Cognizant

Aptitude Questions

Cognizant Online Test Pattern (AMCAT Pattern)

Section	Number of Questions	Time Duration (in Minutes)
Quantitative Aptitude	16	16
Logical Reasoning	14	14
Verbal Ability	25	25
Total	**55 Questions**	**55 Minutes**

Cognizant Online Test Pattern (Merit Trac Pattern)

Section	Number of Questions	Time Duration (in Minutes)
Analytical Ability	30	60 Minutes
Verbal Ability	25	
Total	**55 Questions**	

QUANTITATIVE APTITUDE

1. Number System
2. Percentage
3. Profit and Loss
4. SI and CI
5. Ratio and Proportion
6. Number Series
7. Mixture & Allegation
8. Time & work
8. Simplification
10. Algebra
11. Time, Distance & Speed
12. Averages
13. Logarithms
14. Geometry
15. Mensuration
16. PNC
17. Hight and Distance
18. Probability
19. Progressions
20. Data Sufficiency

Topic	Expected number of questions	Difficulty Level
Divisibility	1 – 2	Easy-Medium
HCF and LCM	1 – 2	Easy
Numbers, decimal fractions	2 – 3	Medium
Profit and Loss	2 – 3	Medium – Difficult
Simple and Compound Interest	1 – 2	Medium
Time, Speed and Distance	2 – 3	Medium – Difficult
Inverse	1 – 2	Easy
Logarithms	2 – 3	Easy
Permutation and Combinations	1 – 2	Medium
Probability	1 – 2	Easy-Medium

Logical Reasoning

1. Number Series
2. Clock
3. Calendars
4. Analogies
5. Analytic Reasoning
6. Verbal Classification
7. Water Images
8. Mirror Images
9. Logical Games
10. Missing Letters
11. Matching Definitions
12. Out the Embedded Figure
13. Classification
14. Non-Verb reasoning Series
15. Completion of Incomplete Pattern
16. Logical Problems
17. Verbal Reasoning
18. Data Interpretation

Topic	Expected number of questions	Difficulty Level
Coding deductive logic	1 – 2	Easy – Medium
Data Sufficiency	2 – 3	Medium – Difficult
Directional Sense	1 – 2	Easy
Logical Word Sequence	1 – 2	Easy
Objective Reasoning	1 – 2	Easy
Selection decision tables	2 – 3	Medium – Difficult
Puzzles	1 – 2	Medium
Number series pattern recognition	2 – 3	Medium – Difficult
Analogy and Classification pattern recognition	1 – 2	Easy
Logical word sequence	2 – 3	Easy

Verbal Ability

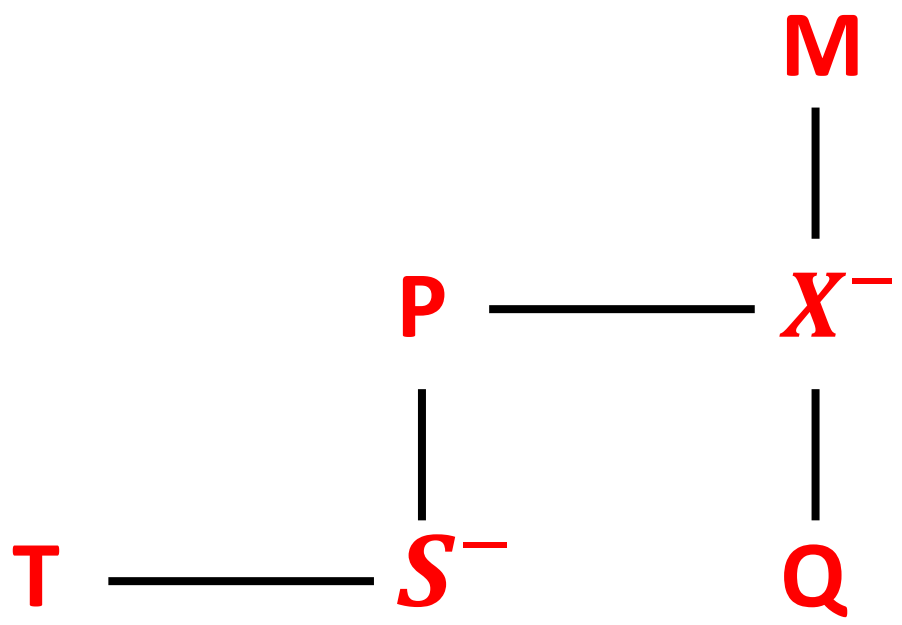
1. Para Jumbles
2. Phrase Replacement
3. Analogy
4. Spellings
5. Fill in the Blanks
6. Theme Detection
7. One word Substitution
8. Error Spotting
9. Sentence Jumbles
10. Synonyms & Antonyms
11. Active & Passive Voice
12. Direct & Indirect Speech
13. Reading Comprehension

Topic	Expected number of questions	Difficulty Level
Synonyms	3 – 4	Medium – Difficult
Antonyms	3 – 4	Medium – Difficult
Contextual Vocabulary	4 – 5	Easy
Error Identification	4 – 5	Easy – Medium
Sentence Improvement and Construction	5 – 6	Medium
Reading Comprehension	2 – 3	Medium – Difficult

Asked Questions in CTS Written Examaminations

Q's mother is sister of P and daughter of M, S is daughter of P and sister of T. How is M related to T?

(a) Grand Mother (b) Father (c) GF or GM

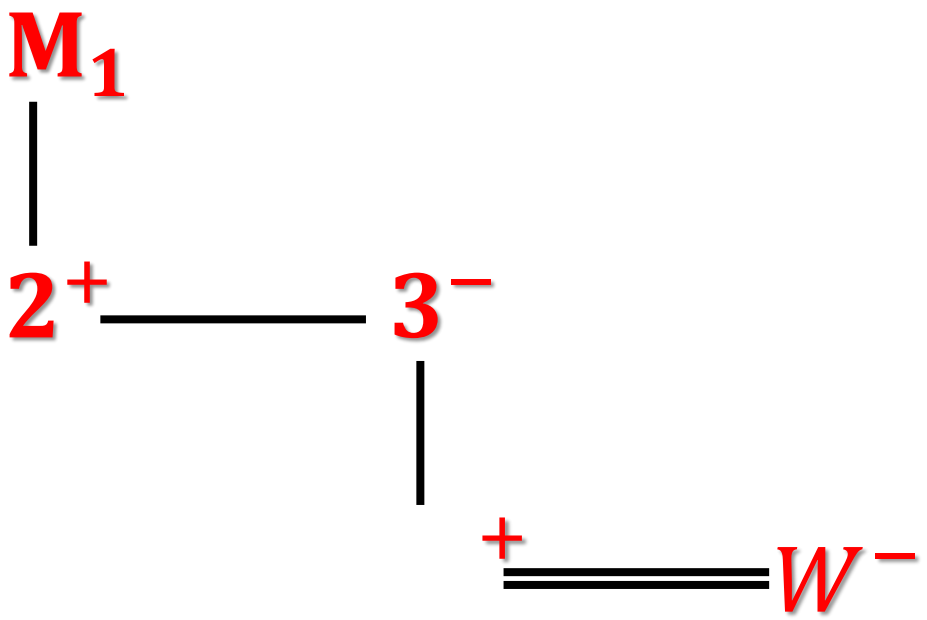


4) Grandfather or Grandmother

Pointing to a photograph a woman says," This man's son's sister is my mother-in-law. “How is the woman's husband related to the man in the photograph?

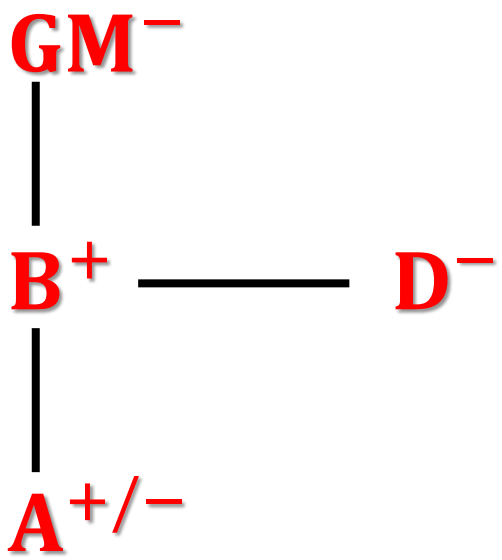
(a) Grandson (b) Son (c) Son in law (d) Nephew

Grandson.



A told B," yesterday I met the only brother of the daughter of my grand mother". Whom did A meet?

(a) Cousin (b) Brother (c) Nephew (d) Father



Father

Pointing to a lady , a man said," The son of her only brother is the brother of my wife. “How is the lady related to the man?
(a) MIL (b) Mother (c) GM (d) Sister of Father-in-law

- D)sister of father-in-law

  brother of my wife = brother-in-law
  it means the man has married "the only brother's" daughter since she is the sister of only brother .it makes her sister of father-in-law

Pointing out to a lady, Rajan said, “She is the daughter of the woman who is the mother of the husband of my mother. “Who is the lady to Rajan ?

(a) Aunt (b) Grand Daughter (c) Daughter (d) sister

- A Aunt
  Husband of my mother = father
  Daughter of father's mother = aunt

A party consists of grandmother, father, mother, four sons and their wives and one son and two daughters to each of the sons. How many females are there is all ?

(a) 14 (b) 16 (c) 18 (d) 24

A) 14

Total females: Grandmother, mother, 4 wives of four son, 2*4 daughters of four son =1

If B is the only child of A M and N are the children of B. D is the grandmother of N. How is A related to D?

(a) GM (b) Husband (c) Mother (d) Son

A,D->B->M,N

A is the husband of D

If M is P'S brothers son. N is the only brother of P. How is N related to M?

