 17 – 2 = 15

Total number of terms = 14 (even)

Median =

$$\frac{\frac{14}{2}th\ observation + (\frac{14}{2}+1)th\ observation}{2}$$

= $\frac{7th\ observation + 8th\ observation}{2}$

= $\frac{5+7}{2}$ = $\frac{12}{2}$ = 6, so a = 6

So , 3a – 2b + c = 3(6) – 2(3) + 15

= 18 – 6 + 15 = 27

Sol.49.(c) Here mode = 14, so it is necessary that 14 is repeated maximum number of times. Here, 11 and 12 are repeated 2 times, so for mode to be 14, it is necessary that 14 is repeated 3 or more than 3 times.

So, k – 1 = 14 ⇒ k = 15

Sol.50.(b)

Standard Deviation = $\sqrt{Variance}$

= $\sqrt{0.81}$ = 0.9

Sol.51.(b) 5, 4, 6, 9, 3, 2, 5, 6, 7, 8, 9, 5, 7, 3

On arranging the above series in ascending order we get,

2, 3, 3, 4, 5, 5, 5, 6, 6, 7, 7, 8, 9, 9

Mode = most repeated observation

= 5 (repeated 3 times)

Total number of terms = 14 (even)

Median =

$$\frac{\frac{14}{2}th\ observation + (\frac{14}{2}+1)th\ observation}{2}$$

= $\frac{7th\ observation + 8th\ observation}{2}$

= $\frac{5+6}{2}$ = 5.5

Mean of the mode and median

= $\frac{Mode + Median}{2}$ = $\frac{5+5.5}{2}$ = 5.25

Sol.52.(d) Range of a distribution

= Highest term – Lowest term

Range = 360 – 270 = 90.

Sol.53.(a) Range of a distribution

= highest term – lowest term

⇒ here highest term is 34 and lowest term is 11.

So, our answer is 34 – 11 = 23.

Search on Telegram @apna_pdf

Coordinate Geometry

Coordinate geometry is a system of geometry where the position of points on the plane is described by using an ordered pair of numbers. The x-coordinate and the y- coordinate of a point taken together is known as coordinates of the point

Key points:

- **Coordinate Axes :** The perpendicular lines in the cartesian system are x axis and y axis . Both of them together are known as coordinate axes.
- **Origin :** The point of intersection of coordinate axes is origin. The coordinates of origin are (0 , 0).
- **Abscissa :** The x - coordinate is called abscissa. It is the perpendicular distance of a point from y axis.
- **Ordinate :** The y-coordinate is called ordinate . It is the perpendicular distance of a point from x-axis.
- If y = a, where a is constant then y = a denotes a straight line parallel to x-axis.
- If x = a, where a is constant then x = a denotes a straight line parallel to y-axis.
- For passing a line through the origin, one of the coordinates of the given equation must be (0, 0).

Important Formulae :

- Distance Formula : If points $P(x_1, y_1)$, $Q(x_2, y_2)$ lie on the plane xy then,

$$PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

- **Section Formula :**

The coordinates of a point which divides the line segment joined by two distinct points (x_1, y_1) and (x_2, y_2) in the ratio m : n are :

$$(x, y) = \left(\frac{mx_2 + nx_1}{m+n}, \frac{my_2 + ny_1}{m+n}\right)$$

Note : When line segment is divided externally in the ratio m : n then ratio becomes $\left(\frac{mx_2 - nx_1}{m-n}, \frac{my_2 - ny_1}{m-n}\right)$

- **Midpoint Formula :**

It is derived from the Section Formula. The coordinates of a point which divides the line segments in the ratio 1 : 1. Then,

$$(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

- **Centroid Formula :**

If (x_1, y_1), (x_2, y_2) and (x_3, y_3) are the vertices of a triangle then coordinates of the centroid are :

$$\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3}\right)$$

- **Incentre Formula :**

If (x_1, y_1), (x_2, y_2) and (x_3, y_3) are the vertices of a triangle then coordinates of the incenter are :

$$\left(\frac{ax_1 + bx_2 + cx_3}{a+b+c}, \frac{ay_1 + by_2 + cy_3}{a+b+c}\right)$$

- **Slope of a line :**

If (x_1, y_1), (x_2, y_2) are any two points on line L, then the ratio $\frac{y_2 - y_1}{x_2 - x_1}$ is called the slope of the line L.

- Angle between two lines of slope m_1 and m_2, respectively then

$$\tan\theta = \left|\frac{m_2 - m_1}{1 + m_1 m_2}\right|$$

- **Intercept form of equation of a line :**

$\frac{x}{a} + \frac{y}{b} = 1$, where 'a' is x intercept of line and 'b' is y intercept of line .

- Perpendicular distance from a point (x_1, y_1) to line ax + by + c = 0, then

$$D = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$$

- **Distance between ∥ lines :**

$a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ is

$$D = \left|\frac{c_1 - c_2}{\sqrt{a^2 + b^2}}\right|$$

- **Equation of a circle**

$x^2 + y^2 + 2gx + 2fy + c = 0$, where center of the circle is (- g , - f) and radius = $\sqrt{g^2 + f^2 - c}$

- If point A (x_1, y_1), B(x_2, y_2) and C (x_3, y_3) are the vertices of a triangle then area of a triangle is : $\frac{1}{2}\left|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)\right|$

- **Equation of a circle** → $(x - h)^2 + (y - k)^2 = r^2$

Where

(h, k) → x, y coordinate of center point

x → x - coordinate of circle point

y → y - coordinate of circle point

Variety Questions

Q.1. The shortest length of the intercept between the x-axis and y-axis of the equation 6x + 8y - 48 = 0 is:
SSC CHSL 02/07/2024 (3rd Shift)
(a)14units (b)6units (c)10units (d)12units

Q.2. What is the area (in unit squares) of the triangle enclosed by the graphs of the equations 2x + 5y = 12, x + y = 3 and the x-axis? SSC CGL Tier II (03/02/2022)
(a) 2.5 (b) 3.5 (c) 3 (d) 4

Q.3. The equation of circle with centre (1 , – 2) and radius 4 cm is :
SSC CHSL 17/03/2020 (Afternoon)
(a) $x^2 + y^2 + 2x - 4y = 16$
(b) $x^2 + y^2 - 2x + 4y = 16$
(c) $x^2 + y^2 + 2x - 4y = 11$
(d) $x^2 + y^2 - 2x + 4y = 11$

Q.4. What is the area (in square units) of the triangular region enclosed by the graphs of the equations x + y = 3, 2x + 5y = 12 and the x axis?
SSC CGL Tier II (13/09/2019)
(a) 2 (b) 3 (c) 4 (d) 6

Practice Questions

SSC MTS 2024 Tier - 1

Q.5. Find the area of the quadrilateral ABCD, the coordinates of whose vertices are A(6, - 3), B(- 4, - 2), C(3, 1) and D(5, 0)? SSC MTS 01/10/2024 (Morning)
(a) 21 unit^2 (b) 30 unit^2
(c) 25 unit^2 (d) 16 unit^2

SSC CHSL 2024 Tier - 1

Q.6. If equation of line p is x + y = 5 and that of line q is x - y = 3, what are the coordinates of the point common to both the lines?
SSC CHSL 01/07/2024 (1st Shift)
(a) (1, 4) (b) (2, 3) (c) (2, 1) (d) (4, 1)

Q.7. The graphs of two linear equations, x + 2y = 15 and 4x + 8y = 13 will be:
SSC CHSL 02/07/2024 (1st Shift)
(a) intersecting at one point
(b) parallel
(c) intersecting at two points
(d) coincident

Q.8. If the point of intersection of lines x + y = 2 and 2x - y = 1 lies on y = Kx + 5, what is the value of K ?
SSC CHSL 02/07/2024 (4th Shift)
(a) 3 (b) - 4 (c) 4 (d) - 3

Q.9. If a circle whose centre is (2, 3) touches the line 4x + 3y - 7 = 0, then the radius of the circle is:
SSC CHSL 03/07/2024 (1st Shift)
(a) 1 unit (b) 3 unit (c) 4 unit (d) 2 unit

Q.10. The length of the portion of the straight line 5x + 12y = 60 intercepted between the axes is:
SSC CHSL 03/07/2024 (1st Shift)
(a) 13 (b) 17 (c) 5 (d) 12

Q.11. What is the area of the region created by the two linear equations 2x + y = 6 and 2x - y = - 2 bounded by these lines and the x-axis ?
SSC CHSL 03/07/2024 (2nd Shift)
(a) 8 sq units (b) 5 sq units
(c) 3 sq units (d) 6 sq units

Q.12. The perpendicular length from the origin to the line 6x + 8y - 48 = 0 is:
SSC CHSL 05/07/2024 (3rd Shift)
(a) 4.8 unit (b) 2.6 unit
(c) 8.3 unit (d) 5.2 unit

Search on Telegram @apna_pdf

Q.13. If the graph of the equation $20x + 21y = 420$ cuts the coordinate axes at P and Q, then what is the measure of the length (in units) of PQ ?
SSC CHSL 05/07/2024 (4th Shift)
(a) 29 (b) 35 (c) 25 (d) 40

Q.14. If the intersection point of the equations 3p − 2q + 23 = 0 and −2p + q − 13 = 0 on the graph is (p, q), then the value of (3p + q) is equal to :
SSC CHSL 09/07/2024 (2nd Shift)
(a) - 1 (b) - 2 (c) 2 (d) 1

Q.15. The lines x + y = 10 and -3x + y = 2 have a unique solution. What is the distance (in units) between the unique solution and the point of intersection of the line x + y = 10 and the x-axis?
SSC CHSL 09/07/2024 (3rd Shift)
(a) $10\sqrt{2}$ (b) $8\sqrt{2}$ (c) 10 (d) 8

Q.16. Find the equation of the sphere having centre (-1,2,-3) and the radius of 3 units. SSC CHSL 09/07/2024 (3rd Shift)
(a) $x^2 + y^2 + z^2 + 2x - 4y + 6z + 5 = 0$
(b) $x^2 + y^2 + z^2 - x + 2y - 3z + 5 = 0$
(c) $x^2 + y^2 + z^2 - 2x + 4y - 6z + 5 = 0$
(d) $x^2 + y^2 + z^2 + x - 2y + 3z + 5 = 0$

SSC CHSL 2023 Tier - 1

Q.17. Find the radius of the circle $x^2 + y^2 = 25$.
SSC CHSL 08/08/2023 (4th Shift)
(a) 25 unit (b) 5 unit (c) 2 unit (d) 12 unit

SSC CGL 2022 Tier - 2

Q.18. Find the coordinates of the points where the graph 57x − 19y = 399 cuts the coordinate axis.
SSC CGL Tier II (07/03/2023)
(a) x-axis at (-7,0) and y-axis at (0,-21)
(b) x-axis at (-7,0) and y-axis at (0,21)
(c) x-axis at (7,0) and y-axis at (0,-21)
(d) x-axis at (7,0) and y-axis at (0,21)

SSC CGL 2021 Tier - 2

Q.19. The graph of the equation x = a (a ≠ 0) is a _____.
SSC CGL Tier II (08/08/2022)
(a) line parallel to x axis
(b) line parallel to y axis
(c) line at an angle of 45 degree to y axis
(d) line at an angle of 45 degree to x axis

