8. PROBLEMS ON AGES

SOLVED EXAMPLES

Ex. 1. ***Rajeev's age after 15 years will be 5 times his age 5 years back. What is the present age of Rajeev ?*** (Hotel Management, 2002)

Sol. Let Rajeev's present age be x years. Then,

Rajeev's age after 15 years = $(x + 15)$ years.

Rajeev's age 5 years back = $(x - 5)$ years.

$\therefore \quad x + 15 = 5(x - 5) \Leftrightarrow x + 15 = 5x - 25 \Leftrightarrow 4x = 40 \Leftrightarrow x = 10.$

Hence, Rajeev's present age = 10 years.

Ex. 2. ***The ages of two persons differ by 16 years. If 6 years ago, the elder one be 3 times as old as the younger one, find their present ages.*** (A.A.O. Exam, 2003)

Sol. Let the age of the younger person be x years.

Then, age of the elder person = $(x + 16)$ years.

$\therefore \quad 3(x - 6) = (x + 16 - 6) \Leftrightarrow 3x - 18 = x + 10 \Leftrightarrow 2x = 28 \Leftrightarrow x = 14.$

Hence, their present ages are 14 years and 30 years.

Ex. 3. ***The product of the ages of Ankit and Nikita is 240. If twice the age of Nikita is more than Ankit's age by 4 years, what is Nikita's age ?*** (S.B.I.P.O. 1999)

Sol. Let Ankit's age be x years. Then, Nikita's age = $\frac{240}{x}$ years.

$\therefore \quad 2 \times \frac{240}{x} - x = 4 \Leftrightarrow 480 - x^2 = 4x \Leftrightarrow x^2 + 4x - 480 = 0$

$\Leftrightarrow (x + 24)(x - 20) = 0 \Leftrightarrow x = 20.$

Hence, Nikita's age = $\left(\frac{240}{20}\right)$ years = 12 years.

Ex. 4. ***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. Find the present age of the father.*** (S.S.C. 2003)

Sol. Let the son's present age be x years. Then, father's present age = $(3x + 3)$ years.

$\therefore \quad (3x + 3 + 3) = 2(x + 3) + 10 \Leftrightarrow 3x + 6 = 2x + 16 \Leftrightarrow x = 10.$

Hence, father's present age = $(3x + 3) = (3 \times 10 + 3)$ years = 33 years.

Ex. 5. ***Rohit was 4 times as old as his son 8 years ago. After 8 years, Rohit will be twice as old as his son. What are their present ages ?***

Sol. Let son's age 8 years ago be x years. Then, Rohit's age 8 years ago = $4x$ years.

Son's age after 8 years = $(x + 8) + 8 = (x + 16)$ years.

Rohit's age after 8 years = $(4x + 8) + 8 = (4x + 16)$ years.

$\therefore \quad 2(x + 16) = 4x + 16 \Leftrightarrow 2x = 16 \Leftrightarrow x = 8.$

Hence, son's present age = $(x + 8) = 16$ years.

Rohit's present age = $(4x + 8) = 40$ years.

Ex. 6. ***One year ago, the ratio of Gaurav's and Sachin's age was 6 : 7 respectively. Four years hence, this ratio would become 7 : 8. How old is Sachin ?*** (NABARD, 2002)

Sol. Let Gaurav's and Sachin's ages one year ago be $6x$ and $7x$ years respectively. Then,
Gaurav's age 4 years hence $= (6x + 1) + 4 = (6x + 5)$ years.
Sachin's age 4 years hence $= (7x + 1) + 4 = (7x + 5)$ years.

$$\therefore \quad \frac{6x+5}{7x+5} = \frac{7}{8} \Leftrightarrow 8(6x+5) = 7(7x+5) \Leftrightarrow 48x + 40 = 49x + 35 \Leftrightarrow x = 5.$$

Hence, Sachin's present age $= (7x + 1) = 36$ years.

Ex. 7. ***Abhay's age after six years will be three-seventh of his father's age. Ten years ago, the ratio of their ages was 1 : 5. What is Abhay's father's age at present ?***

Sol. Let the ages of Abhay and his father 10 years ago be x and $5x$ years respectively. Then,
Abhay's age after 6 years $= (x + 10) + 6 = (x + 16)$ years.
Father's age after 6 years $= (5x + 10) + 6 = (5x + 16)$ years.

$$\therefore \quad (x+16) = \frac{3}{7}(5x+16) \Leftrightarrow 7(x+16) = 3(5x+16) \Leftrightarrow 7x + 112 = 15x + 48$$
$$\Leftrightarrow 8x = 64 \Leftrightarrow x = 8.$$

Hence, Abhay's father's present age $= (5x + 10) = 50$ years.