(a) Nephew (b) Father (c) Cousin (d) Uncle

Father
N is only brother of p
M is son of p brothers
So N is father of M

Introducing a woman. a man said. Her husband is the only son of my father. How is the woman related to the man?

(a) Sister (b) MIL (c) Daughter (d) Wife

4) Wife.
her husband is the only son of his father means the man himself.

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(a) Sister (b) MIL (c) Daughter (d) Wife

4) Wife.
her husband is the only son of his father means the man himself.

M and N have children A and B.F is spouse of B.D is child of F.P is son in law of N.K is kid of P.
who is male child of M and N.?

B is male child of M and N

If P is father of R and R is not son of P,M is spouse of R then how P related to M?

P is father-in-law of M.

->R is daughter of P.
M is husband of R.
Therefore M is son-in-law of P.

A man pointing to a lady says, “Her brother is the father of my only son's sister.” How is that lady related to the man?

(a) Sister (b) Niece (c) Daughter (d) GD

my only son's sister is my daughter
father of my daughter is me only
her brother means she is my sister
ans: sister.

If 'A $ B’ means: 'A is brother of B’,
'A @ B’ means: 'A is wife of B’,
'A #B' means: ' A is daughter of B' and
'A (A) B' means: 'A is father of B', then which of the following expressions indicates the relationship 'U is father-in-law of P?

(a) P@Q$T#U(A)W.

(b) P@W$Q(A)T#U.

(c) P@Q$W(A)T#U.

(d) P@Q$T#W(A)U.

ans: A

A can do a piece of work in 12 days and B can do a piece of work in 18 days how many days will the work be completed if both of them work together?

A's 1 day work=1/12,B's 1 day work =1/18;
(A+B) 1 day work=1/12+1/18=5/36;
they can finish the work in=36/5=7.2
ans=7.2

if a 72x23y is divisible by 88.then find value of x and y

(a) 1,5 (b) 7,2 (c) 7,4 (d) 7,7

1st Mistake>>>>number 72x23y, then sum of odd digits={y+2+2} and sum of even digits={3+x+7}.
My Solution:
number 72x23y is divisible by 88 means it should be divide by 8 and 11 exactly.
check for 8:
So y=2 [(i.e) 232 is absolutely divisible by "8"]
check for 11:
For a number to be divisible by "11" , sum of odd digits - sum of even digits should be either "0" or a number divisible by "11".
so{2+2+2}-{7+x+3} should be equal to "0" or divisible by "11"
6-(10+x)
i.e x=7
now 6-17= -11 which is divisible by 11.
Answer is: x=7,y=2

Fill in blank

$$(01011010)_2 = (\ ?\ )_8$$

simple method for change binary number to octal
make pair of 3 number right to left
(01011010)2=(01 011 010)8=(132)8

Or

010=2
011=3
001=1
ans= 132

Arrange the words

1. Protect 2. Pressure 3. Relief 4. Rain 5. Flood

(a) 2,4,3,1,5 (b) 2,4,5,1,3 (c) 2,5,4,1,3

coz of pressure--rain--flood--protect--relief ansb)

BC CE EG GK ?
(a) KN (b) KU (c) KM (d) None

km is the answer
bc =2 3
ce=35
eg=57
gk=7 11
next km=11 13

Arrange these in ascending order- 2/15,18/29,7/18,10/87

2/15---> 2*7 = 14
18/29---> 18*1 = 18
7/18 ---->7*2 = 14
10/87 ---> 10*8 = 80

10/87 < 2/15 < 7/18 < 18/29

What is the remainder wen 2^{35} is divided by 5?

$$\frac{\mathbf{2^{35}}}{\mathbf{5}}$$

=> (2^4)^8 * 2^3 / 5

$$\Rightarrow \ (\mathbf{5} * \mathbf{3} + \mathbf{1})\mathbf{\hat{}}\mathbf{8} \ * \ (\mathbf{5} + \mathbf{3}) \ / \ \mathbf{5}$$

$$\Rightarrow \ (\mathbf{1} * \mathbf{3})/\mathbf{5}$$

$$\Rightarrow \ \mathbf{3}/\mathbf{5}$$

$$\Rightarrow \ \boldsymbol{remainder} \ = \ \mathbf{3}$$

In how many ways can 6 lottery tickets be distributed among 4 different people, if all of the four different people can get any number of tickets?

a. 6C4 b. 46 c. 6P4 d. 6^4

Ans is 6^4 ..

1st place can be filled in 6 ways
2nd place can be filled in 6 ways
3rd place can be filled in 6 ways
4th place can be filled in 6 ways

What is the unit digit of 3^{34}

a) 1 b) 9 c) 3 d) 7

to find unit digit take last two digit of the power and then divided it by 4 and use remainder as a power of no
like 3^34
34/4 remainder will be 2
then 3^2=9
ans E) 9

There are five friends Sachin, Kunal, Mohit, Anuj and Rohan. Sachin ia shorter than Kunal but taller than Rohan. Mohit is tallest. Anuj is a little shorter than Kunal an little taller than Sachin. Who is the shortest?
(a) Rohan (b) Sachin (c) Anuj (d) Kunal

Sachin ia shorter than Kunal but taller than Rohan

i.e.. Rohan < Sachin < Kunal

Anuj is a little shorter than Kunal and little taller than Sachin. and finally Mohith is tallest

Rohan < Sachin < Anju < Kunal < Mohith

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Rohan < Sachin < Anju < Kunal < Mohith

The average age of a cricket team of eleven is 22 years. The average age gets increased by 1 year, when the coach age is also included, What is the age of the coach?

1) 34 2) 23 3) 30 4) 40

Ans. 1) 34 years

total age of 11 players. = 11x22=242.

let "x" is the age of coach then the avg age :

(22+1)= [(242+x)/12]

=> (23x12)=242+x

=> 276=242+x

=> x= 276-242= 34

24:50::102:??
What will come in pllace of ?

24*2+2=50
50*2+2=102
102*2+2=206(ans

What is the next number of the following sequence 2,3,6,18,108,?

2*3=6

3*6=18

6*18=108

18*108=1944

therefore next no. is 1944

In a club there are male and female members. If 15 female quit then the number of females will become double the number of males. If 45 males quit no. of female becomes five times the number of males. Find the number of females

$(F-15)=2M$.....(i)

$F=5(M-45)$.....(ii)

by solving the equation get $M=80$ then put in (i)

$F=2M+15$

$F=2*80+15$

175

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18*108=1944

therefore next no. is 1944

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6*18=108

18*108=1944

therefore next no. is 1944

The difference of 2numbers is 8 and the difference of their squares is 160. Find the numbers?

x-y = 8 --------(1)

x^2-y^2 = 160

=> (x+y)*(x-y)= 160

=> x+y = 20 --------(2)

solve 1 & 2

x=14, y = 6

Manik is fourteenth from the right end in a row of 40 boys. What is the position from the left ends?

1) 24^{th} 2)25^{th} 3)27^{th} 4)26th

total no of boys in a row=40 ; he is fourteenth from the right end then 40-13=27

ANS=27

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1) 24^{th} 2)25^{th} 3)27^{th} 4)26th

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ANS=27

What is the next number of the following sequence 10, 7, 12, 10, 14, ___ ?

One third of a two digit number exceeds its one fourth by 7. What is the sum of digits of the number?

1) 72 2) 84 3) 15 4) 12

- first let the number be x
  so x/3 - x/4 = 7
  x/12 = 7
  x=84
  number is 84 and sum of digits is 8 + 4 = 12

A supplier supplies cartridges to a news paper publishing house. He earns a profit of 20% by selling cartridges for Rs. 540. Find the cost price of the Cartridges ?

1) Rs. 500 2) Rs. 480 3) Rs. 450 4) Rs. 400

- let Cost Price(C.P) = x
  gain%={(S.P-C.P)/C.P}*100
  20={(540-x)/x}*100
  20/100=(540-x)/x
  x=5(540-x)
  6x=2700
  x=450
  So,Cost Price= Rs.450

Buy one get 1 free offer. Selling price of a t-shirt is 4200. Shopkeeper says he got 33.33% profit. what is cost price ?

- SP = 4200.
  profit% = (profit/CP)*100
  33.33 = {(SP-CP)/CP}*100
  33.33 ={(4200-CP)/CP}*100
  On solving for the value of CP..
  CP =3150.07

In a certain code, COMPUTER is written as RFUVQNPC. How is MEDICINE written in the same code?
A.EOJDJEFM B.EOJDEJF C.MFEJDJOE D.MFEDJJOE

A.EOJDJEFM

last and first letter interchange positions.
so final code of MEDICINE will be
EXXXXXXM
2nd letter E will take 2nd last place after changing to F(next letter)
3rd letter D will take 3rd last place after changing to E(next letter)
...
and so on.

All the faces of cubes are painted with red colour. The cubes is cut into 64 equal small cubes. How many small cubes are there whose three faces are coloured ?

A. 4 B. 8 C. 16 D. 24

B. 8 small cubes are there whose three faces are coloured.

Reason:

Number of small cubes having three faces coloured = No. of corners = 8

if P is father of R, and R is not son of P,M is spouse of R then how P related to M?

- Father-in-law

  P-->father of R
  R--->daughter of P
  M--->husband of R

In a farm 50 hens lays 200 eggs in 2 days, how many days that 20 hens to lay 400 eggs?