SSC CGL 2020 Tier - 2

Q.20. The graphs of the equations $4x + \frac{1}{3}y = \frac{8}{3}$ and $\frac{1}{2}x + \frac{3}{4}y + \frac{5}{2} = 0$ and intersect at a point P. The point P also lies on the graph of the equation:
SSC CGL Tier II (29/01/2022)
(a) $4x - y + 7 = 0$ (b) $x - 3y - 12 = 0$
(c) $3x - y - 7 = 0$ (d) $x + 2y - 5 = 0$

Q.21. What is the area (in unit squares) of the region enclosed by the graphs of the equations 2x − 3y + 6 = 0, 4x + y = 16 and y = 0 ?SSC CGL Tier II (29/01/2022)
(a) 11.5 (b) 14 (c) 10.5 (d) 12

Q.22. The graphs of the equations 7x + 11y = 3 and 8x + y = 15 intersect at the point P, which also lies on the graph of the equation.
SSC CGL Tier II (03/02/2022)
(a) 2x + y = 2 (b) 2x − y = 1
(c) 3x + 5y = 1 (d) 3x + 2y = 3

SSC CGL 2019 Tier - 2

Q.23. The graph of the equations 3x − 20y − 2 = 0 and 11x − 5y + 61 = 0 intersect at P(a, b). What is the value of $(a^2 + b^2 - ab)/(a^2 - b^2 + ab)$?
SSC CGL Tier II (15/11/2020)
(a) $\frac{37}{35}$ (b) $\frac{31}{41}$ (c) $\frac{5}{7}$ (d) $\frac{41}{31}$

Q.24. The area (in sq units) of the triangle formed by the graphs of equations 8x + 3y = 24 , 2x + 8 = y and the x-axis is:
SSC CGL Tier II (15/11/2020)
(a) 28 (b) 14 (c) 15 (d)24

Q.25. The graph of the linear equation 3x − 2y = 8 and 4x + 3y = 5 intersect at the point (α, β). What is the value of (2α − β)?SSC CGL Tier II (16/11/2020)
(a) 4 (b) 6 (c) 3 (d) 5

Q.26. What is the reflection of the point (5, − 3) in the line Y = 3 ?
SSC CGL Tier II (18/11/2020)
(a) (5, -6) (b) (-5, 3) (c) (5, 9) (d) (5, 3)

Q.27. The graphs of the linear equations 4x − 2y = 10 and 4x + ky = 2 intersect at a point (a, 4). The value of k is equal to:
SSC CGL Tier II (18/11/2020)
(a) 3 (b) − 3 (c) − 4 (d) 4

SSC CGL 2018 Tier - 2

Q.28. The graphs of the equations 3x + y − 5 = 0 and 2x − y − 5 = 0 intersect at the point P(α, β). What is the value of (3α + β) ?
SSC CGL Tier II (11/09/2019)
(a) 4 (b) - 4 (c)3 (d) 5

Q.29. The graph of the equation x − 7y = − 42, intersects the y -axis at P(α , β) and the graph of 6x + y − 15 = 0, intersects the x-axis at Q(γ , δ). What is the value of α + β + γ + δ ?
SSC CGL Tier II (11/09/2019)
(a) $\frac{17}{2}$ (b) 6 (c) $\frac{9}{2}$ (d) 5

Q.30. The point of intersection of the graphs of the equations 3x − 5y = 19 and 3y − 7x + 1 = 0 is P(α , β) . What is the value of (3α − β) ?
SSC CGL Tier II (12/09/2019)
(a) - 2 (b) −1 (c) 1 (d) 0

Q.31. The graphs of the equations 2x + 3y = 11 and x − 2y + 12 = 0 intersects at P(x_1 , y_1) and the graph of the equation x − 2y + 12 = 0 intersects the x-axis at Q(x_2 , y_2). What is the value of ($x_1 - x_2 + y_1 + y_2$) ?
SSC CGL Tier II (12/09/2019)
(a) 13 (b) - 11 (c) 15 (d) -9

Q.32. The graph of the equations 5x − 2y + 1 = 0 and 4y − 3x + 5 = 0, intersect at the point P(α, β). What is the value of (2α − 3β) ?
SSC CGL Tier II (13/09/2019)
(a) 4 (b) 6 (c) - 4 (d) - 3

Answer Key :-

1.(c)	2.(c)	3.(d)	4.(b)
5.(a)	6.(d)	7.(b)	8.(b)
9.(d)	10.(a)	11.(a)	12.(a)
13.(a)	14.(b)	15.(b)	16.(a)
17.(b)	18.(c)	19.(b)	20.(c)
21.(b)	22.(c)	23.(b)	24.(a)
25.(d)	26.(c)	27.(c)	28.(d)
29.(a)	30.(b)	31.(c)	32.(a)

Solutions :-

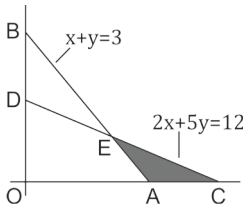
Sol.1.(c) 6x + 8y - 48 = 0
For x intercept put y = 0
6x + 8y - 48 = 0
6x = 48 ⇒ x = 8
For y intercept put x = 0
6x + 8y - 48 = 0
8y = 48 ⇒ y = 6
The shortest length between these two points is the hypotenuse of a right triangle with length 8 and 6.
Using the Pythagorean theorem:
Length = $\sqrt{8^2 + 6^2} = \sqrt{100}$ = 10 units
Thus, the shortest length of the intercept between the x-axis and y-axis is 10 units.

Sol.2.(c) Intersection point of 2x + 5y = 12 and x + y = 3 is (1 , 2)
Intersection point of 2x + 5y = 12 and y = 0 is (6 , 0)
Intersection point of x + y = 3 and y = 0 is (3 , 0)
Area of triangle = $\frac{1}{2}$ | $[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$ |
⇒ $\frac{1}{2}$ | [1(0 − 0) + 6(0 − 2) + 3(2 − 0)] |
⇒ $\frac{1}{2}$ |[− 12 + 6]| = 3 $unit^2$

Search on Telegram @apna_pdf

Sol.3.(d)
Center = (1, −2) and radius = 4 cm
Equation of circle
$\Rightarrow (x-1)^2 + (y+2)^2 = (4)^2$
$x^2 + 1 - 2x + y^2 + 4 + 4y = 16$
$\Rightarrow x^2 - 2x + y^2 + 4y = 16 - 5$
$\Rightarrow x^2 + y^2 - 2x + 4y = 11$

Sol.4.(b) In x + y = 3
put x = 0 ⇒ $y = 3$
put y = 0 ⇒ $x = 3$
Line formed by the equation will be AB
In 2x + 5y = 12
put x = 0 ⇒ $y = 2.4$
put y = 0 ⇒ $x = 6$
Line formed by the equation will be CD
AB and CD will intersect at point E.
Given, x + y = 3 .....(1)
and 2x + 5y = 12 .....(2)
Multiply equation (1) by 2 and subtract it from equation (2)
⇒ $3y = 6 \Rightarrow y = 2$
Put the value of y in any of the equations
x + 2 = 3 ⇒ $x = 1$
So, E(x , y) = (1 , 2)



Area formed by the the equations
x + y = 3 , 2x + 5y = 12 and the x axis is the shaded region or ΔEAC
Now, AC = OC − OA = 6 − 3 = 3
Height of the triangle will be the y coordinate of point E = 2
Required area = $\frac{1}{2}$ × base × Height
= $\frac{1}{2}$ × 3 × 2 = 3 square units.

Sol.5.(a) Area of quadrilateral = $\frac{1}{2}$ $[(x_1y_2 + x_2y_3 + x_3y_4 + x_4y_1) - (y_1x_2 + y_2x_3 + y_3x_4 + y_4x_1)]$
Given, A(x_1, y_1) = (6, - 3) , B (x_2, y_2) = (- 4, - 2) , C (x_3, y_3) = (3, 1) and D(x_4, y_4) =(5, 0)
Area of quadrilateral = $\frac{1}{2}$ × [{6 × (- 2) + (-4) × 1 + 3 × 0 + 5 × (- 3)} - {(-3) × (- 4) + (-2) × 3 + 1 × 5 + 0 × 6}]
= $\frac{1}{2}$ × [{ - 12 - 4 + 0 - 15} - {12 - 6 + 5 + 0}]
= $\frac{1}{2}$ × [{ - 31} - {11}]= $\frac{1}{2}$ × $|[-31 - 11]|$
= $\frac{1}{2}$ × $|-42|$ ⇒ $\frac{1}{2}$ × 42 = 21 unit^2

Sol.6.(d) According to the question,
x + y = 5.....(i) , x - y = 3.....(ii)
On adding both equations we get,
2x = 8 ⇒ x = 4
On putting the value of x in e.q . (i) we get
4 + y = 5 ⇒ y = 1
Required coordinates = (4, 1)

Sol.7.(b) $x + 2y = 15$ **------(i)**
$4x + 8y = 13$------(ii)
$\frac{a_1}{a_2} = \frac{1}{4}, \frac{b_1}{b_2} = \frac{2}{8} = \frac{1}{4}, \neq \frac{c_1}{c_2} = \frac{-15}{-13}$
We can see that,
$\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$
For no solution : $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$
When equations have no solutions then lines are parallel.Hence, lines are parallel.

Sol.8.(b) x + y = 2.....(i)
2x - y = 1.....(ii)
On solving both equation we get,
x = 1, y = 1
According to the question,
1 = K × 1 + 5 ⇒ K = 1 - 5 = - 4

Sol.9.(d)
To find the radius of a circle centered at (2, 3) that touches the line 4x + 3y - 7 = 0
Use the perpendicular distance formula :-
d = $\frac{|A(x_1) + B(y_1) + c|}{\sqrt{A^2+B^2}}$
d = $\frac{|4(2)+3(3)-7|}{\sqrt{4^2+3^2}} = \frac{|8+2|}{\sqrt{16+9}} = \frac{10}{5}$ = 2
So, the radius of the circle is 2 units.

Sol.10.(a) To find the length of the line segment intercepted by the axes for the equation 5x + 12y = 60
x-intercept →
Put y = 0 then 5x + 0 = 60 ⇒ x = 12
Point = (12, 0)
y-intercept →
Put x = 0 then 0 + 12y = 60 ⇒ y = 5
Point = (0, 5)
Length of the intercept:-
Distance formula
= $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
= $\sqrt{(0 - 12)^2 + (5 - 0)^2}$
= $\sqrt{169}$ = 13 units

Sol.11.(a) For 2x + y = 6
When y = 0, 2x + 0 = 6, x = 3
So the point is (3, 0)
2x - y = - 2
When y = 0, x = - 1
So the point is (-1, 0)
Interaction point of two lines:-
2x + y = 6 ....(i) , 2x - y = - 2 ....(ii)
On adding both equations then we get.
4x = 4, x = 1 (put the value of x in e.q . (i) we get)
2 × 1 + y = 6 ⇒ y = 4
So the intersection point is (1, 4)
Vertices of the regions are (3, 0) (-1, 0), (1, 4)
Area of triangle formed by three points = $\frac{1}{2}|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|$
= $\frac{1}{2}|3(0 - 4) + (-1)(4 - 0) + 1(0 - 0)|$
= $\frac{1}{2}|-12 - 4|$ = 8
So, the area of the region bounded by two lines and the x-axis is 8 square units.

