Problems on Ages

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INTRODUCTION

Problems based on ages are generally asked in most of the competitive examinations. To solve these problems, the knowledge of linear equations is essential. In such problems, there may be three situations:

(i) Age some years ago
(ii) Present age
(iii) Age some years hence

Two of these situations are given and it is required to find the third. The relation between the age of two persons may also be given. Simple linear equations are framed and their solutions are obtained. Sometimes, short cut methods given below are also helpful in solving such problems.

SOME USEFUL SHORTCUT METHODS

1. If the age of A, t years ago, was n times the age of B and at present A's age is n_2 times that of B, then

   A's present age $= \left(\dfrac{n_1 - 1}{n_1 - n_2} \right) n_2 t$ years

   and, B's present age $= \left(\dfrac{n_1 - 1}{n_1 - n_2} \right) t$ years

Explanation

Let the present age of B be x years.
Then, the present age of A $= n_2 x$ years
Given, t years ago,

$$n_1(x - t) = n_2 x - t \text{ or, } (n_1 - n_2)x = (n_1 - 1)t$$

or, $\qquad x = \left(\dfrac{n_1 - 1}{n_1 - n_2} \right) t.$

Therefore, B's present age $= . \left(\dfrac{n_1 - 1}{n_1 - n_2} \right) t$ years

and, A's present age $= \left(\dfrac{n_1 - 1}{n_1 - n_2} \right) n_2 t$ years.

Illustration 1: The age of father is 4 times the age of his son. If 5 years ago father's age was 7 times the age of his son at that time, then what is father's present age?

Solution: The father's present age

$$= \left(\dfrac{n_1 - 1}{n_1 - n_2} \right) n_2 t \quad [\text{Here, } n_1 = 7, n_2 = 4 \text{ and } t = 5]$$

$$= \left(\dfrac{7 - 1}{7 - 4} \right) 4 \times 5 = \dfrac{6 \times 4 \times 5}{3} = 40 \text{ years.}$$

2. The present age of A is n_1 times the present age of B. If t years hence, the age of A would be n_2 times that of B, then

   A's present age $= \left(\dfrac{n_2 - 1}{n_1 - n_2} \right) n_2 t$ years

   and B's present age $= \left(\dfrac{n_2 - 1}{n_1 - n_2} \right) t$ years

Explanation

Let the present age of B be x years.
Then, the present age of A $= n_1 x$
Given, t years hence,

$$(n_1 x + t) = n_2 (x + t)$$

or, $\qquad (n_1 - n_2)x = (n_2 - 1)t$

or, $\qquad x = \left(\dfrac{n_2 - 1}{n_1 - n_2} \right) t$

Therefore, B's present age = $\left(\dfrac{n_2 - 1}{n_1 - n_2} \right) n_1 t$ years

and, A's present age = $\left(\dfrac{n_2 - 1}{n_1 - n_2} \right) n_1 t$ years.

Illustration 2: The age of Mr Gupta is four times the age of his son. After ten years, the age of Mr Gupta will be only twice the age of his son. Find the present age of Mr Gupta's son.

Solution: The present age of Mr Gupta's son

$$= \left(\dfrac{n_2 - 1}{n_1 - n_2} \right) t$$

$$= \left(\dfrac{2 - 1}{4 - 2} \right) 10$$

[Here, $n_1 = 4$, $n_2 = 2$ and $t = 10$]

= 5 years.

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3. The age of A, t_1 years ago, was n_1 times the age of B. If t_2 years hence A's age would be n_2 times that of B, then,

   A's present age = $\dfrac{n_1(t_1 + t_2)(n_2 - 1)}{n_1 - n_2} + t_1$ years

   and, B's present age = $\dfrac{t_2(n_2 - 1) + t_1(n_1 - 1)}{n_1 - n_2}$ years.

Explanation

Let A's present age = x years and B's present age = y years.

Given: $x - t_1 = n_1 (y - t_1)$ and $x + t_2 = n_2 (y + t_2)$

i.e., $x - n_1 y = (1 - n_1) t_1$ \hfill (1)

and, $x - n_2 y = (-1 + n_2) t_2$ \hfill (2)

Solving (1) and (2), we get

$$x = \dfrac{n_1(t_1 + t_2)(n_2 - 1)}{n_1 - n_2} + t_1$$

and, $\qquad y = \dfrac{t_2(n_2 - 1) + t_1(n_1 - 1)}{n_1 - n_2}$.

Illustration 3: 10 years ago Anu's mother was 4 times older than her daughter. After 10 years, the mother will be twice older than her daughter. Find the present age of Anu is:

Solution: Present age of Anu

$$= \dfrac{t_1(n_2 - 1) + t_1(n_1 - 1)}{n_1 - n_2}$$

[Here, $n_1 = 4$, $n_2 = 2$, $t_1 = 10$ and $t_2 = 10$]

$$= \dfrac{10(2 - 1) + 10(4 - 1)}{4 - 2} = \dfrac{10 - 30}{2} = 20 \text{ years.}$$

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4. The sum of present ages of A and B is S years. If, t years ago, the age of A was n times the age of B, then

   Present age of A = $\dfrac{Sn - t(n - 1)}{n - 1}$ years,

   and, Present age of B = $\dfrac{S + t(n - 1)}{n + 1}$ years.

Explanation

Let the present ages of A and B be x and y years respectively.

Given: $\qquad x + y = S$ \hfill (1)

and, $\qquad x - t = n (y - t)$

or, $\qquad x - ny = (1 - n)t$ \hfill (2)

Solving (1) and (2), we get

$$x = \dfrac{Sn - t(n - 1)}{n + 1}$$

and, $\qquad y = \dfrac{S + t(n - 1)}{n + 1}$.

Illustration 4: The sum of the ages of A and B is 42 years. 3 years back, the age of A was 5 times the age of B. Find the difference between the present ages of A and B.

Solution: Here, $S = 42$, $n = 5$ and $t = 3$

$\therefore$ Present age of A

$$= \dfrac{Sn - t(n - 1)}{n + 1} = \dfrac{42 \times 5 - 3(5 - 1)}{5 + 1}$$

$$= \dfrac{198}{6} = 33 \text{ years}$$

and, present age of B

$$= \dfrac{5 + t(n + 1)}{n + 1} = \dfrac{42 + 3(5 - 1)}{5 + 1}$$

$$= \dfrac{54}{6} = 9 \text{ years.}$$

$\therefore$ Difference between the present ages of A and B = 33 − 9 = 24 years.

Notes:

If, instead of sum (*S*), difference (*D*) of their ages is given, replace *S* by *D* and in the denominator (*n* + 1) by (*n* − 1) in the above formula.

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5. The sum of present ages of A and B is *S* years. If, *t* years hence, the age of A would be *n* times the age of B, then

    present age of A = $\dfrac{Sn + t(n-1)}{n+1}$ years

    and, present age of B = $\dfrac{S - t(n-1)}{n+1}$ years.

Explanation

Let the present ages of A and B be *x* and *y* years, respectively

Given: $\quad\quad\quad x + y = S \quad\quad\quad\quad$ (1)

and, $\quad\quad\quad x + t = n(y + t)$

or, $\quad\quad\quad x - ny = t(n - 1) \quad\quad$ (2)

Solving (1) and (2), we get

$$x = \frac{Sn + t(n-1)}{n+1}$$

and, $\quad\quad y = \dfrac{S - t(n-1)}{n+1}$.

Illustration 5: The sum of the ages of a son and father is 56 years. After four years, the age of the father will be three times that of his son. Find their respective ages.

Solution: The age of the father

$$= \frac{Sn + t(n-1)}{n+1} = \frac{56 \times 3 + 4(3-1)}{3+1}$$

[Here, *S* = 56, *t* = 4 and *n* = 3]

$$= \frac{176}{4} = 44 \text{ years}$$

The age of son $= \dfrac{S - t(n-1)}{n+1}$

$$= \frac{56 - 4(3-1)}{3+1}$$

$$= \frac{48}{4} = 12 \text{ years.}$$

6. If the ratio of the present ages of A and B is *a*:*b* and *t* years hence, it will be *c*:*d*, then

    A's present age = $\dfrac{at(c-d)}{ad - bc}$

    and, B's present age = $\dfrac{bt(c-d)}{ad - bc}$.