- 50 hens --- 200 eggs ---- 2 days
  50 hens --- 100 eggs ---- 1 day
  1 hen --- 2 eggs ---- 1 day
  20 hens --- 40 eggs ---- 1 day
  So 20 hens can lay 40 eggs in 1 day
  then 20 hens can lay 400 eggs in 10 days (40*10=400)

4 men can repair a road in 7 hours. how many men are required to repair the road in 2 hours

- M1*D1*W2=M2*D2*W1
  HERE W1=W2
  4*7*1=M2*2*1
  M2=14

A trader sells 145 metre of cloth for Rs 12,325 at the profit of Rs 10 per metre’ of cloth. What is the cost price of 1 metre of cloth?
A) Rs. 65 B) Rs. 75 C) Rs. 95 D) Rs 85

- total profit=145*10=1450
  CP=12325-1450
  =10875
  SO, cost price of 1 meter cloths=10875/145=75

You are having 31kg of rice. You are provided with a 1kg stone for weighing. In how many weights the 31kg of rice can be weighed. ?

- 5 weights..... in 1st weight 1kg stone and 1 kg rice.. rice weighed = 1kg.
  2nd weighing 2kg of (stone +rice) and 2 kg of rice.. rice weighed = 3kg.
  3rd weighing 4kg of (stone +rice) and 4 kg of rice.. rice weighed = 7kg.
  4th weighing 8kg of (stone +rice) and 8 kg of rice.. rice weighed = 15kg.
  5th weighing 16kg of (stone +rice) and 16 kg of rice.. rice weighed = 31kg.

Chintu went 15 km to the west from my house, then he turned left and walked 20 km. He then turned east and walked 25 km and finally turning left covered 20 km. How far was he from my house?

a)10 km b)15 km c)20 km d) 16 km

- He is 10km away from the home

A can do a work in 12 hours, B can do in 14 hours. They work alternatively starting from A. A earns rs.15/hr. How much does he earn from the whole job?

a)rs.90 b)rs.165 c)rs.105 d)rs.75

Assume total work is 84
A's 1 day work is 7
B's 1 day work is 6
so both can do (A+B)'s 1 day work is 13
13*6=78
and 6 is remaining from total wotk
for 6 days A earned 90
and for extra 6 work total A earned is 105

The printed price on a book is Rs.400,a bookseller offers a 10% discount on it . If he still earns profit of 12%,then the cost price of the book is?

- discount=10% (400)

  =40

  hence 400-40=360 is sp

  so, cp=100/(100+12)*360

  =321.4
  answer is not there in the options

if a 72x23y is divisible by 88.then find value of x and y

x=3 y=2
x=7 y=2

What is the next number of the following sequence 5, 25, 61, 113, ?[CTS]

(a) 153 (b) 181 (c) 221 (d) 162

$$1^2 + 2^2 = 5$$
$$3^2 + 4^2 = 25$$
$$5^2 + 6^2 = 61$$
$$7^2 + 8^2 = 113$$
$$9^2 + 10^2 = 181$$

The probability that a card drawn form a pack of 52 cards will be a diamond or a king is:

(a) 4/13 (b) 2/13 (c) 4/13 (d) 5/13

Total cards =52

There are 13 cards of diamond (including one king) and there are 3 more kings.

so, 13+3=16

then,

$$\frac{16}{52} = \frac{4}{13}$$

If P is father of R and R is not son of P,M is spouse of R then how P related to M?

- P is father-in-law of M.

  ->R is daughter of P.
  M is husband of R.
  Therefore M is son-in-law of P.

A simple interest earned on certain amount is double the money when invested for 15 years. what is the interest rate offered?

a)26.66% b)12% c)30% d) 13.33%

$$\mathbf{SI} = \frac{\mathbf{PRT}}{\mathbf{100}}$$

$$\boldsymbol{2P} = \frac{\boldsymbol{P \times R \times 15}}{\mathbf{100}}$$

$$\mathbf{R = 13.33\%}$$

The total no. of numbers that are divisible by 2 or 3 between 100 and 200 (both inclusive) are

100

51+33-17=67

if 8^{25} divided by 7 then what is reminder

(a) 25 (b) 1 (c) 0 (d)

$$\frac{8^{24}}{7} \times \frac{8^{1}}{7}$$

$$1 \times 1 = 1$$

What is come in place of "?"

INVITE : JOWJUF : ATTEND : ?

1) BUUFOE 2) BUUGOF 3) CUUFOE 4) CUUGQF

What will come in place of ?
AlE :FNJ:: KSO:?
1) PWU 2)PXT 3) LYT 4) QXU

- A+5=F
  I+5=N
  E+5=J

  K+5=P
  S+5=X
  O+5=T

  PXT is the answer

Choose the word which is different from the rest.
A. Chicken B. Snake C. Swan D. Crocodile E. Frog

- A. Chicken

  Because other animals can live in water .

Five trays cost is 0.35 each and dozen-----

- It is clearly written that 5 trays cost 0.35 each
  which means each cost 0.35, then the cost of 5 trays =1.75
  similarly, cost of 12 trays=0.35*12 = 4.2

  many of us misunderstand the ques as 5 trays cost 0.35, but it is not so.

It BLOCK stands for 26, ANT stands for 10, WRITER stands for 50, MENSURATION stands for 122 and SPHERE stands for 37 then RECTANGLE stand for?

- BLOCK-- 5 letters -- (5*5)+1 =26
  ANT -- 3 letters --(3*3)+1=10
  WRITER --6 letters-- (6*6)+1=37 **might be error here
  MENSURATION -- 11 letters --(11*11)+1 = 121
  SPHERE --6 letters --(6*6)+1=37
  Hence RECTANGLE --(9*9)+1=82

Ques: What is the monthly Salary of my father?
Statements:
a) My father's and my mother's Salary are in the ratio 5:2
b) My mother's salary is 40% of that of my fathers Salary

Op1 : Statement 1 alone is sufficient
Op2 : Statement 2 alone is sufficient
Op3 : Both Statements put together are sufficient
Op4 : Both Statements put together are not sufficient

- 4 : Both Statements put together are not sufficient

  Given ratio of father and mother's salary as 5:2 respectively which implies mother's salary is 40% of that of father and the same is given by statement (b)
  So from both the statements it is not possible to find the father's exact salary and only the ratio is known.
  Hence both the statements put together are not sufficient.

0.28, 0.56, 1.68, ___

$$28 \times 2 = 56$$
$$56 \times 3 = 168$$
$$168 \times 4 = 672$$
$$ans\ 6.72$$

In how many ways 8 members can be selected for a team such that women constitute at least 50% of the team from a group of 8 men and 8 women.

- in all we have to choose 8 members from total
  where at least 50% women are present
  so we have cases like
  4 women and 4 men = 8C4 * 8C4 = 70*70=4900
  5 women and 3 men = 8C5*8C3 = 56*56=3136
  6 women and 2 men = 8C6*8C2=28*28=784
  7 women and 1 man = 8C7*8C1=8*8=64
  8 women and 0 man = 8C8 =1
  adding all the 4 values above obtained we have
  8885 ways

CHAIR = HCARI
SHAME = ?

- CHAIR = HCARI
  SHAME = HSAEM

In how many different ways can the letters of the word ‘MIRACLE’ be arranged?

(a) 720 (b) 5040 (c) 2520 (d) NOT

MIRACLE

Total no of words are 7

so they will arrange in 7!

i.e 5040 ways

Using the digits 1,5,2,8, four digit numbers are formed and the sum of all possible four digit numbers are?

General Formula

if n digits are there:

$$(n-1)! \times (1111..n \text{ times}) \times (\text{sum of given digits})$$

$$(3!) \times (1111) \times (16)$$

$$(1111) \times 96$$

$$106656$$

Using the digits 4,5,2,8, four digit numbers are formed and the sum of all possible four digit numbers are?

General Formula

if n digits are there:

$$(n-1)! \times (1111..n \text{ times}) \times (\text{sum of given digits})$$

$$(3!) \times (1111) \times (19)$$

$$(1111) \times 96$$

$$106656$$

Find the number of factors of 1728?

A. 18 B. 28 C. 30 D. 20

if $N = P^a \times Q^b \times R^c \times \cdots$

then total no. of factors of $N = (a+1) \times (b+1) \times (c+1) \times \cdots$

$$1728 = 2^6 \times 3^3$$

so, number of factors of $1728 = (6+1) \times (3+1) = 28$

One boy can eat 100 chocolates in half a minute, and another can eat half as many in twice the length of time. How many chocolates can both boys eat in 15 seconds?

(a) 20 secs (b) 25 secs (c) 15 secs (d) 30 secs

1st boy eats 100 chocolates / 30 sec
so he can eat 50 in 15 sec

2nd boy can eat one-half of 100 in twice of 30 sec
so he can eat 50 in 60 sec
or that is 12.5 in 15 sec

so, together they can eat
$50 + 12.5$ **or**
62.5 chocolates in 15 seconds.

