



Exercise 3D

Question 23:

$$(a - 1)x + 3y - 2 = 0$$

$$6x + (1 - 2b)y - 6 = 0$$

These equations are of the form

$$a_1x + b_1y + c_1 = 0, a_2x + b_2y + c_2 = 0$$

$$\text{where, } a_1 = (a - 1), b_1 = 3, c_1 = -2$$

$$a_2 = 6, b_2 = (1 - 2b), c_2 = -6$$

For infinite many solutions, we must have

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$$

$$\frac{(a - 1)}{6} = \frac{3}{(1 - 2b)} = \frac{-2}{-6}$$

$$\Rightarrow \frac{a - 1}{6} = \frac{3}{(1 - 2b)} = \frac{1}{3}$$

$$\Rightarrow \frac{a - 1}{6} = \frac{3}{(1 - 2b)} = \frac{1}{3}$$

$$\Rightarrow \frac{a - 1}{6} = \frac{1}{3} \text{ and } \frac{3}{(1 - 2b)} = \frac{1}{3}$$

$$\Rightarrow 3a - 3 = 6 \text{ and } 9 = 1 - 2b$$

$$\Rightarrow 3a = 6 + 3 \text{ and } 2b = 1 - 9$$

$$3a = 9 \Rightarrow a = \frac{9}{3} = 3 \text{ and } 2b = -8$$

$$b = \frac{-8}{2} = -4$$

Question 24:

$$(2a - 1)x + 3y - 5 = 0$$

$$3x + (b - 1)y - 2 = 0$$

These equations are of the form

$$a_1x + b_1y + c_1 = 0, a_2x + b_2y + c_2 = 0$$

$$\text{where, } a_1 = (2a - 1), b_1 = 3, c_1 = -5$$

$$a_2 = 3, b_2 = (b - 1), c_2 = -2$$

These holds only when

$$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$$

$$\frac{(2a - 1)}{3} = \frac{3}{(b - 1)} = \frac{-5}{-2}$$

$$\frac{(2a - 1)}{3} = \frac{3}{(b - 1)} = \frac{5}{2}$$

$$\frac{(2a - 1)}{3} = \frac{5}{2} \text{ and } \frac{3}{(b - 1)} = \frac{5}{2}$$

$$4a - 2 = 15 \text{ and } 5(b - 1) = 6$$

$$4a = 17 \text{ and } 5b - 5 = 6$$

$$a = \frac{17}{4} \text{ and } 5b = 11$$

$$b = \frac{11}{5}$$

$$a = \frac{17}{4} \text{ and } b = \frac{11}{5}$$

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