

18/10/2020

Algebra DANIEL (SOLUTIONS)
ELECT/ELECT

$$5x^2 + y^2 = 5 \quad \dots (1)$$

$$x^2 + y^2 = 4 \quad \dots (2)$$

By elimination method

$$4x^2 = 4y$$

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

$$x = \pm \sqrt{\frac{y}{4}} = \pm 0.5\sqrt{y}$$

Using positive value and substituting

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

$$5(0.5)^2 + y^2 = 5$$

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

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

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

$$y = \pm 1.93$$

$$y = 1.93 \quad x = 0.5$$

1
Find $\frac{dy}{dx}$ of eqn (1) and (2)

$$(1) \quad 5x^2 + y^2 = 5$$

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

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

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

Substitute x and y

$$-\frac{10x}{2y}$$

$$-\frac{2x}{2y} = 0.25$$

Since $\frac{dy}{dx} = \tan \theta$

$$\theta = \tan^{-1} \left(\frac{dy}{dx} \right)$$

$$\theta_2 = \tan^{-1} (0.25)$$

$$\theta_1 = \tan^{-1} (-1.295) = -52.32$$

$$\theta_2 = 14.52$$

$$\theta = |\theta_1 - \theta_2| = 10.5232 - (-74.02)$$

$$237.8^\circ$$

$$f(x) := \sqrt{5 - 5x^2} \quad g(x) := \sqrt{4 - x^2}$$

