

18/EN901/01
~~BASHIR A~~ BASHIR ABUBAKAR IDRIS
 CHEMICAL ENGINEERING

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

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

Soln

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

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

$$y = \sqrt{5 - 5x^2} \dots (i)$$

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

$$y = \sqrt{4 - x^2} \dots (ii)$$

Insert ^{eqn} (ii) into ⁽ⁱ⁾ ...

$$5x^2 + (\sqrt{4 - x^2})^2 = 5$$

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

$$4x^2 = 5 - 4$$

$$x^2 = \frac{1}{4}$$

$$x = \sqrt{\frac{1}{4}} = \pm \frac{1}{2}$$

Insert ^{eqn} x into 1

$$5\left(\frac{1}{2}\right) + y^2 = 5$$

$$y^2 = 5 - \frac{5}{4}$$

$$y = \sqrt{\frac{15}{4}} = 1.9365$$

Tangent eqn

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

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

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

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

$$\theta = \tan^{-1} \left(\frac{-5(0.5)}{1.9365} \right)$$

$$= -52.24$$

$$\theta = -52.24$$

$$\frac{d}{dx} = x^2 + y^2 = 4$$

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

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

$$\theta = \tan^{-1} \left(\frac{-0.5}{1.9365} \right)$$

$$= -14.477$$

$$\theta = -14.477$$

$$d\theta = Q_2 - Q_1$$

$$-14.477 - (-52.24)$$

$$= 37.74$$

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

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