Illustration 6: The ratio of the age of father and son at present is 6:1. After 5 years, the ratio will become 7:2. Find the present age of the son.

Solution: The present age of the son = $\dfrac{bt(c-d)}{ad - bc}$

[Here, *a* = 6, *b* = 1, *c* = 7, *d* = 2 and *t* = 5]

$$= \frac{1 \times 5(7-2)}{6 \times 2 - 1 \times 7} = 5 \text{ years.}$$

Notes:

If, with the ratio of the present ages, the ratio of the ages *t* years ago is given, then replace *t* by (−*t*) in the above formula.

Illustration 7: 6 years ago Mahesh was twice as old as Suresh. If the ratio of their present ages is 9:5 then, what is the difference between their present ages?

Solution: Present age of Mahesh

$$= \frac{-at(c-d)}{ad - bc}$$

$$= \frac{-9 \times 6(2-1)}{1 \times 9 - 5 \times 2}$$

[Here, *a* = 9, *b* = 5, *c* = 2, *d* = 1 and *t* = 6]

$$= 54 \text{ years}$$

Present age of Suresh

$$= \frac{-bt(c-d)}{ad - bc}$$

$$= \frac{-5 \times 6(2-1)}{1 \times 9 - 5 \times 2} = 30 \text{ years.}$$

∴ Difference of their ages = 54 − 30 = 24 years.

EXERCISE-1

1. 10, years ago, Mohan was thrice as old as Ram was but 10 years hence, he will be only twice as old as Ram. Find Mohan's present age.

   (a) 60 years   (b) 80 years
   (c) 70 years   (d) 76 years

2. The ages of Ram and Shyam differ by 16 years. 6 years ago, Mohan's age was thrice as that of Ram's, find their present ages.

   (a) 14 years, 30 years
   (b) 12 years, 28 years
   (c) 16 years, 34 years
   (d) 18 years, 38 years

3. 15 years hence, Rohit will be just four times as old as he was 15 years ago. How old is Rohit at present?

   (a) 20   (b) 25
   (c) 30   (d) 35

4. A man's age is 125% of what it was 10 years ago, but $83\frac{1}{3}$% of what it will be after ten 10 years. What is his present age?

   (a) 45 years   (b) 50 years
   (c) 55 years   (d) 60 years

5. If twice the son's age be added to the father's age, the sum is 70 years and if twice the father's age is added to the son's age, the sum is 95 years. Then father's age is:

   (a) 40 years   (b) 35 years
   (c) 42 years   (d) 45 years

6. 3 years ago, the average age of a family of 5 members was 17 years. A baby having been born, the average age of the family is the same today? What is the age of the child?

   (a) 3 years   (b) 5 years
   (c) 2 years   (d) 1 year

7. The ratio of A's and B's ages is 4:5. If the difference between the present age of A and B 5 years hence is 3, then what is the sum of present ages of A and B?

   (a) 68 years   (b) 72 years
   (c) 76 years   (d) 64 years

8. The ages of A and B are in the ratio 6:5 and sum of their ages is 44 years. The ratio of their ages after 8 years will be:

   (a) 4:5   (b) 3:4
   (c) 3:7   (d) 8:7

9. One year ago the ratio between Samir and Ashok's age was 4:3. One year hence the ratio of their ages will be 5:4. What is the sum of their present ages in years?

   (a) 12 years   (b) 15 years
   (c) 16 years   (d) Cannot be determined

10. Ratio of Ashok's age to Pradeep's age is 4:3. Ashok will be 26 years old after 6 years. How old is Pradeep now?

    (a) 18 years   (b) 21 years
    (c) 15 years   (d) 24 years

11. Jayesh is as much younger to Anil as he is older to Prashant. If the sum of the ages of Anil and Prashant is 48 years, what is the age of Jayesh?

    (a) 20 years   (b) 24 years
    (c) 30 years   (d) Cannot be determined

12. 5 years ago Mr Sohanlal was thrice as old as his son and 10 years hence he will be twice as old as his son. Mr Sohanlal's present age (in years) is:

    (a) 35   (b) 45
    (c) 50   (d) 55

13. Three times the present age of a father is equal to eight times the present age of his son. 8 years hence the father will be twice as old as his son at that time. What are their present ages?

    (a) 35, 15   (b) 32, 12
    (c) 40, 15   (d) 27, 8

14. The sum of the ages of a father and son is 45 years. 5 years ago, the product of their ages was four times the father's age at that time. The present age of the father is:

    (a) 39 years   (b) 36 years
    (c) 25 years   (d) None of these

15. One year ago a father was four times as old as his son. In 6 years time his age exceeds twice his son's age by 9 years. Ratio of their ages is:

    (a) 13:4   (b) 12:5
    (c) 11:3   (d) 9:2

16. The ages of A, B and C together is 185 years. B is twice as old as A and C is 17 years older than A. Then, the respective ages of A, B and C are:

(a) 40, 86 and 59 years   (b) 42, 84 and 59 years

(c) 40, 80 and 65 years   (d) None of these

17. A father's age is three times the sum of the ages of his two children, but 20 years hence his age will

be equal to the sum of their ages. Then, the father's age is:

(a) 30 years   (b) 40 years

(c) 35 years   (d) 45 years

EXERCISE-2
(BASED ON MEMORY)

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1. The difference between the present ages of Arun and Deepak is 14 years. Seven years ago the ratio of their ages was 5:7 respectively. What is Deepak's present age?

   (a) 49 years   (b) 42 years

   (c) 63 years   (d) 35 years

   (e) None of these

   [SBI PO, 2008]

2. The ages of Sachin and Jatin are in the ratio 8:11. After 10 years the ratio of their ages will be 13:16. What is the difference in their ages?

   (a) 16 years   (b) 3 years

   (c) 8 years   (d) 6 years

   (e) None of these

   [Corporation Bank PO, 2007]

3. One year ago the ratio of the ages of Sanika and Gouri was 3:4 respectively. One year hence the ratio of their ages will be 10:13 respectively. What is Sanika's present age?

   (a) 18 years   (b) 20 years

   (c) 26 years   (d) Cannot be determined

   (e) None of these

   [OBC PO, 2007]

4. The present age of Mr Sanyal is 3 times the present age of his son. Six years hence the ratio of their ages will be 5:2. What is the present age of Mr Sanyal?

   (a) 50 years   (b) 48 years

   (c) 54 years   (d) 60 years

   (e) None of these

   [OBC PO, 2007]

5. The ages of Samir and Tanuj are in the ratio of 8:15. After 9 years the ratio of their ages will be 11:18. What is the difference between their ages?

   (a) 24 years   (b) 20 years

   (c) 33 years   (d) 21 years

   (e) None of these

   [Bank of Baroda PO, 2007]

6. The present ages of A, B and C are in the ratio of 8:14:22. The present ages of B, C and D are in the

ratio 21:33:44. Which of the following respresents the ratio of the present ages of A, B, C and D?

   (a) 12:21:33:44   (b) 12:22:31:44

   (c) 12:21:36:44   (d) Cannot be determined

   (e) None of these

   [SBI PO, 2005]

7. Present ages of Seema and Naresh are in the ratio of 5:7. Five years hence the ratio of their ages becomes 3:4. What is Naresh's present age in years?

   (a) 25   (b) 40

   (c) 30   (d) Cannot be determined

   (e) None of these

   [SBI PO, 2005]

8. The average age of 11 players of a cricket team is increased by 2 months when two of them aged 18 years and 20 years are replaced by two new players. The average age of the new players is:

   (a) 19 years 1 month   (b) 19 years 6 months

   (c) 19 years 11 months   (d) 19 years 5 months

   [SSC (GL) Prel, 2005]

9. The average age of 30 boys in a class is 15 years. One boy aged 20 years left the class, but two new boys came in his place whose ages differ by 5 years. If the average age of all the boys now in the class still remains 15 years, then the age of the younger newcomer is:

   (a) 20 years   (b) 15 years

   (c) 10 years   (d) 8 years

   [SSC (GL) Prel, 2005]

10. The ratio of the present ages of two brothers is 1:2 and 5 years back the ratio was 1:3. What will be the ratio of their ages after 5 years?