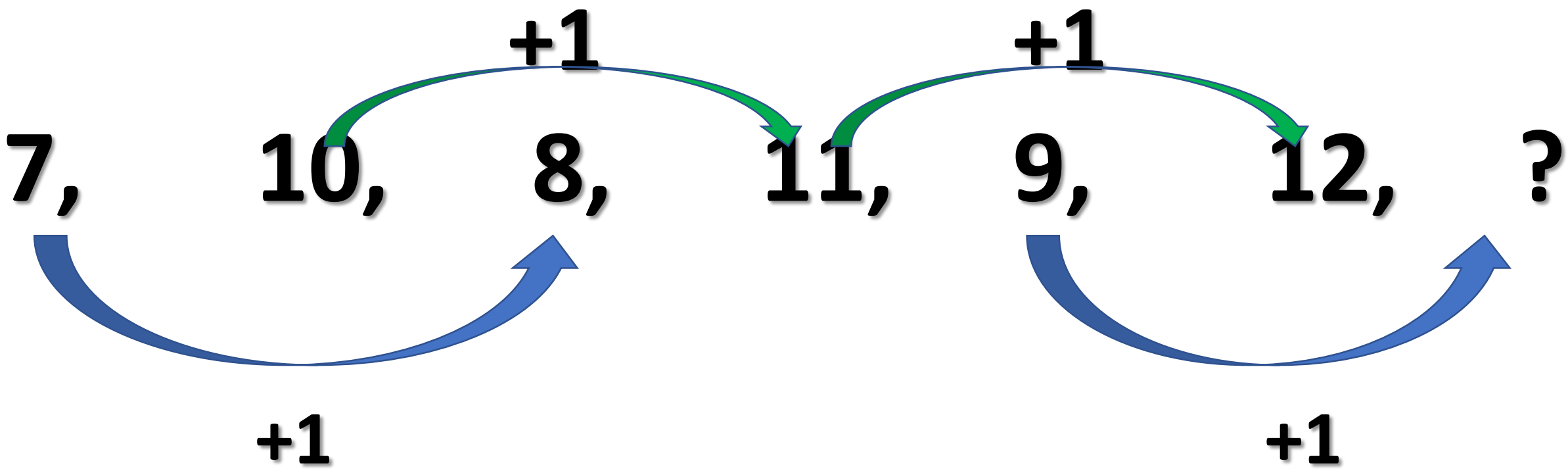
How many 6 digits can formed with 0 1 5 6 7 with zero not in first place ?

a) 1600 b) 1200 c) 12500 d) 2500

$$\underline{\mathbf{4}} \times \underline{\mathbf{5}} \times \underline{\mathbf{5}} \times \underline{\mathbf{5}} \times \underline{\mathbf{5}} \times \underline{\mathbf{5}} = \mathbf{12500}$$

Look at this series: 7, 10, 8, 11, 9, 12, … What number should come next?

(a) 13 (b) 10 (c) 14 (d) 16



Find the odd man out.

3, 5, 11, 14, 17, 21

A. 21 B. 17 C. 14 D. 3

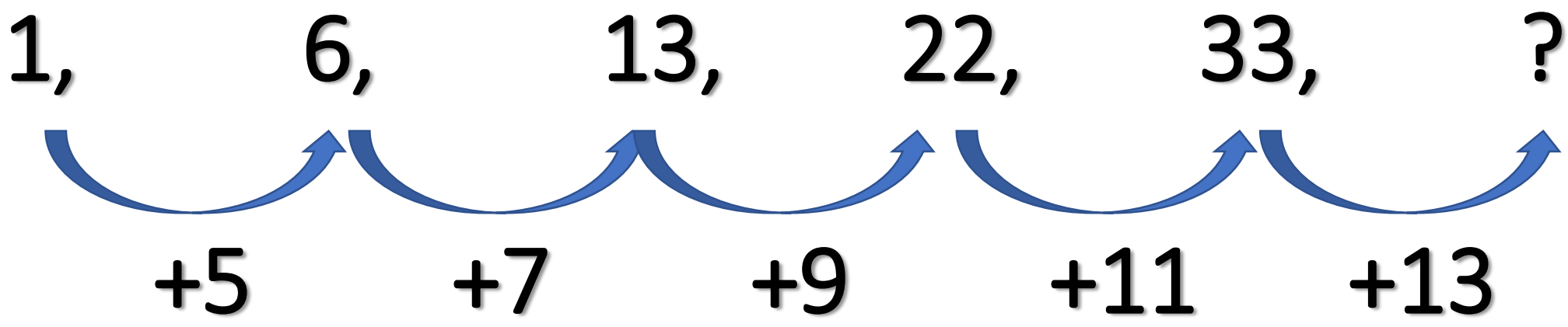
ans:14

all are prime numbers but 14 is an even number

Find the next number in the series

1, 6, 13, 22, 33, ……

A. 44 B. 45 C. 46 D. 47



33+13=46

Which is greater 2^{300} or 3^{200}

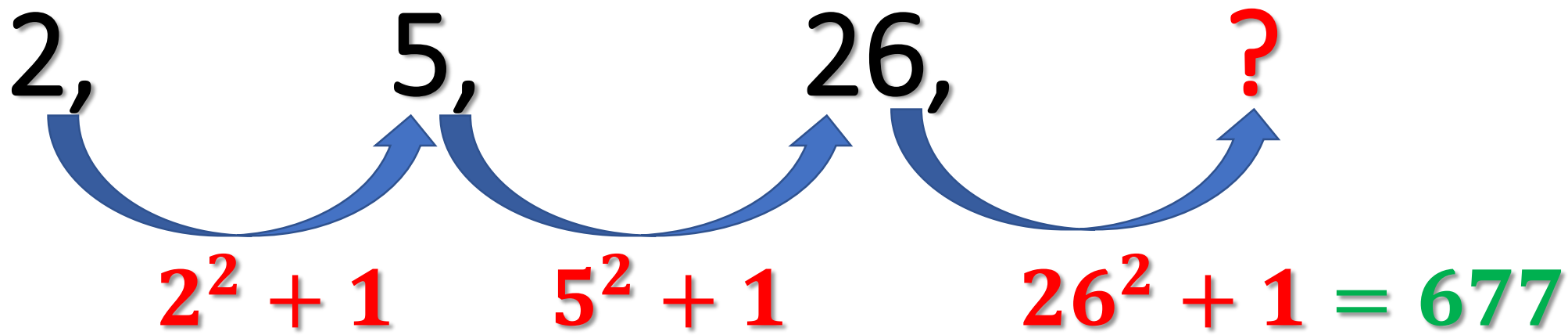
(a) 2^{300} (b) 3^{200}

$$2^{300} = 2^{3\times100} = 8^{100}$$
$$3^{200} = 3^{2\times100} = 9^{100}$$

Clearly $3^{200} > 2^{300}$

find the next term 2, 5, 26, ?

(a) 526 (b) 677 (c) 746 (d) 497



Find the missing number

2,5,10,17,?

(a) 24 (b) 25 (c) 26 (d) 27

2, 5, 10, 17, ?

$1^2 + 1$ $2^2 + 1$ $3^2 + 1$ $4^2 + 1$ $5^2 + 1$

26 Will be answer.

Supriya runs a marathon race in 50 minutes at an average speed of 48 km/hr in order to set a national record she need to win the race in 40 minutes considering that her speed remain constant at what minimum speed she run to set the record

a) 70 km/hr b) 60 km/hr c) 55 km/hr d) 50km/hr

$$\mathbf{50}\boldsymbol{mins} = \mathbf{5}/\mathbf{6}\boldsymbol{hr}$$

$$\boldsymbol{distance} = \mathbf{48} \times \left(\frac{\mathbf{5}}{\mathbf{6}}\right) = \mathbf{40}\boldsymbol{km}$$

$$\mathbf{40}\boldsymbol{mins} = \frac{\mathbf{2}}{\mathbf{3}}\boldsymbol{hr}$$

$$\boldsymbol{speed} = \frac{\mathbf{40}}{\mathbf{2}/\mathbf{3}} = \mathbf{40} \times \left(\frac{\mathbf{3}}{\mathbf{2}}\right) = \mathbf{60}\boldsymbol{km}/\boldsymbol{hr}.$$

Raman drove from home to a neighbouring town at the speed of 50 km/hr and on his return journey, he drove at the speed of 45 km/hr and also took an hour longer to reach home. What distance did he cover each way?

A)450 km B)225 km C)900 km D)500 km

If distance Raman drove on each way$= x\ km$, then

$$\frac{x}{45} = \left(\frac{x}{50}\right) + 1$$

$$\frac{x}{9} = \frac{d + 50}{10}$$

$$x = 450$$

Two trains leave X for Y at 6.30am and 7.40am and travel at 30 km/hr and 40 km/hr respectively. How many kms from A will the trains meet?

(a) 150 km (b) 140 km (c) 160 km

When two train are leaving the station at $t_1 and\ t_2$ time and their speed is s_1 and s_2 then they will meet at distance

$$= (t_2 - t_1) \times \frac{S_1 \times S_2}{S_2 - S_1}$$

$$= 7/6 \times \frac{30 \times 40}{40 - 30}$$

=140km

$$\left(1\ hr\ 10\ min = \frac{7}{6}\right)$$

A goods train leaves a station at a certain time and at a fixed speed. after 6 hrs an express train leaves the same station and moves in same direction at a uniform speed of 90 kmph. this train catches up the goods train in 4 hrs. find the speed of the good train.

(a) 52 km/hr (b) 36 km/hr (c) 38 km/hr

Let the speed of the goods train be $x\ km/ph$

Distance covered by goods train in 10 hours

= Distance covered by the express train in 4 hours.

$$\therefore 10x = 4 \times 90$$

$$x = 36$$

Speed of goods train $= 36\ km/ph.$

The Ratio between speeds of two trains is 5:3. If the first train runs 350 km in 2 hours, then what is the speed of the second train?

(a) 105 km (b) 108 km (c) 110 km

Speed of first train is $= 5x$,

Speed of second train $= 3x$

First train speed is $= \frac{350}{2} = 175\ km/hr$

$$5x = 175 \Longrightarrow x = 35$$

Second train speed is $= 3 \times 35 = 105\ km$

A train covers a distance between station A and B in 45 minutes. If the speed is reduced by 5 km/hr, it will cover the same distance in 48 min. What is the distance between A & B in km

(a) 42 km (b) 60 km (c) 48 km

Let distance between A and B be x km then

speed of train $= \frac{x}{45/60} = \frac{4x}{3}\ km/hr$

Reduced speed = $\frac{x}{48/60} = \frac{5x}{4}\ km/hr$

then the speed equation is, $\frac{4x}{3} - 5 = \frac{5x}{4}$

$$16x - 15x = 60$$

$$x = 60\ km$$

A man decided to travel 80 km in 8 hrs, partly by foot and partly on a cycle. If his speed on foot is 8 kmph and on the bicycle is 16 kmph, what distance does he travel on foot?