Sol.12.(a) Perpendicular distance from the origin to the line Ax + By + C = 0
d = $\frac{|Ax + By + C|}{\sqrt{A^2 + B^2}}$
Line = 6x + 8y - 48 = 0
A = 6 , B = 8 , C = - 48
Coordinates of the origin (x_1, y_1) = (0 , 0)
d = $\frac{|6(0) + 8(0) - 48|}{\sqrt{(6)^2 + (8)^2}} = \frac{48}{10}$ = 4.8 unit

Sol.13.(a) Given: 20x + 21y = 420
⇒ $\frac{x}{21} + \frac{y}{20}$ = 1
According to the question,
Coordinates of P and Q = (21, 0) and (0, 20)
Length of PQ = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
= $\sqrt{(0 - 21)^2 + (20 - 0)^2}$
= $\sqrt{441 + 400} = \sqrt{841}$ = 29 units

Sol.14.(b)
3p − 2q + 23 = 0 **-------(i)**
− 2p + q − 13 = 0 **-------(ii)**
Equation (i) + 2 × equation(ii) we get;
3p − 2q + 23 + 2(−2p + q − 13) = 0
- p - 3 = 0 ⇒ p = - 3
Put, p = - 3 in equation (i) we get;
3(-3) − 2q + 23 = 0
− 2q = -14 ⇒ q = 7
Then, (3p + q) = 3 × - 3 + 7 = - 2

Sol.15.(b) First step : -
x + y = 10 ....(i)
- 3x + y = 2 .....(ii)
On subtract e.q . (ii) from (i) we get
$x + 3x + y - y$ = 10 - 2
4x = 8, x = 2
Put the value of x in e.q . (i) we get,
y = 10 - 2 = 8
So the unique solution is (2, 8)
2nd step:-To find the intersection point with x-axis put y = 0 in the equation x + y = 10
x = 10
thus, the point of intersection with the x-axis is (10, 0)
Calculate the distance between the unique solution (2, 8) and the point (10, 0)
Distance = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
= $\sqrt{(10 - 2)^2 + (0 - 8)^2}$
= $\sqrt{64 + 64} = \sqrt{128} = 8\sqrt{2}$

Search on Telegram @apna_pdf

Sol.16.(a) The equation of a sphere with center (h, k, l) and radius r is given by.

$(x-h)^2+(y-k)^2+(z-l)^2=r^2$

According to the question,

$[(x-(-1)]^2+(y-2)^2+[z-(-3)]^2=3^2$

$x^2+1+2x+y^2+4-4y+z^2+9+6z=9$

$x^2+y^2+z^2+2x-4y+6z+14-9=0$

$x^2+y^2+z^2+2x-4y+6z+5=0$

Sol.17.(b) Equation of circle passing through origin :-

$x^2+y^2=r^2$ .....(r = radius)

Here , $x^2+y^2=25 \Rightarrow$ radius = 5 units

Sol.18.(c) 57x – 19y = 399

At x-axis → y = 0

57x – 19y = 399 ⇒ x = $\frac{399}{57}$ = 7

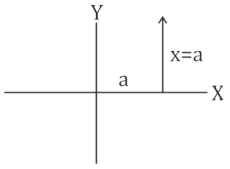
At y-axis → x = 0

57x – 19y = 399 ⇒ y = $\frac{-399}{19}$ = –21

So , the graph 57x – 19y = 399 cuts the coordinate axis ,

x-axis at (7,0) and y-axis at (0,–21)

Sol.19.(b)



The graph of the equation x = a is a line parallel to the y axis.

Sol.20.(c) 4x + $\frac{1}{3}$y = $\frac{8}{3}$

12x + y = 8 .....e.q .(1)

$\frac{1}{2}$x + $\frac{3}{4}$y + $\frac{5}{2}$ = 0

2x + 3y = –10 .....e.q .(2)

Multiplying (1) by 3 and subtracting from (2) we get,

– 34x = – 34 , ⇒ x = 1,

Putting x = 1 in e.q .(1) , we get

y = – 4

Checking these values of x and y we find only option (c) satisfies these values.

Sol.21.(b) Intersection point of 2x – 3y + 6 = 0 and 4x + y = 16 is (3 , 4)Intersection point of 2x – 3y + 6 = 0 and y = 0 is (– 3 , 0)

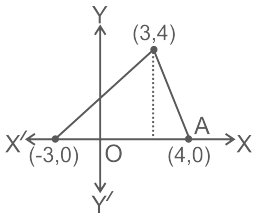
Intersection point of 4x + y = 16 and y = 0 is (4 , 0)

Area of triangle = $\frac{1}{2}$ | $[x_1(y_2-y_3)+x_2(y_3-y_1)+x_3(y_1-y_2)]$ |

⇒ $\frac{1}{2}$ | [3(0 – 0) – 3(0 – 4) + 4(4 – 0)] |

⇒ $\frac{1}{2}$ | $[12+16]$ | = 14 $unit^2$

Short Trick :-



Required area = $\frac{1}{2}$ × 7 units × 4 units

= 14 $unit^2$

Sol.22.(c) 7x + 11y = 3 .....(1)

8x + y = 15 .....(2)

On solving eqn. (1) and (2) , we get

y = – 1 and x = 2

If we put the obtained value of x and y in options given, then only option (c) gets satisfied.

Sol.23.(b) The point where both the lines meet is the only point which satisfies both the equations.

On solving both the e.q . , we get

a = 6 and b = 1

$(a^2+b^2-ab)/(a^2-b^2+ab)$

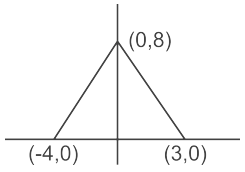
= $\frac{36+1-6}{36-1+6}$ = $\frac{31}{41}$

Sol.24.(a) Points of intersection

By 8x + 3y = 24 and 2x + 8 = y is (0 , 8)

y = 0 and 2x + 8 = y is (–4 ,0)

y = 0 and 8x + 3y = 24 is (3 ,0)



Base = 7 and height = 8

Area = $\frac{1}{2}$ × 8 × 7 = 28 $unit^2$

Sol.25.(d) 3x – 2y = 8 and 4x + 3y = 5

On solving both the e.q . , we get

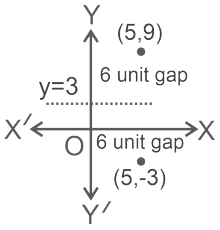
α = 2 , β = – 1 ⇒ (2α – β) = 5

Sol.26.(c) y = 3 is parallel to x axis so on reflection x axis will not change

Perpendicular distance of (5 , – 3) from y = 3 = 6 units

6 units on the other side of the line (y = 3) = 3 + 6 = 9

So the point = (5 , 9)



Sol.27.(c) They intersect at y = 4

So , 4x – 2(4) = 10 ⇒ x = 4.5

4x + ky = 2 ⇒ 4(4.5) + k(4) = 2

k = – 4

Sol.28.(d) 3x + y = 5 .....e.q .(1)

2x – y = 5 .....e.q .(2)

Adding e.q . (1) and (2) , we get

⇒ x = 2

Put the value of x in e.q . (1) , we get

3x + y = 5 ⇒ 3(2) + y = 5 ⇒ y = – 1

So, intersecting point of the given lines {P(α , β)} = (2 , – 1)

⇒ $(3\alpha+\beta)=\{3(2)+(-1)\}$ = 5

Sol.29.(a) Given,

x – 7y = – 42 .....e.q .(1)

6x + y – 15 = 0 .....e.q .(2)

On y axis, x = 0

Put the value of x in e.q . (1) , we get

⇒ 0 – 7y = – 42 ⇒ $y=6$

⇒ $P(\alpha,\beta)=(0,6)$

On x axis , y = 0

Put the value of y in e.q . (2) , we get

⇒ 6x + 0 = 15 ⇒ x = $\frac{5}{2}$

⇒ $Q(\gamma,\delta)=(\frac{5}{2},0)$

⇒ $the\ value\ of\ \alpha+\beta+\gamma+\delta$

= 0 + 6 + $\frac{5}{2}+0=\frac{17}{2}$

Sol.30.(b) Given,

3x – 5y =19 .....e.q .(1)

and 3y – 7x + 1= 0

7x – 3y = 1 .....e.q .(2)

Multiply e.q :- (1) by 3 and e.q . (2) by 5 and subtract e.q :- (2) from e.q .(1) , we get

⇒ $26x=-52 \Rightarrow x=-2$

Putting the value of x in e.q . (1) ,

3(– 2) – 5y = 19

⇒ $y=-5 \Rightarrow P(\alpha,\beta)=(-2,-5)$

$(3\alpha-\beta) \Rightarrow 3(-2)-(-5)=-1$

Sol.31.(c) 2x + 3y =11 .....e.q .(1)

and x – 2y + 12 = 0

2y – x = 12 .....e.q . (2)

Multiply e.q .(2) by 2 and then add both the equation ,

⇒ $7y=35 \Rightarrow y=5$ and x = – 2

⇒ $P(x_1,y_1)=(-2,5)$

Now,

x – 2y + 12 = 0

At x axis y = 0 ⇒ $x=-12$

Q(x_2, y_2) = (– 12 , 0)

$(x_1-x_2+y_1+y_2)$

⇒ { – 2 – (– 12) + 5 + 0 } = 15

Sol.32.(a)

5x – 2y + 1 = 0 or 2y – 5x = 1...e.q .(1)

4y – 3x + 5 = 0 or 3x – 4y = 5 ...e.q .(2)

Multiply eq(1) by 2 and add it in eq (2)

$-7x=7 \Rightarrow x=-1$

Put this value in any of the equation

5(– 1) – 2y + 1 = 0

⇒ $y=-2$

⇒ $P(\alpha,\beta)=(-1,-2)$

⇒ $(2\alpha-3\beta)=\{2(-1)-3(-2)$ = 4

Search on Telegram @apna_pdf

Probability

Definition :- Probability can be defined as the ratio of the number of favorable outcomes to the total number of outcomes of an event.
The value of the probability of an event to happen can lie between 0 and 1 because the favorable number of outcomes can never cross the total number of outcomes. Also, the favorable number of outcomes cannot be negative.

Examples :- Flipping or tossing of a coin, Rolling a dice, Drawing a ball from a bag containing a number of balls, etc. all such events lead to finding the probability.
The formula for probability →

$$P(E) = \frac{Number\ of\ Favorable\ Outcomes}{Number\ of\ total\ outcomes.}$$

Let us consider some of the popular events or conditions one by one :

i) Flipping or tossing of a coin →
Suppose a coin tossed then we get two possible outcomes either a head (H) or a tail (T) , there is no other possibility.
and it is impossible to predict whether the result of a toss will be a head or tail.
So , total Possible outcomes = 2
(a) Here, probability of getting a head →

$$\frac{Number\ of\ times\ heads\ shows\ up}{number\ of\ total\ possible\ outcomes} = \frac{1}{2}$$

(b) Probability of getting a tail →

$$\frac{Number\ of\ times\ tail\ shows\ up}{number\ of\ total\ possible\ outcomes} = \frac{1}{2}$$

ii) Rolling a dice →
When a dice is rolled once, it will be 1, 2, 3, 4, 5 or 6 only, there is no other possibility.

iii) Drawing a card from a deck of card→
A deck containing 52 cards is grouped into four suits of Spade (♠), club (♣) , heart (♥), and diamond (♦).

