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IDIATA ANTHONY EHINOMEN

1) $x - y - 14 = 0$ ——— (1)

$x^2 + y^2 - 6x + 8y = 0$ ——— (2)

$x^2 - 6x + y^2 + 8y = 0$

$(x-3)^2 + (y+4)^2 = 4^2 + (-3)^2$

$(x-3)^2 + (y+4)^2 = 25$ ——— (2)

From eqn (1)

$y = x - 14$ ——— (1)

Sub eqn (1) into (2)

$(x-3)^2 + (x-14+4)^2 = 25$

$(x-3)^2 + (x-10)^2 = 25$

$x^2 - 6x + 9 + x^2 - 20x + 100 = 25$

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

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

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

$\therefore x_2 = 7 \quad x_1 = 6$

Sub values of x into eqn (1)

$y_2 = 7 - 14$ $\quad y_1 = 6 - 14$

$y_2 = -7$ $\quad = -8$

$\therefore$ points of intersect $= (7, -7), (6, -8)$

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

$y = -2x + 10$ ——— (1)

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

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

$(x+2)^2 + (y-3)^2 = 2^2 + (-3)^2$

$(x+2)^2 + (y-3)^2 = 13$ ——— (2)

Sub eqn (1) into eqn (2)

$(x+2)^2 + (-2x+10-3)^2 = 13$

$(x+2)^2 + (-2x+7)^2 = 13$

$x^2 + 4x + 4 + 4x^2 - 28x + 49 = 13$

$5x^2 - 24x + 40 = 0$

$$x^2 - \frac{24}{5}x + \frac{40}{5} = 0$$

$$x^2 - \frac{24}{5}x + 8 = 0$$

$$x^2 - \frac{24}{5}x = 8$$

$$\left(x - \frac{24}{10}\right)^2 = 8 \times \left(\frac{24}{10}\right)^2$$

$$\left(x - \frac{24}{10}\right)^2 = 8 \frac{1152}{25}$$

$$x - \frac{24}{10} = \pm\sqrt{\frac{1152}{25}}$$

$$x - \frac{24}{10} = \pm \frac{24\sqrt{2}}{5}$$

$$x = +\frac{24\sqrt{2}}{5} + \frac{24}{10}$$

$$= 9.19$$

or $$x = -\frac{24\sqrt{2}}{5} + \frac{24}{10}$$

$$= -4.39$$

Sub values of x into eqn (1)

$y = -2(9.19) + 10$

$= -18.38 + 10$

$= -8.38$

or $y = -2(-4.39) + 10$

$= 8.78 + 10$

$= 18.78$

$\therefore$ points $= (9.19, -8.38), (-4.39, 18.78)$