(a) 52 km (b) 48 km (c) 56 km (d) NOT

A_____80 km _____B

$Let\ x = distance\ travelled\ by\ foot$

$80 - x = distance\ travelled\ by\ bicycle$

$travel\ time = distance/speed$

$$\frac{x}{8} + \frac{80 - x}{16} = 8$$

$$2x + 80 - x = 128$$

$$x = 48$$

$Distance\ travelled\ on\ foot = \mathbf{48\ km}.$

A man travelled a distance of 60 km in 7 hours. he travelled partly on foot @ 6 km/hr and partly on bicycle @ 12 km/hr. what is the distance (in kms) travelled on foot?

(a) 26 km (b) 24 km (c) 36 km (d) 30 km

A_____60 km _____B

$Let\ x = distance\ travelled\ by\ foot$

$60 - x = distance\ travelled\ by\ bicycle$

$travel\ time = distance/speed$

$$\frac{x}{6} + \frac{60 - x}{12} = 7$$

$$2x + 60 - x = 84$$

$$x = 24$$

$$Distance\ travelled\ on\ foot = 24\ km.$$

Without stoppages a train travels a certain distance with an average speed of 80 km/h and with stoppages It covers the same distance with an average speed of 60 km/h What is the time in minutes per hour for which train stops?

(a) 15 mins (b) 20 mins (c) 36 mins (d) 30 mins

$$Stoppage\ time\ per\ hr = \frac{change\ in\ speed}{faster\ speed}\ hr$$

$$= \frac{20}{80} = \frac{1}{4}\ hr = 15\ \text{min}$$

A train travels at an average speed of 90 km/hr without any stoppages. However, its average speed decrease to 60 km/hr on account of stoppages. On an average, how many minutes per hour does the train stop?

$$Stoppage\ time\ per\ hr = \frac{change\ in\ speed}{faster\ speed}\ hr$$

$$= \frac{30}{90} = \frac{1}{3}\ hr = 20\ \text{min}$$

A man can row 8 kmph in still water. If the river is running at 2 kmph, it takes 4 hrs more upstream than to go downstream for the same distance. Then the distance is given by

a) 60 km b) 62 km c) 45 km d) NOT

Let the distance be d

$$\frac{d}{8-2} - \frac{d}{8+2} = 4$$

$$\frac{d}{6} - \frac{d}{10} = 4$$

By options, put $d = 60$

A man can row 8 km/hr in still water. If the river is running at 3 km/hr, it takes 3 hours more in upstream than to go downstream for the same distance. How far is the place?

a) 26.67 km b) 32.5 km c) 27.5 km

Speed of man in still water $= \mathbf{8}\ \boldsymbol{km/hr}$,Speed of stream $= \mathbf{3}\ \boldsymbol{km/hr}$

Upstream speed $= \mathbf{8 - 3 = 5}\ \boldsymbol{km/hr}$

Downstream speed $= \mathbf{8 + 3 = 11}\ \boldsymbol{km/hr}$

If distance a man rows$= \boldsymbol{x}\ \boldsymbol{km}$, then

Given, Time taken for upstream$= \mathbf{3} +$ Time taken for downstream

$$\frac{\boldsymbol{x}}{\mathbf{5}} + \frac{\boldsymbol{x}}{\mathbf{11}} = \mathbf{3}$$

$$\boldsymbol{x} = \mathbf{27.5}$$

A man covers a distance of 1200 km in 70 days resting 9 hours a day, if he rests 10 hours a day and walks with speed $1\frac{1}{2}$ times of the previous in how many days will he cover 750 km?

The man's previous speed $= \frac{1200}{70\times(24-9)}\,kmph = \frac{8}{7}\ kmph$

New speed $= \frac{8}{7}\times\frac{3}{2}\ kmph\ = \frac{12}{7}\ kmph$

Per day he walks for $(24-10) =\ 14\ hours$

Each day he covers $= \left(\frac{12}{7}\right)\times 14\ =\ 24\ kms$

The total time taken for covering $750\ Kms\ = \frac{750}{24}\ days\ =\ 31.25\ days$

You drive to the store at 20 mph and return by the same route at 30 mph. Discounting the time spent at the store, what was your average speed?

(a) 24 km/hr (b) 30 km/hr (c) 36 km/hr

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$$

Let distance to store be K

then, $\text{Total time} = \left(\frac{K}{20}\right) + \left(\frac{K}{30}\right) = \frac{K}{12}$

and, $\text{Total distance} = (2K)$

so average speed$= \frac{2K}{K/12} = 24kmph.$

A son and father goes for boating in river upstream . After rowing for 1 mile son notices the hat of his father falling in the river. After 5 min he tells his father that his hat has fallen. So they turn round and are able to pick the hat at the point from where they began boating after 5min. Find the speed of river in miles/hours? (Accenture, CTS, Wipro)

Actually hat fell when they were 1 mile away from starting point and total time hat takes to travel to the starting point is

$$10\ minutes\ (\ 5\ +\ 5\ )$$

so, speed of river = speed of hat = $\frac{1}{10} \times 60 = 6\ miles\ per\ hr$

- After falling the hat son and father travelled for 5 min. after realization they came back to the starting point in 5 min.
- That means there is a 10 min gap between the falling time and picking time. but in the same time the hat had reach to the starting point and hat will travel with speed of the river because the boat was traveling in the upstream.
  the hat travels 1 mile in 10 min or in 1/6 hrs.
  $\mathbf{Speed\ of\ the\ hat = speed\ of\ the\ river} = 1/(1/6)$
  $= 6\ mph$

A 330 m-long train passes a pole in 6 sec. How long will it take to cross a railway platform 165 meters long?

1) 9 sec 2) 6 sec 3) 11 sec 4) 12 sec

- Speed of the train=330/6=55 m/s
  Time taken to cross railway platform 165 m. long= (Platform length+Train's length)/Speed=(165+330)/55=495/55=9 sec.

In a journey of 15 miles two third distance was traveled with 40 mph and remaining with 60 mph. How much time the journey takes...

- 15x2/3=10 miles covered with 40mph =>time 15min.
  rest 5 miles covered with 60 mph =>time 5 min.
  total=20 min

A goods carnage of length 2 km. headed to Srinagar from Punjab was running at a speed 0(30 km/hr It crosses a tunnel which is 58 km long with that speed Find the time taken by the goods carriage to cross the tunnel

- train covered the distance of tunnel ,as well as its length.
  So, the total distance travelled by the train is= 58 km + 2 km=60 km
  now time taken =60 km / (30 km/hr)= 2 hours

Shiva decided to drive through the city and on the first day he drove for only 7 miles. On the last day he drove for 51 miles, increasing his journey 4 miles each day. Calculate the number of days he travelled and how far did he travel?

Miles travelled in first day $= 7\ miles$

According to the question

miles travelled in 2nd day $= 7 + 4$

miles travelled by $3rd, 4th \ldots . = 7 + 2 \times 4, 7 + 3 \times 4 \ldots \ldots$

$\mathrm{A.P.} = 7, 7 + 4, 7 + 2 \times 4, \ldots \ldots 7 + (\mathrm{n} - 1)4$

It's given

$$7 + (n - 1)4 = 51$$
$$(n - 1)4 = 44$$
$$n = 12$$

Total number of days = 12

total miles travelled Shiva

= n/2(a + l) [a = 1st term , l = last term]

= 12/2(7 + 51)

= 6(58)

= 348

so total miles 348 travelled in 12 days

A 330 m-long train passes a pole in 6 sec. How long will it take to cross a railway platform 165 meters long?

1) 9 sec 2) 6 sec 3) 11 sec 4) 12 sec

Speed of the train=330/6=55 m/s
Time taken to cross railway platform 165 m. long= (Platform length+Train's length)/Speed=(165+330)/55=495/55=9 sec.

In a journey of 15 miles two third distance was travelled with 40 mph and remaining with 60 mph. How much time the journey takes...

$15 \times \frac{2}{3} = 10$ miles covered with $40mph \implies 15$ min.

rest 5 miles covered with 60 mph =>time 5 min.

total=20 min

B is 50% faster than A. If A starts at 9 A.M. and B starts at 10 A.M. A travels at a speed of 50 km/hr. If A and B are 300 kms apart, The time when they meet when they travel in opposite direction is?

- By 10 A.M., A had been traveling for 1 hr, covering a distance of 50 Km at 50 km per hr.
  Speed of B=50+50%*50=50+25=75 km/hr
  let x=travel time (hours) it would take for A & B to meet after 10 A.M.
  (x+1) = total travel time (hours) of A

  distance=speed*travel time
  50(x+1)+75x=300
  50x+50+75x=300
  125x=250
  x=2 hrs

  The time when they meet when they travel in opposite directions is=10+2=12 noon

Walking at ¾ of his usual speed a man is 16 min late for his office. the usual time taken by him to cover that distance is

- Distance = Speed * Time
  Here distance is constant
  therefore s1*t1=s2*t2
  where s1 is his normal speed let it be =x
  t1 = t
  s2=3x/4
  t2=t+16(as it take 16 min more)
  now s1*t1=s2*t2
  x*t = (3x/4)(t+16)
  4t - 3t =48 min

  :- time t = 48 min

A boy in a car notices that he can count 21 shops which are evenly spaced on a highway in one minute. If they are known to be 100 meter apart, then at what speed is the train travelling?

