

Answers

1. Sets

Practice set 1.1

- (1) (i) $\{2, 4, 6, 8, \dots\}$ (ii) $\{2\}$ (iii) $\{-1, -2, -3, \dots\}$ (iv) $\{\text{sa, re, ga, ma, pa, dha, ni}\}$
- (2) (i) $\frac{4}{3}$ is an element of set Q. (ii) -2 is not an element of set N
- (iii) Set P is a set of all p 's such that p is an odd number.
- (4) (i) $A = \{\text{Chaitra, Vaishakh, Jyeshth, Ashadh, Shravan, Bhadra, Ashwin, Kartik, Aagrahayan, Paush, Magh, Phalgun}\}$
- (ii) $X = \{\text{C, O, M, P, L, E, N, T}\}$ (iii) $Y = \{\text{Nose, Ears, Eyes, Tounge, Skin}\}$
- (iv) $Z = \{2, 3, 5, 7, 11, 13, 17, 19\}$
- (v) $E = \{\text{Asia, Africa, Europe, Australia, Antarctica, South America, North America}\}$
- (5) (i) $A = \{x \mid x = n^2, n \in \mathbb{N}, n \leq 10\}$ (ii) $B = \{x \mid x = 6n, n \in \mathbb{N}, n < 9\}$
- (iii) $C = \{y \mid y \text{ is a letter in the word 'SMILE'}\}$
- (iv) $D = \{z \mid z \text{ is a day of a week}\}$ (v) $X = \{y \mid y \text{ is a letter in the word 'eat'}\}$

Practice set 1.2

- (1) $A = B = C$ (2) $A = B$ (3) A and C are empty sets.
- (4) (i), (iii), (iv), (v) are finite sets (ii), (vi), (vii) are infinite sets

Practice set 1.3

- (1) (i), (ii), (iii), (v) are false and (iv), (vi) are true statements.
- (4) $\{1\}, \{3\}, \{2\}, \{7\}, \{1, 3\}, \{1, 2\}, \{1, 7\}, \{3, 2\}, \{3, 7\}, \{2, 7\}, \{1, 3, 2\}, \{1, 2, 7\}, \{3, 2, 7\}, \{1, 3, 2, 7\}$ any three like these sets..
- (5) (i) $P \subseteq H, P \subseteq B, I \subseteq M, I \subseteq B, H \subseteq B, M \subseteq B$ (ii) set B
- (6) (i) N, W, I any of these sets. (ii) N, W, I any of these sets.
- (7) Set of students getting marks less than 50% in Maths.

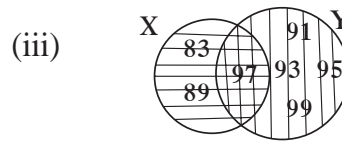
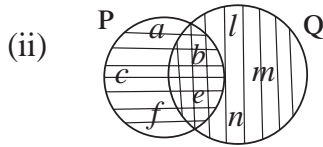
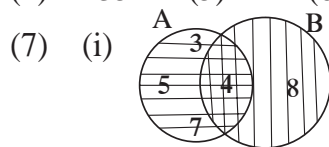
Practice set 1.4

- (1) $n(B) = 21$ (2) Number of students who do not take any of the drinks = 5
- (3) Total number of students = 70
- (4) The number of students who do not like rock climbing and sky-watching = 20
The students who like only rock climbing = 20,
The students who like only sky watching = 70
- (5) (i) $A = \{x, y, z, m, n\}$ (ii) $B = \{p, q, r, m, n\}$
- (iii) $A \cup B = \{x, y, z, m, n, p, q, r\}$ (iv) $U = \{x, y, z, m, n, p, q, r, s, t\}$
- (v) $A' = \{p, q, r, s, t\}$ (vi) $B' = \{x, y, z, s, t\}$ (vii) $(A \cup B)' = \{s, t\}$

