

ASSIGNMENT

1) $x - y - 14 = 0$ and $x^2 + y^2 - 6x + 8y = 0$

Solution

$x - y - 14 = 0$ — (i)

$x^2 + y^2 - 6x + 8y = 0$ — (ii)

make y subject of the formular in eqn (i)

$x - y - 14 = 0$

$-y = 14 - x$

$y = -(14 - x)$

$y = x - 14$ — (iii)

Substitute $y = x - 14$ in equation (ii)

$x^2 + (x - 14)^2 - 6x + 8(x - 14) = 0$

$x^2 + (x - 14)(x - 14) - 6x + 8x - 112 = 0$

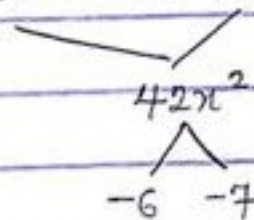
$x^2 + x^2 - 14x - 14x + 196 - 6x + 8x - 112 = 0$

$2x^2 - 14x - 14x - 6x + 8x + 196 - 112 = 0$

$2x^2 - 26x + 84 = 0$

Divide through by 2

$x^2 - 13x + 42 = 0$



$x^2 - 6x - 7x + 42 = 0$

$x(x - 6) - 7(x - 6) = 0$

$(x - 7)(x - 6) = 0$

$x - 7 = 0$ or $x - 6 = 0$

$x = 7$ or $x = 6$

Substitute $x = 7$ in eqn (iii)

$y = x - 14$

$y = 7 - 14 = -7$

Therefore one of the points of intersections is ~~(6, 6)~~ ~~(6, -7)~~

$(7, -7)$

$$(3) \quad x - 5y - 2 = 0 \quad \text{and} \quad x^2 + 25y^2 - 6xy - 16 = 0$$

Solution

$$x - 5y - 2 = 0 \quad \text{--- (i)}$$

$$x^2 + 25y^2 - 6xy - 16 = 0 \quad \text{--- (ii)}$$

make x the subject of the formula in equation (i)

$$x - 5y - 2 = 0$$

$$x = 5y + 2 \quad \text{--- (iii)}$$

Substitute $x = 5y + 2$ in equation (ii)

$$x^2 + 25y^2 - 6xy - 16 = 0$$

$$(5y + 2)^2 + 25y^2 - 6(5y + 2)y - 16 = 0$$

$$(5y + 2)(5y + 2) + 25y^2 - 6y(5y + 2) - 16 = 0$$

$$25y^2 + 10y + 10y + 4 + 25y^2 - 30y^2 - 12y - 16 = 0$$

$$25y^2 + 25y^2 + 10y + 10y - 12y + 4 - 16 - 30y^2 = 0$$

$$50y^2 - 30y^2 + 8y - 12 = 0$$

$$20y^2 + 8y - 12 = 0$$

Divide through by 2

$$10y^2 + 4y - 6 = 0$$

$$\begin{array}{r} \diagdown \quad \diagup \\ -60y^2 \\ \diagup \quad \diagdown \\ 10 \quad -6 \end{array}$$

$$10y^2 + 10y - 6y - 6 = 0$$

$$\cancel{10y} 10y(y + 1) - 6(y + 1) = 0$$

$$(10y - 6)(y + 1) = 0$$

$$10y - 6 = 0 \quad \text{or} \quad y + 1 = 0$$

$$\frac{10y}{10} = \frac{6}{10} \quad \text{or} \quad y = -1$$

$$y = \frac{3}{5} \quad \text{or} \quad y = -1$$

Substitute $y = 3/5$ in eqn (iii)

$$x = 5y + 2$$

$$x = 5\left(\frac{3}{5}\right) + 2 = 5$$

Therefore one of the points of intersection is $(5, 3/5)$

Substitute $x=6$ in equation (iii)

$$y = x - 14$$

$$y = 6 - 14$$

$$y = -8$$

Therefore another point of intersection is $(6, -8)$

2) $2x + y - 10 = 0$ and $x^2 + y^2 + 4x - 6y = 0$

Solution

$$2x + y - 10 = 0 \quad \text{--- (i)}$$

$$x^2 + y^2 + 4x - 6y = 0 \quad \text{--- (ii)}$$

make y subject of the formula in equation (i)

$$2x + y - 10 = 0$$

$$y = 10 - 2x \quad \text{--- iii}$$

Substitute $y = 10 - 2x$ in equation (ii)

CS $x^2 + y^2 + 4x - 6y = 0$ Scanned with CamScanner

$$x^2 + (10 - 2x)^2 + 4x - 6(10 - 2x) = 0$$

Substitute $y = -1$ in equation (ii)

$$x = 5y + 2$$

$$x = 5(-1) + 2$$

$$x = -5 + 2$$

$$x = -3$$

Therefore another point of intersection is $(-3, -1)$.

