

Exercise 6(F)

Solution 1:

Let present age of A = x years
And present age of B = y years
According to the question,

Five years ago,

$$x - 5 = 4(y - 5)$$

$$x - 4y = -15 \dots(1)$$

Five years later,

$$x + 5 = 2(y + 5)$$

$$x - 2y = 5 \quad \dots(2)$$

Now subtracting (1) from (2)

$$x - 2y = 5 \quad \dots(2)$$

$$x - 4y = -15 \quad \dots(1)$$

$$\begin{array}{r} - \quad + \quad + \\ \hline 2y = 20 \end{array}$$

$$y = 10$$

From (1)

$$x - 4(10) = -15$$

$$x = 25$$

Present ages of A and B are 25 years and 10 years respectively.

Solution 2:

Let A's present age be x years
and B's present age be y years

According to the question

$$x = y + 20$$

$$x - y = 20 \dots(1)$$

Five years ago,

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

$$x - 3y = -10 \quad \dots(2)$$

Subtracting (1) from (2),

$$x - 3y = -10 \quad \dots(2)$$

$$x - y = 20 \quad \dots(1)$$

$$\begin{array}{r} - \quad + \quad - \\ \hline -2y = -30 \end{array}$$

$$y = 15$$

From (1)

$$x = 15 + 20$$

$$x = 35$$

Thus, present ages of A and B are 35 years and 15 years.

Solution 3:

Let the present age of the mother be x years
and the present age of the daughter be y year.

According to the question,

$$x - 4 = 4(y - 4) \Rightarrow x - 4 = 4y - 16 \Rightarrow x - 4y = -12 \dots (i)$$

$$\text{and } x + 6 = 2\frac{1}{2}(y + 6) \Rightarrow x + 6 = \frac{5}{2}y + 15 \Rightarrow x - \frac{5}{2}y = 9 \dots (ii)$$

Solving (i) and (ii), we get

$$y = 14 \text{ and } x = 44$$

Hence, the present age of the mother is 44 years
and the present age of the daughter is 14 years.

Solution 4:

Let the present age of the man be x years
and let the sum of the ages of his two children be y years.

According to the question,

$$x = 2y \dots (i)$$

$$\text{and } x + 20 = y + 40 \dots (ii) \dots (\text{Since he has two children})$$

Solving (i) and (ii), we get

$$2y + 20 = y + 40 \Rightarrow y = 20$$

$$\text{So, } x = 2y \Rightarrow x = 40$$

Hence, the present age of the man is 40 years.

Solution 5:

Let A's annual income = Rs. x
and B's annual income = Rs. y

According to the question,

$$\frac{x}{y} = \frac{3}{4}$$

$$4x - 3y = 0 \dots (1)$$

$$\text{and, } \frac{x - 5000}{y - 5000} = \frac{5}{7}$$

$$7x - 5y = 10000 \dots (2)$$

Multiplying equation no. (1) by 7 and (2) by 4 and subtracting (4) from (3)

$$28x - 21y = 0 \quad \dots (3)$$

$$28x - 20y = 40000 \quad \dots (4)$$

$$\begin{array}{r} - \quad + \quad - \\ \hline - y = -40000 \end{array}$$

$$y = 40,000$$

From (1)

$$4x - 3(40000) = 0$$

$$x = 30000$$

Thus, A's income in Rs. 30,000 and B's income is Rs. 40,000.

Solution 6:

Let the no. of pass candidates be x
and the no. of fail candidates be y .
According to the question,

$$\frac{x}{y} = \frac{y}{1}$$

$$x - 4y = 0 \dots(1)$$

$$\text{and } \frac{x - 20}{y - 10} = \frac{5}{1}$$

$$x - 5y = -30 \dots(2)$$

$$x - 4y = 0 \quad \dots(1)$$

$$x - 5y = -30 \quad \dots(2)$$

$$\begin{array}{r} - \quad + \quad + \\ \hline y = 30 \end{array}$$

From (1)

$$-4(30) = 0$$

$$x = 120$$

$$\text{Total students appeared} = x + y$$

$$= 120 + 30$$

$$= 150$$

Solution 7:

Let the number of pencils with A = x
and the number of pencils with B = y .

If A gives 10 pencils to B,

$$y + 10 = 2(x - 10)$$

$$2x - y = 30 \dots(1)$$

If B gives 10 pencils to A

$$y - 10 = x + 10$$

$$x - y = -20 \quad \dots(2)$$

$$2x - y = 30 \quad \dots(1)$$

$$\begin{array}{r} - \quad + \quad - \\ \hline -x = -50 \end{array}$$

$$x = 50$$

From (1)

$$2(50) - y = 30$$

$$y = 70$$

Thus, A has 50 pencils and B has 70 pencils.

Solution 8:

Let the number of adults = x
and the number of children = y

According to the question,

$$x + y = 1250 \dots(1)$$

$$\text{and } 75x + 25y = 61250$$

$$3x + y = 2450 \quad \dots(2)$$

$$x + y = 1250 \quad \dots(1)$$

$$\begin{array}{r} - \quad - \quad - \\ \hline 2x = 1200 \end{array}$$

$$x = 600$$

From (1)

$$600 + y = 1250$$

$$y = 650$$

Thus, number of adults = 600

and the number of children = 650.

Solution 9:

Let the cost price of article A = Rs. x
and the cost price of articles B = Rs. y

According to the question,

$$(x + 5\% \text{ of } x) + (y + 7\% \text{ of } y) = 1167$$

$$\left(x + \frac{5}{100}x\right) + \left(y + \frac{7}{100}y\right) = 1167$$

$$\frac{21x}{20} + \frac{107y}{100} = 1167$$

$$105x + 107y = 116700 \dots(1)$$

$$\text{and } \frac{107x}{100} + \frac{105y}{100} = 1165$$

$$107x + 105y = 116500 \dots(2)$$

Adding(1) and (2)

$$212x + 212y = 233200$$

$$x + y = 1100 \dots(3)$$

subtracting (2) from (1)

$$-2x + 2y = 200$$

$$-x + y = 100 \quad \dots(4)$$

$$x + y = 1100 \quad \dots(3)$$

$$\hline 2y = 1200$$

$$y = 600$$

from (3)

$$x + 600 = 1100$$

$$x = 500$$

Thus, cost price of article A is Rs. 500.

and that of article B is Rs. 600.

Solution 10:

$$\text{Let Pooja's 1 day work} = \frac{1}{x}$$

$$\text{and Ritu's 1 day work} = \frac{1}{y}$$

According to the question,

$$\frac{1}{x} + \frac{1}{y} = \frac{7}{120} \quad \dots(1)$$

$$\text{and, } \frac{1}{x} = \frac{3}{4} \cdot \frac{1}{y}$$

$$y = \frac{3}{4}x \quad \dots(2)$$

Using the value of y from (2) in (1)

$$\frac{1}{x} + \frac{4}{3x} = \frac{7}{120}$$

$$\frac{1}{x} \left(\frac{7}{3} \right) = \frac{7}{120}$$

$$x = 40$$

$$\text{From (2) } y = \frac{3}{4}(40) = 30$$

$$y = 30$$

Pooja will complete the work in 40 days and Ritu will complete the work in 30 days.