EXERCISE 8A

(OBJECTIVE TYPE QUESTIONS)

Directions : ***Mark (✓) against the correct answer :***

1. Sachin is younger than Rahul by 4 years. If their ages are in the respective ratio of 7 : 9, how old is Sachin ? **(Bank P.O. 2003)**
   (*a*) 16 years (*b*) 18 years (*c*) 28 years
   (*d*) Cannot be determined (*e*) None of these

2. The ratio between the present ages of P and Q is 6 : 7. If Q is 4 years old than P, what will be the ratio of the ages of P and Q after 4 years ? **(S.B.I.P.O. 1998)**
   (*a*) 3 : 4 (*b*) 3 : 5 (*c*) 4 : 3
   (*d*) Data inadequate (*e*) None of these

3. The ratio between the present ages of P and Q is 5 : 7 respectively. If the difference between Q's present age and P's age after 6 years is 2, what is the total of P's and Q's present ages ? **(Bank P.O. 1999)**
   (*a*) 48 years (*b*) 52 years (*c*) 56 years
   (*d*) Cannot be determined (*e*) None of these

4. At present, the ratio between the ages of Arun and Deepak is 4 : 3. After 6 years, Arun's age will be 26 years. What is the age of Deepak at present ? **(R.R.B. 2003)**
   (*a*) 12 years (*b*) 15 years (*c*) $19\frac{1}{2}$ years (*d*) 21 years

5. Present ages of X and Y are in the ratio 5 : 6 respectively. Seven years hence this ratio will become 6 : 7 respectively. What is X's present age in years ? **(Bank P.O. 2003)**
   (*a*) 35 (*b*) 42 (*c*) 49
   (*d*) Cannot be determined (*e*) None of these

6. Present ages of Sameer and Anand are in the ratio of 5 : 4 respectively. Three years hence, the ratio of their ages will become 11 : 9 respectively. What is Anand's present age in years ? **(R.B.I. 2003)**
   (*a*) 24 (*b*) 27 (*c*) 40
   (*d*) Cannot be determined (*e*) None of these

7. 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 ? **(Bank P.O. 2004)**
(*a*) 16 years (*b*) 18 years (*c*) 20 years
(*d*) Cannot be determined (*e*) None of these

8. 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*) 24 years (*b*) 32 years (*c*) 34 years (*d*) 38 years

9. 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 ? **(S.S.C. 2002)**
(*a*) 1 : 4 (*b*) 2 : 3 (*c*) 3 : 5 (*d*) 5 : 6

10. Hitesh is 40 years old and Ronnie is 60 years old. How many years ago was the ratio of their ages 3 : 5 ?
(*a*) 5 years (*b*) 10 years (*c*) 20 years (*d*) 37 years

11. 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*) 5 : 2 (*b*) 2 : 1 (*c*) 11 : 7 (*d*) 13 : 9

12. 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). **(I.M.T. 2002)**
(*a*) 8, 20, 28 (*b*) 16, 28, 36 (*c*) 20, 35, 45 (*d*) None of these

13. 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*) 8 years (*b*) 10 years (*c*) 12 years (*d*) 15 years

14. 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 ? **(Bank P.O. 2002)**
(*a*) 25 years (*b*) 30 years (*c*) 36 years
(*d*) Cannot be determined (*e*) None of these

15. 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 ? **(SIDBI, 2000)**
(*a*) 1 : 3 (*b*) 2 : 1 (*c*) 3 : 1 (*d*) 4 : 1 (*e*) None of these

16. 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*) 20 years (*b*) 30 years (*c*) 45 years (*d*) None of these

17. 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 ? **(Hotel Management, 2003)**
(*a*) 7 (*b*) 8 (*c*) 9 (*d*) 10 (*e*) 11

18. 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 : **(R.R.B. 2003)**
(*a*) 14 years (*b*) 18 years (*c*) 20 years (*d*) 22 years

19. 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 : **(S.S.C. 2003)**
(*a*) 54 (*b*) 72 (*c*) 105 (*d*) 108

20. 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*) 32 years (*b*) 36 years (*c*) 40 years (*d*) 48 years
(IGNOU. 2003)