- 21 shop means he will start from 1st shop(0m) so at 21st shop he must have covered d=20*100=2000m or 2km
  t=1min=1/60hr
  s=d/t=2/(1/60)=120kmph

A started at 9.00 am with 6 mph and B started at 9.30 am with 8mph in the same direction. At what time they will meet..

- A's speed=6mph ,B's speed=8mph
  Let,after x hrs they will meet..
  so,the distance traveled by A in x hrs should be same the distance traveled by B in (x-1/2)hrs [as B started journey after 30 min of A]
  Thus, 6x=8(x-1/2)[as distance=speed*time]
  =>8x-6x=4
  =>2x=4
  =>x=2
  after 2 hrs they will meet so time=(9+2)=11.00a.m

When a train travels at a speed of 60 kmph, it reaches the destination on time. When the same train travels at speed a of 50 kmph. It reaches its destination 15 minutes late. What is the length of journey?

- Let the length of journey be of 'x' km and given difference between the time for covering same journey is 15 min. or 1/4 hour.
  So (x/50) - (x/60)=1/4
  On solving , x=75

Ratio between speeds of 2 trains is 5:3. if the first train runs 350 km in 2 hours then what is the speed of the second train?

Ratio of speed of two trains A and B is 5 : 3

Let proportionality constant is x, speed of train A = 5x

speed of train B = 3x

According to question, the train A runs 350 km in 2hours

e.g., speed of train A = distance/time = 350/2 = 175 km/h

but from equation (1),

speed of train A=5x 175 = 5x => x = 35

so, speed of train B = 3x = 3 × 35 = 105 km/h

hence, speed of train B = 105 km/h

Walking at ¾ of his usual speed a man is 16 min late for his office. the usual time taken by him to cover that distance is

- Distance = Speed * Time
  Here distance is constant
  therefore s1*t1=s2*t2
  where s1 is his normal speed let it be =x
  t1 = t
  s2=3x/4
  t2=t+16(as it take 16 min more)
  now s1*t1=s2*t2
  x*t = (3x/4)(t+16)
  4t - 3t =48 min

  :- time t = 48 min

A boy in a car notices that he can count 21 shops which are evenly spaced on a highway in one minute. If they are known to be 100 meter apart, then at what speed is the train travelling?

- Distance covered in 1 minute= Distance between 21 shops which are 100 m. apart=20*100=2000 m. (since starting and ending will not be considered) speed= dist/time
  speed=2km*60=120 km/h

A started at 9.00 am with 6 mph and B started at 9.30 am with 8mph in the same direction. At what time they will meet..

- A's speed=6mph ,B's speed=8mph
  Let, after x hrs they will meet..
  so, the distance travelled by A in x hrs should be same the distance travelled by B in (x-1/2)hrs [as B started journey after 30 min of A]
  Thus, 6x=8(x-1/2)[as distance=speed*time]
  =>8x-6x=4
  =>2x=4
  =>x=2
  after 2 hrs they will meet so time=(9+2)=11.00a.m

Ravi and Raja are 20Kms apart. Ravi starts towards Raja at a speed of 4kmph at 10 AM while Raja starts off at 12 PM towards Ravi at a speed of 1kmph and keeps increases his speed by 1kmph every hour. If so, at what time would they meet each other?

- By 10 AM ravi starts hence by 12 AM with a speed of 4kmph he would have travelled 8kms.Hence the distance between ravi & raja by 12 PM is 12 kms
  By 1 pm ravi travels another 4 kms & raja 1 km, hence now distance is between them is 7 kms by 2pm there distance is 1 km
  suppose they meet after t hrs
  then 4t+3t=1 or,t=1/7*60=8.57min then at 2.8pm they will meet

A train for Lucknow leaves for every 2 1/2hrs from Delhi station. An announcement was made that train left 40mins ago and next train comes at 18:00hrs.At what time was the announcement made?

Next train comes at 18:00 hrs.
So, last train will be = 18:00hrs - 2:30hrs
= 15:30hrs
announcement made after 40min of the last train.
S0, 15:30hrs + 00:40min
=16:10 hrs

In a farm 50 hens lays 200 eggs in 2 days, how many days that 20 hens to lay 400 eggs?

$$\frac{M_1 \times D_1 \times H_1}{W_1} = \frac{M_2 \times D_2 \times H_2}{W_2}$$

$$\frac{50 \times 2}{200} = \frac{20 \times D_2}{400}$$

$$D_2 = 100\ days$$

4 men can repair a road in 7 hours. how many men are required to repair the road in 2 hours

$$\boldsymbol{M1 \times D1 = M2 \times D2}$$

$$\boldsymbol{4 \times 7 = M_2 \times 2}$$

$$\boldsymbol{M_2 = 14}$$

A can do a work in 12 hours, B can do in 14 hours. They work alternatively starting from A. A earns rs.15/hr. How much does he earn from the whole job?

Assume total work is 84
A's 1 day work is 7
B's 1 day work is 6
so both can do (A+B)'s 1 day work is 13
13*6=78
and 6 is remaining from total work
for 6 days A earned 90
and for extra 6 work total A earned is 105

8 men can do a piece of work in 12 days while 20 women can do it in 10 days. In how many days 12 men and 15 women complete the same work.

men 1 day work = 1/12
1 man 1 day work = 1/96
same as
20 women 1 day work = 1/10
1 woman 1 day work = 1/200
:- 12 men + 15 women 1 day work = (12/96) + (15/200)
= (1/8+3/40)
= 8/40
12 men + 15 women 1 day work ==> 1/5

therefore 12 men and 15 men women can complete the same work in 5 days

A can do a work in 8 days, B can do a work in 7 days, C can do a work in 6 days. A works on the first day, B works on the second day and C on the third day respectively that is they work on alternate days. When will they finish the work.

- a-8 days, b- 7 days, c- 6 days

  (a+b+c)'s 3 days work= (1/8+1/7+1/6)
  = 73/168

  work done in 3 triplets of days=(2*73)/168
  = 73/84

  remaining work =(1-(73/84))
  =11/84

  now remaining work is done by (A+b) together= 11/84
  1/8 + B =11/84
  B = 11/84 - 1/8 =1/168

  1/168 work done by b in (7*1/168)= 7/168 days

  total time taken = 7 + 1/168= 7 7/168

a and b can do a piece of work in 28 days. with the help of c, they can finish it in 21 days .how long will c take to finish it

A + B 's 1 day work = 1/28

A + B + C 's 1 day work = 1/21

1/28 + C= 1/21
C = 1/21 - 1/28
C = 1/84

So C ll finish the work alone in 84 days

Ans : 84 days

Recycling 900 kg of paper saves 17 trees. How many trees are saved when 1200 kg of paper are recycled?

- Trees saved when 1200 kg of paper are recycled= 17*1200/900=68/3=22.66
  So Approx 22 from given options

Two candles of the same height are lighted at the same time. The first is consumed in 6 hours and the second in 4 hours. Assuming that each candle burns at a constant rate, in how many hours after being lighted, was the first candle was twice the height of the second?

- As first candle was twice the height of second so 2:1
  then (1-(t/6))/(1-(t/4))=2/1
  (24-4t)/(24-6t)=2/1
  24-4t=48-12t
  24=8t
  t=3hrs

Ram can do work in 15 days and Mohan can do the same work in 20 days. They both work together for 4 days and both leave the work. What fraction of work is left now?

Work completed by Ram and Mohan in 4 days = $4[(1/15)+(1/20)]=7/15$
So fraction of work left=$1- (7/15)=8/15$

it takes 52 days to complete an agreement deal by a certain number of men. after 17 days 300 men are added and 21 days are reduced. how many men were working initially

If 'x' men were working initially, their 1 day work=1/52,

so 1 men 1 day work=1/(52x)
As after adding 300 men, days reduces to 52-21=31,

i.e. up to 17 days 'x' men works & for another 14 days 'x+300' men works
So (17/52) + (x+300)*[14/(52x)]=1
On solving, x=200

It takes 8, 12 and 16 days for A,B and C resp. to complete a task. How many days will it take if A works on the job for 2 days then B works on it until 25% of the job is left for C to do, and C completes the work?

- work done by A in 1 day =8
  fr 2 days 1/4.
  work to be done is 3/4
  25% of work is one by C = 25% of 3/4=3/16

  work done by B is 3/4-3/16=9/16
  no of days fr B to complete 9/16 work =27/4=6days 18 hr
  no of days fr C to complt d work is 3 days
  total days = 2+6+3+18hr=11days 18 hr = 12 day approxly

Mohan takes 8 days less than the time taken by Ravi to finish a piece of work. If both Mohan and Ravi together can finish it in 7.5 days, then how many days Ravi will take to finish the work alone ?

- Let the time taken by Ravi to finish the work be 'x' days, then Mohan takes 'x-8' days.
  As Mohan and Ravi together can finish the work in 7.5 or 15/2 days, their 1 day work=2/15.
  So, $1/x + 1/(x-8) = 2/15$
  $(x-8+x)/[x(x-8)] = 2/15$
  $x^2 - 23x + 60 = 0$
  $(x-3)(x-20)=0$
  as x can't be 3, x=20,

A is thrice as good a workman as B and takes 10 days less to do a piece of work than B takes. the number of days taken by B to finish the work is:

- Let the efficiencies of A and B be '3x' and 'x' respectively.
  No of days taken by A and B to complete the work be 'd' and 'd+10' respectively.

  So, 3x*d=x*(d+10)
  =>3xd=xd+10x
  =>2xd=10x
  =>2d=10
  =>d=5.

  The number of days taken by B = d+10=5+10=15.

Spanish Language Broadcast records last 90 min on each of two sides. If it takes 3 hours to translate one hour of broadcast, how long will it take to translate 16 full records?

