Question 23:

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

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

These equations are of the form

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

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

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

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

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

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

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

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

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

$3a = 9 \Rightarrow a = \frac{9}{3} = 3$ 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

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

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

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

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

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

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

$4a - 2 = 15$ and $5(b - 1) = 6$

$4a = 17$ and $5b - 5 = 6$

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

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

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

********** END *********