



### Exercise 3E

Question 45:

Let the length of a rectangle be  $x$  meters and breadth be  $y$  meters.

Then, area =  $xy$  sq.m

Now,

$$xy - (x - 5)(y + 3) = 8$$

$$xy \times [xy \times 5y + 3x - 15] = 8$$

$$xy \times xy + 5y \times 3x + 15 = 8$$

$$3x - 5y = 7 \text{ ---(1)}$$

And

$$(x + 3)(y + 2) - xy = 74$$

$$xy + 3y + 2x + 6 \times xy = 74$$

$$2x + 3y = 68 \text{ ---(2)}$$

Multiplying (1) by 3 and (2) by 5, we get

$$9x - 15y = 21 \text{ ---(3)}$$

$$10x + 15y = 340 \text{ ---(4)}$$

Adding (3) and (4), we get

$$19x = 361 \Rightarrow x = \frac{361}{19} = 19$$

Putting  $x = 19$  in (3) we get

$$9 \times 19 - 15y = 21 \Rightarrow 171 - 15y = 21 \Rightarrow y = \frac{150}{15} = 10$$

$x = 19$  meters,  $y = 10$  meters

Hence, length = 19m and breadth = 10m

Question 46:

Let man's 1 day's work be  $\frac{1}{x}$  and 1 boy's day's work be  $\frac{1}{y}$

Also let  $\frac{1}{x} = u$  and  $\frac{1}{y} = v$

$$\text{Then, } \frac{2}{x} + \frac{5}{y} = \frac{1}{4} \Rightarrow 2u + 5v = \frac{1}{4} \text{ --- (1)}$$

$$\text{and } \frac{3}{x} + \frac{6}{y} = \frac{1}{3} \Rightarrow 3u + 6v = \frac{1}{3} \text{ --- (2)}$$

Multiplying (1) by 6 and (2) by 5 we get

$$12u + 30v = \frac{6}{4} \text{ --- (3)}$$

$$15u + 30v = \frac{5}{3} \text{ --- (4)}$$

Subtracting (3) from (4), we get

$$3u = \frac{5}{3} - \frac{6}{4}$$

$$\Rightarrow 3u = \frac{20-18}{12}$$

$$\Rightarrow 3u = \frac{2}{12}$$

$$\Rightarrow 3u = \frac{1}{6}$$

$$\Rightarrow u = \frac{1}{18}$$

Putting  $u = \frac{1}{18}$  in (1), we get

$$2 \times \frac{1}{18} + 5v = \frac{1}{4} \Rightarrow \frac{1}{9} + 5v = \frac{1}{4} \Rightarrow 5v = \frac{1}{4} - \frac{1}{9}$$

$$\Rightarrow 5v = \frac{5}{36} \Rightarrow v = \frac{1}{36}$$

$$\text{Now } u = \frac{1}{18} \Rightarrow x = \frac{1}{u} = 18$$

$$\text{and } v = \frac{1}{36} \Rightarrow y = \frac{1}{v} = 36$$

$$x = 18, y = 36$$

The man will finish the work in 18 days and the boy will finish the work in 36 days when they work alone.

\*\*\*\*\* END \*\*\*\*\*