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2. COURSE: ENGINEERING

18/2A/G03/036

$$5x^2 + y^2 = 5, \quad x^2 + y^2 = 4$$

$$y^2 = 5 - 5x^2, \quad y^2 = 4 - x^2$$

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

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

$$1 = 4x^2$$

$$x_1 = \frac{1}{2}, \quad x_2 = -\frac{1}{2}$$

$$y_1^2 = 5 - 5x^2$$

$$y_1 = \sqrt{5 - 5x^2}$$

$$= \sqrt{5 - 5\left(\frac{1}{2}\right)^2}$$

$$y_2 = \sqrt{5 - 5\left(-\frac{1}{2}\right)^2}$$

$$= 1.94$$

$$\therefore \underline{\underline{1.94}}$$

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

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

$$\frac{dy}{dx} = -\frac{5(0.5)}{2(1.94)}$$

$$\frac{dy}{dx} = -1.29$$

$$\theta_1 = \tan^{-1}(-1.29)$$

$$\theta_1 = -52.22$$

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

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

$$\frac{dy}{dx} = -\frac{2(0.5)}{2(1.94)}$$

$$= -0.26$$

$$\therefore \theta_2 = \tan^{-1}(-0.26)$$

$$= -14.57^\circ$$

$$\text{The total angle} = \theta_2 - \theta_1$$

$$= -14.57 - (-52.22)$$

$$= 37.65$$