- Records last 90 min on each of 2 sides,
  ==> record last 90*2 = 180 min = 3 hours

  16 full records--> 16*3 = 48 hour broadcast

  Given, 3 hours to translate 1 hour of broadcast
  Let x be the time required to translate 48 hour broadcast(16 full records)

  x = 48*3
  =144 hours

A, B and C can do a piece of work in 20, 30 and 100 days respectively. If A worked alone on the first day, B worked alone on the second day, C worked alone on the third day, A worked alone on the fourth day, and so on, then in how many days the work get completed?

- A's, B's and C's 1 day work = 1/20 + 1/30 + 1/100

  Total 3 day's work = 28/300
  Total 30 day work = 280/300
  Remaining work = 20/300 = 1/15
  Now A's 1 day work = 1/20
  Then remaining work = (1/60)/(1/30) = 1/2
  Now, B's then B complete the remaining work in 1/2
  Total number of days = 31 1/2 days.

A, B and C can do a piece of work in 24 days, 30 days and 40 days respectively. They began the work together but C left 4 days before the completion of the work. In how many days was the work completed?

- One day's work of A, B and C = (1/24 + 1/30 + 1/40) = 1/10.
- C leaves 4 days before completion of the work, which means only A and B work during the last 4 days.
- Work done by A and B together in the last 4 days = 4 (1/24 + 1/30) = 3/10.
- Remaining Work = 7/10, which was done by A,B and C in the initial number of days.
- Number of days required for this initial work = 7 days.
- Thus, the total numbers of days required = 4 + 7 = 11 days.

A can swim & cross 50m(the length of swimming pool) in 2 min. B can swim & cross 50m in 2min 15sec. Every time when they meet a bell gong is struck. For 2000m how many bell sounds might be produced?

arrange these in ascending order-

$$\frac{2}{15}, \frac{18}{29}, \frac{7}{18}, \frac{10}{87}$$

- 2/15---> 2*7 = 14
  18/29---> 18*1 = 18
  7/18 ---->7*2 = 14
  10/87 ---> 10*8 = 80

  10/87 < 2/15 < 7/18 < 18/29

What is the remainder when 2^{35} is divided by 5?

- 2^35 / 5
  => (2^4)^8 * 2^3 / 5
  => (5*3+1)^8 * (5+3) / 5
  => (1*3)/5
  => 3/5
  => remainder = 3

In a club there are male and female members. If 15 female quit then the number of females will become double the number of males. If 45 males quit no. of female becomes five times the number of males. Find the number of females.

The difference of 2numbers is 8 and the difference of their squares is 160. Find the numbers?

- x-y = 8 ---------(1)

  x^2-y^2 = 160
  => (x+y)*(x-y)= 160
  => x+y = 20 ---------(2)
  solve 1 & 2
  x=14, y = 6

$7^{a+4} \times 5^{b} = 1715$ then $ab = ?$

$$1715 = 7 \times 7 \times 7 \times 5$$

that means $7^{3} \times 5^{1}$

Now write:

$$7^{a+4} \times 5^{b} = 7^{3} + 5^{1}$$

compare L.H.S and R.H.S ,

$$a + 4 = 3, b = 1$$
$$a = -1, b = 1$$
$$ab = -1$$

If $8^{-1} \times x = 4^{-1}$ then, $x = ?$

- 8^-1 *X=4^-1
  1/8* X = 1/4
  X=8/4
  X=2

  Ans : 2

In a club there are male and female members. If 15 female quit then the number of females will become double the number of males. If 45 males quit no. of female becomes five times the number of males. Find the number of females.

- (F-15)=2M.....(i)
  F=5(M-45).....(ii)
  by solving the equation get M=80 then put in (i)
  F=2M+15
  F=2*80+15
  175

$m^n = 2401,$ what is m/n?

- m^n= 2401
  7^4= 2401
  here m= 7 and n=4
  thus m/n= 7/4= 1.75

In a class of 50 students, 18 take Chorus, 26 take Band, and 2 take both Chorus and Band. How many students in the class are not enrolled in either Chorus or Band?

- p(a U b)==p(a)+p(b)-p(a intersection b)
  a=chorus students
  b=band students
  so,p(a U b)=42
  8 students does not learn anything ...

Manu has invested 30% of the capital in Petro bonds and rest in Lic plan. he has invested Rs.34000 more in Lic plan than in Petro bonds. How much is the total investment made by Manu?

- 70% of x=34000+30% of x
  so,x=85000

What is the number that should come in the place of question mark?=

1050, 420, 168, 67.2, ?

- 1050/2.5 = 420
  420/2.5 = 168
  168/2.5 = 67.2
  so 67.2/2.5 = 26.88

If $a^2 + b^2 + c^2 = 250$ and $ab + bc + ca = 3$, then $a + b + c$ is

- by formula ,

  (a + b + c)^2= a^2 + b^2 + c^2 + 2(ab + bc + ca),

  since, a^2 + b^2 + c^2 = 250 and ab + bc + ca = 3,

  (a + b + c)^2 = 250 + 2(3)
  = 256
  = 16^2

  therefore: a + b + c = 16 ,.

$\frac{x^n - 27}{x-3}$ what is the value of n?

- n=3

  (x^3-3^3)/(x-3)=(x-3) * (x^2-3x+9)/(x-3)

if $f(f(X)) = 81.$ then. value of $X =?$ when $f(X) = 2X - 1 + f(X - 1).$ is not equal to zero and $f(X = 0) = 0$

- f(X=0) = 0

  f(X=1) = 2*1-1+f(1-1)
  = 2-1+0
  = 1

  f(X=2) = 2*2-1+f(2-1)
  = 4-1+1
  = 4

  f(X=3) = 2*3-1+f(3-1)
  = 6-1+4
  = 9

  ===>f(X=n) = n^2
  f(f(X)) = 81
  X = sqrt(sqrt(81)) = 3

A,B,C, can do a work in 8,14,16 days respectively. A does the work for 2 days. B continues from it and finishes till 25% of the remaining work. C finishes the remaining work. How many days would have taken to complete the work?

- A works for 2 days. since he needs 8 days for completing the whole work he has completed 25% work in 2 days

  So remaining work = 75%.

  B works till 25% is remaining, i.e. B completes 50 % work which will take him 0.5 * 14 = 7 days.

  C completes remaining 25% work which takes him 0.25 * 16 = 4 days.

  So total days for work completion = 2 + 7 + 4 = 13 days

Solve $(x-a)\times(x-b)\times(x-c)\ldots.(x-z)=?$

- (x-a)*(x-b)*(x-c)*.....(x-z)
  = (x-a)*(x-b)*(x-c)*.....(x-x)*(x-y)*(x-z)

  since (x-x)=0 so, whole product is zero

  (x-a)*(x-b)*(x-c)*.....(x-z)= 0

Sum of square of three numbers is 95 and the product of these numbers is 101. Find the numbers.

- 101 is a prime no. hence it cant be product of three nos. numbers do not exist.

$$\frac{12345678910111213.....181920}{8}$$ then remainder =?

the condition for any number to be divisible by 8 is, the last three digits must be divisible by 8 in the given digit. so 920 on dividing with 8 gives 0 as reminder.

2,3,6,7 using these numbers form the possible four digit numbers that are divisible by 4.

- For divisible by 4, last 2 digits should be 32,36, 72,76.

  possible numbers without repetition of 2,3,6,7 are
  2376, 2736, 3276, 3672, 6372, 6732, 7632 7236

- last two digit of a number divisible by 4 .
  possible numbers-72,76,36,32.

  last digits end with 32 is 4*4=16

  last digits ends with 36 is 4*4=16

  last digits ends with 72 is 4*4=16

  last digits ends with 76 is 4*4=16

  total with repetition=16+16+16+16=64

Two distinct numbers are taken from 1,2,3,4……28
Find the probability that their sum is less than 13

- There are 28C2*2! = 378 pairs of numbers that are possible.

  The pairs that sum to less than 13 are

  1 + 2
  1 + 3
  ...
  1 + 11 (10)
  We skip 2 + 1, because it's the same as 1 + 2
  2 + 3
  ..
  2 + 10 (8)
  3 + 4
  ..
  3 + 9 (6)
  4 + 5
  ..
  4 + 8 (4)
  5 + 6
  5 + 7 (2)

  For a total of 30 pairs.

  30/378

last two digit in $15 \times 51 \times 97 \times 63 \times 37$

- step 1- multiplying them 5*1*7*3*7 then we got 5. this is the unit digit.
  step 2- divided by 10 we get 5
  =55

what is the remainder when we divide $125!$ by 10^{31}

- the shortcut method to find the no, of zeroes in N! is dividing N by 5 and its higher powers till we get 1 as quotient. just get the quotient and don't consider the remainder if not perfectly divisible
  similarly
  125 / 5 = 25
  125 / 5^2 = 5
  125 / 5^3 = 1
  so adding it up we get 31
  and 10^31 has 31 zeroes so perfectly divisible, hence remainder is 0

how many zeros are there from $\mathbf{1}\ \boldsymbol{to}\ \mathbf{10000}$?

- No. of 0's in Single Digit Number (0–9) = **0**
- No. of 0's in Double Digit Number (10–99) = **9**
- No. of 0's in Three Digit Number (100–999) = **180**
- No. of 0' in Four Digit Number (1000–9999) = **2700**
- Number of 0's for five digit Number(10000): **4**

On adding $(\mathbf{0 + 9 + 180 + 2700 + 4 = 2893})$

no. of prime factors of $30^7 \times 22^5 \times 34^{11}$?