    (a) 1:4   (b) 2:3

    (c) 3:5   (d) 5:6

    [SSC (GL) Prel, 2005]

11. 6 years ago, Seema was half of that of Rupa in age. Four years hence the ratio of their ages would be 3:5. How old is Rupa at present?

(a) 32 years   (b) 16 years
(c) 40 years   (d) Cannot be determined
(e) None of these

12. Father is aged three times more than his son Ramu. After 8 years, he would be $2\frac{1}{2}$ times of Ramu's age. After further 8 years, how many times would he be of Ramu's age?

(a) 2 times   (b) $2\frac{1}{2}$ times

(c) $2\frac{3}{4}$ times   (d) 3 times

13. The present age of a father is 3 years more than three times the age of his son. Three years hence, father's age will be 10 years more than twice the age of the son. The father's present age is:

(a) 33 years   (b) 39 years
(c) 45 years   (d) 40 years

14. My grandfather was 8 times older than me 16 years ago. He would be 3 times of my age 8 years from now. Eight years ago, what was the ratio of my age to that of my grandfather?

(a) 3:8   (b) 1:5
(c) 1:2   (d) None of these

15. In a class, the average age of 40 boys is 13.5 years and that of the girls is 13 years. The average age of the whole class is 13.4 years. Find the number of girls in the class.

(a) 20   (b) 13
(c) 11   (d) 10

16. The average age of 8 men is increased by 2 years when two of them whose ages are 21 and 23 years are replaced by two new men. The average age of the two new men is:

(a) 22 years   (b) 24 years
(c) 28 years   (d) 30 years

17. In a school with 600 students, the average age of the boys is 12 years and that of the girls is 11 years. If the average age of all the students of the school is 11 years and 9 months, then the numbers of girls in the school is:

(a) 450   (b) 250
(c) 150   (d) 350

18. A father said to his son 'I was as old as you are at present at the time of your birth'. If the father's age is 38 years now, the son's age five years back was:

(a) 14 years   (b) 19 years
(c) 38 years   (d) 33 years

19. The average age of a husband and wife was 23 years at the time of their marriage. After 5 years they have a one year old child. The average age of the family now is:

(a) 28.5 years   (b) 19 years
(c) 29.9 years   (d) 23 years

20. Renu's mother was three times as old as Renu 5 years ago. After 5 years, she will be twice as old as Renu. Renu's present age in years is:

(a) 35   (b) 10
(c) 20   (d) 15

21. The average age of a class of 20 students is 20 years. If the teacher's age is also included the average age increases by one year. The teacher's age is:

(a) 24 years   (b) 30 years
(c) 41 years   (d) 44 years

22. The average age of x and y is 18. If z is equal to 9 then, the average of x, y and z is:

(a) 3   (b) 9
(c) 12   (d) 15

23. The average age of 12 players of a team is 25 years. If the captain's age is included, the average age increases by 1 year. The age of the captain is:

(a) 25 years   (b) 38 years
(c) 36 years   (d) 26 years

24. The average age of 24 students and the class teacher is 16 years. If the class teacher's age is excluded, the average reduces by one year. What is the age of the class teacher?

(a) 50 years   (b) 45 years
(c) 40 years   (d) Data inadequate
(e) None of these

25. If the ages of P and R are added to twice the age of Q, the total becomes 59. If the ages of Q and R

are added to thrice the age of P, the total become 68. And, if the age of P is added to thrice the age of Q and twice the age of R, the total becomes 108. What is the age of P?

(a) 15 years   (b) 19 years
(c) 17 years   (d) 12 years
(e) None of these

                              [SBI PO, 1999]

26. The product of the ages of Harish and Seema is 240. If twice the age of Seema 4 years is more than Harish's then, what is Seema's age in years?

(a) 12   (b) 20
(c) 10   (d) 14
(e) Data inadequate

                              [SBI PO, 1999]

27. The average age of 34 boys in a class is 14 years If the teacher's age is included the average age of the boys and the teacher becomes 15. What is the teacher's age?

(a) 48 years   (b) 46 years
(c) 49 years   (d) 45 years
(e) None of these   **[SBI PO, 2000]**

28. Q is as much younger than R as he is older than T. If the sum of the ages of R and T is 50 years, what is definitely the difference between R and Q's age?

(a) 25 years   (b) 1 year
(c) 2 years   (d) Data inadequate
(e) None of these   **[SBI PO, 2000]**

29. The ratio between the ages of a father and a son at present is 5:2, 4 years, hence the ratio between the ages of the son and his mother will be 1:2. What is the ratio between the present ages of the father and the mother?

(a) 3:4   (b) 5:4
(c) 4:3   (d) Cannot be determined

                   [Allahabad Bank PO, 2010]

30. Radha's present age is three years less than twice her age 12 years ago. Also the ratio between Raj's persent age and Radha's present age in 4:9. What will be Raj's age after 5 years?

(a) 12 years   (b) 7 years
(c) 21 years   (d) None of these

                 [Punjab and Sind Bank PO, 2010]

31. The ratio of the present ages of Swati and Trupti is 4:5. 6 years hence the ratio of their ages will be 6:7. What is the difference between their ages?

(a) 2 years   (b) 3 years
(c) 4 years   (d) Cannot be determined

                 [Punjab National Bank PO, 2010]

32. 4 years ago Shayam's age was $\frac{3}{4}$ times that of Ram. 4 years hence, Shayam's age will be $\frac{5}{6}$ times that of Ram. What is the present age of Shayam?

(a) 15 years   (b) 20 years
(c) 4 years   (d) 24 years

                 [Corporation Bank PO, 2009]

33. The ratio of the present ages of Anju and Sandhya is 13:17, 4 years ago the ratio of their ages was 11:15. What will be the ratio of their ages 6 years hence ?

(a) 3:4   (b) 7:8
(c) 5:4   (d) None of these

                 [Corporation Bank PO, 2010]

34. The ages of Melwyn and Louis are in the ratio of 7:10. After 6 years the ratio of their age will be 17:23. What is the difference in their ages?

(a) 8 years   (b) 4 years
(c) 12 years   (d) 10 years

                 [New Indian Insurance PO, 2009]

35. The ages of Bhakti and Neil are in the ratio of 8:7. After 6 years, the ratio of their ages will be 19:17. What is the difference in their ages?

(a) 4 years   (b) 8 years
(c) 10 years   (d) 12 years

                 [Haryana Grameen Bank PO, 2009]

36. The ages of Sulekha and Arunima are in the ratio of 9:8. After 5 years the ratio of their ages will be 10:9. What is the difference between their ages (in years)?

(a) 4 years   (b) 5 years
(c) 6 years   (d) 7 years

                 [Andhra Bank PO, 2008]

37. The present ages of Amit and his father are in the ratio of 2:5. 4 years hence the ratio of the their ages will become 5:11. What was the father's age 5 years ago?

(a) 40 years   (b) 45 years
(c) 30 years   (d) 35 years

                 [Andhra Bank PO, 2009]

38. The ages of Ranjana and Rakhi are in the ratio of 15:17. After 6 years the ratio of their ages will be 9:10. What will be the age of Ranjana after 6 years?

(a) 40 years   (b) 30 years
(c) 34 years   (d) 36 years

                 [Uttrakhand GBO PO, 2007]

39. The ratio between the present age of Manisha and Deepali is 5:x. Manisha is 9 years younger than Parineeta. Parineeta's age after 9 years will be

33 years. The difference between Deepali's and Manisha's age is same as the present age of Parineeta. What will come in place of *x*?

(a) 23　　　　　　　　(b) 39
(c) 15　　　　　　　　(d) None of these

40. The ages of Shirish and Kunder are in the ratio of 5:6. After 8 years the ratio of their ages will be 7:8. What is the difference in their ages?

(a) 4 years　　　　　　(b) 8 years
(c) 10 years　　　　　(d) 12 years

41. The ages of Nishi and Vinnee are in the ratio of 6:5. After 9 years the ratio of their ages will be 9:8. What is the difference in their ages?

(a) 9 years　　　　　　(b) 7 years
(c) 5 years　　　　　　(d) 3 years

42. The total of the ages of a class of 75 girls is 1050, the average age of 25 of them is 12 years and that of another 25 is 16 years. Find the average age of the remaining girls.