Important terms in probability **:-**

1. Event : A probability event can be defined as a set of outcomes of an experiment.
The probability of an event E is a number P(E) such that $0 \le P(E) \le 1$

2. Elementary event : An event having only one outcome. Sum of all probabilities of all the elementary events of an experiment = 1.

3. Sure or certain event : The probability of such an event is equal to 1.

4. Impossible events : The probability of such an event is zero.
For example, in an experiment of rolling a dice, the probability of getting a number greater than 6, is an impossible event.

5. Complementary events : For any event, $P(E) + P(\overline{E}) = 1$
Where $\overline{E}$ stands for "not E".
Also, $P(E) = 1 - P(\overline{E})$
Here E and $\overline{E}$ are called complementary events.

6. Equally likely outcomes : All outcomes with equal probability

7. Sample space : A sample space is a collection or a set of possible outcomes of a random experiment.
Example – Sample space for tossing of a coin once gives S = {H, T}
Sample space for tossing a coin twice gives S = {HH, HT, TH, TT}
Sample space for rolling a dice gives S = {1,2,3,4,5,6}

8. Simple event : If an event E has only one sample point of a sample space, it is called a simple (or elementary) event.
For example, in the experiment of tossing two coins, the sample space obtained is S = { HH, HT, TH, TT }
There are four simple events as follows :
These are, E_1={HH}, E_2= {HT}, E_3= {TH}, E_4= {TT}

9. Compound event : If an event has more than one sample point, it is called a compound event.
Example – In the experiment of "tossing a coin thrice", the events **:-**
X – 'Exactly one head appeared'
Y– 'At Least one head appeared'
Z– 'Atmost one head appeared' etc.
are all compound events. The subsets of S associated with these events are
X={HTT,THT,TTH}
Y={HTT,THT, TTH, HHT, HTH, THH, HHH}
Z= {TTT, THT, HTT, TTH}
Each of the above subsets contain more than one sample point, hence they are all compound events.

10. The event A and B (A∩B)
Intersection of two sets A∩B is the set of those elements which are common to both A and B ie., belonging to 'both A and B'
Suppose, S = {1,2,3,4,5,6,7} ,
A = {2,3,5} and B = {1,3,5}
Here, A∩B = {3,5}

11.The event 'A or B' ($A \cup B$)
When the sets A and B are two events associated with a sample space, then '$A \cup B$' means A union B.
$A \cup B$ is the event 'either A or B or both'
Suppose, S = {1,2,3,4,5,6,7} , A = {2,3,5} and B = {1,3,5}
Here, $A \cup B$ = {1,2,3,5}

12. Relation between above two mentioned events :
$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

13. The event A but not B :
Set of all those elements which are present in A but not in B.
Is is denoted as : $A - B = A \cap B'$

14. The event B but not A :
Set of all those elements which are present in A but not in B.
Is is denoted as : $B - A = B \cap A'$
Example :-
Suppose → S = {1,2,3,4,5,6,7} ,
A = {2,3,5} and B = {1,3,5}
A or B means $A \cup B$ = {1,2,3,5}
A and B means A∩B = {3,5}
B but not A means $B \cap A'$= {1}
A but not B means $A \cap B'$= {2}
Not A means A' = {1,4,6,7}
Not B means B' = {2,4,6,7}

15. Mutually exclusive events :
Mutually exclusive events or disjoint events are those events which do not occur at the same time.
Example :-
when a coin is tossed then the result will be either head or tail, but we cannot get both the results.

16. Exhaustive event
Exhaustive events are those events whose union is equal to the sample space of the experiment. or
E1, E2, E3.....En are said to be Exhaustive events if at least one of them necessarily happens whenever is performed.
Example :-
In rolling a die once, the possible outcomes or the sample space →
S = {1, 2, 3, 4, 5, 6}
X : a number less than 4 appears
Y : a number greater than 2 or less than 5 appears
Z : a number greater than 4 appears
Now, X∪Y∪Z = {1,2,3} ∪ {3,4} ∪ {5,6} = S
Such events are said to be exhaustive. Here, it can be clearly seen, whenever the experiment will be performed, at least one of them will necessarily occur.

17. Independent events

Definition 1: Two events are said to be independent if the occurrence of one of them is not affected by the occurrence of the other.
Example :-

Search on Telegram @apna_pdf

Consider the experiment of drawing a card from a deck of 52 playing cards, in which The elementary events are assumed to be equally likely. If E and F denote the events
'the card drawn is a spade' and 'the card drawn is an ace' respectively, then

Therefore, P(E) = P(F) = $\frac{13}{52} = \frac{1}{4}$

That means, both are equal and are not affected by the occurrence of the other.

Definition 2 : Two events are said to be independent if
P(F|E) = P(F) provided P(E) ≠ 0
P(E|F) = P(E) provided P(F) ≠ 0

Definition 3 : two events are said to be independent if
P(E ∩ F) = P(E) × P(F)

18. Biased and unbiased coin

Unbiased coin : A fair coin having equal probability of getting a head or a tail.
Here,

Probability of getting a head P(H) = $\frac{1}{2}$

Probability of getting a tail P(T) = $\frac{1}{2}$

Biased coin : an unfair coin having unequal probability of getting a head or a tail.
Such coins have more or less probability of getting a particular face.

19. Conditional probability
The probability of an event E is called conditional probability of E, given that F has already occurred and is denoted by P(E|F) .
Example :-
Tossing of a coin thrice, or tossing three coins simultaneously gives the sample space
S = {HHH, THH, HTH, HHT, TTT, TTH, THT, HTT}
Let E be the event, two tails appear, therefore E = {TTT, HTT, THT, TTH} ⇒

P(E) = $\frac{4}{8} = \frac{1}{2}$

And F be the event in which, first coin shows head, therefore, H = {HTT, HHH, HHT, HTH} ⇒ P(F) = $\frac{4}{8} = \frac{1}{2}$

Also, E ∩ F = {HTT} ⇒ P(E ∩ F) = $\frac{1}{4}$

Now, suppose that if it is given that the first coin shows tail, ie., F occurs, and then we have to find the probability of E. Then in this case, we have to find the conditional probability.
The conditional probability of E, given that F has already occurred is calculated as follows

P(E|F)=
$$\frac{\text{number of elementary events favorable to } E\cap F}{\text{number of elementary events favorable to } F}$$

⇒ P(E|F) = $\frac{P(E\cap F)}{P(F)}$

Therefore, P(E|F) = $\frac{\frac{1}{4}}{\frac{1}{2}} = \frac{1}{2}$

20. Permutation and Combination

Definition of permutation : a permutation is an arrangement in a definite order of a number of objects taken some or all at a time.
a). The number of permutations of 'n' different things taken 'r' at a time, where repetition is not allowed is given by n

$$n_{P_r} = \frac{n!}{(n-r)!}$$

Where, 0 ≤ r ≤ n

b). n! = 1 × 2 × 3 ×.....× n

c). n! = n × (n - r)!

d). The number of permutations of 'n' different things taken 'r' at a time, where repetition is allowed is given by

n^r , Where, 0 ≤ r ≤ n

e). The number of combinations of 'n' different things taken 'r' at a time, is given by

$n_{C_r} = \frac{n!}{(n-r)!\,r!}$, 0 ≤ r ≤ n

Note :-

(i) n_{C_1} = n and **(ii)** n_{C_0} = 1

Example :-
Suppose, a bag contains '6' red, 4 white and 8 blue balls. If three balls are drawn at random, then finding the probability, of 1 red and 2 white balls as
No. of ways to draw 1 red ball out of 6 = $^6C_1$
No. of ways to draw 2 white ball out of 4 = $^4C_2$
No. of ways to draw 3 balls out of 18 = $^{18}C_3$

Required probability = $\frac{n(E)}{n(S)}$

$= \frac{^6C_1 \times {^4C_2}}{^{18}C_3} = \frac{3}{68}$

Some key points to remember :

1. Tossing of a coin once, gives the sample space S = {H,T}
2. Tossing of a coin twice or tossing of two coins simultaneously is the same experiment and in both the cases we get the sample sample space S = {HH, HT, TH, TT}
3. Tossing of a coin thrice or tossing of three coins simultaneously is the same experiment and in both the cases we get the sample space S = {HHH, THH, HTH, HHT, TTT, HTT, THT, TTH}
4. Rolling of a dice once, gives the sample space S = {1,2,3,4,5,6}
5. Rolling of a dice twice, or Rolling two die simultaneously is the same experiment and in both the cases,
We get the sample space S =

1, 1	1, 2	1, 3	1, 4	1, 5	1, 6
2, 1	2, 2	2, 3	2, 4	2, 5	2, 6
3, 1	3, 2	3, 3	3, 4	3, 5	3, 6
4, 1	4, 2	4, 3	4, 4	4, 5	4, 6
5, 1	5, 2	5, 3	5, 4	5, 5	5, 6
6, 1	6, 2	6, 3	6, 4	6, 5	6, 6

6. A "standard" deck of playing cards consists of 52 Cards and further categorized into 4 suits of Spade (♠), club (♣) , heart (♥), and diamond (◆) constituting 13 cards each.
Each suit contains 13 cards: Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen and King.

a). Number cards(2,3.....9,10) → 9 × 4 = 36,
, Face cards (J,Q,K,) → 3 × 4 = 12
Ace cards (A) → 1 × 4 = 4

Previous Year Questions

SSC CHSL 2024 Tier - 2

Q.1. A die is cast twice and a coin is tossed thrice. Find the probability that the die will turn a 5 each time and the coin will turn a head every time.
SSC CHSL Tier II (18/11/2024)
(a) $\frac{1}{50}$ (b) $\frac{1}{100}$ (c) $\frac{1}{288}$ (d) $\frac{1}{200}$

SSC CHSL 2023 Tier - 2

Q.2. If A and B are events with P(A) = $\frac{3}{8}$, P(B) = $\frac{1}{2}$ and P(A ∩ B) = $\frac{1}{4}$, Find $P(\overline{A}\cap\overline{B})$.
SSC CHSL Tier II (02/11/2023)
(a) $\frac{1}{8}$ (b) $\frac{3}{8}$ (c) $\frac{5}{8}$ (d) $\frac{7}{8}$

Q.3. Sudarsan and Abraham appear for an interview for two vacancies. The probability of Sudarsan's selection is $\frac{1}{3}$ and that of Abraham's selection is $\frac{1}{5}$.
Find the probability that none of them be selected.
SSC CHSL Tier II (10/01/2024)

