

120 bananas

Work & Time

Q 1.

Example: A can do a piece of work in 10 days. B can also do the same work in 12 days and C can do the same work in 15 days. A & B start the work and work for 2 days and then B leave and after 1 more day, C joins A to complete the work. In how many days will the work be completed?

Ans

$$\begin{aligned} A &\longrightarrow 10 \text{ days}, \quad (W) \Rightarrow \underline{1 \text{ day}} \longrightarrow \left(\frac{1}{10} W\right) \Rightarrow 2 \\ B &\longrightarrow 12 \text{ days}, \quad \Rightarrow 1 \text{ day} \longrightarrow \left(\frac{W}{12}\right) \Rightarrow 10 \\ C &\longrightarrow 15 \text{ days}, \quad \Rightarrow 1 \text{ day} \longrightarrow \left(\frac{W}{15}\right) \end{aligned}$$

① A & B - 2 days

$$\text{Total Work, } W_1 = \left(2 \times \frac{W}{10}\right) + \left(2 \times \frac{W}{12}\right)$$

② (A) - 1 day

$$W_2 = 1 \times \frac{W}{10} \longrightarrow \underline{3-2}$$

③ (C) & (A) - 2 days

$$W_{\text{total}} = W_1 + W_2 = \left(2 \times \frac{W}{10}\right) + \left(2 \times \frac{W}{12}\right) + \left(1 \times \frac{W}{10}\right)$$

$$\begin{aligned} W_{\text{total}} &= \left[\frac{24W + 20W + 12W}{120} \right] \\ &= \frac{56W}{30} = \left[\frac{7}{5} W \right] \end{aligned}$$

$$W_{\text{left}} = (W) - \left(\frac{7}{5} W \right)$$

$$W_{\text{left}} = \left(\frac{15-7}{15} \right) W = \frac{8}{15} W$$

$$W_{A\&C} = \left(\frac{W}{10} + \frac{W}{15} \right) \times \underline{x} = \underline{\frac{8}{15} W}$$

$$\left(\frac{3W + 2W}{30 \cdot 2} \right) \times x = \frac{8}{15} W$$

$$\frac{5W}{2} \times x = 8W$$

$$x = \frac{16}{5}$$

$$x = 3.2 \text{ days}$$

$$\begin{aligned} \text{Total Days} &= 2 + 1 + 3.2 \\ &= \boxed{6.2 \text{ days}} \end{aligned}$$