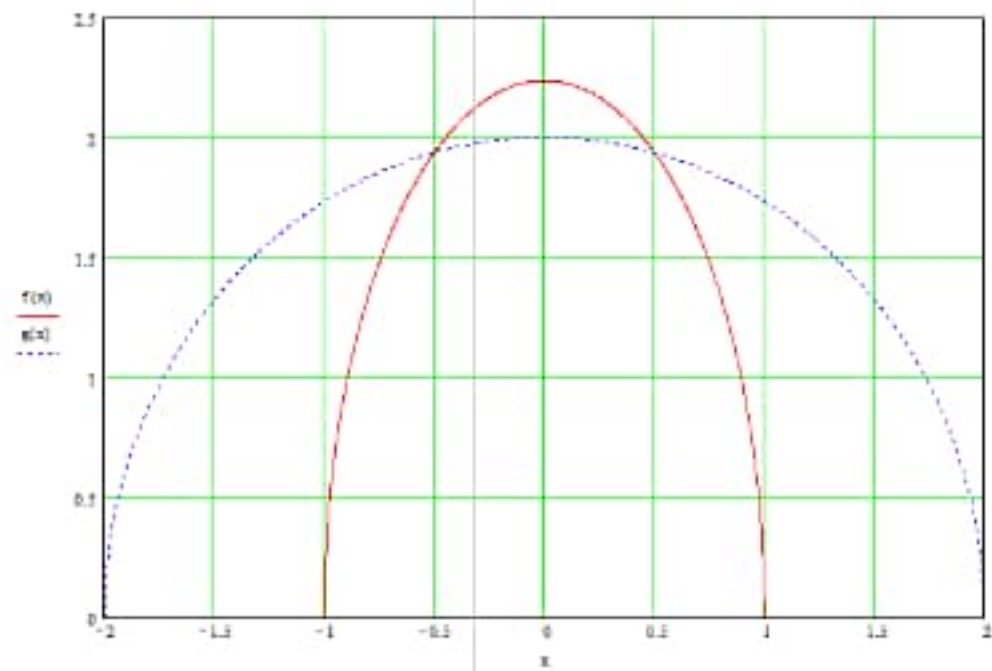


$$f(x) = \sqrt{5 - 5x^2}$$

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



Chetral Greeneth  
 18/ENG061018  
 MECHANICAL ENGINEERING  
 ENG 281 (mathematics)

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

$$y = \sqrt{4 - x^2} \dots \textcircled{1}$$

$$5x^2 + y^2 = 4 \dots \textcircled{11}$$

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

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

$$4x^2 = 1$$

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

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

Subst  $x = \frac{1}{2}$  in eqn  $\textcircled{2}$

$$\left(\frac{1}{2}\right)^2 + y^2 = 4$$

$$\frac{1}{4} + y^2 = 4$$

$$y^2 = 4 - \frac{1}{4}$$

$$y^2 = 3\frac{3}{4}$$

$$= \sqrt{15/2}$$

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

Differentiate eqn 1

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

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

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

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

Substitute  $x = 1/2$  &  $y = \sqrt{15/2}$

$$\frac{dy}{dx} = \frac{-5(1/2)}{\sqrt{15/2}} = -1.2917$$

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

$$\theta_1 = \tan^{-1}(-1.2917)$$

$$\theta_1 = -52.239^\circ$$

Differentiate eqn 2

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

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

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

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

$$= \frac{1/2}{\sqrt{15/2}}$$

$$= -0.258$$

$$\tan \theta = dy/dx, \theta = \tan^{-1} dy/dx$$

$$\theta_2 = \tan^{-1}(-0.258)$$

$$\theta_2 = -14.4775^\circ$$

$$\theta_2 - \theta_1 = -52.239 - (-14.4775)$$

$$= -52.239 + 14.4775$$

$$= -37.7615$$

$$|\theta_2 - \theta_1| = 37.7615$$

$$= 37.7615^\circ$$