Search on Telegram @apna_pdf

(a) $\frac{8}{15}$ (b) $\frac{14}{15}$ (c) $\frac{1}{15}$ (d) $\frac{22}{15}$

SSC CGL 2023 Tier - 2

Q.4. If $P(A \cup B) = \frac{5}{9}$, $P(\overline{A} \cup \overline{B}) = \frac{13}{27}$, $P(A) = \frac{11}{18}$, then the odds against the event B are :
SSC CGL Tier II (26/10/2023)
(a) $\frac{38}{17}$ (b) $\frac{7}{57}$ (c) $\frac{29}{25}$ (d) $\frac{47}{7}$

Q.5. Three cards are drawn one after another with replacement from a pack of cards. What is the probability of getting first card a Jack, second card a black card, and third card an even numbered card?
SSC CGL Tier II (26/10/2023)
(a) $\frac{5}{338}$ (b) $\frac{20}{338}$ (c) $\frac{25}{26}$ (d) $\frac{5}{169}$

SSC CHSL 2022 Tier - 2

Q.6. In grade 11 of a school, 40 students opted for Physics, 17 opted for Biology, and 20 opted for Chemistry. If the total number of students in grade 11 was 60, all of these students opted for at least one of the three subjects mentioned here, and exactly five of these students opted for all these three subjects, what is the probability that a randomly selected student of grade 11 of this school would have opted for exactly one of these three subjects?
SSC CHSL Tier II (26/06/2023)
(a) 0.75 (b) 0.85 c) 0.90 (d) 0.80

SSC CGL 2022 Tier - 2

Q.7. A person can hit a target 5 times out of 8 shots. If he fires 10 shots, what is the probability that he will hit the target twice?
SSC CGL Tier II (07/03/2023)
(a) $\frac{1135 \times 3^8}{8^{10}}$ (b) $\frac{1165 \times 3^8}{8^{10}}$
(c) $\frac{1175 \times 3^8}{8^{10}}$ (d) $\frac{1125 \times 3^8}{8^{10}}$

Q.8. The probabilities of solving a problem by three students A, B and C are $\frac{3}{7}$, $\frac{5}{9}$ and $\frac{1}{5}$, respectively. The probability that problem will be solved is:
SSC CGL Tier II (06/03/2023)
(a) $\frac{155}{315}$ (b) $\frac{64}{315}$ (c) $\frac{251}{315}$ (d) $\frac{32}{315}$

Q.9. A speaks the truth 5 out of 7 times and B speaks truth 8 out of 9 times. What is the probability that they contradict each other in stating the same fact?
SSC CGL Tier II (03/03/2023)
(a) $\frac{1}{7}$ (b) $\frac{1}{9}$ (c) $\frac{1}{4}$ (d) $\frac{1}{3}$

Q.10. A glass jar contains 6 white, 8 black, 4 red and 3 blue marbles. If a single marble is chosen at random from the jar, what is the probability that it is black or blue?
SSC CGL Tier II (02/03/2023)
(a) $\frac{8}{21}$ (b) $\frac{11}{21}$ (c) $\frac{5}{21}$ (d) $\frac{1}{7}$

Practice Questions

Q.11. A man is known to speak the truth 5 out of 8 times. He throws a dice and reports that it is a four. Find the probability that it is actually a four?
(a) $\frac{1}{6}$ (b) $\frac{3}{4}$ (c) $\frac{1}{4}$ (d) $\frac{5}{48}$

Q.12. If the odds in favour of an event A are 3 : 4 and the odds against another independent event B are 7 : 4 find the probability that at least one of the event will happen :
(a) $\frac{7}{18}$ (b) $\frac{7}{11}$ (c) $\frac{5}{8}$ (d) $\frac{8}{19}$

Q.13. If from each of the three boxes containing 3 white and 1 black, 2 white and 2 black, 1 white and 3 black balls, one ball is drawn at random, then the probability that 2 white and 1 black ball will be drawn is :-
(a) $\frac{13}{32}$ (b) $\frac{1}{4}$ (c) $\frac{1}{32}$ (d) $\frac{3}{16}$

Q.14. A bag contains 4 purple, 1 white and 2 blue balls. Two balls are drawn at random. What is the probability that none of the balls drawn is blue?
(a) $\frac{1}{2}$ (b) $\frac{10}{21}$ (c) $\frac{3}{5}$ (d) $\frac{9}{8}$

Q.15. What is the probability of getting all heads, when 3 coins are tossed simultaneously
(a) $\frac{1}{4}$ (b) $\frac{1}{5}$ (c) $\frac{1}{3}$ (d) $\frac{1}{8}$

Q.16. A bag contains 3 red and 7 black balls. Two balls are taken out at random, without replacement. If the first ball is red, then what is the probability that the second ball is also red ?
(a) $\frac{1}{10}$ (b) $\frac{1}{15}$ (c) $\frac{3}{10}$ (d) $\frac{2}{21}$

Q.17. A jar contains 3 red marbles, 7 green marbles and 10 white marbles. If 2 marble is drawn from the jar at random, what is the probability that this marble is white?
(a) $\frac{9}{38}$ (b) $\frac{3}{40}$ (c) $\frac{7}{10}$ (d) $\frac{1}{2}$

Q.18. If a number of two digits is formed with the digits 4, 3, 5, 8, 6 without repetition of digits, what is the probability that the number formed is 46?
(a) $\frac{1}{10}$ (b) $\frac{1}{20}$ (c) $\frac{1}{6}$ (d) $\frac{1}{2}$

Q.19. A bag contains cards numbered from 33 to 92 . If one card is drawn from a bag. The probability that the number on the drawn card is a perfect square is :
(a) $\frac{1}{15}$ (b) $\frac{1}{17}$ (c) $\frac{4}{35}$ (d) $\frac{8}{37}$

Q.20. A bag contains 4 white and 6 red balls. Three balls are drawn at random. What is the probability that two balls are white and 1 is red ?
(a) $\frac{8}{17}$ (b) $\frac{3}{10}$ (c) $\frac{9}{13}$ (d) $\frac{9}{17}$

Q.21. A box contains 10 identical electronic components of which 4 are defective. If 3 components are selected at random from the box in succession, without replacing the units already drawn, what is the probability that two components of the selected components are defective?
(a) $\frac{3}{10}$ (b) $\frac{5}{26}$ (c) $\frac{5}{12}$ (d) $\frac{1}{3}$

Q.22. 29 defective pens are accidentally mixed with 319 good ones. It is not possible to just look at a pen and tell whether or not it is defective. One pen is taken out at random from this lot. Determining the probability that the pen is taken out is a good one.
(a) $\frac{11}{13}$ (b) $\frac{11}{12}$ (c) $\frac{13}{15}$ (d) $\frac{18}{19}$

Q.23. Calculating the probability of selecting a black card or a six number from a deck of 52 cards.
(a) $\frac{7}{13}$ (b) $\frac{4}{13}$ (c) $\frac{3}{52}$ (d) $\frac{4}{52}$

Q.24. Tickets numbered 1 to 20 are mixed up and then a ticket is drawn at random. What is the probability that the ticket drawn has a number which is a multiple of 3 or 5?
(a) $\frac{1}{2}$ (b) $\frac{3}{5}$ (c) $\frac{9}{20}$ (d) $\frac{8}{15}$

Q.25. A bag contains 6 red balls and 4 blue balls. 2 balls are drawn at random. Find the probability that they are of the same color?
(a) $\frac{8}{15}$ (b) $\frac{1}{8}$ (c) $\frac{7}{15}$ (d) $\frac{1}{3}$

Search on Telegram @apna_pdf

Q.26. A student appeared for a sectional test containing 10 questions. A reviewer checks the answers and finds that the student answered three questions wrong. What is the probability that the sixth reviewed question is the last wrong question?

(a) $\frac{1}{12}$ (b) $\frac{1}{14}$ (c) $\frac{1}{20}$ (d) $\frac{1}{15}$

Q.27. A bag contains 4 white balls and 2 black balls. Another bag contains 3 white balls and 5 black balls. If one ball is drawn from each bag, what is the probability that both the balls are black.

(a) $\frac{1}{24}$ (b) $\frac{3}{24}$ (c) $\frac{5}{24}$ (d) $\frac{9}{24}$

Q.28. A bag contains white, black and red balls only. A ball is drawn at random from the bag. If the probability of getting a white ball is $\frac{3}{10}$ and that of a black ball is $\frac{2}{5}$, then find the probability of getting a red ball. If the bag contains 20 black balls, then find the total number of balls in the bag.

(a) $\frac{4}{10}$, 40 (b) $\frac{3}{10}$, 50

(c) $\frac{3}{5}$, 60 (d) $\frac{7}{10}$, 70

Q.29. A bag contains 4 white, 5 red and 6 blue balls. Three balls are drawn at random from the bag. The probability that all of them are red, is:

(a) $\frac{2}{91}$ (b) $\frac{1}{22}$ (c) $\frac{3}{22}$ (d) $\frac{2}{77}$

Q.30. The probability of a shooter hitting a target is 0.75 . How many minimum number of times must he/she fire so that the probability of hitting a target at least once is more than 0.99 ?

(a) 4 (b) 2 (c) 1 (d) 3

Q.31. What is the probability of getting a sum as 7 when two dice are thrown?

(a) $\frac{1}{4}$ (b) $\frac{1}{5}$ (c) $\frac{2}{5}$ (d) $\frac{1}{6}$

Q.32. Bag A contains 2 white and 4 black balls. Bag B contains 5 white and 3 black balls. A ball is drawn from each bag, Find the probability that both are black.

(a) $\frac{1}{4}$ (b) $\frac{11}{13}$ (c) $\frac{1}{4}$ (d) $\frac{11}{52}$

Q.33. A problem is given to three students whose chances of solving it are $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$ respectively. What is the probability that the problem will be solved?

(a) $\frac{3}{4}$ (b) $\frac{1}{4}$ (c) $\frac{1}{12}$ (d) $\frac{1}{24}$

Q.34. I forgot the last digit of a 7-digit telephone number. If one randomly dialed the final 3 digits after correctly dialing the first four, then what is the chance of dialing the correct number ?

(a) $\frac{1}{999}$ (b) $\frac{1}{1001}$ (c) $\frac{1}{1000}$ (d) $\frac{4}{1003}$

Q.35. Two dice are tossed. The probability that the total score is a prime number is:

(a) $\frac{7}{12}$ (b) $\frac{5}{12}$ (c) $\frac{5}{14}$ (d) $\frac{7}{15}$

Q.36. Tickets numbered 1 to 20 are mixed up and then a ticket is drawn at random. What is the probability that the ticket drawn has a number which is a multiple of 4 or 5 ?

(a) $\frac{8}{20}$ (b) $\frac{7}{20}$ (c) $\frac{11}{20}$ (d) $\frac{3}{20}$

Q.37. A man and his wife appear in an interview for two vacancies in the same post. The probability of husband's selection is $(\frac{1}{7})$ and the probability of wife's selection is $(\frac{1}{5})$. What is the probability that only one of them is selected ?

(a) $\frac{6}{13}$ (b) $\frac{2}{7}$ (c) $\frac{1}{7}$ (d) $\frac{3}{7}$

Q.38. A basket contains 10 apples and 20 oranges out of which 3 apples and 5 oranges are defective. If we choose two fruits at random, what is the probability that either both are oranges or both are non defective ?