21. 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 ? **(S.S.C. 2003)**

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

22. 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*) 5 : 2 (*b*) 7 : 3 (*c*) 9 : 2 (*d*) 13 : 4

(L.I.C.A.A.O. 2003)

23. 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*) 32 years (*b*) 36 years (*c*) 44 years

(*d*) Data inadequate (*e*) None of these

24. 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*) 9 : 2 (*b*) 11 : 3 (*c*) 12 : 5 (*d*) 13 : 4

25. 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*) 12 years (*b*) 14 years (*c*) 18 years (*d*) 20 years

(R.R.B. 2000)

26. 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 ? **(SIDBI, 2000)**

(*a*) 12 (*b*) 24 (*c*) C is elder than A

(*d*) Data inadequate (*e*) None of these

27. 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*) 1 year (*b*) 2 years (*c*) 25 years

(*d*) Data inadequate (*e*) None of these **(Bank P.O. 1999)**

28. The age of a man is three times the sum of the ages of his two sons. Five years hence, his age will be double of the sum of the ages of his sons. The father's present age is :

(*a*) 40 years (*b*) 45 years (*c*) 50 years (*d*) 55 years

29. The sum of the ages of a father and his son is 45 years. Five years ago, the product of their ages was 34. The ages of the son and the father are respectively :

(*a*) 6 and 39 (*b*) 7 and 38 (*c*) 9 and 36 (*d*) 11 and 34

30. Rajan got married 8 years ago. His present age is $\frac{6}{5}$ times his age at the time of his marriage. Rajan's sister was 10 years younger to him at the time of his marriage. The age of Rajan's sister is : **(U.P.S.C. 2003)**

(*a*) 32 years (*b*) 36 years (*c*) 38 years (*d*) 40 years

31. The sum of the ages of 5 children born at the intervals of 3 years each is 50 years. What is the age of the youngest child ? **(S.S.C. 2000)**

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

32. Father is aged three times more than his son Ronit. After 8 years, he would be two and a half times of Ronit's age. After further 8 years, how many times would he be of Ronit's age ? **(C.B.I. 1998)**

(*a*) 2 times (*b*) $2\frac{1}{2}$ times (*c*) $2\frac{3}{4}$ times (*d*) 3 times

33. The difference between the ages of two persons is 10 years. Fifteen years ago, the elder one was twice as old as the younger one. The present age of the elder person is :
(*a*) 25 years (*b*) 35 years (*c*) 45 years (*d*) 55 years

34. 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*) 33 years (*d*) 38 years
(Assistant Grade, 1998)

35. In 10 years, A will be twice as old as B was 10 years ago. If A is now 9 years older than B, the present age of B is :
(*a*) 19 years (*b*) 29 years (*c*) 39 years (*d*) 49 years

36. Sneh's age is $\frac{1}{6}$th of her father's age. Sneh's father's age will be twice of Vimal's age after 10 years. If Vimal's eighth birthday was celebrated two years before, then what is Sneh's present age ?
(*a*) $6\frac{2}{3}$ years (*b*) 24 years (*c*) 30 years (*d*) None of these

37. If 6 years are subtracted from the present age of Gagan and the remainder is divided by 18, then the present age of his grandson Anup is obtained. If Anup is 2 years younger to Madan whose age is 5 years, then what is Gagan's present age ?
(*a*) 48 years (*b*) 60 years (*c*) 84 years (*d*) 96 years

38. Ayesha's father was 38 years of age when she was born while her mother was 36 years old when her brother four years younger to her was born. What is the difference between the ages of her parents ? **(Hotel Management, 2002)**
(*a*) 2 years (*b*) 4 years (*c*) 6 years (*d*) 8 years

39. My brother is 3 years elder to me. My father was 28 years of age when my sister was born while my mother was 26 years of age when I was born. If my sister was 4 years of age when my brother was born, then, what was the age of my father and mother respectively when my brother was born ?
(*a*) 32 yrs, 23 yrs (*b*) 32 yrs, 29 yrs (*c*) 35 yrs, 29 yrs (*d*) 35 yrs, 33 yrs

40. A person was asked to state his age in years. His reply was, "Take my age three years hence, multiply it by 3 and then subtract three times my age three years ago and you will know how old I am." What was the age of the person ? **(S.S.C. 2004)**
(*a*) 18 years (*b*) 20 years (*c*) 24 years (*d*) 32 years