(a) 12 years　　　　　(b) 13 years
(c) 14 years　　　　　(d) 15 years

43. Michelle got married 9 years ago. Today her age is $1\frac{1}{3}$ times her age at the time of marriage. At present her daughter's age is $\frac{1}{6}$ of her age. What was her daughter's age 2 years ago?

(a) 6 years　　　　　　(b) 7 years
(c) 3 years　　　　　　(d) None of the above

44. The ratio between the present ages of Ram and Rakesh is 6:11. 4 years ago, the ratio of their ages was 1:2. What will be Rakesh's age after five years?

(a) 45 years　　　　　(b) 29 years
(c) 49 years　　　　　(d) Cannot be determined

45. The ratio between the present ages of Ram Rohan and Raj is 3:4:5. If the average of their present ages is 28 years then what will be the sum of the ages of Ram and Rohan together after 5 years?

(a) 45 years　　　　　(b) 55 years
(c) 52 years　　　　　(d) 59 years

46. The present ages of Vishal and Shekhar are in the ratio of 14:17. 6-years from now, their ages will be in the ratio of 17:20. What is Shekhar's present age ?

(a) 17 years　　　　　(b) 51 years
(c) 34 years　　　　　(d) 28 years

47. Ram's present age is three times his son's present age and $\frac{2}{5}$ of his father's present age. The average of the present ages of all of them is 46 years. What is the difference between the Ram's son's present age and Ram's father's present age?

(a) 68 years　　　　　(b) 88 years
(c) 58 years　　　　　(d) None of these

48. At present, Meena is eight times her daughter's age. 8 years from now, the ratio of the ages of Meena and her daughter will be 10:3. What is Meena's present age?

(a) 32 years　　　　　(b) 40 years
(c) 36 years　　　　　(d) Cannot be determined

49. The ratio of the ages of Anubha and her mother is 1:2. After 6 years the ratio of their ages will be 11:20. 9 years before, what was the ratio of their ages?

(a) 3:5　　　　　　　(b) 2:7
(c) 1:4　　　　　　　(d) 2:5

50. The ratio of the age of Tina and Rakesh is 9:10. 10 years ago the ratio of their ages was 4:5. What is the present age of Rakesh?

(a) 25 years　　　　　(b) 20 years
(c) 30 years　　　　　(d) 24 years

51. The average age of women and child workers in factory was 15 years. The average age of all the 16 children was 8 years and the average age of women workers was 22 years. If 10 women workers were married, then the number of unmarried women workers is:

(a) 16　　　　　　　　(b) 12
(c) 8　　　　　　　　(d) 6

52. The age of a father is three times of that of his son. After 5 years, the double of father's age will be five times the age of son. The present age of father and son is:

(a) 30 years, 10 years   (b) 36 years, 12 years
(c) 42 years, 14 years   (d) 45 years, 15 years

[UPPCS, 2012]

53. In a family, mother's age is twice that of daughter's age. Father is 10 years older than mother. Brother is 20 years younger than his mother and 5 years older than his sister. What is the age of the father?

(a) 62 years   (b) 60 years
(c) 58 years   (d) 55 years

[SSC (GL), 2011]

54. The ratio of the ages of Ram and Rahim 10 years ago was 1:3. The ratio of their ages 5 years hence will be 2:3. Then the ratio of their present ages is:

(a) 1:2   (b) 3:5
(c) 3:4   (d) 2:5

[SSC (GL), 2011]

55. The average age of 11 players of a cricket team is increased by 2 months when two of them aged 18 years and 20 years are replaced by two new players. The average age of the new players is:

(a) 19 years 1 month
(b) 19 years 6 months
(c) 19 years 11 months
(d) 19 years 5 months

[SSC (GL), 2011]

56. Shan is 55 years old, Sathian is 5 years junior to Shan and 6 years senior to Balan. The youngest brother of Balan is Devan and he is 7 years junior to him. So what is the age difference between Devan and Shan?

(a) 18 years   (b) 15 years
(c) 13 years   (d) 7 years

[SSC (GL), 2011]

57. A man is 3 years older than his wife and four times as old as his son. If the son becomes 15 years old after 3 years, what is the present age of the wife?

(a) 60 years   (b) 51 years
(c) 48 years   (d) 45 years

[SSC (GL), 2010]

58. After replacing an old member by a new member, it was found that the average age of five members of a club is same as it was 3 years ago. The difference between the ages of the replaced and the new members is:

(a) 2 years   (b) 4 years
(c) 8 years   (d) 15 years

[SSC, 2014]

59. 7 years ago, the ages (in years) of A and B were in the ratio 4:5; and 7 years hence they will be in the ratio 5:6. The present age of B is:

(a) 56 years   (b) 63 years
(c) 70 years   (d) 77 years

[SSC, 2010]

60. The ratio of the present ages of A and B is 7:9. 6 years ago the ratio of $\frac{1}{3}$ of A's age at that time and $\frac{1}{3}$ of B's age at that time was 1:2. What will be the ratio of A's to B's age 6 years from now?

(a) 4:5   (b) 14:15
(c) 6:7   (d) 18:25
(e) 22:25

[IBPS PO/MT, 2014]

61. The present age of Romila is $\frac{1}{4}$ that of her father. After 6 years her father's age will be twice the age of Kapil. If Kapil celebrated fifth birthday 8 years ago, what is Romila's present age?

(a) 7 years   (b) 7.5 years
(c) 8 years   (d) 8.5 years
(e) None of these

[IBPS PO/MT, 2013]

62. The sum of the ages of 4 members of a family, 5 years ago, was 94 years. Today, when the daughter has been married off and replaced by a daughter-in-law, the sum of their ages is 92. Assuming that there has been no other change in the family structure and all the people are alive, what is the difference between the age of the daughter and that of the daughter-in-law?

(a) 22 years   (b) 11 years
(c) 25 years   (d) 19 years
(e) 15 years

[IBPS PO/MT, 2012]

63. The ratio of the present age of Manisha and Deepali is 5:*X*. Manisha is 9 years younger than Parineeta. After 9 years, parineeta's age will be 33 years. The difference between Deepali's and Manisha's age is the same as the present age of Parineeta. What should come in place of *X*?

(a) 23   (b) 39
(c) 15   (d) Cannot be determined
(e) None of these

[IBPS PO/MT, 2011]

64. The age of the father is 30 years more than the son's age. Ten years hence, the father's age will become three times the son's age that time. What is the son's present age in years?

(a) Eight   (b) Seven
(c) Five   (d) Cannot be determined
(e) None of these

65. The ratio of the present age of Manoj to that of Wasim is 3:11. Wasim is 12 years younger than Rehana. Rehana's age after 7 years will be 85 years. What is the present age of Manoj's father, who is 25 years older than Manoj?

(a) 43 years   (b) 67 years
(b) 45 years   (d) 69 years
(e) None of these

66. Raman's present age is three times his daughter's and $\frac{9}{13}$ of his mother's present age. The sum of the present ages of all three of them is 125 years. What is the difference between the present ages of Raman's daughter and Raman's mother?

(a) 45 years   (b) 40 years
(c) 50 years   (d) Cannot be determined
(e) None of these

67. The ratio of the present ages of Ram and Rakesh 6:11. 4 years ago, the ratio of their ages was 1:2. What will be Rakesh's age after 5 years?

(a) 45 years   (b) 29 years
(c) 49 years   (d) Cannot be determined
(e) None of these

68. Radha's present age is 3 years less than twice her age 12 years ago. Also, the ratio of Raj's present age to Radha's present age is 4:9. What will be Raj's age after 5 years?

(a) 12 years   (b) 7 years
(c) 21 years   (d) Cannot be determined
(e) None of these

69. The ratio of the ages of a father and a son at present is 5:2. 4 years hence, the ratio of the ages of the son and his mother will be 1:2. What is the ratio of the present ages of the father and the mother?

(a) 3:4   (b) 5:4
(c) 4:3   (d) Cannot be determined
(e) None of these

70. Ratio of the ages of Tania and Rakesh is 9:10. 10 years ago, the ratio of their ages was 4:5. What is the present age of Rakesh?

(a) 25 years   (b) 20 years
(c) 30 years   (d) 24 years
(e) None of these

71. At present, Meena is eight times her daughter's age. 8 years from now, the ratio of the ages of Meena and her daughter will be 10:3. What is Meena's present age?