(a) $\frac{316}{435}$ (b) $\frac{361}{435}$ (c) $\frac{391}{435}$ (d) $\frac{319}{435}$

Q.39. A bag contains cards numbered between 33 and 92. If one card is drawn from the bag, the probability that the number on the drawn card is a multiple of five :

(a) $\frac{5}{59}$ (b) $\frac{4}{59}$ (c) $\frac{6}{29}$ (d) $\frac{1}{12}$

Q.40. A man is known to speak the truth 3 out of 8 times. He throws a dice and reports that it is a four. Find the probability that it is actually a four?

(a) $\frac{1}{6}$ (b) $\frac{3}{4}$ (c) $\frac{1}{4}$ (d) $\frac{3}{28}$

Q.41. If 9 students are standing on a circular path, then the probability that 2 of them are always standing together is....

(a) $\frac{1}{4}$ (b) $\frac{2}{7}$ (c) $\frac{7}{8}$ (d) $\frac{1}{3}$

Q.42. Two letters selected from the word 'TENDULKAR'. The probability that both are vowels is:

(a) $\frac{2}{9}$ (b) $\frac{1}{12}$ (c) $\frac{5}{9}$ (d) $\frac{5}{12}$

Q.43. Two integers are selected at random from the first 11 natural numbers. If the sum of the integers is even, then the probability that both the numbers are odd is:

(a) $\frac{13}{121}$ (b) $\frac{3}{5}$ (c) $\frac{4}{9}$ (d) $\frac{5}{11}$

Q.44. Five salesmen A,B,C,D and E, of a company are considered for a three member trade delegation to represent the company at an international trade conference. What is the probability that A gets selected?

(a) $\frac{3}{5}$ (b) $\frac{2}{5}$ (c) $\frac{4}{5}$ (d) $\frac{1}{5}$

Q.45. A letter of the English alphabet is chosen at random. Probability of getting a vowel is...

(a) $\frac{5}{26}$ (b) $\frac{6}{25}$ (c) $\frac{1}{4}$ (d) $\frac{5}{21}$

Q.46. A card is drawn at random from a pack of playing cards. What is the probability of getting a face card?

(a) $\frac{5}{13}$ (b) $\frac{1}{13}$ (c) $\frac{4}{13}$ (d) $\frac{3}{13}$

Q.47. In tossing three coins at a time, the probability of getting at least one head is:

(a) $\frac{7}{8}$ (b) $\frac{1}{2}$ (c) $\frac{1}{8}$ (d) $\frac{3}{8}$

Q.48. A dice is thrown twice and the sum of the appearing numbers is 10. Then the probability that the number 5 has appeared at least once is:

(a) $\frac{1}{4}$ (b) $\frac{1}{36}$ (c) $\frac{2}{36}$ (d) $\frac{1}{2}$

Q.49. A box contains 2 black, 6 green and 4 yellow balls. If 2 balls are picked up at random, the probability that both are green-coloured is:

(a) $\frac{5}{22}$ (b) $\frac{1}{22}$ (c) $\frac{3}{22}$ (d) $\frac{3}{11}$

Q.50. Two cards are drawn from a pack of 52 cards. The probability that out of 2 cards, one card is red and one card is black is:

(a) $\frac{1}{2}$ (b) $\frac{13}{25}$ (c) $\frac{25}{51}$ (d) $\frac{26}{51}$

Q.51. A bag contains 2 red , 3 green and 2 blue balls. Two balls are drawn at random. What is the probability that none of the balls drawn is blue?

(a) $\frac{10}{21}$ (b) $\frac{6}{21}$ (c) $\frac{10}{14}$ (d) $\frac{5}{7}$

Q.52. There are 10 points lie on a circle. By joining points how many triangles can

Search on Telegram @apna_pdf

be drawn from these points ?
(a) 61 (b) 119 (c) 120 (d) 60

Q.53. if we select 3 persons randomly from a group, consisting of 4 men, 3 women and 2 boys, then the probability that 2 men are selected is:
(a) $\frac{5}{14}$ (b) $\frac{7}{12}$ (c) $\frac{3}{14}$ (d) $\frac{5}{28}$

Q.54. An urn contains 10 black and 5 white balls. Two balls are drawn from the urn one after the other without replacement. What is the probability that both drawn balls are black?
(a) $\frac{2}{7}$ (b) $\frac{3}{7}$ (c) $\frac{4}{7}$ (d) $\frac{5}{7}$

Q.55. Two dice are thrown simultaneously. Find the probability of getting a sum of 8 ?
(a) $\frac{1}{9}$ (b) $\frac{5}{36}$ (c) $\frac{7}{36}$ (d) $\frac{1}{4}$

Q.56. A box contains 2 black, 6 green and 4 yellow balls. If 2 balls are picked up at random, the probability that both are yellow is:
(a) $\frac{1}{22}$ (b) $\frac{1}{6}$ (c) $\frac{3}{11}$ (d) $\frac{1}{11}$

Q.57. Kings and Queens of black color are taken out from a deck of 52 playing cards. A card is drawn from the remaining well-shuffled cards. Probability of getting a spade card is:
(a) $\frac{1}{4}$ (b) $\frac{11}{13}$ (c) $\frac{11}{48}$ (d) $\frac{11}{52}$

Q.58. A bag contains balls numbered 1, 2, 3, ……. 30. One ball is drawn from the bag at random. What is the probability that the number on the ball drawn is divisible by 4 or 6?
(a) $\frac{1}{15}$ (b) $\frac{1}{3}$ (c) $\frac{3}{10}$ (d) $\frac{2}{5}$

Q.59. A bag contains balls numbered 1, 2, 3, ……..29. One ball is drawn from the bag at random. What is the probability that the number on the ball drawn is divisible by 3 or 5 ?
(a) $\frac{2}{5}$ (b) $\frac{1}{2}$ (c) $\frac{13}{29}$ (d) $\frac{1}{10}$

Q.60. Daniel speaks truth in $\frac{2}{5}$ cases and Sherin lies in $\frac{3}{7}$ cases. What is the percentage of cases in which both Daniel and Sherin contradict each other in stating a fact?
(a) 72.6% (b) 51.4% (c) 62.3% (d).47.5%

Q.61. There are a total 18 balls in a bag. Out of them 6 are red in colour, 4 are green in colour and 8 are blue in colour. If Vishal picks three balls randomly from the bag, then what will be the probability that all the three balls are not of the same colour?
(a) $\frac{95}{102}$ (b) $\frac{19}{23}$ (c) $\frac{21}{26}$ (d) $\frac{46}{51}$

Q.62. 2 dice are thrown simultaneously. What is the probability that the sum of the numbers on the faces is divisible by either 3 or 5?
(a) $\frac{7}{36}$ (b) $\frac{19}{36}$ (c) $\frac{9}{36}$ (d) $\frac{2}{7}$

Q.63. A card is drawn from a well shuffled pack of 52 cards. What is the probability of getting a queen or club card?
(a) $\frac{17}{52}$ (b) $\frac{15}{52}$ (c) $\frac{4}{13}$ (d) $\frac{3}{13}$

Q.64. Two friends Harish and Kalyan appeared for an exam. Let A be the event that Harish is selected and B is the event that Kalyan is selected. The probability of A is $\frac{2}{5}$ and that of B is $\frac{3}{7}$. Find the probability that both of them are selected.
(a) $\frac{35}{36}$ (b) $\frac{5}{35}$ (c) $\frac{5}{12}$ (d) $\frac{6}{35}$

Answer Key :-

1.(c)	2.(b)	3.(a)	4.(c)
5.(a)	6.(d)	7.(d)	8.(c)
9.(d)	10.(b)	11.(c)	12.(b)
13.(a)	14.(b)	15.(d)	16.(b)
17.(a)	18.(b)	19.(a)	20.(b)
21.(a)	22.(b)	23.(a)	24.(c)
25.(c)	26.(a)	27.(c)	28.(b)
29.(a)	30.(a)	31.(d)	32.(c)
33.(a)	34.(c)	35.(b)	36.(a)
37.(b)	38.(a)	39.(c)	40.(d)
41.(a)	42.(b)	43.(b)	44.(a)
45.(a)	46.(d)	47.(a)	48.(b)
49.(a)	50.(d)	51.(a)	52.(c)
53.(a)	54.(b)	55.(b)	56.(d)
57.(c)	58.(b)	59.(c)	60.(b)
61.(d)	62.(b)	63.(c)	64.(d)

Solutions :-

Sol.1.(c) Probability of getting 5 on rolling dice once = $\frac{1}{6}$

Probability of getting 5 on rolling dice Twice = $\frac{1}{6} \times \frac{1}{6} = \frac{1}{36}$

Probability of getting head on tossing a coin once = $\frac{1}{2}$

Probability of getting head on tossing a coin thrice = $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8}$

Combined probability of getting 5 and head = $\frac{1}{36} \times \frac{1}{8} = \frac{1}{288}$

Sol.2.(b) $P(\bar{A} \cap \bar{B}) = 1 - P(A \cup B)$

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$P(A \cup B) = \frac{3}{8} + \frac{1}{2} - \frac{1}{4}$

$P(A \cup B) = \frac{5}{8}$

$\therefore P(\bar{A} \cap \bar{B}) = 1 - \frac{5}{8} = \frac{3}{8}$

Sol.3.(a) Probability of sudarsan's selection(P) = $\frac{1}{3}$, $\therefore$ P' = $\frac{2}{3}$

Probability of Abraham's selection(Q) = $\frac{1}{5}$, $\therefore$ Q' = $\frac{4}{5}$

Hence probability of neither of them selection = P' × Q' = $\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$

Sol.4.(c) $P(\bar{A}) = 1 - P(A) = 1 - \frac{11}{18} = \frac{7}{18}$

$P(\bar{A} \cap \bar{B}) = 1 - P(A \cup B) = 1 - \frac{5}{9} = \frac{4}{9}$

$P(\bar{A} \cup \bar{B}) = P(\bar{A}) + P(\bar{B}) - P(\bar{A} \cap \bar{B})$

$\frac{13}{27} = \frac{7}{18} + P(\bar{B}) - \frac{4}{9}$

$P(\bar{B}) = \frac{13}{27} - \frac{7}{18} + \frac{4}{9} = \frac{29}{54}$

$P(B) = 1 - \frac{29}{54} = \frac{25}{54}$

Odds against the event B = $\left(\frac{P(\bar{B})}{P(B)}\right)$

$= \frac{No\ of\ unfavorable\ outcomes}{No\ of\ favorable\ outcomes}$

$= \frac{\frac{29}{54}}{\frac{25}{54}} = \frac{29}{25}$

Sol.5.(a) Total no of jack card in a pack of cards = 4

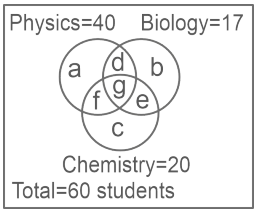
Total no of black card in a pack of cards = 26

Total no of even numbered card in a pack of cards = 20 i.e.(2,4,6,8,10)