Problem set 1

- (1) (i) (C) (ii) (D) (iii) (C) (iv) (B) (v) (A) (vi) (A)
 (2) (i) (A) (ii) (A) (iii) (B) (iv) (C)
 (3) People speaking only English 57, People speaking only french 28,
 People speaking both languages 15

- (4) 135 (5) 12 (6) 4



- (8) $S \subseteq X$, $V \subseteq X$, $S \subseteq X$, $T \subseteq X$, $S \subseteq Y$, $S \subseteq V$, $S \subseteq T$, $V \subseteq T$, $Y \subseteq T$,
 (9) $M \cup \phi = M$, $M \cap \phi = \phi$
 (10) $U = \{1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 13\}$, $A = \{1, 2, 3, 5, 7\}$ $B = \{1, 5, 8, 9, 10\}$
 $M \cup B = \{1, 2, 3, 5, 7, 8, 9, 10\}$, $A \cap B = \{1, 5\}$
 (11) $n(A \cup B) = 16$

2. Real Numbers

Practice set 2.1

- (1) Terminating (i), (iii), (iv) Non recurring non terminating (ii), (v)
 (2) (i) 0.635 (ii) $0.\overline{25}$ (iii) $3.\overline{285714}$ (iv) 0.8 (v) 2.125
 (3) (i) $\frac{2}{3}$ (ii) $\frac{37}{99}$ (iii) $\frac{314}{99}$ (iv) $\frac{1574}{99}$ (v) $\frac{2512}{999}$

Practice set 2.2

- (4) (i) Infinitely many numbers like $-0.4, -0.3, 0.2$
 (ii) Infinitely many numbers like $-2.310, -2.320, -2.325$
 (iii) Infinitely many numbers like $5.21, 5.22, 5.23$
 (iv) Infinitely many numbers like $-4.51, -4.55, -4.58$

Practice set 2.3

- (1) (i) 3 (ii) 2 (iii) 4 (iv) 2 (v) 3
 (2) (i), (iii), (vi) are surds and (ii), (iv), (v) are not surds.
 (3) Like surds : (i), (iii), (iv) and unlike surds : (ii), (v), (vi)
 (4) (i) $3\sqrt{3}$ (ii) $5\sqrt{2}$ (iii) $5\sqrt{10}$ (iv) $4\sqrt{7}$ (v) $2\sqrt{42}$
 (5) (i) $7\sqrt{2} > 5\sqrt{3}$ (ii) $\sqrt{247} < \sqrt{274}$ (iii) $2\sqrt{7} = \sqrt{28}$
 (iv) $5\sqrt{5} < 7\sqrt{5}$ (v) $4\sqrt{42} > 9\sqrt{2}$ (vi) $5\sqrt{3} < 9$ (vii) $7 > 2\sqrt{5}$
 (6) (i) $13\sqrt{5}$ (ii) $10\sqrt{5}$ (iii) $24\sqrt{3}$ (iv) $\frac{12}{5}\sqrt{7}$

- (7) (i) $18\sqrt{6}$ (ii) $126\sqrt{5}$ (iii) $6\sqrt{10}$ (iv) 80
 (8) (i) 7 (ii) $\sqrt{\frac{5}{2}}$ (iii) $\sqrt{2}$ (iv) $\sqrt{62}$.
 (9) (i) $\frac{3}{5}\sqrt{5}$ (ii) $\frac{\sqrt{14}}{14}$ (iii) $\frac{5\sqrt{7}}{7}$ (iv) $\frac{2}{9}\sqrt{3}$ (v) $\frac{11}{3}\sqrt{3}$

Practice set 2.4

- (1) (i) $-3 + \sqrt{21}$ (ii) $\sqrt{10} - \sqrt{14}$ (iii) $-18 + 13\sqrt{6}$
 (2) (i) $\frac{\sqrt{7} - \sqrt{2}}{5}$ (ii) $\frac{3(2\sqrt{5} + 3\sqrt{2})}{2}$ (iii) $28 - 16\sqrt{3}$ (iv) $4 - \sqrt{15}$