(a) 32 years   (b) 40 years
(c) 36 years   (d) Cannot be determined
(e) None of these

72. The ages of Shirish and Kunder are in the ratio of 5:6. After 8 years, the ratio of their ages will be 7:8. What is the difference in their ages?

(a) 4 years   (b) 8 years
(c) 10 years   (d) 12 years
(e) None of these

73. In a class, there are 32 boys and 28 girls. The average age of the boys in the class is 14 years, and the average age of the girls in the class is 13 years. What is the average age of the whole class? (Rounded off to two digits after decimal)

(a) 13.50   (b) l3.53
(c) 12.51   (d) 13.42
(e) None of these

74. 4 years ago Shyam's age was $\frac{3}{4}$ times that of Ram. 4 years hence, Shyam's age will be $\frac{5}{6}$ times that of Ram. What is the present age of Shyam?

(a) 15 years   (b) 20 years
(c) 16 years   (d) 24 years
(e) 8 years

ANSWER KEYS

EXERCISE-1

1. (c)   **2.** (a)   **3.** (b)   **4.** (b)   **5.** (a)   **6.** (c)   **7.** (b)   **8.** (d)   **9.** (c)   **10.** (c)   **11.** (b)   **12.** (c)   **13.** (b)

14. (b)   **15.** (c)   **16.** (b)   **17.** (a)

EXERCISE-2

1. (e)   **2.** (d)   **3.** (e)   **4.** (c)   **5.** (d)   **6.** (a)   **7.** (e)   **8.** (c)   **9.** (b)   **10.** (c)   **11.** (e)   **12.** (a)   **13.** (a)

14. (d)   **15.** (d)   **16.** (d)   **17.** (c)   **18.** (b)   **19.** (b)   **20.** (d)   **21.** (c)   **22.** (d)   **23.** (b)   **24.** (c)   **25.** (d)   **26.** (a)

27. (c)   **28.** (d)   **29.** (d)   **30.** (d)   **31.** (b)   **32.** (c)   **33.** (d)   **34.** (c)   **35.** (a)   **36.** (b)   **37.** (d)   **38.** (d)   **39.** (d)

40. (a)   **41.** (d)   **42.** (c)   **43.** (d)   **44.** (c)   **45.** (d)   **46.** (c)   **47.** (d)   **48.** (a)   **49.** (d)   **50.** (b)   **51.** (d)   **52.** (d)

53. (b)   **54.** (b)   **55.** (c)   **56.** (a)   **57.** (c)   **58.** (d)   **59.** (d)   **60.** (c)   **61.** (c)   **62.** (a)   **63.** (e)   **64.** (c)   **65.** (a)

66. (c)   **67.** (c)   **68.** (e)   **69.** (d)   **70.** (b)   **71.** (a)   **72.** (a)   **73.** (b)   **74.** (c)

EXPLANATORY ANSWERS

EXERCISE-1

1. **(c)** Let, Mohan's present age be x years and Ram's present age be y years.

Then, according to the first condition,

$x - 10 = 3(y - 10)$

or, $x - 3y = -20$ ...(1)

Now, Mohan's age after 10 years

$= (x + 10)$ years

Ram's age after 10 years $= (y + 10)$

∴ $(x + 10) = 2(y + 10)$

or, $x - 2y = 10$ ...(2)

Solving (1) and (2), we get

$x = 70$ and, $y = 30$

∴ Mohan's age = 70 years and Ram's age = 30 years.

2. **(a)** Let, Ram's age $= x$ years

So, Mohan's age $= (x + 16)$ years

Also, $3(x - 6) = x + 16 - 6$ or, $x = 14$

∴ Ram's age = 14 years

and, Mohan's age = 14 + 16 = 30 years.

3. **(b)** Let, the present age of Rohit be x years

Then, given: $x + 15 = 4(x - 15)$ ⇒ $x = 25$.

4. **(b)** Let, the present age be x years.

Then, 125% of $(x - 10) = x$

and, $83\frac{1}{3}$ % of $(x + 10) = x$

∴ 125 % of $(x - 10) = 83\frac{1}{3}$ % of $(x + 10)$

or, $\frac{5}{4}(x - 10) = \frac{5}{6}(x + 10)$

or, $\frac{5}{4}x - \frac{5}{6}x = \frac{50}{6} + \frac{50}{4}$

or, $\frac{5x}{12} = \frac{250}{12}$ or, $x = 50$ years.

5. **(a)** Let, son's age (in years) $= x$ and father's age (in years) $= y$

Given: $2x + y = 70$ and, $x + 2y = 95$

Solving for y, we get $y = 40$.

6. **(c)** Present age of 5 members

$= 5 \times 17 + 3 \times 5 = 100$ years

Also, present ages of 5 members + Age of the baby

$= 6 \times 17 = 102$ years

∴ Age of the baby $= 102 - 100 = 2$ years.

7. **(b)** Given: $\frac{A}{B} = \frac{4}{5}$ or, $B = \frac{5}{4}A$

and, $B - (A + 5) = 3$ or, $B = A + 8$

∴ $\frac{5}{4}A = A + 8$

or, $A\left(\frac{5}{4} - 1\right) = 8$

$\therefore$ A = 32 years

and, B = $\frac{5}{4} \times 32 = 40$ years

$\therefore$ A + B = 40 + 32 = 72 years.

8. **(d)** Let, present ages (in years) of A and B respectively, are $6x$ and $5x$.

Given: $6x + 5x = 44 \Rightarrow x = 4$

Ratio of ages after 8 years will be

$6x + 8 : 5x + 8$

or, 32:28 or, 8:7.

9. **(c)** Let, one year ago

Samir's age be $4x$ years

and, Ashok's age be $3x$ years

Present age of Samir = $(4x + 1)$ years

Present age of Ashok = $(3x + 1)$ years

One year hence

Samir's age = $(4x + 2)$ years

Ashok's age = $(3x + 2)$ years

According to question,

$\frac{4x+2}{3x+2} = \frac{5}{4} \Rightarrow 16 + 8 = 15x + 10$

or, $x = 2$.

$\therefore$ Sum of their present ages = $4x + 1 + 3x + 1$

$= 7x + 2$

$= 7 \times 2 + 2 = 16$ years.

10. **(c)** Let, the present ages of Ashok and Pradeep be $4x$ and $3x$

So that $4x + 6 = 26 \Rightarrow x = 5$

$\therefore$ Present age of Pradeep is $3x = 3 \times 5$, i.e., 15 years

11. **(b)**

12. **(c)** Let, Mr Sohanlal's age (in years) = x

and his son's age = y

Then, $x - 5 = 3(y - 5)$ i.e., $x - 3y + 10 = 0$

and, $x + 10 = 2(y + 10)$ i.e., $x - 2y - 10 = 0$

Solving the two equations, we get

$x = 50, y = 20$.

13. **(b)**

14. **(b)** Let, father's present age = x years

Then, son's present age = $(45 - x)$ years

Given: $(x - 5)(45 - x - 5) = 4(x - 5)$

or, $x^2 - 41x + 180 = 0$ or, $(x - 36)(x - 5) = 0$

$\therefore x = 36$ years.

15. **(c)** Let, the present ages of father and son be x and y years, respectively

Then, $(x - 1) = 4(y - 1)$

or, $4y - x = 3$ …(1)

and, $(x + 6) - 2(y + 6) = 9$

or, $-2y + x = 15$ …(2)

Solving (1) and (2), we get, $x = 33, y = 9$

$\therefore$ Ratio of their ages = 33:9 = 11:3.

16. **(b)** Let, A's age be x years

B's age be $2x$ years

C's age = $(x + 17)$ years

According to the question,

$x + 2x + (x + 17) = 185$

$\therefore 4x = 185 - 17 = 168$ $\therefore x = 42$

$\therefore$ A's age = 42 years

B's age = 84 years

C's age = 42 + 17 = 59 years.

17. **(a)** Let, the present age of father be x years and the present age of son be y years.

$\therefore x = 3y$ …(1)

Also, $(x + 20) = (y + 20 + 20)$ …(2)

Solving (1) and (2), we get

$x = 30$ years.

