PROBLEMS ON AGES

Problems based on ages which is a sub topic of Ratio and proportion means we will use all logic and shortcuts what we studied in that chapter.

So, let's start...

If the current age of a person be X, then

-age after n years = X + n

-age n years ago = X – n

-n times the age = nX

-If ages in the numerical are mentioned in ratio A: B, then A: B will be AX and BX

Q1. The age of the father 3 years ago was 7 times the age of his son. At present, the father's age is five times that of his son. What are the present ages of the father and the son?

Solution:

Let the present age of son = x years

Then, the present age of father = 5xyr

3 years ago,

7(x – 3) = 5x – 3

Or, 7x – 21 =5x – 3

Or, 2x =18

x = 9 years.

Therefore, son's age = 9 years

Father's age = 45 years

Short tricks: - Son's age = $3\times\frac{7-1}{7-5}$ = 9 years

And father's age = 9 × 5 = 45 years.

Q2. At present, the age of the father is five times the age of his son. Three years hence, the father's age would be four times that of his son. Find the present ages of the father and the son.

Solution:

Let the present age of son = x years

Then, the present age of father = 5x years

3 years hence,

4(x+3) = 5x+3

Or, 4x + 12=5x +3

x= 9years.

Therefore, son's age = 9 years and father's age = 45 years

Short tricks: Son's age = {3× (4-1)/5-4} = 9 years father's age = 9 × 5 =45 years

Q3. Three years earlier, the father was 7 times as old as his son. Three years hence, the father's age would be four times his son. What are the present ages of the father and the son?

Solution:

Let the present age of son = x years and the present age of father = y years

3 years earlier, 7(x – 3) = y – 3

7x – y =18……. (i)

3 yes hence, 4(x+3) = y +3

4x +12 = y + 3

4x – y = – 9 ……(ii)

Solving (1) & (2) we get, x = 9 years & y = 45 years

Short tricks: Son's age = {3× (4-1) +3(7-1)}/ (7-4) = 9 years

Q4. The sum of the ages of a mother and her daughter is 50 years. Also 5 years ago, the mother's age was 7 times the age of the daughter. What are the present ages of the mother and the daughter?

Solution:

Let the age of the daughter be x years.

Then, the age of the mother is (50x – x) years

5 years ago, 7(x – 5) = 50 – x – 5

Or, 8x = 50 – 5 +35 = 80

x =10

Therefore, daughter's age = 10 years and mother's age = 40years

Q5. The sum of the ages of a son and father is 56 years. After 4 years, the age of the father will be three times that of the son. What is the age of the son?

Solution:

Let the age of the son be x years. Then, the age of the father is (56 – x) years.

After 4 years, 3(x+4) = 56 – x +4

Or, 4x =56 +4 – 12 = 48

x = 12 years

Thus, son's age = 12 years.

Short tricks: {56 -4(3-1)}/ (3+1) = 12 years

Q6. The present age of the father is 5 times the age of his son. Five years ago, the age of the Father was ten times the age of his son at that time. How old is the father at present?

(1) 45 years

(2) 40 years

(3) 48 years

(4) 49 years

(5) None of these

Regular Method to solve Age Problem

Solution:

Step 1: Let us assume father's present age as F Let us assume the present age of the son to be as S

Step 2: As mentioned in the question, the present age of the father is 5 times the age of son F = 5×S (i)

Step 3: Now frame an equation now (F – 5) = 10 (S – 5) (ii)

Step 4:

F – 5 = 10S – 50

5S – 5 = 10S – 50

5S = 45

S =9 F = 9×5 = 45

SMART METHOD TO SOLVE AGE PROBLEMS

Step 1: To solve this question using the smart method, we need to understand the question carefully.

As mentioned in the question that the father's age is 5 times the age of son, we can clearly make out that the father's age should be a multiple of 5.

By this, we can easily eliminate the options which are not the multiples of 5. Therefore, option 3 and option 4 are eliminated.

Step 2: If the father's present age is 45 then the son's age would be 9, since the father is 5 times the son's age.

Now, five years ago father's age would be 40 and son's age would be 4. Hence, the second statement states that 5 years ago the father's age was 10 times the age of the son.

As, 40 = 10 x 4; option 1 satisfies both the conditions.

Therefore, the father's present age is 45.