Practice set 2.5

- (1) (i) 13 (ii) 5 (iii) 28 (2) 2 or $\frac{4}{3}$ (ii) 1 or 6 (iii) -2 or 18 (iv) 0 or -40

Problem set 2

- (1) (i) B (ii) D (iii) C (iv) D (v) A
 (vi) C (vii) C (viii) C (ix) A (x) B
 (2) (i) $\frac{555}{1000}$ (ii) $\frac{29539}{999}$ (iii) $\frac{9306}{999}$ (iv) $\frac{357060}{999}$ (v) $\frac{30189}{999}$
 (3) (i) $-0.\overline{714285}$ (ii) $0.\overline{81}$ (iii) $2.2360679\dots$ (iv) $9.\overline{307692}$ (v) 3.625
 (5) (i) $\frac{3}{2}\sqrt{2}$ (ii) $-\frac{5}{3}\sqrt{5}$
 (6) (i) $\sqrt{2}$ (ii) $\sqrt{2}$ (iii) $\sqrt{3}$ (iv) $\sqrt{10}$ (v) $\sqrt{2}$ (vi) $\sqrt{11}$
 (7) (i) $6\sqrt{3}$ (ii) $\frac{34}{3}\sqrt{3}$ (iii) $\frac{15}{2}\sqrt{6}$ (iv) $-25\sqrt{3}$ (v) $\frac{8}{3}\sqrt{3}$
 (8) (i) $\frac{\sqrt{5}}{5}$ (ii) $\frac{2\sqrt{7}}{21}$ (iii) $\sqrt{3} + \sqrt{2}$ (iv) $\frac{3\sqrt{5} - 2\sqrt{2}}{37}$ (v) $\frac{6(4\sqrt{3} + \sqrt{2})}{23}$

3. Polynomials

Practice set 3.1

- (1) (i) No, because index of y in $\frac{1}{y}$ is (-1) .
 (ii) No, because index of x in the term $5\sqrt{x}$ is $\left(\frac{1}{2}\right)$.
 (iii) Yes. (iv) No, because index of m in the term $2m^{-2}$ is (-2) . (v) Yes.
 (2) (i) 1 (ii) $-\sqrt{3}$, (iii) $-\frac{2}{3}$
 (3) (i) x^7 (ii) $2x^{35} - 7$ (iii) $x^8 - 2x^5 + 3$ other polynomials like these.
 (4) (i) 0 (ii) 0 (iii) 2 (iv) 10 (v) 1 (vi) 5 (vii) 3 (viii) 10
 (5) (i) Quadratic (ii) Linear (iii) Linear (iv) Cubic (v) Quadratic (vi) Cubic

- (6) (i) $m^3 + 5m + 3$ (ii) $y^5 + 2y^4 + 3y^3 - y^2 - 7y - \frac{1}{2}$
 (7) (i) $(1, 0, 0, -2)$ (ii) $(5, 0)$ (iii) $(2, 0, -3, 0, 7)$ (iv) $\left(\frac{-2}{3}\right)$
 (8) (i) $x^2 + 2x + 3$ (ii) $5x^4 - 1$ (iii) $-2x^3 + 2x^2 - 2x + 2$
 (9) Quadratic polynomial : x^2 ; $2x^2 + 5x + 10$; $3x^2 + 5x$;
 Cubic polynomial : $x^3 + x^2 + x + 5$; $x^3 + 9$ Linear polynomial : $x + 7$;
 Binomial : $x + 7$, $x^3 + 9$; Trinomial : $2x^2 + 5x + 10$; Monomial : x^2