ANSWERS

1. (*e*)	**2.** (*e*)	**3.** (*a*)	**4.** (*b*)	**5.** (*a*)	**6.** (*a*)	**7.** (*a*)	**8.** (*d*)
9. (*c*)	**10.** (*b*)	**11.** (*b*)	**12.** (*b*)	**13.** (*c*)	**14.** (*d*)	**15.** (*c*)	**16.** (*d*)
17. (*d*)	**18.** (*d*)	**19.** (*d*)	**20.** (*c*)	**21.** (*d*)	**22.** (*b*)	**23.** (*e*)	**24.** (*d*)
25. (*d*)	**26.** (*a*)	**27.** (*d*)	**28.** (*b*)	**29.** (*a*)	**30.** (*c*)	**31.** (*a*)	**32.** (*a*)
33. (*b*)	**34** (*b*)	**35.** (*c*)	**36.** (*d*)	**37.** (*b*)	**38.** (*c*)	**39.** (*a*)	**40.** (*a*)

SOLUTIONS

1. Let Rahul's age be x years. Then, Sachin's age = $(x - 7)$ years.

$\therefore \quad \frac{x-7}{x} = \frac{7}{9} \Leftrightarrow 9x - 63 = 7x \Leftrightarrow 2x = 63 \Leftrightarrow x = 31.5.$

Hence, Sachin's age = $(x - 7) = 24.5$ years.

2. Let P's age and Q's age be $6x$ years and $7x$ years respectively.
Then, $7x - 6x = 4 \Leftrightarrow x = 4$.
$\therefore$ Required ratio $= (6x + 4) : (7x + 4) = 28 : 32 = 7 : 8$.

3. Let the present ages of P and Q be $5x$ years and $7x$ years respectively.
Then, $7x - (5x + 6) = 2 \Leftrightarrow 2x = 8 \Leftrightarrow x = 4$.
$\therefore$ Required sum $= 5x + 7x = 12x = 48$ years.

4. Let the present ages of Arun and Deepak be $4x$ years and $3x$ years respectively. Then,
$4x + 6 = 26 \Leftrightarrow 4x = 20 \Leftrightarrow x = 5$.
$\therefore$ Deepak's age $= 3x = 15$ years.

5. Let the present ages of X and Y be $5x$ years and $6x$ years respectively.
Then, $\frac{5x + 7}{6x + 7} = \frac{6}{7} \Leftrightarrow 7(5x + 7) = 6(6x + 7) \Leftrightarrow x = 7$.
$\therefore$ X's present age $= 5x = 35$ years.

6. Let the present ages of Sameer and Anand be $5x$ years and $4x$ years respectively.
Then, $\frac{5x + 3}{4x + 3} = \frac{11}{9} \Leftrightarrow 9(5x + 3) = 11(4x + 3) \Leftrightarrow x = 6$.
$\therefore$ Anand's present age $= 4x = 24$ years.

7. Let the ages of Kunal and Sagar 6 years ago be $6x$ and $5x$ years respectively.
Then, $\frac{(6x + 6) + 4}{(5x + 6) + 4} = \frac{11}{10} \Leftrightarrow 10(6x + 10) = 11(5x + 10) \Leftrightarrow 5x = 10 \Leftrightarrow x = 2$.
$\therefore$ Sagar's present age $= (5x + 6) = 16$ years.

8. Let the ages of Jayant, Prem and Saransh 10 years ago be $2x$, $3x$ and $4x$ years respectively.
Then, $(2x + 10) + (3x + 10) + (4x + 10) = 93 \Leftrightarrow 9x = 63 \Leftrightarrow x = 7$.
$\therefore$ Saransh's present age $= (4x + 10) = 38$ years.

9. Let the present ages of the two brothers be x years and $2x$ years respectively.
Then, $\frac{x - 5}{2x - 5} = \frac{1}{3} \Leftrightarrow 3(x - 5) = (2x - 5) \Leftrightarrow x = 10$.
$\therefore$ Required ratio $= (x + 5) : (2x + 5) = 15 : 25 = 3 : 5$.

10. Suppose, the ratio was $3 : 5$, x years ago.
Then, $\frac{40 - x}{60 - x} = \frac{3}{5} \Leftrightarrow 5(40 - x) = 3(60 - x) \Leftrightarrow 2x = 20 \Leftrightarrow x = 10$.

11. Let the present ages of the father and son be $7x$ and $3x$ years respectively.
Then, $7x \times 3x = 756 \Leftrightarrow 21x^2 = 756 \Leftrightarrow x^2 = 36 \Leftrightarrow x = 6$.
$\therefore$ Required ratio $= (7x + 6) : (3x + 6) = 48 : 24 = 2 : 1$.