Q1: Father's age is 25 years more than the son's age. Four years hence, Father's age will become 1 less than thrice the son's age

What is father's present age?

(1) 31

(2) 38

(3) 34

(4) 36

(5) None of these

Regular Method to solve Age Problems

Solution:

Step 1: Let us assume father's present age to be as 'F.'

Let us assume our son's present age to be as 'S.'

As mentioned in the question, the father's age is 25 years more than the son's age.

F = S + 25 (i)

Step 2: After 4 years,

Father's age = F + 4

Son's age = S + 4

Father's age is 1 less than the thrice of son's age

F + 4 = 3 (S + 4) – 1 (ii)

Step 3: By substituting equation (i) in equation (ii) we get that,

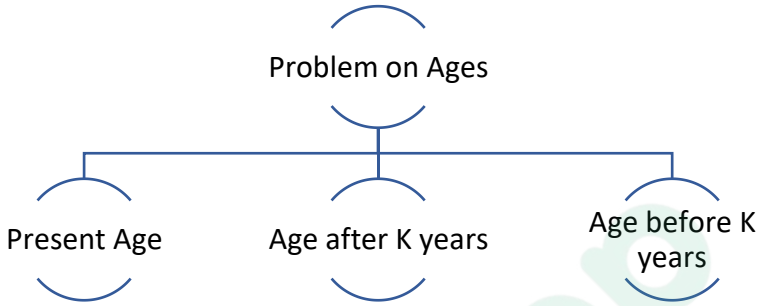
F + 4 = 3 (F – 25 + 4) – 1

F + 4 = 3F – 63 – 1

2F = 68

F= 34 years.

Therefore, Father's present age is 34 years.



Q2. The ratio of A's age 3 years ago and B's age 5 years ago is 4:5. If A is 4 years younger than B then what is the present age of B?

Solution:

Approach 1: Let assume at present A's age is X and B's age is Y.

Given, (X-3) :(Y-5) = 4:5 and X = Y-4

Solve both equations and then get X and Y. Now, we have two equations and two variables. Generally, this type of approach consumes more time and is not preferable.

Approach 2: In this type of question, assume only one variable i.e., called base variable. Let A's present age is X, then B's present age is X+4. Students often commit silly mistakes; they tick the option which has X value but present age of B is asked in question.

So, (A's 3 years ago) :(B's 5 years ago) = 4:5

(X-3): (X+4-5) = 4:5

(X-3): (X-1) = 4:5 5X-15 = 4X-4 X= 11 i.e., A's Present age and B's present age is X+4 = 11+4 = 15 years.

Q3. A is 3 years older than B while B is 2 years older than C. The ratio of age of A 4 years hence and B 3years ago is 5:3. What was the age of C 6 years ago?

Solution:

There are three variables in this question and students are often confused about which variables should be assumed as base variables. You can see in the question relation of B with both A and C is mentioned. So, you can assume B as base variable. If you assume another one as the base variable, there is a chance that calculation may become a little harder.

Let present age of B's is X, then A's age =

X+3 and C's age = X-2 (Age of A 4 years hence): (Age of B 4 years ago) = 5:3

(X+3+4): (X-3) = 5:3

(X+7): (X-3) = 5:3

3X+21 = 5X-15

2X = 36

X = 18

present age of C is X-2 = 18-2 = 16 years age of C 6 years ago = 16-6 = 10 years

Shortcut: (X+7): (X-3) = 5:3

difference of 5 and 3 is directly proportional to difference of (X+7) and (X-3)

So, (5-3) ∝ (X+7) -(X-3)

2 ∝ 10

1 ∝ 5

We can write X+7 = 5×5, X = 18

Hence, age of C 6 years ago = 10 years

Q4. The average age of Atul, Jatin and Sonu is 24years. 2 year ago, the average age of Atul and Sonu was 23years. 2years hence the average age of Jatin and Sonu is 26 years. Find the present age of Sonu?

Solution:

Given, average age of Atul, Jatin and Sonu = 24 years ∴ total age of Atul, Jatin and Sonu = 24×3

= 72 years …. (1)

2 years ago, average age of Atul and Sonu = 23

2 years ago, total age of Atul and Sonu = 46

∴ present total age of Atul and Sonu = 50 …. (2)

2 years hence, average age of Jatin and Sonu = 26

2 years hence, total age of Jatin and Sonu = 52

∴ present total age of Jatin and Sonu = 48 ……. (3)

From equation 1, 2 and 3 Present age of Sonu is 26 years.

