



Exercise 3C

Question 7:

$$7x - 2y - 3 = 0$$

By cross multiplication, we have

$$\therefore \frac{x}{\begin{bmatrix} (-2)(-8) - \left(\frac{-3}{2}\right) \times (-3) \end{bmatrix}} = \frac{y}{\begin{bmatrix} (-3 \times 11) - (-8 \times 7) \end{bmatrix}} = \frac{1}{\begin{bmatrix} 7 \times \left(\frac{-3}{2}\right) - 11 \times (-2) \end{bmatrix}}$$

$$\Rightarrow \frac{x}{16 - \frac{9}{2}} = \frac{y}{-33 + 56} = \frac{1}{\frac{-21}{2} + 22}$$

$$\Rightarrow \frac{x}{\left(\frac{23}{2}\right)} = \frac{y}{23} = \frac{1}{\frac{23}{2}}$$

$$\Rightarrow \frac{x}{\left(\frac{23}{2}\right)} = \frac{1}{\frac{23}{2}}, \frac{y}{23} = \frac{1}{\frac{23}{2}}$$

Hence $x = 1$, $y = 2$ is the solution

Question 8:

$$\frac{x}{6} + \frac{y}{15} - 4 = 0$$

$$\frac{x}{3} - \frac{y}{12} - \frac{19}{4} = 0$$

$$\therefore \frac{\frac{x}{\frac{1}{15} \times \left(-\frac{19}{4}\right) - \left(-\frac{1}{12}\right)(-4)}}{\frac{y}{(-4)\left(\frac{1}{3}\right) - \left(\frac{1}{6}\right)\left(-\frac{19}{4}\right)}} = \frac{1}{\frac{1}{6} \times \left(-\frac{1}{12}\right) - \frac{1}{3} \times \frac{1}{15}}$$

$$\text{or } \frac{\frac{x}{-\frac{19}{60} - \frac{1}{3}}}{-\frac{4}{3} + \frac{19}{24}} = \frac{y}{-\frac{1}{72} - \frac{1}{45}} = \frac{1}{-\frac{1}{72} - \frac{1}{45}}$$

$$\text{or } \frac{\frac{x}{-\frac{39}{60}}}{-\frac{13}{24}} = \frac{y}{-\frac{13}{360}} = \frac{1}{-\frac{13}{360}}$$

$$\therefore x = -\frac{39}{60} \times \left(-\frac{360}{13}\right), y = \frac{-13}{24} \times \left(\frac{-360}{13}\right)$$

$x = 18, y = 15$ is the solution

Question 9:

$$ax + by - (a - b) = 0$$

$$bx - ay - (a + b) = 0$$

By cross multiplication, we have

$$\therefore \frac{\frac{x}{[b \times (-(a+b)) - (-a) \times (-(a-b))]}{\frac{y}{[b \times (-(a-b)) - a \times (-(a+b))]} = \frac{1}{-a^2 - b^2}}$$

$$\therefore \frac{\frac{x}{(-ba - b^2 - a^2 + ab)}}{\frac{y}{(-ba + b^2 + a^2 + ab)}} = \frac{1}{-a^2 - b^2}$$

$$\Rightarrow \frac{\frac{x}{-b^2 - a^2}}{\frac{y}{b^2 + a^2}} = \frac{1}{-a^2 - b^2}$$

$$\Rightarrow \frac{\frac{x}{-b^2 - a^2}}{\frac{1}{-(a^2 + b^2)}} = \frac{\frac{y}{b^2 + a^2}}{\frac{1}{-(a^2 + b^2)}}$$

$$\therefore x = \frac{-(b^2 + a^2)}{-(a^2 + b^2)}, y = \frac{(b^2 + a^2)}{-(a^2 + b^2)}$$

\therefore the solution is $x = 1, y = -1$

***** END *****