12. Let their present ages be $4x$, $7x$ and $9x$ years respectively.
Then, $(4x - 8) + (7x - 8) + (9x - 8) = 56 \Leftrightarrow 20x = 80 \Leftrightarrow x = 4$.
$\therefore$ Their present ages are 16 years, 28 years and 36 years respectively.

13. Let the present ages of the man and his wife be $4x$ and $3x$ years respectively.
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.
Then, $\frac{32 - z}{24 - z} = \frac{5}{3} \Leftrightarrow 3(32 - z) = 5(24 - z) \Leftrightarrow 2z = 24 \Leftrightarrow z = 12$.

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

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

Then, $\frac{5x-4}{3x+4}=\frac{1}{1} \Leftrightarrow 5x-4=3x+4 \Leftrightarrow 2x=8 \Leftrightarrow x=4.$

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

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

Then, $\frac{x+10}{2x+10}=\frac{3}{4} \Leftrightarrow 4(x+10)=3(2x+10) \Leftrightarrow 2x=10 \Leftrightarrow x=5.$

$\therefore$ Sum of their present ages $=(x+10)+(2x+10)=(3x+20)=35$ years.

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

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

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

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

$\therefore (x+24)+2=2(x+2) \Leftrightarrow x+26=2x+4 \Leftrightarrow x=22.$

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

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

$\therefore$ Required sum $=(2x+x)=3x=108$ years.

20. Let the mother's present age be x years. Then, the person's present age $=\left(\frac{2}{5}x\right)$ years.

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

21. 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.

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

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

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

Then, $(3x+10)+10=2[(x+10)+10] \Leftrightarrow 3x+20=2x+40 \Leftrightarrow x=20.$

$\therefore$ Required ratio $=(3x+10):(x+10)=70:30=7:3.$

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

Then, $[(3x+4)+4]+[(x+4)+4]=64 \Leftrightarrow 4x=48 \Leftrightarrow x=12.$

$\therefore$ Father's present age $=3x=36$ years.

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

Then, $[(4x+1)+6]-[(x+1)+6]=9 \Leftrightarrow 3x=9 \Leftrightarrow x=3.$

$\therefore$ Required ratio $=(4x+1):(x+1)=13:4.$

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

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

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

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

27. $R-Q=R-T \Rightarrow Q=T$. Also, $R+T=50 \Rightarrow R+Q=50.$

So, $(R-Q)$ cannot be determined.

28. Let the sum of present ages of the two sons be x years.
Then, father's present age = $3x$ years.
$\therefore \quad (3x + 5) = 2\,(x + 10) \Leftrightarrow 3x + 5 = 2x + 20 \Leftrightarrow x = 15.$
Hence, father's present age = 45 years.

29. Let the ages of father and son be x and $(45 - x)$ years respectively.
Then, $(x - 5)\,(45 - x - 5) = 34 \Leftrightarrow (x - 5)\,(40 - x) = 34 \Leftrightarrow x^2 - 45x + 234 = 0$
$\Leftrightarrow (x - 39)\,(x - 6) = 0 \Leftrightarrow x = 39$ or $x = 6.$
$\therefore$ Father's age = 39 years and son's age = 6 years.

30. Let Rajan's present age be x years. Then, his age at the time of marriage = $(x - 8)$ years.
$\therefore \quad x = \frac{6}{5}(x - 8) \Leftrightarrow 5x = 6x - 48 \Leftrightarrow x = 48.$
Rajan's sister's age at the time of his marriage = $(x - 8) - 10 = (x - 18) = 30$ years.
$\therefore$ Rajan's sister's present age = $(30 + 8)$ years = 38 years.

31. Let the ages of the children be x, $(x + 3)$, $(x + 6)$, $(x + 9)$ and $(x + 12)$ years.
Then, $x + (x + 3) + (x + 6) + (x + 9) + (x + 12) = 50 \Leftrightarrow 5x = 20 \Leftrightarrow x = 4.$
$\therefore$ Age of the youngest child = $x = 4$ years.

32. Let Ronit's present age be x years. Then, father's present age = $(x + 3x)$ years = $4x$ years.
$\therefore \quad (4x + 8) = \frac{5}{2}(x + 8) \Leftrightarrow 8x + 16 = 5x + 40 \Leftrightarrow 3x = 24 \Leftrightarrow x = 8.$
Hence, required ratio = $\frac{(4x + 16)}{(x + 16)} = \frac{48}{24} = 2.$

33. Let their ages be x years and $(x + 10)$ years respectively.
Then, $(x + 10) - 15 = 2\,(x - 15) \Leftrightarrow x - 5 = 2x - 30 \Leftrightarrow x = 25.$
$\therefore$ Present age of the elder person = $(x + 10) = 35$ years.