Practice set 3.2

- (1) (i) $a + bx$ (ii) xy (iii) $10n + m$
 (2) (i) $6x^3 - 2x^2 + 2x$ (ii) $-2m^4 + 2m^3 + 2m^2 + 3m - 6 + \sqrt{2}$ (iii) $5y^2 + 6y + 11$
 (3) (i) $-6x^2 + 10x$ (ii) $10ab^2 + a^2b - 7ab$
 (4) (i) $2x^3 - 4x^2 - 2x$ (ii) $x^8 + 2x^7 + 2x^5 - x^3 - 2x^2 - 2$ (iii) $-4y^4 + 7y^2 + 3y$
 (5) (i) $x^3 - 64 = (x - 4)(x^2 + 4x + 16) + 0$
 (ii) $5x^5 + 4x^4 - 3x^3 + 2x^2 + 2 = (x^2 - x)(5x^3 + 9x^2 + 6x + 8) + (8x + 2)$
 (6) $a^4 + 7a^2b^2 + 2b^4$

Practice set 3.3

- (1) (i) Quotient = $2m + 7$, Remainder = 45
 (ii) Quotient = $x^3 + 3x - 2$, Remainder = 9
 (iii) Quotient = $y^2 + 6y + 36$, Remainder = 0
 (iv) Quotient = $2x^3 - 3x^2 + 7x - 17$, Remainder = 51
 (v) Quotient = $x^3 - 4x^2 + 13x - 52$, Remainder = 200
 (vi) Quotient = $y^2 - 2y + 3$, Remainder = 2

Practice set 3.4

- (1) 5 (2) 1 (3) $4a^2 + 20$ (4) -11

Practice set 3.5

- (1) (i) -41 (ii) 7 (iii) 7 (2) (i) 1, 0, -8 (ii) 4, 5, 13 (iii) -2, 0, 10
 (3) 0 (4) 2 (5) (i) 17 (ii) $2a^3 - a^2 - a$ (iii) 1544 (6) 92 (7) Yes
 (8) 2 (9) (i) No (ii) Yes (10) 30 (11) Yes
 (13) (i) -3 (ii) 80

Practice set 3.6

- (1) (i) $(x + 1)(2x - 1)$ (ii) $(m + 3)(2m - 1)$ (iii) $(3x + 7)(4x + 11)$
 (iv) $(y - 1)(3y + 1)$ (v) $(x + \sqrt{3})(\sqrt{3}x + 1)$ (vi) $(x - 4)\left(\frac{1}{2}x - 1\right)$
 (2) (i) $(x - 3)(x + 2)(x - 2)(x + 1)$ (ii) $(x - 13)(x - 2)$

- (iii) $(x - 8)(x + 2)(x - 4)(x - 2)$ (iv) $(x^2 - 2x + 10)(x^2 - 2x - 2)$
 (v) $(y^2 + 5y - 22)(y + 4)(y + 1)$ (vi) $(y + 6)(y - 1)(y + 4)(y + 1)$
 (vii) $(x^2 - 8x + 18)(x^2 - 8x + 13)$

Problem set 3

- (1) (i) D (ii) D (iii) C (iv) A (v) C (vi) A (vii) D (viii) C (ix) A (x) A
 (2) (i) 4 (ii) 0 (iii) 9
 (3) (i) $7x^4 - x^3 + 4x^2 - x + 9$ (ii) $5p^4 + 2p^3 + 10p^2 + p - 8$
 (4) (i) (1, 0, 0, 0, 16) (ii) (1, 0, 0, 2, 3, 15)
 (5) (i) $3x^4 - 2x^3 + 0x^2 + 7x + 18$ (ii) $6x^3 + x^2 + 0x + 7$ (iii) $4x^3 + 5x^2 - 3x + 0$
 (6) (i) $10x^4 + 13x^3 + 9x^2 - 7x + 12$ (ii) $p^3q + 4p^2q + 4pq + 7$
 (7) (i) $2x^2 - 7y + 16$ (ii) $x^2 + 5x + 2$
 (8) (i) $m^7 - 4m^5 + 6m^4 + 6m^3 - 12m^2 + 5m + 6$
 (ii) $5m^5 - 5m^4 + 15m^3 - 2m^2 + 2m - 6$
 (9) Remainder = 19 (10) $m = 1$ (11) Total population = $10x^2 + 5y^2 - xy$
 (12) $b = \frac{1}{2}$ (13) $11m^2 - 8m + 5$ (14) $-2x^2 + 8x + 11$ (15) $2m + n + 7$

