

20191020\_163931.jpg

IMG-20191020-WA0061.jpg

NWUDU OKECHUKWU JEREMIAH  
18/ENGO4/055  
ELECTRICAL/ELECTRONICS ENGINEERING

ENG-281

$$5x + y^2 = 5 \quad \text{--- (1)}$$

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

eqn 1 - eqn 2

$$4x^2 = 1$$

$$x^2 = \sqrt{1/4}$$

$$x = 1/2$$

substituting x in eqn 2

$$x^2 + y^2 = 4$$

$$(1/2)^2 + y^2 = 4$$

$$y^2 = 4 - 1/4$$

$$\sqrt{y} = \sqrt{15/4}$$

$$y = \sqrt{15}/2$$

$$y = 1.9365$$

coordinates of point of intersection  
(x, y) = (1/2,  $\sqrt{15}/2$ ) = (0.5, 1.9365)

In order to plot the graph, we make y the subject of the formula for both eqn.

$$5x^2 + y^2 = 5$$

$$y^2 = 5 - 5x^2$$

$$y = \sqrt{5 - 5x^2}$$

$$x^2 + y^2 = 4$$

$$y^2 = 4 - x^2$$

$$y = \sqrt{4 - x^2}$$

Angle of Intersection  
Angle ( $\theta$ )

$$5x^2 + y^2 = 5$$

$$10x + 2y \frac{dy}{dx} = 0$$

$$\frac{2y \frac{dy}{dx}}{2y} = \frac{-10x}{2y}$$

$$\frac{dy}{dx} = \frac{-5x}{y}$$

Substituting x and y

$$\frac{dy}{dx} = \frac{-5(1/2)}{\sqrt{15}/2} = -1.2910$$

$$\frac{dy}{dx} = \tan \theta_2$$

$$\tan \theta = -1.20110$$

$$\theta = \tan^{-1}(-1.20110)$$

$$\theta = -52.24^\circ$$

Angle ( $\theta_2$ )

$$x^2 + y^2 = 4$$

$$2x + 2y \frac{dy}{dx} = 0$$

$$\frac{dy}{dx} = \frac{-2x}{2y}$$

$$\frac{dy}{dx} = -\frac{x}{y}$$

Substituting x/y

$$\frac{dy}{dx} = \frac{-1}{2} \div \frac{\sqrt{15}}{2}$$

$$= \frac{-1}{2} \times \frac{2}{\sqrt{15}}$$

$$= \frac{-1}{\sqrt{15}}$$

$$= \frac{-\sqrt{15}}{\sqrt{15}} = -0.2538$$

$$\frac{dy}{dx} = \tan \theta_2$$

$$\tan \theta_2 = -0.2582$$

$$\theta_2 = \tan^{-1}(-0.2582)$$

$$= -14.48^\circ$$

$$\theta = \theta_2 - \theta_1$$

$$= -14.48 - (-52.24)$$

$$= 37.76^\circ$$