Required probability

$= \frac{4}{52} \times \frac{26}{52} \times \frac{20}{52} = \frac{5}{338}$

Sol.6.(d)



Search on Telegram @apna_pdf

$\Rightarrow a + d + f + g = 40$
$\Rightarrow b + d + g + e = 17$
$\Rightarrow c + f + g + e = 20$
On adding above equation , we get
$a + b + c + 2d + 2e + 2f + 3g = 77$...e.q .(1)
and $a + b + c + d + e + f + g = 60$ ....e.q .(2)
on subtracting e.q .(2) from e.q .(1) , we get
$d + e + f + 2g = 17$
$d + e + f + g = 17 - 5 = 12$
Number of students who opted exactly one subject = $60 - 12 = 48$ students
Required probability = $\frac{48}{60} = 0.80$

Sol.7.(d)
Probability if the target hits (F) = $\frac{5}{8}$
Probability if the target does not hits (E) = $\frac{3}{8}$
Required probability = $10_{C_2} \times (F)^2 \times (E)^8$
$= \frac{10!}{2! \times 8!} \times (\frac{5}{8})^2 \times (\frac{3}{8})^8$
$= 45 \times \frac{25 \times 3^8}{8^{10}} = \frac{1125 \times 3^8}{8^{10}}$

Sol.8.(c) Probability that A solved the problem P(A) = $\frac{3}{7} \Rightarrow P(\overline{A}) = \frac{4}{7}$
Probability that B solved the problem P(B) = $\frac{5}{9} \Rightarrow P(\overline{B}) = \frac{4}{9}$
Probability that C solved the problem P(C) = $\frac{1}{5} \Rightarrow P(\overline{C}) = \frac{4}{5}$
Probability that no one can solved the problem = $\frac{4}{7} \times \frac{4}{9} \times \frac{4}{5} = \frac{64}{315}$
Required Probability = $1 - \frac{64}{315} = \frac{251}{315}$

Sol.9.(d)
Probability of (A)speaking truth = $\frac{5}{7}$
and for telling a lie = $\frac{2}{7}$
Probability of (B) speaking truth = $\frac{8}{9}$
and for telling a lie = $\frac{1}{9}$
Required probability → P(A)truth × P(B)lie + P(B)truth × P(A)lie = $\frac{5}{7} \times \frac{1}{9} + \frac{8}{9} \times \frac{2}{7}$
$= \frac{5}{63} + \frac{16}{63} = \frac{21}{63} = \frac{1}{3}$

Sol.10.(b)
6 white, 8 black, 4 red and 3 blue
Total no. of marbles = 21
Favorable outcomes = (8 + 3) = 11
Required Probability
$= \frac{Number\ of\ Favorable\ Outcomes}{Total\ Number\ of\ possible\ outcomes}$
$= \frac{11}{21}$

Sol.11.(c)
Probability that a Man speak truth = $\frac{5}{8}$
Probability (lie) = $1 - \frac{5}{8} = \frac{3}{8}$
Probability of getting 4 = $\frac{1}{6}$
Probability of not getting 4 = $\frac{5}{6}$
Required Probability :-
$\frac{\frac{1}{6} \times \frac{5}{8}}{\frac{1}{6} \times \frac{5}{8} + \frac{5}{6} \times \frac{3}{8}} = \frac{1}{4}$

Sol.12.(b) Probability of A = P(A)
$= \frac{3}{3+4} = \frac{3}{7}$ and $P(\overline{A}) = \frac{4}{7}$
Probability of B = P(B) = $\frac{4}{7+4} = \frac{4}{11}$
and $P(\overline{B}) = \frac{7}{11}$
The required event can be defined as that A takes place and B does not + B takes place and A doesn't + A and B both takes place :-
$= \frac{3}{7} \times \frac{7}{11} + \frac{4}{7} \times \frac{4}{11} + \frac{3}{7} \times \frac{4}{11}$
$= \frac{21}{77} + \frac{16}{77} + \frac{12}{77} = \frac{7}{11}$

Sol.13.(a)

	Box A	:	Box B	:	Box C
White →	3	:	2	:	1
Black →	1	:	2	:	3

Now, one ball is taken randomly :-
Possible case for 2 white and 1 black will be taken:-

	Box A	:	Box B	:	BoxC
Case 1 =	Black $\frac{1}{4}$	:	white $\frac{2}{4}$	:	white $\frac{1}{4}$
Case 2 =	white $\frac{3}{4}$	:	Black $\frac{2}{4}$	:	white $\frac{1}{4}$
Case 3 =	white $\frac{3}{4}$	:	white $\frac{2}{4}$	:	Black $\frac{3}{4}$

Required possibility :- $\frac{1}{4} \times \frac{2}{4} \times \frac{1}{4} + \frac{3}{4} \times \frac{2}{4} \times \frac{1}{4} + \frac{3}{4} \times \frac{2}{4} \times \frac{3}{4}$
$= \frac{2}{64} + \frac{6}{64} + \frac{18}{64} = \frac{13}{32}$

Sol.14.(b) Number of ways of drawing 2 balls out of 7 $\{n(S)\}$ = $^7C_2$
Event of drawing two balls, none of the balls drawn is blue $\{n(E)\}$= $^5C_2$
$P(E) = \frac{n(E)}{n(s)} = \frac{5c_2}{7c_2} = \frac{10}{21}$

Sol.15.(d) Total no. of outcomes when 3 coins are tossed = 2^3 = 8 (TTT, THH, TTH, HHT, HTT, THT, HTH, HHH)
Required probability = $\frac{1}{8}$

Sol.16.(b)
Total balls in the bag = 3 + 7 = 10
Probability for getting one red ball out of 10 balls = $\frac{3}{10}$
Similarly, Probability for taking out one red ball out of the remaining 9 balls = $\frac{2}{9}$.
Required probability :- $\frac{3}{10} \times \frac{2}{9} = \frac{1}{15}$

Sol.17.(a)
No. of ways of drawing 2 white marble out of 10 white marbles $\{n(E)\}$ = $^{10}C_2$
No. of ways of drawing 2 marble out of total 20 marbles $\{n(S)\}$= $^{20}C_2$
$P(E) = \frac{n(E)}{n(s)} = \frac{10C_2}{20C_2} = \frac{9}{38}$

Sol.18.(b)
No. of favorable outcome$\{n(E)\}$ = 1
and Total no. of ways of two digit no. formed with the digits 4, 3, 5, 8, 6 without repetition $\{n(S)\}$ = 5× 4 = 20
So, Required probability = $\frac{n(E)}{n(s)} = \frac{1}{20}$

Sol.19.(a) Total no. of cards from 33 to 92 which is a perfect square $\{n(E)\}$ = $\{36, 49, 64, 81\}$ = 4
Total no. of cards from 33 to 92 $\{n(S)\}$ = (92 – 33) + 1 = 60
Required probability = $\frac{n(E)}{n(S)} = \frac{4}{60} = \frac{1}{15}$

Sol.20.(b) Probability that two balls are white and 1 is red $\{n(E)\}$ = $^4C_2 \times {}^6C_1$
= 36
No. of ways to draw 3 balls out of 10 balls $\{n(S)\}$ = $^{10}C_3$ = 120
Required probability = $\frac{n(E)}{n(S)} = \frac{36}{120} = \frac{3}{10}$

Sol.21.(a) Total number of ways of selecting three components $\{n(S)\}$ = $^{10}C_3$
Number of ways of selecting two defective components = $^4C_2$
Number of ways of selecting one non-defective component = $^6C_1$
Required probability
$= \frac{^6C_1 \times {}^4C_2}{^{10}C_3} = \frac{6 \times 6}{120} = \frac{3}{10}$

Sol.22.(b)
Total number of pens = 319 + 29 = 348
Number of ways of selecting a good pen out of 319 good pens $\{n(E)\}$ = $^{319}C_1$
Number of ways of selecting a pen out of 348 pens $\{n(S)\}$ = $^{348}C_1$
Required probability = $\frac{n(E)}{n(s)} = \frac{319}{348} = \frac{11}{12}$

Search on Telegram @apna_pdf

Sol.23.(a) Probability of selecting a black card = $\frac{26}{52} = \frac{1}{2}$

Probability of selecting a (6) no. card = $\frac{4}{52} = \frac{1}{13}$

probability of selecting both a black card and a (6) no. card = $\frac{2}{52} = \frac{1}{26}$

We know that

P(A ∩ B) = P(A) + P(B) – P(A ∪ B)

$= \frac{1}{2} + \frac{1}{13} - \frac{2}{52} = \frac{28}{52} = \frac{7}{13}$

Sol.24.(c) Here,

$n(S)$ = {1, 2, 3, 4, ..., 19, 20}

Event of getting a multiple of 3 or 5 $\{n(E)\}$ = {3, 6 , 9, 12, 15, 18, 5, 10, 20}

P(E) = $\frac{n(E)}{n(S)} = \frac{9}{20}$

Sol.25.(c)

No. of ways to draw 2 balls out of 10

= $^{10}C_2 = \frac{10 \times 9 \times 8!}{8! \times 2} = 45$

Probability of Red = $^{6}C_2 = \frac{6 \times 5 \times 4!}{4! \times 2} = 15$

Probability of blue = $^{4}C_2 = \frac{4 \times 3 \times 2!}{2! \times 2} = 6$

So, Probability = $\frac{15+6}{45} = \frac{7}{15}$

Sol.26.(a) Total outcomes = $^{10}C_3$

It is given 6th question is definitely wrong,

So, there will be 2 wrong questions in above 5 questions,

that will be arranged in = $^{5}C_2$

Now, Required probability

$= \frac{^{5}C_2}{^{10}C_3} = \frac{10}{120} = \frac{1}{12}$

Sol.27.(c) Probability of drawing one black ball from the first bag = $\frac{2}{6} = \frac{1}{3}$

Probability of drawing one black ball from the second bag = $\frac{5}{8}$

Required probability :- $\frac{1}{3} \times \frac{5}{8} = \frac{5}{24}$

Sol.28.(b) Total probability = 1

P(White) = $\frac{3}{10}$, P(Black) = $\frac{2}{5}$

P(Red) = $1 - \frac{3}{10} - \frac{2}{5} = \frac{3}{10}$

P(Black) = $\frac{No.\ of\ Black\ balls}{Total\ no.\ of\ balls}$

Total no. of balls = $20 \times \frac{5}{2}$ = 50 balls

Sol.29.(a) Number of ways of drawing 3 balls out of 15 $\{n(S)\}$ = $^{15}C_3$

$= \frac{15 \times 14 \times 13}{3 \times 2 \times 1} = 455$

Event of getting all the 3 red balls $\{n(E)\}$

= $^{5}C_3 = \frac{5 \times 4}{2 \times 1} = 10$

P(E) = $\frac{n(E)}{n(S)} = \frac{10}{455} = \frac{2}{91}$

Sol.30.(a) = 0.75 = $\frac{3}{4}$

Total chances to hit = 4

Total successful hit = 3

Probability of hitting a target more than 0.99 = 1

It means he shot all hits successfully which is 4.