4. Ratio and Proportion

Practice set 4.1

- (1) (i) 6 : 5 (ii) 2 : 3 (iii) 2 : 3
 (2) (i) 25 : 11 (ii) 35 : 31 (iii) 2 : 1 (iv) 10 : 17 (v) 2 : 1 (vi) 220 : 153
 (3) (i) 3 : 4 (ii) 11 : 25 (iii) 1 : 16 (iv) 13 : 25 (v) 4 : 625
 (4) 4 people (5) (i) 60% (ii) 94% (iii) 70% (iv) 91% (v) 43.75%
 (6) Abha's age 18 years, Mother's age 45 years (7) After 6 years
 (8) Present age of Rehana is 8 years.

Practice set 4.2

- (1) (i) 20, 49, 2.5 respectively (ii) 7, 27, 2.25 respectively
 (2) (i) $1 : 2\pi$ (ii) $2 : r$ (iii) $\sqrt{2} : 1$ (iv) 34 : 35
 (3) (i) $\frac{\sqrt{5}}{3} < \frac{3}{\sqrt{7}}$ (ii) $\frac{3\sqrt{5}}{5\sqrt{7}} = \frac{\sqrt{63}}{\sqrt{125}}$ (iii) $\frac{5}{18} > \frac{17}{121}$
 (iv) $\frac{\sqrt{80}}{\sqrt{48}} = \frac{\sqrt{45}}{\sqrt{27}}$ (v) $\frac{9.2}{5.1} > \frac{3.4}{7.1}$

- (4) (i) 80° (ii) Present age of Albert is 25 years, Present age of Salim is 45 years
 (iii) Length 13.5 cm, Breadth 4.5 cm (iv) 124, 92 (v) 20, 18
- (5) (i) 729 (ii) $45 : 7$ (6) $2 : 125$ (7) $x = 5$

Practice set 4.3

- (1) (i) $22 : 13$ (ii) $125 : 71$ (iii) $316 : 27$ (iv) $38 : 11$
- (2) (i) $3 : 5$ (ii) $1 : 6$ (iii) $7 : 43$ (iv) $71 : 179$ (3) $170 : 173$
- (4) (i) $x = 8$ (ii) $x = 9$ (iii) $x = 2$ (iv) $x = 6$ (v) $x = \frac{9}{14}$ (vi) $x = 3$

Practice set 4.4

- (1) (i) 36, 22 (ii) $16, 2a - 2b + 2c$
- (2) (i) $29 : 21$ (ii) $23 : 7$ (4) (i) $x = 2$ (ii) $y = 1$

Practice set 4.5

- (1) $x = 4$ (2) $x = \frac{347}{14}$ (3) 18, 12, 8 or 8, 12, 18 (6) $\frac{x + y}{xy}$

Problem set 4

- (1) (i) B (ii) C (iii) B (iv) D (v) C
- (2) (i) $7 : 16$ (ii) $2 : 5$ (iii) $5 : 9$ (iv) $6 : 7$ (v) $6 : 7$
- (3) (i) $1 : 2$ (ii) $5 : 4$ (iii) $1 : 1$
- (4) (i) and (iii) are in continued proportion. (ii) and (iv) are not in continued proportion.
- (5) $b = 9$
- (6) (i) 7.4% (ii) 62.5% (iii) 73.33% (iv) 31.25% (v) 12%
- (7) (i) $5 : 6$ (ii) $85 : 128$ (iii) $1 : 2$ (iv) $50 : 1$ (v) $3 : 5$
- (8) (i) $\frac{17}{9}$ (ii) 19 (iii) $\frac{35}{27}$ (iv) $\frac{13}{29}$
- (11) $x = 9$

