

Soyemi Oriola

19/6 NG 05/060

Mechatronics Engineering

Mr Oksunlola

MAT 102

$$(1) \quad x - y - 14 = 0 \quad \text{and} \quad x^2 + y^2 - 6x + 8y = 0$$

$$y = -14 + x$$

$$y = x - 14$$

$$\text{Sub } y = x - 14 \text{ into } x^2 + y^2 - 6x + 8y = 0$$

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

$$x^2 + x^2 - 28x + 196 - 6x + 8x - 112 = 0$$

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

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

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

$$x(x - 6) - 7(x - 6)$$

$$(x - 7)(x - 6)$$

$$x = 7$$

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

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

$$\text{when } x = 6, \quad y = -8$$

$$x = 7, \quad y = -7 \quad (7, -7)$$

$$x = 6, \quad y = -8 \quad (6, -8)$$

$$(2) \quad 2x + y - 10 = 0 \quad \text{and} \quad x^2 + y^2 + 4x - 6y = 0$$

$$y = 10 - 2x$$

$$\text{Sub } y = 10 - 2x \text{ into } x^2 + y^2 + 4x - 6y = 0$$

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

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

$$5x^2 + 84x + 40 = 0$$

$$\frac{5x^2}{5} - \frac{84x}{5} + \frac{40}{5} = 0$$

$$x^2 - \frac{84x}{5} + 8 = 0$$

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

Solution

$$x - 2 = 5y$$

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

Substitute $y = \frac{x}{5} - \frac{2}{5}$ into $x^2 + 25y^2 - 6xy - 16 = 0$

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

$$x^2 + \left(\frac{25x^2}{5} - \frac{25 \times 2}{5} \right) - \left(\frac{6xx}{5} - \frac{2 \times 6x}{5} \right) - 16 = 0$$

$$x^2 + (5x^2 - 10)^2 - (6x^2/5 - 12x/5) - 16 = 0$$

$$x^2 + 25x^2 - 100x + 100 - 6x^2/5 + 12x/5 - 16 = 0$$

$$5x^2 + 125x^2 - 500x + 500 - 6x^2 + 12x - 16 = 0$$

$$130x^2 - 500x + 500 - 6x^2 + 12x - 16 = 0$$

$$124x^2 - 488x + 484 = 0$$

$$x^2 - \frac{488x}{124} + \frac{484}{124} = 0$$

$$x^2 = \frac{122}{31} + \frac{121}{31} = 0$$