34. Let the son's present age be x years. Then, $(38 - x) = x \Leftrightarrow 2x = 38 \Leftrightarrow x = 19.$
$\therefore$ Son's age 5 years back = $(19 - 5)$ years = 14 years.

35. Let B's present age = x years. Then, A's present age = $(x + 9)$ years.
$\therefore \quad (x + 9) + 10 = 2\,(x - 10) \Leftrightarrow x + 19 = 2x - 20 \Leftrightarrow x = 39.$

36. Vimal's age after 10 years = $(8 + 2 + 10)$ years = 20 years.
Sneh's father's age after 10 years = 40 years. Sneh's father's present age = 30 years.
$\therefore$ Sneh's age = $\left(\frac{1}{6} \times 30\right)$ years = 5 years.

37. Anup's age = $(5 - 2)$ years = 3 years. Let Gagan's age be x years.
Then, $\frac{x - 6}{18} = 3 \Leftrightarrow x - 6 = 54 \Leftrightarrow x = 60.$

38. Mother's age when Ayesha's brother was born = 36 years.
Father's age when Ayesha's brother was born = $(38 + 4)$ years = 42 years.
$\therefore$ Required difference = $(42 - 36)$ years = 6 years.

39. Clearly, my brother was born 3 years before I was born and 4 years after my sister was born.
So, father's age when brother was born = $(28 + 4)$ years = 32 years;
mother's age when brother was born = $(26 - 3)$ years = 23 years.

40. Let the present age of the person be x years.
Then, $3\,(x + 3) - 3\,(x - 3) = x \Leftrightarrow (3x + 9) - (3x - 9) = x \Leftrightarrow x = 18.$

EXERCISE 8B

(DATA SUFFICIENCY TYPE QUESTIONS)

Directions (*Questions 1 to 8*) : *Each of the questions given below consists of a statement and/or a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statement(s) is/are sufficient to answer the question. Read both the statements and*

Give answer (a) if the data in Statement I alone are sufficient to answer the question, while the data in Statement II alone are not sufficient to answer the question;

Give answer (b) if the data in Statement II alone are sufficient to answer the question, while the data in Statement I alone are not sufficient to answer the question;

Give answer (c) if the data either in Statement I or in Statement II alone are sufficient to answer the question;

Give answer (d) if the data even in both Statements I and II together are not sufficient to answer the question;

Give answer (e) if the data in both Statements I and II together are necessary to answer the question.

1. The sum of the ages of P, Q and R is 96 years. What is the age of Q ?
   I. P is 6 years older than R.
   II. The total of the ages of Q and R is 56 years.
2. What is Sonia's present age ? **(Bank P.O. 2003)**
   I. Sonia's present age is five times Deepak's present age.
   II. Five years ago her age was twenty-five times Deepak's age at that time.
3. How old is C now ?
   I. Three years ago, the average of A and B was 18 years.
   II. With C joining them now, the average becomes 22 years.
4. What is Reena's present age ? **(Bank P.O. 2003)**
   I. Reena's present age is five times her son's present age.
   II. Reena's age two years hence will be three times her daughter's age at that time.
5. What is the average age of A and B ?
   I. The ratio between one-fifth of A's age and one-fourth of B's age is 1 : 2.
   II. The product of their ages is 20 times B's age.
6. Average age of employees working in a department is 30 years. In the next year, ten workers will retire. What will be the average age in the next year ? **(I.M.T. 2002)**
   I. Retirement age is 60 years.
   II. There are 50 employees in the department.
7. What is the ratio between the ages of the father and the son ?
   I. The sum of their ages is 50 years.
   II. 3 times the sum of their ages is equal to 5 times the father's age.
8. Divya is twice as old as Shruti. What is the difference in their ages ? **(Bank P.O. 2003)**
   I. Five years hence, the ratio of their ages would be 9 : 5.
   II. Ten years back, the ratio of their ages was 3 : 1.

Directions (*Questions 9 to 13*) : *Each of the questions given below consists of a question followed by three statements. You have to study the question and the statements and decide which of the statements is/are necessary to answer the question.*

9. What is the present age of A ?
   I. The sum of the ages of A and B is 21 years.
   II. The difference of the ages of A and B is 5 years.