5. Linear Equations in Two Variables

Practice set 5.1

- (3) (i) $x = 3; y = 1$ (ii) $x = 2; y = 1$ (iii) $x = 2; y = -2$
 (iv) $x = 6; y = 3$ (v) $x = 1; y = -2$ (vi) $x = 7; y = 1$

Practice set 5.2

- (1) 30 notes of ₹ 5 and 20 notes of ₹ 10.
(2) $\frac{5}{9}$ (3) Priyanka's age is 20 years, Deepika's age is 14 years
(4) 20 lions, 30 peacocks
(5) Initial salary ₹ 3900, Yearly increment ₹ 150
(6) ₹ 4000 (7) 36 (8) $\angle A = 90^\circ$, $\angle B = 40^\circ$, $\angle C = 50^\circ$
(9) 420 cm (10) 10

Problem set 5

- (1) (i) A (ii) C (iii) C
(2) (i) $x = 2$; $y = 1$ (ii) $x = 5$; $y = 3$ (iii) $x = 8$; $y = 3$
(iv) $x = 1$; $y = -4$ (v) $x = 3$; $y = 1$ (vi) $x = 4$; $y = 3$
(3) (i) $x = 1$; $y = -1$ (ii) $x = 2$; $y = 1$ (iii) $x = 26$; $y = 18$ (iv) $x = 8$; $y = 2$
(4) (i) $x = 6$; $y = 8$ (ii) $x = 9$; $y = 2$ (iii) $x = \frac{1}{2}$; $y = \frac{1}{3}$ (5) 35
(6) ₹ 69 (7) ₹ 1800 and ₹ 1400 is the monthly income of each person respectively.
(8) length 347 units, breadth 207 units (9) 40 km/hr, 30 km/hr
(10) (i) 54, 45 (ii) 36, 63 etc.

6. Financial Planning

Practice set 6.1

- (1) ₹ 1200 (2) Capital after second years ₹ 42,000, 16% loss on initial capital.
(3) Monthly income ₹ 50,000 (4) Shri. Fernandes (5) ₹ 25,000

Practice set 6.2

- (1) (i) Need not pay income tax (ii) Needs to pay (iii) Needs to pay
(iv) Needs to pay (v) Need not pay income tax
(2) ₹ 9836.50

Problem set 6

- (1) (i) A (ii) B (2) Income ₹ 8750
(3) 36.73% profit of Hiralal, 16.64% profit of Ramniklal. Hiralal's profit is more.
(4) ₹ 99383.75 (5) ₹ 4,00,000 (6) 12.5%

- (7) Savings of Ramesh is ₹ 48000 ; Savings of Suresh is ₹ 51000 ; Savings of Priti is ₹ 36000
 (8) (i) ₹ 213000 (ii) ₹ 7500 (iii) No tax.

7. Statistics

Practice set 7.2

- (1) Primary data : (i), (iii), (v) Secondary data : (ii), (iv)

Practice set 7.3

- (1) Lower limit of class = 20, Upper limit of class = 25 (2) 37.5 (3) 7–13

Practice set 7.4

- (3) (i) 38 (ii) 3 (iii) 19 (iv) 62 (4) (i) 24 (ii) 3 (iii) 43 (iv) 43

Practice set 7.5

- (1) 7 quintal (2) 74 (3) 100 (4) ₹ 4900 (5) 75 gram
 (6) Mean = 3, Median = 3, Mode = 4 (7) 78.56 (8) $x = 9$ (9) 20 (10) 70
 (11) 34.25 (12) 37 kg (13) 2 (14) 35 and 37

Problem set 7

- (1) (i) C (ii) B (iii) D (iv) B (v) A (vi) D
 (vii) B (viii) A (ix) C (x) C
 (2) ₹ 26000 (3) ₹ 127
 (4) (i) 24 (ii) 06
 (5) $p = 20$
 (6) (i) 66 (ii) 14 (iii) 45
 (7) (i) 11 (ii) 68
 (8) $x = 52$, Mean = 55.9, Mode = 52