- 30^7 * 22^5 * 34^11
  (2*3*5)^7 * (2*11)^5 * (2*17)^11
  => 2^23 * 3^7 * 5^7 * 11^5 * 17^11
  Total no. of prime factors ll be => (23+7+7+5+11) = 53

  Ans : 53

convert- (10101)2 to (....)10

- Use the place value like below

  16 8 4 2 1

  1 0 1 0 1

  As per the place value 1 means add those number 16+4+1= 21

The sum of three consecutive numbers of 4 digits A,B,C and D are 4613,4961,5010 and 5099, then what is the largest number among A,B,C,D?

- A+B+C = 4613
  B+C+D = 4961
  C+D+A = 5010
  D+B+A = 5099

  add four eqns

  3(A+B+C+D) = 19683
  => A+B+C+D = 6561

  so, largest no. = (A+B+C+D) - (A+B+C) = 6561- 4613 = 1948

When a number is divided by 138 the remainder is 26. What will be the remainder if the same number is divided by 23?

a) 1 b) 3 c) 2 d) 4

- number=quotient*divisor + remainder;
  so, here
  number=138k+26
  =(23x6k)+(23+3)
  =23(6k+1)+3
  so, remainder is 3.

There are 4 numbers as 5,8,2,1 Form 4, four digit numbers as A, B and find the sum?

- 1,2 5, 8 - 4 numbers that can be arranged to form 4-digit number in 4! ways = 24 ways.

  For totalling If we place all the 4 digit numbers formed vertically one below each other
  eg
  1285
  2185
  8125
  2518
  Out of 24 such arrangements each number (A or B or C or D) repeats itself in a vertical column (eg tens place or units place) = 24/ 4 = 6 times
  so total of each column is (1 + 2 + 5 + 8) = 16
  so each total is repeated 6 times hence total of a vertical row = 16 * 6 = 96

  so total of all 4 digit numbers formed numbers is 96 (1+10+100+ 1000) = 96*(1111) = 106656

FIND THE VALUE OF x ?

$$\left(\frac{2}{7}\right)^{-8} * \left(\frac{7}{2}\right)^{-2} = \left(\frac{2}{7}\right)^{x}$$

- (2/7)^-8*(7/2)^-2=(2/7)^x
  Now, (7/2)^8*(2/7)^2=(2/7)^x
  on solving,
  (7/2)^6=(2/7)^x
  (2/7)^-6=(2/7)^x
  Thus, x=-6.

2^{81} when divided by 6,what is the remainder

- 2^odd/6------->remainder= 2.
  2^even/6------>remainder= 4.

  So, the answer is 2.

- 2^81/6 ====> (2^1*2^2*2^3*....81 times]/6

  2^1/6 ----------> remainder=2
  2^2/6 -->4/6 ---> remainder=4
  2^3/6 -->8/6 ---> remainder=2
  2^4/6 -->16/6 --->remainder=4
  2^5/6 -->32/6 --->remainder=2
  .
  .
  .
  it goes on in a cyclic manner

  so remainder is "2" for all odd powers of 2 nd "4" for all even powers of 2

  here 2^81 which has the odd power

  so remainder =2

16, 136, 1096, ?

$$16 \times 8 + 8 = 136$$
$$136 \times 8 + 8 = 1096$$
$$1096 \times 8 + 8 = 8776$$

Present ages of Karan and Arjun are in the ratio 4 : 5 respectively. Six years hence the ratio becomes 7 : 8. What is the sum of the present ages of Karan and Arjun?

1) 18 years 2) 30 years 3) 36 years

- Let the present ages be 4x,5x. According to question,(4x+6)/(5x+6)=7/8.
  Therefore x=2
  4x=8,5x=10.
  Sum=18

Ram is five year elder to his youngest sibling shreya. Shreya is two years younger than her brother Ritesh. Ritesh is 13 years old and is Ram’s brother. How old will ram be in two year from now ?

- Let shreya's age be x, then Ram's age = x+5
  Ritesh's age= x+2
  given,
  x+2=13
  therefore, x=11
  hence,
  Ram's age= 16
  Ram's age after 2 yrs=16+2=18 yrs

Pooja told narmadha, "I am four times as old as you were when I was your present age and also I am 9 years older than you" . what is pooja's age?

- 12 years

  If present ages of Pooja=x and Narmadha=y, then
  x-y=9 ---(i) &
  4y=x ---(ii)
  On solving (i) & (ii), x=12, y=3

When I was married 10 years ago my wife is the 6th member of the family. Today my father died and a baby born to me. The average age of my family during my marriage is same as today. What is the age of Father when he died?

let average age 10 yrs ago was x yrs,
total age 10 yrs before was 6x yr ,
at present,father died, now members remains= 5,
now total age after 10 yrs is (no. of member)*(x+10) yrs,i.e.total age is 5(x+10)
and after baby born total age = 5(x+10)+0, because baby age is 0 yrs
as per ques. both time, age is same i.e. 6x=5x+50+0
after solving.. x=50,i.e. father's age before 10 yrs was 50 yrs,
now father died after 10 yrs hence age at dead time= 50+10=60 yrs.

The ages of Khushi and Jagriti are in the ratio of 5 : 8 respectively. After 8 years the ratio of their ages will be 3 : 4. What is the difference in their ages?

- If present age of Khushi= K and Jagriti=J, then
  K/J=5/8 or 8K- 5J=0 ---(i) and
  (K+8)/(J+8)= 3/4 or 4K -3J= -8 ---(ii)
  On solving (i) & (ii), J=16, K=10
  So difference of their ages=16 -10= 6 years

At present Manorama is six times older than her son's age. Seven years hence, the ratio of their ages will be 11:3. What is Manorama's present age?

- let Present ages of sun = x and manorama = 6x
  after 7 years 6x+7 and x+7 in the ration 11 : 3

  6x+7 11
  ------- = ----
  x + 7 3
  :- 3(18x+7) = 11(x+7)
  = > 7x = 56
  :- x = 8
  Present age of manorama is 6x = 6*8 = 48 years

The ratio of the ages of the father and the son is 5:3, After 10 years it will be in the ratio 3:2. What will be their ages?

let the present age of father and son be 5x and 3x respectively

then after 10 years the ratio becomes

$$(5x + 10)/(3x + 10) = 3/2$$

so we get x=10

thus present of father and son are 50 and 30 respectively

Present ages of P and Q are in the ratio 4 : 5 respectively. Six years hence the ratio becomes 7 : 8. What is the sum of the present ages of P and Q?

- **Let the present ages of P and Q are 4x and 5x**
  6 years hence the ages are 4x+6 and 5x+6 in the ratio 7 : 8

  4X + 6 = 7
  -------- ---
  5x + 6 = 8

  :- 8(4x+6) = 7(5x+6)
  ==> 32x + 48 = 35x + 42
  ==> 3x = 6
  := x = 2
  The present ages of P and Q are (4*2) and (5*2) = 8 and 10
  the sum of the present ages of P and Q 8 + 10 = 18 years

If meena's age was twice of her present age, when subtracted from four times three years from hence, with three times the three years before her present age. What will be her age after one year?

Given:{(x+3)* 4} - {(x-3)*3)}
implies x=21
so her present age is 21.so, her age after 1 year is 22.

If i am twice as old as he was when i was as old as him. sum of our ages is 42. find my present age?

1. 26 2. 24 3. 12 4. None of these

I was married 10 years before my wife was sixth member of my family and now I have a baby and today father died and the average age of my family was same as it was 10 years before. Find my father's age when I was married.

Let the Father be x years when he died

Average Age 10 years ago be A

Total Age 10 years ago = 6*A

Total Age after 10 years(Just before father's Death) = 6A + 6*10 = 6A + 60

Father Died and Baby was born => the Total number of people in the family is Same (6)
Baby born today so age of baby = 0

(6A +60 - x)/6 = 6A/6
=> A + 10 -(x/6) = A
=> x/6 = 10
=> x = 60

Therefore we can conclude that the father was 60 years old when he died.

The average age of 30 boys of a class is equal to 14 yrs. When the age of the class teacher is included the average becomes 15 yrs. Find the age of the class teacher.

- The average age of 30 boys of a class is equal to 14 yrs:
  i.e Sum of all boys:30*14

  include class teacher:31 candidates in a class
  & avg age is:15 yr
  i.e. sum of all:31*15(include class teacher)=465

  so,the age of the class teacher:465-420=45yr
  answer will be 45 yrs(option c)

The average age of a cricket team of eleven is 22 years. The average age gets increased by 1 year, when the coach age is also included, What is the age of the coach?

- 1) 34 years

  If age of coach be 'x' years, then new average=(11*22 +x)/(11+1) =(22+1)
  x=12*23 - 11*22 = 34

The average weight of a group of 75 girls was calculated as 47 kg. It was later discovered that the weight of one of the girls was read as 45 kg, whereas her actual weight was 25 kg. What is the actual average weight of the group of 75 girls? (Rounded off to two digits after decimal)

- Average weight of 75 girls was 47
  then
  total weight=(75*47)=3525
  1 of d girl weight was 25 but wrongly put as 25.
  so 20 kg is the incresed weight.
  now real total weight of 75 girls was=3525-20=3505
  actual avg weight was 3505/75=46.73(a)

A plane travels in the shape of equilateral triangle have sped of 20km/hr, 40km/hr and 60km/hr. Find the average speed of the plane.

- the average speed when 3 terms are given= 3s1s2s3/(s1s2+s2s3+s1s3)
  =3*20*40*60(20*40+40*60+20*60)=360/11 is the average speed

The average of three consecutive even numbers is 30. What is the sum of the three numbers?

Let the consecutive even numbers be x, x+2 and x+4
then average=[x+(x+2)+(x+4)]/3=30, x=28
So the sum of three numbers=28+30+32=90

Rahul played well in this season. His current batting average is 51, If he scores 78 runs in today's match, his batting average will become 54. How many matches had he played in this season?