III. The product of the ages of A and B is 104 years.

(a) I and II only (b) II and III only (c) I and III only

(d) Any two of the three (e) None of these

10. What is the present age of Tanya ? **(Bank P.O. 2004)**

I. The ratio between the present ages of Tanya and her brother Rahul is 3 : 4 respectively.

II. After 5 years the ratio between the ages of Tanya and Rahul will be 4 : 5.

III. Rahul is 5 years older than Tanya.

(a) I and II only (b) II and III only (c) I and III only

(d) All I, II and III (e) Any two of the three

11. What is the difference between the ages of Y and X ?

I. The ratio between the ages of X and Y is 2 : 3.

II. Y's age is 50% more than X's age.

III. One-fourth of X's age is equal to one-sixth of Y's age.

(a) All I, II and III (b) Any two of the three

(c) III, and either I or II (d) Only I and II

(e) Question cannot be answered even with information in all three statements

12. What is Arun's present age ? **(M.B.A. 2002)**

I. Five years ago, Arun's age was double that of his son's age at that time.

II. Present ages of Arun and his son are in the ratio of 11 : 6 respectively.

III. Five years hence, the respective ratio of Arun's age and his son's age will become 12 : 7.

(a) Only I and II (b) Only II and III (c) Only I and III

(d) Any two of the three (e) None of these

13. What is Ravi's present age ? **(R.B.I. 2002)**

I. The present age of Ravi is half of that of his father.

II. After 5 years, the ratio of Ravi's age to that of his father's age will be 6 : 11.

III. Ravi is 5 years younger than his brother.

(a) I and II only (b) II and III only

(c) I and III only (d) All I, II and III

(e) Even with all the three statements answer cannot be given.

Directions (*Questions 14 to 16*) : *Each of these questions is followed by three statements. You have to study the question and all the three statements given to decide whether any information provided in the statement(s) is redundant and can be dispensed with while answering the given question.*

14. What is the ratio of the present ages of Anna and her mother ?

I. The sum of the ages of Anna, her mother and her father is 62.

II. Five years ago, Anna's age was one-fifth of her father's age.

III. Two years ago, the sum of the ages of Anna and her father was 36.

(a) I or II only (b) II or III only (c) III only

(d) I or III only (e) All I, II and III are required.

15. What will be the ratio between ages of Sam and Albert after 5 years ? **(Bank P.O. 1999)**

I. Sam's present age is more than Albert's present age by 4 years.

II. Albert's present age is 20 years.

III. The ratio of Albert's present age to Sam's present age is 5 : 6.

(a) I or II or III only (b) II only (c) III only
(d) I or III only (e) II or III only.

16. What is the difference between the present ages of Ayush and Deepak ? (S.B.I.P.O. 1998)
I. The ratio between Ayush's present age and his age after 8 years is 4 : 5.
II. The ratio between the present ages of Ayush and Deepak is 4 : 3.
III. The ratio between Deepak's present age and his age four years ago is 6 : 5.
(a) Any two of I, II and III (b) I or III only
(c) Any one of the three (d) All I, II and III are required
(e) Even with all I, II and III, the answer cannot be obtained.

ANSWERS

1. (e)	2. (e)	3. (e)	4. (d)	5. (e)	6. (e)	7. (b)	8. (c)
9. (d)	10. (e)	11. (e)	12. (d)	13. (a)	14. (e)	15. (a)	16. (c)

SOLUTIONS

1. Given : $P + Q + R = 96$ ...(i)
I. $P = R + 6$ ...(ii)
II. $Q + R = 56$ ...(iii)
On subtracting (iii) from (i), we get $P = 40$.
Putting $P = 40$ in (ii), we get $R = 34$. Putting $R = 34$ in (iii), we get $Q = 22$.
Thus, I and II both together give the answer. So, correct answer is (e).

2. I. $S = 5D \Rightarrow D = \frac{S}{5}$ ...(i)
II. $S - 5 = 25\,(D - 5) \Leftrightarrow S = 25D - 120$ ...(ii)
Using (i) in (ii), we get $S = \left(25 \times \frac{S}{5}\right) - 120 \Leftrightarrow 4S = 120 \Leftrightarrow S = 30$.
Thus, I and II both together give the answer. So, correct answer is (e).