Q5. The average age of A and B is 25 years. If C were to replace A, the average would be 24 and if C were to replace B, the average would be 26. What are the ages of A, B and C respectively?

Solution:

Given, avg. of (A+B) = 25

∴ (A+B) = 50 Avg. of (C+B) = 24

∴ (C+B) = 48

Avg. of (A+C) = 26

∴ (A+C) = 52

Now, A+B+C = (50+48+52)/2

A+B+C = 75

C = 25,

A = 27,

B = 23

Q6. The ages of Sona and Mona are in the ratio of 15:17 respectively. After 6 years, the ratio of their ages will be 9:10. What will be the age of Mona after 6 years?

Solution: Let present age of Sona is 15X, then Mona = 17X

Given, (15X+6) : (17X+6) = 9 : 10

150X+60 = 153X+54

3X = 6

X = 2 years

Age of Mona after 6 years is (17×2+6)

=40 years.

SOLVED EXAMPLES

Q1. Difference between the ages of Raman and Preet is 16 years. If Raman 's age ten years hence will be two times the age of Preet, find Raman 's age?

Solution:

R – P = 16

(R + 10) = 2P

Solve, R = 42

Q2. When a couple was married, their average age was 22 years. When their first child was born, the average age of all the three became16 years. When their second child was born, the average of all 4 became 15 years. Find the average age of a couple at the time when their second child was born?

Solution:

At the time of marriage total age of couple=44

when 1st child is born total age of three=16×3=48

Difference=48-44=4 years (Child is of 0 years hence this is the sum of age increase of couple)

When second child is born sum of age=4×15=60 years

=> increase of 12 years after the first child, means the age of husband, wife and first child increased by 4 years each. So, increase in husband and wife

total age = 8 years total increase =4+8=12

total age=44+12=56;

average=56/2=28 years

Q3. The average age of a group of 20 men is 22 years. If two men whose age are 24 and 31 years respectively join the group, the average age of the new group increases or decreases by?

Solution:

When 2 new people join if the sum of their age is 44 then the average will not change, but the sum of age of new people is 55

i.e increase of 11 hence average increases by 11/22=0.5 years.

Q4. The ratio of present age of Tiya and Piya is 3: 5 and the ratio of ages of Tiya 5 years ago and Piya 5 years hence is 1: 3. Find the present age of Piya?

Solution:

T/P=3/5 ——- (i)

T-5/P+5 =1/3 ———- (ii)

Solve and get

T=15 years

P= 25 years

Q5. 10 years ago, daughter‘s age was two-fifths of her mother ‘s age at that time. While 10 years hence her age will be three-fifth of her mother ‘s age then. Find the difference in the ages of the two?

Solution:

(x-10) = 2/5 (y-10)

(x+10) = 3/5 (y+10)

Solve, x = 26 and y = 50

Q6. A person ‘s present age is two-ninth of the age of his mother. After 10 years, he will be four-eleventh of the age of his mother. How old is the mother after 15 years?

Solution:

Present ratio P:M ==>2:9

After 10years P:M=4:11

Then (2x+10)/(9x+10) = 4/11

22x+110=36x+40

X=5.

Then Mother ‘s present age=9×5=45 years.

After 15 years Mother ‘s age is=60 years.

Q7. Ratio of the ages of A and B is 5: x. A is 18 years younger to C. After nine years C will be 47 years old. If the difference between the ages of A and B is same as the age of C, what is the value of x?

Solution:

A: B=5:x –1

A = C – 18 —2

C + 9 = 47 =>C=47-9=38 years.

A – B = C —3

From 2 A=38-18=20 years.

From 1 20/B=5/x==> B=4x

From 3 4x-20=38

X=14.5.

Q8. Ratio of present age of A and B is 7: 9 and ratio of ages of A 5 years back and age of B 5 years later is 3:5. Find the present age of B?

Solution:

A/B=7/9

(A-5)/(B+5) =3/5

solve both and get A=35 and B=45

Q9. The present age of a son is 40% of his father's age. And the age of his mother is 220% of his age. The average age of three members is 38. Find the present age of mother?