Exercise-2
(Based on Memory)

1. **(e)** Let, the present ages of Arun and Deepak be x and y years respectively.

$\therefore y - x = 14$

$\therefore x = y - 14$

and, $\frac{x-7}{y-7} = \frac{5}{7}$

$7x - 49 = 5y - 35$

$\Rightarrow 7(y - 14) - 49 = 5y - 35$

$\Rightarrow 7y - 98 - 49 = 5y - 35$

$\Rightarrow 7y - 5y = 98 + 49 - 35$

$\therefore y = 56$ years

2. **(d)** $\frac{8x+10}{11x+10} = \frac{13}{16}$

$\Rightarrow 128x + 160 = 143x + 130$ $\therefore x = \frac{30}{15} = 2$

$\therefore$ difference in their ages

$= 11x - 8x = 3x = 3 \times 2 = 6$ years.

3. (e) We have $\dfrac{S-1}{G-1}=\dfrac{3}{4} \Rightarrow 4S-3G=1$ …(1)

and $\dfrac{S+1}{G+1}=\dfrac{10}{13} \Rightarrow 13S-10G=-3$ …(2)

Solving (1) and (2), we have, S = 19 years.

4. (c) Let, son's age = x, Sanyal's age = $3x$

$\dfrac{3x+6}{x+6}=\dfrac{5}{2} \Rightarrow 6x+12=5x+30 \;\; x=18$

Sanyal's age = $3x = 3 \times 18 = 54$.

5. (d) We have $\dfrac{(8k+9)}{(15k+9)}=\dfrac{11}{18}$

or, $144k+162=165k+99$

or, $21k=63$

∴ $k=3$

∴ Required difference = $(15-8) \times 3 = 21$

6. (a) ∴ A:B:C = 8:14:22

= 12:21:33

B:C:D = 21:33:44

∴ A:B:C:D = 12:21:33:44

7. (e) Let, the present ages of Seema and Naresh be $5x$ years and $7x$ years respectively.

∴ $\dfrac{5x+5}{7x+5}=\dfrac{3}{4}$

$\Rightarrow 21x+15=20x+20$

$\Rightarrow x=5$

∴ Present age of Naresh = 35 years.

8. (c) Let, the average age of 11 players be x.

∴ When two players aged 18 years and 20 years are replaced by two new players, the average age of 11 players

$= \dfrac{11x-18-20+2p}{11}=x+\dfrac{1}{6}$

where p is the average age of the two new players.

∴ $11x-18-20+2p=11x+\dfrac{11}{6}$

$\Rightarrow 2p=38+\dfrac{11}{6} \Rightarrow p=19+\dfrac{11}{12}$

$\Rightarrow$ Average age of the two new players

= 19 years and 11 months.

9. (b) Let, the ages of the two new boys be x and $x+5$ respectively.

∴ $\dfrac{450-20+x+(x+5)}{31}=15$

$\Rightarrow 2x-15=31 \times 15-450=15$

$\Rightarrow x=15$

∴ Age of the younger newcomer = 15 years

10. (c) Let the ratio of the present ages of the two brothers be $x{:}y$.

∴ $\dfrac{x}{y}=\dfrac{1}{2}, \dfrac{x-5}{y-5}=\dfrac{1}{3}$

$\Rightarrow 3(x-5)=y-5$

$\Rightarrow 3x-y=10$

$\Rightarrow x=10$ $\qquad [\because\ y=2x]$

$\Rightarrow y=20$

∴ $\dfrac{x+5}{y+5}=\dfrac{15}{25}=\dfrac{3}{5}$

= Ratio of the ages of the two brothers after 5 years.

11. (e) Let, Seema's age at present be x years and Rupa's age be y years.

Now, according to the question,

$(y-6)=2(x-6) \Rightarrow y-6=2x-12$

or, $2x-y=6$ …(1)

Also, $\dfrac{x+4}{y+4}=\dfrac{3}{5}$

or, $5x+20=3y+12$

or, $5x-3y=-8$ …(2)

From equations (1) and (2), we get

$x=26$ years and $y=46$ years

12. (a) Given: F = R + 3R = 4R …(1)

and, $F+8=2\dfrac{1}{2}(R+8)=\dfrac{5}{2}(R+8)$ …(2)

$F+16= ? \times (R+16)$

(1) and (2) gives F = 32 and R = 8

∴ $F+16=48, R+16=24$.

13. (a) Given: F − 3S = 3 …(1)

and, (F + 3) − 2(S + 3) = 10

or, F − 2S = 13 …(2)

Solving (1) and (2), we get F = 33 years.

14. (d) Let, the present age of grandfather and me be 'x' years and 'y' years, respectively

Given: $x-16=8(y-16) \Rightarrow 8y-x=112$ …(1)

and, $x+8=3(y+8) \Rightarrow x-3y=16$ …(2)

Solving (1) and (2), we get

$x=\dfrac{464}{5}$ and $y=\dfrac{128}{5}$

∴ Ratio 8 years ago = $y-8{:}x-8$

= 88:424 = 11:53.

15. (d) Let, number of girls = K

$40 \times 13.5+13K=13.4(K+40)$

$\Rightarrow 13K+540=13.4K+536$

$\Rightarrow 0.4K=4 \Rightarrow K=10$.

16. (d) Let, average age of 8 men be K and average age of two new men be M

∴ $8K-21-23+2M=8(K+2) \Rightarrow M=30$.

17. (c) Let, number of girls = G

∴   Number of boys = 600 − G

Given: $12(600 - G) + 11G = 11\dfrac{3}{4} \times 600$

⇒   7200 − 12 G + 11G = 7050

⇒   G = 150.

18. (b) At present, the son's age = 19 years.

19. (b) We have, H + W = 46

and, (H + 5) + (W + 5) + C = H + W + 10 + C

= 46 + 10 + 1 = 57

∴   Average age of H, W and C now = $\dfrac{57}{3}$ = 19.

20. (d) Given: $3(R - 5) = (M - 5)$

and, $2(R + 5) = (M + 5)$

∴   M = 35, R = 15.

21. (c) The teacher's age = 21 × 21 − 20 × 20

= 441 − 400 = 41 years.

22. (d) Given: $x + y = 36$ and $z = 9$

∴ $\dfrac{x + y + z}{3}$ = 15.

23. (b) Age of the captain = (25 + 1) × 13 − 25 × 12

= 338 − 300 = 38 years.

24. (c) Age of the class teacher

= 25 × 16 − 24 ×15

= 400 − 360 = 40 years.

25. (d) P + R + 2Q = 59

Q + R + 3P = 68 and P + 3Q + 2R = 108

Solving these, we get

P = 12 years.

26. (a) Let, the ages of Harish and Seema be x and y years, respectively.

According to question,

$x \times y = 240$ …(1)

$2y - x = 4$ …(2)

Solving equations (1) and (2), we get

y = 12 years

27. (c) Teacher's age = 35 × 15 − 34 × 14

= 525 − 476 = 49 years.

28. (d)

29. (d) Let, the ages of father and son are $5x$ and $2x$ years.

After four years the age of son = 2x + 4

After four years the age of mother = 4x + 8

So the present age of mother = 4x + 4

Ratio of the age of father and mother = 5x:(4x + 4)

Data are insufficient, so cannot be determined.

30. (d) Present age of Radha = x years.

According to question,

$$x + 3 = 2(x - 12)$$

$$x + 3 = 2x - 24$$

$x = 27$

Present age of Raj:Present age of Radha = 4:9

∴   Present age of Raj = $\dfrac{27}{9} \times 4 = 12$

After 5 years age of Raj = 12 + 5 = 17 years

31. (b) $\dfrac{S + 6}{T + 6} = \dfrac{6}{7}$

$7S + 42 = 6T + 36$

$7S - 6T = 36 - 42 \quad \left(\because \dfrac{S}{T} = \dfrac{4}{5} \right)$

$7 \times \dfrac{4T}{S} - 6T = -6$

$\dfrac{28T - 30T}{5} = -6$

$-2T = -30$

∴ $T = 15$ then $S = \dfrac{4T}{5} = \dfrac{4 \times 15}{5} = 12$

Difference = 15 − 12 = 3 years

32. (c) Age before 4 years.

