

Name: Chikere Chibu-udom

Department: Mechatronics Engineering

Matric Number:19/ENG05/024

Date submitted: 05/09/2020

Name: Chikere Chibu-udom

Department: Mechatronics Engineering

Matric Number: 19/ENG05/024

Date submitted: 09/06/2020

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

from equation 1,

$$y = x - 14 \quad \text{-eq 3}$$

Substitute y into eq 2

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

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

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

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-26) \pm \sqrt{(-26)^2 - 4 \times 2 \times 84}}{2(2)}$$

$$= \frac{26 \pm \sqrt{676 - 672}}{4}$$

$$= \frac{26 \pm \sqrt{4}}{4} \quad \therefore x = \frac{26 + \sqrt{4}}{4} \quad \text{or} \quad \frac{26 - \sqrt{4}}{4}$$

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

for the values of y , sub x into eq 3

$$y = x - 14 \quad x = 7$$

$$y = 7 - 14$$

$$\therefore y = -7$$

$$\therefore P_1 = (7, -7)$$

$$x = 6$$

$$y = 6 - 14$$

$$y = -8$$

$$\therefore P_2 = (6, -8)$$

$$2 \quad 2x + y = 10 = 0 \quad \text{-eq 1}$$

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

from equation 1,

$$y = -2x + 10 \quad \text{-eq 3}$$

Sub eq 3 into eq 2

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

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

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

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-24) \pm \sqrt{(-24)^2 - 4 \times 5 \times 40}}{2(5)}$$
$$= \frac{24 \pm \sqrt{576 - 800}}{10}$$

3 $x - 5y - 2 = 0$ - eq 1

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

from equation 1

$$y = \frac{2 - x}{-5} \text{ - eq 3}$$

Sub y into eq 2

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

$$x^2 + 25\left(\frac{4 - 4x + x^2}{25}\right) - 6x\left(\frac{2-x}{-5}\right) - 16 = 0$$

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

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

$$\frac{4x^2}{5} - \frac{8x}{5} - 12 = 0$$

$$\therefore x = 5, x = -3$$

Sub x into eq 3

$$x = 5 \quad x = -3$$

$$y = \frac{2-5}{-5} = \frac{3}{5}$$

$$y = \frac{2-(-3)}{-5} = -1$$

$$\therefore P_1 = \left(5, \frac{3}{5}\right)$$

$$P_2 = (-3, -1)$$