3. I. 3 years ago, $\frac{1}{2}(A + B) = 18 \Rightarrow$ 3 years ago, $(A + B) = 36$
Now, $(A + B) = (36 + 3 + 3) = 42 \Rightarrow A + B = 42$ ...(i)
II. Now, $\frac{1}{3}(A + B + C) = 22 \Rightarrow A + B + C = 66$ ...(ii)
From I and II, we get $C = (66 - 42) = 24$.
Thus, I and II both together give the answer. So, correct answer is (e).

4. I. Reena's Present age = 5 × (Her son's present age).
II. Reena's age 2 years hence = 3 times her daughter's age at that time.
Clearly, data even in I and II is not sufficient to get Reena's present age.
∴ Correct answer is (d).

5. I. $\frac{A}{5} : \frac{B}{4} = 1 : 2 \Leftrightarrow \frac{A}{5} \times \frac{4}{B} = \frac{1}{2} \Leftrightarrow \frac{A}{B} = \left(\frac{1}{2} \times \frac{5}{4}\right) = \frac{5}{8} \Leftrightarrow A : B = 5 : 8$.
II. $20B = AB$.
Let A's age be $5x$ years. Then, B's age is $8x$ years.
∴ $20 \times 8x = 5x \times 8x \Leftrightarrow 40x = 160 \Leftrightarrow x = 4$.
∴ $A = 20$ and $B = 32$.
Thus, I and II together give the answer. So, correct answer is (e).

6. I. Retirement age is 60 years.
II. There are 50 employees in the department.
Average age of 50 employees = 30 years.
Total age of 50 employees = (50×30) years = 1500 years.
Number of employees next year = 40.
Total age of 40 employees next year = $(1500 + 40 - 60 \times 10) = 940$.
Average age next year = $\frac{940}{40}$ years = $23\frac{1}{2}$ years.
Thus, I and II together give the answer. So, correct answer is (*e*).

7. I. $F + S = 50$ ...(*i*) II. $3(F + S) = 5F$ ...(*ii*)
From II, we get $2F = 3S \Leftrightarrow \frac{F}{S} = \frac{3}{2}$.
Thus, II alone gives the answer, but I alone does not give the answer.
∴ Correct answer is (*b*).

8. Let Divya's present age be D years and Shruti's present age be S years.
Then, $D = 2 \times S \Leftrightarrow D - 2S = 0$ ...(*i*)
I. $\frac{D+5}{S+5} = \frac{9}{5}$ ...(*ii*) II. $\frac{D-10}{S-10} = \frac{3}{1}$ ...(*iii*)
From (*ii*), we get $5D + 25 = 9S + 45 \Leftrightarrow 5D - 9S = 20$ ...(*iv*)
From (*iii*), we get $D - 10 = 3S - 30 \Leftrightarrow D - 3S = -20$ ...(*v*)
Thus from (*i*) and (*ii*), we get the answer.
Also, from (*i*) and (*iii*), we get the answer.
∴ I alone as well as II alone gives the answer. Hence, the correct answer is (*e*).

9. I. $A + B = 21$. II. $A - B = 5$. III. $AB = 104$.
Clearly, any two of three will give the answer. So, correct answer is (*d*).

10. I. Let the present ages of Tanya and Rahul be $3x$ years and $4x$ years.
II. After 5 years, (Tanya's age) : (Rahul's age) = 4 : 5.
III. (Rahul's age) = (Tanya's age) + 5.
From I and II, we get $\frac{3x+5}{4x+5} = \frac{4}{5}$. This gives x.
∴ Tanya's age = $3x$ can be found. Thus, I and II give the answer.
From I and III, we get $4x = 3x + 5$. This gives x.
∴ Tanya's age = $3x$ can be found. Thus, I and III give the answer.
From III : Let Tanya's present age be t years.
Then, Rahul's present age = $(t + 5)$ years.
Thus, **from II and III,** we get : $\frac{t}{t+5} = \frac{4}{5}$. This gives t.
Thus, II and III give the answer.
∴ Correct answer is (*e*).

11. I. $X : Y = 2 : 3 \Rightarrow \frac{X}{Y} = \frac{2}{3} \Rightarrow 3X = 2Y$.
II. $Y = \frac{150}{100}X \Rightarrow Y = \frac{3X}{2} \Rightarrow 3X = 2Y$.
III. $\frac{1}{4}X = \frac{1}{6}Y \Rightarrow 6X = 4Y \Rightarrow 3X = 2Y$.
Thus, even I, II and III together do not give the answer.
∴ Correct answer is (*e*).