Shyam:Ram = 3:4

After 4 years, age is

$\dfrac{3x + 8}{4x + 8} = \dfrac{5}{6}$

$20x + 40 = 18x + 48$

$20x - 18x = 48 - 40$

$2x = 8$

$x = 4$

33. (d) $\dfrac{13x - 4}{17x - 4} = \dfrac{11}{15}$

$195x - 60 = 187x - 44$

$195x - 187x = -44 + 60$

$8x = 16$

$x = 2$

Ratio of their ages after 6 years = $\dfrac{13 \times 2 + 6}{17 \times 2 + 6}$

$= \dfrac{32}{40} = \dfrac{4}{5}$ = 4:5

34. (c) Let, the present age of Melwyn and Louis are 7x and 10x. After 6 years the age is

$\dfrac{7x + 6}{10x + 6} = \dfrac{17}{23}$

⇒   170x + 102 = 161x + 138

⇒   170x + 161x = 138 − 102

⇒   9x = 36

$x = 4$

Age difference between Melwyn and Louis

= 10x − 7x

= 3x = 3 × 4

= 12 years   [Putting, x = 4]

35. (a) Let, the ages of Bhaki and Neil are $8x$ and $7x$ respectively.

After 6 years

$$\frac{8x+6}{7x+6} = \frac{19}{17}$$

$\Rightarrow \qquad 136x + 102 = 133x + 114$

$\Rightarrow \qquad 136x - 133x = 114 - 102$

$\Rightarrow \qquad 3x = 12$

$\Rightarrow \qquad x = \dfrac{12}{3} = 4$

Age of Bhakti = $8x = 8 \times 4 = 32$

Present age of Neil = $7 \times x = 7 \times 4 = 28$

Required difference = $32 - 28 = 4$ years

36. (b) Let, the age of Sulekha and Arunima is $9x$ and $8x$.

$\therefore \qquad \dfrac{9x+5}{8x+5} = \dfrac{10}{9}$

$\qquad 81x + 45 = 8x + 50$

$\qquad 81x - 80x = 50 - 45$

$\qquad x = 5$

$\therefore$ Difference = $9 \times 5 - 8 \times 5$

$\qquad = 45 - 40 = 5$ years

37. (d) Let, the present age of Amit and his father is $2x$ and $5x$ years respectively.

After 4 years the ratio of their ages,

$$\frac{2x+4}{5x+4} = \frac{5}{11}$$

$\qquad 25x + 20 = 22x + 44$

$\qquad 25x - 22x = 44 - 20$

$\qquad 3x = 24$

$\qquad x = 8$

Age of his father before 5 years

$\qquad = 5x - 5$

$\qquad = 5 \times 8 - 5 \qquad [\because x = 8]$

$\qquad = 40 - 5$

$\qquad = 35$ years

38. (d) Let, the age of Ranjana and Rakhi is $15x$ years and $17x$ years.

After 6 years the age of Ranjana and Rakhi

$$\frac{15x+6}{17x+6} = \frac{9}{10}$$

$\Rightarrow \quad 153x + 54 = 150x + 60$

$\qquad 153x - 150x = 60 - 54$

$\qquad 3x = 6x = 2$

So, the age of Ranjana after 6 years

$\qquad = 15 \times 2 + 6 = 30 + 6 = 36$ years

39. (d) Given Parineeta's age after 9 years = 33 years

$\therefore$ Parineeta's present age = $33 - 9$

$\qquad = 24$ years

$\therefore$ Manisha's present age = $24 - 9$

$\qquad = 15$ years

$\therefore$ Deepali's present age = $15 + 24$

$\qquad = 39$ years

Hence, ratio between Manisha and Deepali

$\qquad = 15:39 = 5:13$

$\therefore \quad x = 13$

40. (a) Let, the age of Shirish = $5x$ years

age of Kunder = $6x$ years

$\dfrac{5x+8}{6x+8} = \dfrac{7}{8}$

$\Rightarrow \quad 42x + 56 = 40x + 64$

$42x - 40x = 64 - 56$

$2x = 8$

$x = 4$

Required difference = $6x - 5x$

$= 6 \times 4 - 5 \times 4$

$= 24 - 20$

$= 4$ years

41. (d) Let, the ages of Nishi and Vinnee and $6x$ and $5x$ years.

$\therefore \quad \dfrac{6x+9}{5x+9} = \dfrac{9}{8}$

$\Rightarrow \quad 48x + 72 = 45x + 81$

$\Rightarrow \quad 48x - 45x = 81 - 72$

$\Rightarrow \qquad 3x = 9$

$\therefore \quad x = 3$

Required difference

$6x - 5x = x = 3$ years

42. (c) Average age of the remaining grils

$= \dfrac{1050 - (25 \times 12 + 25 \times 16)}{25}$

$= \dfrac{1050 - (300 + 400)}{25}$

$= \dfrac{1050 - 700}{25}$

$= 14$ years

43. (d) Let, at the time of marriage, the age of Michelle was x years.

$x + 9 = \dfrac{4}{3}x$

$\therefore \quad \dfrac{x}{3} = 9$

$\Rightarrow \quad x = 3 \times 9 = 27$ years

$\therefore$ Present age of Michelle

$= 27 + 9 = 36$ years

Here daughter's age two years ago

$= \dfrac{36}{6} - 2 = 6 - 2 = 4$ years

44. (c) Let, the age of Ram = x and, Rakesh = y, then, $\dfrac{x}{y}$

= $\dfrac{6}{11}$

$\therefore \quad x = \dfrac{6y}{11}$

According to the question,

$\dfrac{x-4}{y-4} = \dfrac{1}{2}$

$2x - 8 = y - 4$

$2 \times \dfrac{6y}{11} - 8 = y - 4$

$\dfrac{12y}{11} - y = -4 + 8$

$\dfrac{y}{11} = 4$

$\therefore \quad\quad y = 44$ years

$\therefore$ Age of Rakesh after 5 years

= 44 + 5 = 49 years

45. (d) Let, the ages of Ram, Rohan and Raj be $3x$, $4x$ and $5x$ respectively.

Then,

$\dfrac{3x+4x+5x}{3} = 28$

$\Rightarrow \quad 4x = 28$

$\Rightarrow \quad x = \dfrac{28}{4} = 7$ years

So, the present ages of Ram and Rohan together

= $3x + 4x$

= $7x = 7 \times 7$

= 49 years

Hence, the sum of the ages of Ram and Rohan together after 5 years

= 49 + 5 × 2

= 49 + 10

= 59 years

46. (c) $\dfrac{V}{S} = \dfrac{14}{17}$

$\therefore \quad V = \dfrac{14S}{17}$

Again, $\dfrac{V+6}{S+6} = \dfrac{17}{20}$

$20V + 120 = 17S + 102$

$20 \times \dfrac{14S}{17} + 120 = 17S + 102$

$\dfrac{280S}{17} + 120 = 17S + 102$

$120 - 120 = \dfrac{17S - 280S}{17}$

$18 = \dfrac{289S - 280S}{17}$

$\dfrac{18 \times 17}{9} = S$

$34 = S$

47. (d) Suppose age of Ram = R

His son's age = S

and his father's age = F

According to the question, S = $\dfrac{R}{3}$ and R = F × $\dfrac{2}{5}$

$\therefore \quad F = \dfrac{5R}{2}$

and, $\dfrac{R+S+F}{3} = 46$

R + S + F = 46 × 3

R + $\dfrac{R}{3} + \dfrac{5R}{2}$ = 138

R = 36

S = $\dfrac{36}{3}$ = 12

F = $\dfrac{5 \times 36}{2}$ = 90

Difference = 90 − 12 = 78 years

48. (a) Let, the age of daughter = x years

Age of Meena = $8x$ years

After 8 years

$\dfrac{8x+8}{x+8} = \dfrac{10}{3}$

$24x + 24 = 10x + 80$

$24x - 10x = 80 - 24$

$14x = 56$

$x = 4$

So, the age of Meena = $8x = 8 \times 4 = 32$ years

49. (d) Ratio of the present age of Anubha and her mother = 1:2

According to question, $\dfrac{x+6}{2x+6} = \dfrac{11}{20}$

$20x + 120 = 22x + 66$

$2x = 54$

$x = 27$

Before 9 years the ratio of Anubha and her mother

= $\dfrac{27-9}{27 \times 2 - 9} = \dfrac{18}{45}$ = 2:5

50. (b) Let, the age of Tina and Rakesh is $9x$ and $10x$.

