Exercise 3B

Question 17:

The given equations are:

$.8x + .3y = 3.8$ ---(1)

$.4x - .5y = 0.6$ ---(2)

Multiplying each one of the equation by 10, we get

$8x + 3y = 38$ ---(3)

$4x - 5y = 6$ ---(4)

Multiplying (3) by 5 and (4) by 3, we get

$40x + 15y = 190$ ---(5)

$12x - 15y = 18$ ---(6)

Adding (5) and (6), we get

$$52x = 208 \Rightarrow x = \frac{208}{52} = 4$$

Substituting $x = 4$ in (3), we get

$$8 \times 4 + 3y = 38 \Rightarrow 3y = 38 - 32$$

$$3y = 6 \Rightarrow y = \frac{6}{3} = 2$$

Hence, the solution is $x = 4, y = 2$

Question 18:

The given equations are:

$.05x + .2y = .07$ ---(1)

$.3x - .1y = .03$ ---(2)

Multiplying (1) by 100 and (2) by 100

$5x + 20y = 7$ ---(3)

$30x - 10y = 3$ ---(4)

Multiplying (3) by 10 and (4) by 20, we get

$50x + 200y = 70$ ---(5)

$600x - 200y = 60$ ---(6)

Adding (5) and (6), we get

$$650x = 130 \Rightarrow x = \frac{130}{650} = \frac{1}{5} = .2$$

Substituting $x = 2$ in (3) we get

$5 \times (.2) + 20y = 7$

$1 + 20y = 7$

$$20y = 7 - 1 \Rightarrow 20y = 6, y = \frac{6}{20} = \frac{3}{10}$$

$y = .3$

$\therefore$ solution is $x = .2$ and $y = .3$

Question 19:

$$mx - ny = m^2 + n^2 \text{ ---(1)}$$

$x + y = 2m$ ---(2)

Multiplying (1) by 1 and (2) by n

$$mx - ny = m^2 + n^2 \quad ---(3)$$
$$nx + ny = 2mn \quad ---(4)$$

Adding (3) and (4), we get

$$mx + nx = m^2 + n^2 + 2mn$$
$$x(m + n) = (m + n)^2$$
$$x = \frac{(m + n)^2}{m + n} = m + n$$

Putting $x = m + n$ in (1), we get

$$m(m + n) - ny = m^2 + n^2$$
$$m^2 + mn - ny = m^2 + n^2$$
$$-ny = m^2 + n^2 - m^2 - mn$$
$$-ny = n^2 - nm$$
$$-y = \frac{n(n - m)}{n}$$
$$-y = (n - m)$$
$$y = (m - n)$$

$\therefore$ solution is $x = (m + n), y = (m - n)$

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