

7. Problems on Ages

Ages Introduction:

- If the present age of A is x years, then his/her age m years ago was $(x-m)$ years and his/her age after n years will be $(x+n)$ years.
- If the age of a person n_1 years ago was x years, then after n_2 years his age will be $(x+n_1+n_2)$ years.
- If the age of a person after n_1 years will be x years, then his age n_2 years ago was $(x-n_1-n_2)$ years.
- If the sum of the ages of n persons is S years, then the sum of their ages m years ago was $(S-mn)$ years
- If the sum of the ages of n persons is S years, then the sum of their ages after m years will be $(S+mn)$ years

EXERCISE

1. Hitesh is 40 years old and Ronnie is 60 years old. How many years ago was the ratio of their ages 3:5?
(a) 2 years (b) 10 years
(c) 30 years (d) 47 years
2. The ratio of the father's age to his son's age is 7 : 3. The product of their ages is 756. The ratio of their ages after 6 years will be:
(a) 6 : 7 (b) 2 : 1
(c) 10:9 (d) 3 : 2
3. The present ages of three persons are in proportions 4 : 7 : 9. Eight years ago, the sum of their ages was 56. Find their present ages (in years).
(a) 10, 12, 24 (b) 16, 28, 36
(c) 20, 35, 45 (d) 20, 25, 35
4. 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) 3 : 4 (b) 3 : 2
(c) 3 : 5 (d) 5 : 6
5. The total of the ages of Jayant, Prem and Saransh is 93 years. Ten years ago, the ratio of their ages was 2 : 3 : 4. What is the present age of Saransh?
(a) 44 years (b) 36 years
(c) 33 years (d) 38 years
6. Six years ago, the ratio of the ages of Kunal and Sagar was 6 : 5. Four years hence, the ratio of their ages will be 11 : 10. What is Sagar's age at present?
(a) 16 years (b) 19 years
(c) 22 years (d) 25 years
7. The ratio of the ages of a man and his wife is 4 : 3. After 4 years, this ratio will be 9 : 7. If at the time of marriage, the ratio was 5:3, then how many years ago were they married?
(a) 10 years (b) 25 years
(c) 12 years (d) 18 years
8. The ratio between the school ages of Neelam and Shaan is 5 : 6 respectively. If the ratio between the one-third age of Neelam and half of Shaan's age is 5 : 9, then what is the school age of Shaan?
(a) 28 years (b) 23 years
(c) 39 years (d) cannot be determined
9. The ratio between the present ages of A and B is 5:3 respectively. The ratio between A's age 4 years ago and B's age 4 years hence is 1 : 1. What is the ratio between A's age 4 years hence and B's age 4 years ago?
(a) 3 : 2 (b) 5 : 2
(c) 3 : 1 (d) 6: 1
10. Ten years ago, A was half of B in age. If the ratio of their present ages is 3 : 4, what will be the total of their present ages?
(a) 25 years (b) 32 years
(c) 45 years (d) None of these
11. A is two years older than B who is twice as old as C. If the total of the ages of A, B and C be 27, then how old is B?
(a) 6 years (b) 9 years
(c) 13 years (d) 10 years
12. A man is 24 years older than his son. In two years, his age will be twice the age of his son. The present age of the son is:

- (a) 24 years (b) 26 years
(c) 28 years (d) 22 years
13. Eighteen years ago, a father was three times as old as his son. Now the father is only twice as old as his son. Then the sum of the present ages of the son and the father is:
(a) 102 years (b) 76 years
(c) 105 years (d) 108 years
14. A person's present age is two-fifth of the age of his mother. After 8 years, he will be one-half of the age of his mother. How old is the mother at present?
(a) 44 years (b) 42 years
(c) 40 years (d) 55 years
15. Tanya's grandfather was 8 times older to her 16 years ago. He would be 3 times of her age 8 years from now. Eight years ago, what was the ratio of Tanya's age to that of her grandfather?
(a) 6:1 (b) 1:5
(c) 7:3 (d) 11:53
16. The age of father 10 years ago was thrice the age of his son. Ten years hence, father's age will be twice that of his son. The ratio of their present ages is:
(a) 8 : 3 (b) 7 : 3
- (c) 11:2 (d) 13 : 4
17. Four years ago, the father's age was three times the age of his son. The total of the ages of the father and the son after four years, will be 64 years. What is the father's age at present?
(a) 35 years (b) 40 years
(c) 46 years (d) Data inadequate
18. One year ago, Promila was four times as old as her daughter Sakshi. Six years hence, Promila's age will exceed her daughter's age by 9 years. The ratio of the present ages of Promila and her daughter is:
(a) 8:3 (b) 11:5
(c) 12:5 (d) 13:4
19. The sum of the present ages of a father and his son is 60 years. Six years ago, father's age was five times the age of the son. After 6 years, son's age will be:
(a) 15 years (b) 16 years
(c) 19 years (d) 20 years
20. The total age of A and B is 12 years more than the total age of B and C. C is how many years younger than A?
(a) 12 (b) 26
(c) C is elder than A (d) None of these

