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MATRIC NO: - 19/BNG02/005

DEPARTMENT: - COMPUTER ENGINEERING

1) From $x - y - 14 = 0$ — equ (1)

$$y = x - 14 \quad \text{--- (1)}$$

$$x^2 + y^2 - 6x + 8y = 0 \quad \text{--- (2)}$$

Put equ (1) into equ (2)

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

$$x^2 + x^2 - 28x + 196 + 2x - 112 = 0$$

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

$$x^2 - 12x + 42 = 0$$

Using quadratic formula

$$x = 7 \quad \text{or} \quad 6$$

when $x = 7$

$$y = x - 14$$

$$y = 7 - 14$$

$$y = -7 \quad \text{,,}$$

when $x = 6$

$$y = 6 - 14$$

$$y = -8 \quad \text{,,}$$

Hence the point of intersection are

$$(7, -7) \quad \text{and} \quad (6, -8)$$

2) From $2x + y - 10 = 0$ — (1)

$$y = 10 - 2x \quad \text{--- (1)}$$

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

Put eqn ① into eqn ②

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

$$x^2 + 4x^2 - 40x + 100 + 4x - 60 + 12x = 0$$

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

Using quadratic formula

$$x = 1.5 \quad \text{or} \quad -1.5$$

$$\text{when } x = 1.5$$

$$y = 10 - 2x$$

$$y = 10 - 2(1.5)$$

$$y = 10 - 3$$

$$y = 7$$

$$\text{when } x = -1.5$$

$$y = 10 - 2x$$

$$y = 10 - 2(-1.5)$$

$$y = 10 + 3$$

$$y = 13$$

Hence the points of intersection are

$$(1.5, 7) \quad \text{and} \quad (-1.5, 13)$$

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$$\text{from } x - 5y - 2 = 0 \quad \text{--- } \textcircled{*}$$

$$y = \frac{x-2}{5} \quad \text{--- } \textcircled{1}$$

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

$$x^2 + 25\left[\frac{x-2}{5}\right]^2 - 6x\left[\frac{x-2}{5}\right] - 16 = 0$$

$$2x^2 - 4x + 4 - \frac{6x^2 + 12x - 16}{5} = 0$$

Multiply through by 5

$$10x^2 - 20x + 20 - 6x^2 + 12x - 16 = 0$$

$$4x^2 - 8x + 4 = 0$$

$$x^2 - 2x + 1 = 0$$

$$(x-1)^2 = 0$$

Using quadratic formula

$$x = 1 \quad \text{or} \quad -1$$

$$\text{when } x = 1$$

$$\text{when } x = -1$$

$$y = \frac{x-2}{5}$$

$$y = \frac{x-2}{5}$$

$$y = \frac{1-2}{5}$$

$$y = \frac{-1-2}{5}$$

$$y = -\frac{1}{5}$$

$$y = -\frac{3}{5}$$

Hence the points of intersection are

$$(1, -\frac{1}{5}) \quad \text{and} \quad (-1, -\frac{3}{5})$$