Sol.31.(d) Total number of possible outcomes $\{n(S)\}$ = 6 × 6 = 36

Favorable outcomes $\{n(E)\}$ = (1, 6) (2, 5), (3, 4), (4, 3), (5, 2), (6, 1)

⇒ P(A) = $\frac{n(E)}{n(S)} = \frac{6}{36} = \frac{1}{6}$

Sol.32.(c) Probability of black ball drawn from bag A = $\frac{4}{6}$

Probability of black ball drawn from bag B = $\frac{3}{8}$

Probability (both balls are black)

= P(A) × P(B) = $\frac{4}{6} \times \frac{3}{8} = \frac{1}{4}$

Sol.33.(a) Probability of student A for not solving the problem

P($\overline{A}$) = $1 - \frac{1}{2} = \frac{1}{2}$

P($\overline{B}$) = $1 - \frac{1}{3} = \frac{2}{3}$

and P($\overline{C}$) = $1 - \frac{1}{4} = \frac{3}{4}$

P(none solved the problem)

$= \frac{1}{2} \times \frac{2}{3} \times \frac{3}{4} = \frac{1}{4}$

P(the problem will be solved)

$= 1 - \frac{1}{4} = \frac{3}{4}$

Sol.34.(c) It is given that the last three digits are randomly dialed, then each of the digits can be selected out of 10 digits(0, 1, 2, 3, 4, 5, 6, 7, 8, 9) in 10 ways.

Required probability = $(\frac{1}{10})^3 = \frac{1}{1000}$

Sol.35.(b) Clearly, n(S) = (6 × 6) = 36.

Let E = Event that the sum is a prime number.

Then E= { (1, 1), (1, 2), (1, 4), (1, 6), (2, 1), (2, 3), (2, 5), (3, 2), (3, 4), (4, 1), (4,3),(5, 2), (5, 6), (6, 1), (6, 5) }

n(E) = 15.

P(E) = $\frac{n(E)}{n(S)} = \frac{15}{36} = \frac{5}{12}$

Sol.36.(a) Here, S = {1, 2, 3, 4, ..., 19, 20}.

Let E = event of getting a multiple of 4 or 5 = {4, 8, 12, 16, 20, 5 , 10 , 15}.

P(E) = $\frac{n(E)}{n(S)} = \frac{8}{20}$

Sol.37.(b) Probability of husband not to selected = $\frac{6}{7}$

Probability of wife not to selected = $\frac{4}{5}$

Required probability

$\Rightarrow (\frac{1}{7} \times \frac{4}{5}) + (\frac{6}{7} \times \frac{1}{5}) = \frac{10}{35} = \frac{2}{7}$

Sol.38.(a) Probability of both are oranges

$\{n(A)\} = \frac{^{20}C_2}{^{30}C_2}$

Probability of both are non-defective

$\{n(B)\} = \frac{^{22}C_2}{^{30}C_2}$

Probability of both are non-defective oranges $\{n(A \cap B)\} = \frac{^{15}C_2}{^{30}C_2}$

Now, n(A∪B) = $\frac{^{20}C_2}{^{30}C_2} + \frac{^{22}C_2}{^{30}C_2} - \frac{^{15}C_2}{^{30}C_2}$

$= \frac{316}{435}$

Sol.39.(c) Multiples of 5 between 33 and 92 = 35 , 40 90

No. of favorable outcomes = 12

Total no. of possible outcomes = 58

We know that, Probability

$= \frac{(No.of\ favorable\ outcomes)}{(Total\ no.of\ possible\ outcomes)}$

$= \frac{12}{58} = \frac{6}{29}$

Sol.40.(d) P (Required)

$= \frac{\frac{1}{6} \times \frac{3}{8}}{\frac{1}{6} \times \frac{3}{8} + \frac{5}{6} \times \frac{5}{8}} = \frac{3}{28}$

Sol.41.(a) Total arrangement of 9 students in a circle = 8!

Total number of arrangements formed when two students are always together = 7! × 2

Probability = $\frac{7! \times 2}{8!} = \frac{1}{4}$

Sol.42.(b) TENDULKAR

Total letters = 9 , Vowels = 3

Number of ways of selecting two letters and both should be vowel = $^{3}C_2 = 3$

Total number of ways of selection of two letters = $^{9}C_2 = 36$

Required probability = $\frac{3}{36} = \frac{1}{12}$

Sol.43.(b) First 11 natural numbers = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

Odd = 6 and even = 5

Favorable outcomes = 6_{C_2} = 15

Search on Telegram @apna_pdf

odd+odd=even or even+even = even

Total outcomes = $6_{C_2} + 5_{C_2}$ = 15 + 10 = 25

Required probability = $\frac{15}{25} = \frac{3}{5}$

Sol.44.(a)

Total salesman = 5(A, B, C, D, E)

3 members should be selected and A must be selected

Favorable outcomes = $1 \times 4_{C_2}$ = 6

Total outcomes = 5_{C_3} = 10

Required probability = $\frac{6}{10} = \frac{3}{5}$

Sol.45.(a)

Total number of vowel in alphabet = 5

Total number of alphabet = 26

Probability of getting a vowel = $\frac{5}{26}$

Sol.46.(d) Total cards = 52

Face cards = 12

Probability of drawing a face card

$= \frac{12}{52} = \frac{3}{13}$

Sol.47.(a)

Total outcomes = 2 × 2 × 2 = 8

Favorable outcomes = 8 - 1(all tail) = 7

The probability of getting at least one heads = $\frac{7}{8}$

Sol.48.(b) Favourable outcomes = (5 ,5)

Total outcomes = 36

Probability = $\frac{1}{36}$

Sol.49.(a) Number of ways of selecting two balls of green coloured

$\{n(E)\} = {}^6C_2 = 15$

Number of ways of two balls out of 12 balls $\{n(S)\} = {}^{12}C_2 = 66$

Required probability = $\frac{n(E)}{n(s)} = \frac{15}{66} = \frac{5}{22}$

Sol.50.(d) Case (i) First card is black and second one is red = $\frac{26}{52} \times \frac{26}{51}$,

Case (ii) First card is red and second one is black = $\frac{26}{52} \times \frac{26}{51}$

Required probability :-

$=(\frac{26}{52} \times \frac{26}{51}) + (\frac{26}{52} \times \frac{26}{51})$

$= \frac{13}{51} + \frac{13}{51} = \frac{26}{51}$

Sol.51.(a)

Total balls = 7 (2 red , 3 green and 2 blue)

If we draw 2 balls and want no blue ball, that means the balls drawn must be either red or green.

Favorable outcomes = $5_{C_2} = \frac{5 \times 4}{1 \times 2} = 10$

Total outcomes = $7_{C_2} = \frac{7 \times 6}{1 \times 2} = 21$

Required probability = $\frac{10}{21}$

Sol.52.(c) All 10 points on circumference are non-collinear.

No. of possible ways to form triangle

$= 10_{C_3} = \frac{10 \times 9 \times 8}{3 \times 2 \times 1} = 120$

Sol.53.(a)

Favorable outcomes = $4_{C_2} \times 5_{C_1}$ = 6 × 5 = 30

Total outcomes = $9_{C_3} = \frac{9 \times 8 \times 7}{1 \times 2 \times 3} = 84$

Required probability = $\frac{30}{84} = \frac{5}{14}$

Sol.54.(b) There are 10 black balls

Total balls = 15

Probability that both drawn balls are black = $\frac{10}{15} \times \frac{9}{14} = \frac{3}{7}$

Sol.55.(b) getting a sum of 8:

Let E = event of getting a sum of 8.

[(2, 6), (3, 5), (4, 4), (5, 3), (6, 2)] = 5

$P(E) = \frac{No.\ of\ favorable\ outcomes}{Total\ No.of\ possible\ outcomes}$

$= \frac{5}{36}$

Sol.56.(d) Favorable condition

$= 4_{C_2} = \frac{4 \times 3}{2} = 6$

Total possible condition

$= 12_{C_2} = \frac{12 \times 11}{2} = 66$

Probability of 2 yellow balls are picked up at random = $\frac{6}{66} = \frac{1}{11}$

Sol.57.(c) Total number of cards after removing king and queen of black colour = 52 − 4 = 48

Remaining spade card = 13 − 2 = 11

Required probability = $\frac{11}{48}$

Sol.58.(b) Total number of balls = 30

Multiple of 4 from 1 to 30 = 7

Multiple of 6 from 1 to 30 = 5

Common multiple of 4 and 6 = 2

Favorable outcomes = 7 + 5 − 2= 10

Required probability = $\frac{10}{30} = \frac{1}{3}$

Sol.59.(c) Total numbers = 29

Multiple of 3 between 1 and 29 = 9

Multiple of 5 between 1 and 29 = 5

Common multiple of 3 and 5 = 1

Favorable outcomes = 9 + 5 − 1 = 13

Required probability = $\frac{13}{29}$

Sol.60.(b)

Daniel and Sherin will contradict each other when one speaks truth and other speaks lies.

Probability of Daniel speak truth and Sherin lies = $\frac{2}{5} \times \frac{3}{7} = \frac{6}{35}$

Probability of Sherin speak truth and Daniel lies = $\frac{4}{7} \times \frac{3}{5} = \frac{12}{35}$

Hence, probabilities that Daniel and Sherin contradict each other:

$= \frac{6}{35} + \frac{12}{35}$

$\Rightarrow \frac{18}{35} = \frac{18}{35} \times 100 = 51.4\%$

Sol.61.(d) Number of ways in which the person can pick three balls out of 18 balls = 18_{C_3} = 816

Number of ways of picking 3 balls of same colour = $6_{C_3} + 4_{C_3} + 8_{C_3}$

= (20 + 4 + 56) = 80

Probability of picking three balls of same color = $\frac{80}{816} = \frac{5}{51}$

Required probability = 1 − probability of picking three balls of same color

$= 1 - \frac{5}{51} = \frac{46}{51}$

Sol.62.(b) Clearly n(s) = 6 × 6 = 36

Let E be the event that the sum of the numbers on the 2 faces is divisible by either 3 or 5. Then

E = {(1,2), (1,4), (1,5), (2,1), (2,3), (2,4), (3,2), (3,3), (3,6), (4,1), (4,2), (4,5), (4,6), (5,1), (5,4), (5,5), (6,3), (6,4), (6,6)}

n(E) = 19

Hence P(E) = $\frac{n(E)}{n(s)} = \frac{19}{36}$

Sol.63.(c) The probability of getting queen card = $\frac{4}{52}$

The probability of getting club card = $\frac{13}{52}$

The club card contains already a queen card, therefore required probability is,

$\frac{4}{52} + \frac{13}{52} - \frac{1}{52} = \frac{16}{52} = \frac{4}{13}$

Sol.64.(d) Given, A be the event that Harish is selected and B is the event that Kalyan is selected.

P(A) = $\frac{2}{5}$ and P(B) = $\frac{3}{7}$

Let C be the event that both are selected.

P(C) = P(A) × P(B) as A and B are independent events:

P(C) = $\frac{2}{5} \times \frac{3}{7} \Rightarrow$ P(C) = $\frac{6}{35}$

The probability that both of them are selected is.

Search on Telegram @apna_pdf