

EBONG PRINCE VINCENT

ELECTRICAL ELECTRONICS ENGINEERING

18ENG041028

ENG 281

ASSIGNMENT

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

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

$$\text{Using equation 2 } y^2 = 4 - x^2 \quad \text{--- equation 3}$$

putting equation (3) into equation (1)

$$5x^2 + (4 - x^2) = 5$$

$$4x^2 + 4 = 5$$

$$4x^2 = 1$$

$$x^2 = 1/4$$

$$x = \sqrt{1/4} \Rightarrow \pm 1/2$$

$$x_1 = +1/2$$

$$x_2 = -1/2$$

Substituting x into equation (3)

$$y^2 = 4 - (1/2)^2 \Rightarrow y^2 = 4 - 1/4$$

$$y = \pm \sqrt{3.75} \Rightarrow \pm 1.94$$

$$y_1 = 1.94 \quad y_2 = -1.94$$

$$dy/dx = \tan \theta$$

For equation (1)

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

$$dy/dx = \frac{-10x}{2y} \Rightarrow \frac{-5x}{y} \Rightarrow \frac{-5(1/2)}{1.94} = 1.29$$

$$\tan^{-1} \left(\frac{2y}{-5x} \right) = \theta \quad \theta_1 = -52.220 \Rightarrow 127.78^\circ$$

For equation 2

$$dy/dx \Rightarrow 2x + 2y \frac{dy}{dx} \Rightarrow \frac{dy}{dx} = \frac{-2x}{2y} = \frac{-x}{y} = \frac{-1/2}{1.94}$$

$$\Rightarrow 0.2577$$

$$\tan^{-1} (-0.2577) = \theta \quad \theta_2 = -14.45$$

$$\Rightarrow 165.55^\circ$$

$$f(x) := \sqrt{5 - 5x^2}$$

$$g(x) := \sqrt{4 - x^2}$$