Solution: Son= 40% of father.

F:S=5:2

Mother=220% of son=11/5

M:S=11:5

make F:M:S =25:22:10

average= (25+22+10)/3=19

19=38

1=2

=>22=44

Q10. Rama got married 8 years ago. Her present age is 1 (1/3) times of her age at the time of marriage. She has a son who is one eighth of her present age. Then find the age of her son?

Solution:

1 (1/3) =4/3

Ratio of present age of Rama and her age at time of marriage=4:3 ———– difference =1

1=8 years

4=32

age of son=32/8=4 years

Q11. The fathers age is four times as much as the sum of the age of his three children but 6 years hence his age will be thrice as the sum of their age. The present age of the father is?

Solution:

Let sum of children age=x;

hence father =4x (4x+6)/x+6 = 3/1

x=12; father=48

Q12. In a class of 20 students the average of all the students is 18 years. If the age of their teacher is added then the average becomes 19 years. Find the age of the teacher after 5 year?

Solution:

Let age of teacher=x

(total age)/ total people=19

360+x/21=19

x=39

hence age after 5 years=44

Q.13. The average age of a couple at the time of their marriage was 22. Two years after the marriage their child was born. Now he is 4 years old. Find the average age of their present age?

Solution:

Sum of couples age at time of marriage=2×22=44

when son was born, total age=44+2+2=48

After 4 years total age=48+4+4+4=60

average=60/3=20

Q14. The present age of Sumit is 1/8th of his father. After 4 years, the father 's age will be twice the age of Raman. If Raman celebrated his 6th birthday eight years ago, what is Sumit's present age?

Solution:

Present ratio Sumit: Father is 1: 8……. (1)

4 years after, Father: Raman is 2: 1……. (2)

Raman 's 6th birthday was 8 years ago, so after 4 years he will be 18 years old Put in equation (2), Raman = 18, Father = 36

So present age of father = 32 So of Sumit is 32/8 = 4 years

Q15. Sheetal 's age at the time of her marriage was 4/5th of her present age. If she married 6 years ago and now, she has a son who is 1/10th of her present age, then find the age of her son 5 years hence.?

Solution:

4/5 × 6 = 24/30

24 => at the time of marriage

30 years => now

Son = 1/10 of present age = 1/10 × 30 = 3 years

5 years hence = 3+5 = 8 years

Q16. Ram is 6 years older than his brother and 5 years younger than her sister Sheena. When Sheena was born, her father 's age was 24 and when Ram 's brother was born his mother 's age was 29. Find the difference between ages of Ram 's father and his mother.

Solution:

Bother=x

Ram=x+6

Sheena=x+11

Father=x+11+24=x+35

Mother=x+29

Difference=x+35 –(x+29) =6 years

Q.17. If 6 years are subtracted from the present age of Babita and the remainder is divided by 18, then the present age of her granddaughter Geeta is obtained. If Geeta is 2 years younger to Sita whose age is 5 years, then what is Babita's present age?

Solution:

Geeta 's age = (5-2) = 3 years

Let age of Babita = x years

So (x-6)/18 = 3 Solve, x = 60

Q18. A 's age is twice C 'age. Ratio of age of B 2 years hence to age of C 2 years ago is 5: 2. C is 14 years younger than D. Difference in ages of D and A is 4 years. Find the average of their ages?

Solution:

A = 2C

(B+2)/(C-2) = 5/2

C = D – 14

D – A = 4

Solve, A = 20, B = 18, C = 10, D = 24

Q19. Ratio of ages of A 5 years hence to B 's age 3 years ago is 5: 3. Also the ratio of ages of A 4 years ago to B 's age 2 years hence is 4: 5. Find the age of the elder?

Solution:

(A+5)/(B-3) = 5/3

(A-4)/(B+2) = 4/5

Solve A = 20, B = 18

Q20. The respective ratio between the present ages of father, mother and daughter is 7: 6: 2. The difference between mother's and the daughter's age is 24 years. What is the father's age at present?

Solution:

Let the common ratio be x

∴ The percentages of father's, mothers and daughters are 7x, 6x, 2x respectively.

According to the question

$6x - 2x = 24$

$4x = 24$

$x = 6$

$\therefore$ father's present age = $7 \times 6 = 42$ years