$\dfrac{9x-10}{10x-10} = \dfrac{4}{5}$

$45x - 50 = 40x - 40$

$5x = 10$

$x = 2$

∴ Present age of Rakesh

= $10x = 10 \times 2 = 20$ years

51. (d) Let, unmarried women workers are x, then as per question,

$$\frac{16 \times 8 + 22 \times (10 + x)}{16 + 10 + x} = 15$$

⇒ 128 + 220 + 22x = 390 + 15x

⇒ 7x = 42

∴ $x = 6$

52. (d) Let, present age of son is x years and then present age of father is 3x years then,

5 (x + 5) = 2 (3x + 5)

⇒ 5x + 25 = 6x + 10

∴ $x = 15$ years

Present age of father

= 45 years.

53. (b) Let, the age of the daughter be x.

Then, age of brother

= x + 5 years

Therefore, age of mother

= 2x years

∴ 2x − 20 = x + 5

⇒ 2x − x = 5 + 20

⇒ x = 25 years.

Age of mother = 2x

= 2 × 25 = 50 years

Age of father = 50 + 10 = 60 years

54. (b) Let, the age of Ram and Rahim 10 years ago be x and 3x years respectively. Ages of Ram and Rahim after 5 years from now,

$$\frac{x + 15}{3x + 15} = \frac{2}{3}$$

⇒ 2(3x + 15) = 3(x + 15)

⇒ 6x + 30 = 3x + 45

⇒ 6x − 3x = 45 − 30

⇒ 3x = 15

⇒ $x = \frac{15}{3} = 5$ years

55. (c) Total increase = 11 × 2 = 22 months

Therefore, sum of the ages of both cricketers = (18 + 20) years 22 months = 38 years 22 months

Hence, Average age = 19 years 11 months

56. (a) Shan's age = 55 years

Sathian's age = 50 − 5

= 50 years

Balan's age = 50 − 6 = 44 years

Devan's age = 44 − 7 = 37 years

Difference between Shan's age and Devan's age = 55 − 37 = 18 years

57. (c) Let, the present age of the son be x years.

Therefore, the present age of the father = 4x years

According to the question x + 3 = 15 years

Therefore, as x = 15 − 3 = 12 years

Hence, the present age of the father = 4x

= 4 × 12 = 48 years

58. (d) Increase in ages of five members in 3 years = (3 × 5) years = 15 years

Since the average age remains same, therefore, required difference = 15 years

59. (d) Let, A's present age be x and B's present age be y. Now, according to the question

$$\frac{x - 7}{y - 7} = \frac{4}{5} \qquad \qquad \ldots(1)$$

$$\frac{x + 7}{y + 7} = \frac{5}{6} \qquad \qquad \ldots(2)$$

Above equations become

5x − 4y = 74 \qquad \qquad …(3)

6x − 5y = − 7 \qquad \qquad …(4)

On solving these equations, we get x = 63 and y = 77

∴ B's present age = 77 years.

60. (c) Let, the present age of A be 7x years and that of B be 9x years.

Now, 6 years ago, $\dfrac{3(7x - 6)}{3(9x - 6)} = \dfrac{1}{2}$

or, 42x − 36 = 27x − 18

or, 15x = 18

∴ $x = \dfrac{6}{5}$ years

Ratio after 6 years

$$\frac{\dfrac{7 \times 6}{5} + 6}{9 \times \dfrac{6}{5} + 6} = \frac{42 + 30}{54 + 30} = \frac{72}{84} = 6:7$$

∴ Required ratio = 6:7

61. (c) Kapil's present age = (8 + 5) = 13 years

Kapil's age after 6 years = 13 + 6 = 19 years

Now, Romila's father's age = 2 × Kapil's age = 2 × 19 = 36 years

Father's present age = 38 − 6 = 32 years

Romila's present age $= \dfrac{1}{4} \times$ father's present age

$= \dfrac{1}{4} \times 32 = 8$ years

62. (a) There are four members in a family. Five years ago the sum of ages of the family members = 94 years

Now, sum of present ages of family members = 94 + 5 × 4 = 114 years

∴ Daughter is replaced by daughter-in-law.

Thus, sum of family member's ages becomes 92 years.

∴ Difference = 114 − 92 = 22 years

63. (e) Parineeta's present age = (33 − 9) = 24 years

∴ Manisha's present age = (24 − 9) = 15 years

∴ Deepali's present age = 15 + 24 = 39 years

∴ Ratio of the present age of Manisha and Deepali = 15:39 = 5:13

∴ X = 13

64. (c) Let the son's present age be x years. Then the father's present age is $(x + 30)$ years.

Father's age after 10 years = $(x + 40)$ years

Son's age after 10 years = $(x + 10)$ years

According to question:

$(x + 40) = 3(x + 10)$

$\Rightarrow \quad x + 40 = 3x + 30$

$\Rightarrow \quad 2x = 10$

∴ $x = 5$

65. (a) Present age of Rehana = 85 − 7 = 78 years

Present age of Wasim = 78 − 12 = 66 years

Present age of Manoj $= \dfrac{3}{11} \times 66 = 18$ years

Present age of Manoj's father = 18 + 25 = 43 years

66. (c) Let, Raman's present age be x years.

∴ his daughter's present age $= \dfrac{x}{3}$ years

His mother's present age $= \dfrac{13x}{9}$ years

Now, according to the question,

$x + \dfrac{x}{3} + \dfrac{13x}{9} = 125$

$\Rightarrow \quad \dfrac{9x + 3x + 13x}{9} = 125$

$\Rightarrow \quad 25x = 125 \times 9$

$\Rightarrow \quad x = \dfrac{125 \times 9}{25} = 45$

∴ Required difference $= \dfrac{13x}{9} - \dfrac{x}{3} = \dfrac{13x - 3x}{9} = \dfrac{10x}{9}$

$= \dfrac{10}{9} \times 45 = 50$ years.

67. (c) Let, the present age of Ram and Rakesh be $6x$ and $11x$ years respectively. According to question,

$\dfrac{6x - 4}{11x - 4} = \dfrac{1}{2}$

$\Rightarrow \quad 12x - 8 = 11x - 4$

∴ $x = 8 - 4 = 4$

∴ present age of Rakesh = $11 \times 4 = 44$ years

After five years, Rakesh's age = 49 years

68. (e) Let, the present ages of Raj and Radha be $4x$ and $9x$.

Then, according to the question,

$9x = 2(9x - 12) - 3 \quad \Rightarrow \quad 9x = 27 \quad \Rightarrow \quad x = 3$ years

Raj's present age = $4x = 12$ years

After 5 years, Raj's age will be $12 + 5 = 17$ years

69. (d)

70. (b) Let, the ages of Tina and Rakesh be $9x$ and $10x$ respectively.

Then, $\dfrac{9x - 10}{10x - 10} = \dfrac{4}{5}$

$\Rightarrow \quad 45x - 40x = 50 - 40$

$\Rightarrow \quad x = \dfrac{10}{5} = 2$

Rakesh's present age = $10x = 10 \times 2 = 20$ years.

71. (a) Given M = 8D

M→ Age of Meena

D→ Age of her daughter

Also, $\dfrac{8D + 8}{D + 8} = \dfrac{10}{3}$. Solving, we get D = 4

Meena's present age = 8D = $8 \times 4 = 32$ years

72. (a) Let, their present ages be $5x$ and $6x$ respectively.

Then, $\dfrac{5x + 8}{6x + 8} = \dfrac{7}{8} \quad \Rightarrow \quad (42 - 40)x = (64 - 56)$

$\Rightarrow \quad x = \dfrac{8}{2} = 4$

Difference in their present ages = $6x - 5x = x = 4$ years.

73. (b) $\dfrac{32 \times 14 + 28 \times 13}{60} = \dfrac{812}{60} = 13.53$

74. (c) The two equations are

$x - 4 = \dfrac{3}{4}(y - 4);$

$x + 4 = \dfrac{5}{6}(y + 4);$

$x →$ Shyam's present age

$y →$ Ram's present age