

Katey Godwin  
18/ ENA 06/ 035  
Mechanical

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

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

using elimination method

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

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

$$4x^2 = 1$$

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

$$x = \sqrt{\frac{1}{4}} = \pm 0.50$$

$$x_2 = -0.50, x_1 = 0.50$$

Inserting positive values of  $x$  into 2

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

$$(0.50)^2 + y^2 = 4$$

$$0.25 + y^2 = 4$$

$$y^2 = 4 - 0.25$$

$$y^2 = 3.75$$

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

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

Finding the  $\frac{dy}{dx}$  of the equation

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

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

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

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

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

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

$$\tan \theta_1 = \frac{dy}{dx}$$
$$\theta_1 = \tan^{-1} \left( \frac{dy}{dx} \right)$$

$$\theta_1 = 52.22$$

Finding  $\frac{dy}{dx}$  of eqn 2

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

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

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

$$\frac{dy}{dx} = \frac{-2x}{2y} = -0.26$$

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

$$\tan \theta_2 = -0.26$$

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

$$\theta_2 = -14.57^\circ$$

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

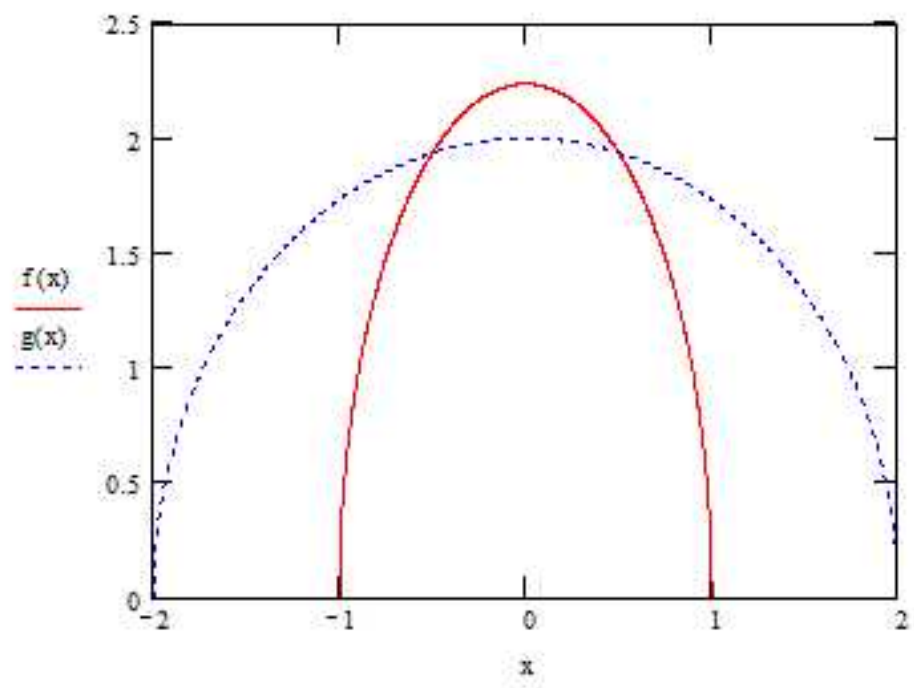
$$= -14.57 - (-52.22)$$

$$\theta = -14.57 + 52.72^\circ$$

$$\theta_2 = 37.65^\circ$$

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

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



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