ANSWER KEY

1	b	6	a	11	d	16	b
2	b	7	c	12	d	17	b
3	b	8	d	13	d	18	d
4	c	9	c	14	c	19	d
5	d	10	d	15	d	20	a

SOLUTIONS

1. Suppose, the ratio was 3 : 5, x years ago.

$$\text{Then, } \frac{40-x}{60-x} = \frac{3}{5}$$

$$\Leftrightarrow 5(40 - x) = 3(60 - x) \Leftrightarrow 2x = 20 \Leftrightarrow x = 10 \text{ years}$$

2. Let the present ages of the father and son be $7x$ and $3x$ years respectively.

$$\text{Then, } 7x \times 3x = 756$$

$$\Leftrightarrow 21x^2 = 756 \Leftrightarrow x^2 = 36 \Leftrightarrow x = 6.$$

$$\text{Required ratio} = (7x + 6) : (3x + 6)$$

$$= 48 : 24 = 2 : 1.$$

3. Let their present ages be $4x$, $7x$ and $9x$ years respectively.

$$\text{Then, } (4x - 8) + (7x - 8) + (9x - 8) = 56 \Leftrightarrow 20x = 80 \Leftrightarrow x = 4.$$

Their present ages are 16 years, 28 years and 36 years respectively.

4. Let the present ages of the two brothers be x years and $2x$ years respectively.

$$\text{Then, } \frac{x-5}{2x-5} = \frac{1}{3}$$

$$\Leftrightarrow 3(x - 5) = (2x - 5) \Leftrightarrow x = 10.$$

$$\text{Required ratio} = (x + 5) : (2x + 5) = 15 : 25 \\ = 3 : 5.$$

5. Let the ages of Jayant, Prem and Saransh 10 years ago be $2x$, $3x$ and $4x$ years respectively.

$$\text{Then, } (2x + 10) + (3x + 10) + (4x + 10) = 93 \Leftrightarrow 9x = 63 \Rightarrow x = 7.$$

$$\text{Saransh's present age} = (4x + 10) = 38 \text{ y}$$

6. Let the ages of Kunal and Sagar 6 years ago be $6x$ and $5x$ years respectively.

$$\text{Then, } \frac{(6x+6)+4}{(5x+6)+4} = \frac{11}{10} \\ = 10(6x + 10) = 11(5x + 10) \\ = 5x = 10 \Leftrightarrow x = 2$$

$$\therefore \text{Sagar's present age} = (5x + 6) = 16 \text{ y}$$

7. Let the present ages of the man and his wife be $4x$ and $3x$ years respectively.

$$\text{Then, } \frac{4x+4}{3x+4} = \frac{9}{7}$$

$$\Leftrightarrow 7(4x + 4) = 9(3x + 4) \\ \Leftrightarrow x = 8.$$

So, their present ages are 32 years and 24 years respectively.

Suppose they were married z years ago.

$$\text{Then, } \frac{32-z}{24-z} = \frac{5}{3}$$

$$\Leftrightarrow 3(32 - z) = 5(24 - z) \\ \Leftrightarrow 2z = 24 \Leftrightarrow z = 12 \text{ years}$$

8. Let the school ages of Neelam and Shaan be $5x$ and $6x$ years respectively.

$$\text{Then, } \frac{\frac{1}{3} \times 5x}{\frac{1}{2} \times 6x} = \frac{5}{9} \Leftrightarrow \left(\frac{1}{3} \times 9 \times 5x\right)$$

$$= \left(\frac{5}{2} \times 6x\right) \Leftrightarrow 15 = 15.$$

Thus, Shaan's age cannot be determined.

9. Let the present ages of A and B be $5x$ and $3x$ years respectively.

$$\text{Then, } \frac{5x-4}{3x+4} = \frac{1}{1}$$

$$\Leftrightarrow 5x - 4 = 3x + 4 \\ \Leftrightarrow 2x = 8 \Leftrightarrow x = 4.$$

$$\text{Required ratio} = (5x + 4) : (3x - 4) \\ = 24 : 8 = 3 : 1.$$

10. Let the ages of A and B 10 years ago be x and $2x$ years respectively.

$$\text{Then } \frac{x+10}{2x+10} = \frac{3}{4}$$

$$\Leftrightarrow 4(x + 10) = 3(2x + 10) \\ \Leftrightarrow 2x = 10 \Leftrightarrow x = 5.$$

Sum of their present ages

$$= (x + 10) + (2x + 10) = (3x + 20) = 35 \text{ years.}$$

11. Let C's age be x years. Then, B's age = $2x$ years. A's age = $(2x + 2)$ years.

$$(2x + 2) + 2x + x = 27 \Leftrightarrow 5x = 25 \Leftrightarrow x = 5.$$

Hence, B's age = $2x = 10$ years.

12. Let the son's present age be x years. Then, man's present age = $(x + 24)$ years.

$$(x + 24) + 2 = 2(x + 2)$$

$$\Leftrightarrow x + 26 = 2x + 4 \Leftrightarrow x = 22.$$

13. Let the present ages of the father and son be $2x$ and x years respectively.

$$\text{Then, } (2x - 18) = 3(x - 18) \Leftrightarrow x = 36.$$

$$\text{Required sum} = (2x + x) = 3x = 108 \text{ years.}$$

14. Let the mother's present age be x years. Then, the person's present age = $\frac{2}{5}x$ years.

$$\left(\frac{2}{5}x + 8\right) = \frac{1}{2}(x + 8) \Leftrightarrow 2(2x + 40) = 5(x + 8) \Leftrightarrow x = 40.$$

15. 16 years ago, let T = x years and G = $8x$ years.

After 8 years from now, T = $(x + 16 + 8)$ years and G = $(8x + 16 + 8)$ years.

$$8x + 24 = 3(x + 24) \Leftrightarrow 5x = 48.$$

8 years ago,

$$\frac{T}{G} = \frac{x+8}{8x+8} = \frac{\frac{48}{5}+8}{8 \times \frac{48}{5}+8} = \frac{88}{424} = \frac{11}{53}.$$

16. Let the ages of father and son 10 years ago be $3x$ and x years respectively.

$$\text{Then, } (3x + 10) + 10 = 2[(x + 10) + 10]$$

$$\Leftrightarrow 3x + 20 = 2x + 40$$

$$\Leftrightarrow x = 20.$$

Required ratio

$$= (3x + 10) : (x + 10) = 70 : 30 = 7 : 3.$$

17. Let the ages of father and son 4 years ago be $3x$ and x years respectively.

$$\text{Then, } [(3x + 4) + 4] + [(x + 4) + 4] = 64$$

$$\Leftrightarrow 4x = 48 \Leftrightarrow x = 12.$$

$$\text{Father's present age} = 3x + 4$$

$$= 3 \times 12 + 4 = 40 \text{ years}$$

18. Let the ages of Promila and Sakshi 1 year ago be $4x$ and x years respectively.

$$\text{Then, } [(4x + 1) + 6] - [(x + 1) + 6] =$$

$$9 \Leftrightarrow 3x = 9 \Leftrightarrow x = 3.$$

$$\text{Required ratio} = (4x + 1) : (x + 1) = 13 : 4.$$

19. Let the present ages of son and father be x and $(60 - x)$ years respectively.

$$\text{Then, } (60 - x) - 6 = 5(x - 6) \Leftrightarrow 54 - x = 5x - 30 \Leftrightarrow 6x = 84 \Leftrightarrow x = 14.$$

$$\text{Son's age after 6 years} = (x + 6) = 20 \text{ years.}$$

$$20. (A + B) - (B + C) = 12 \Leftrightarrow A - C = 12.$$