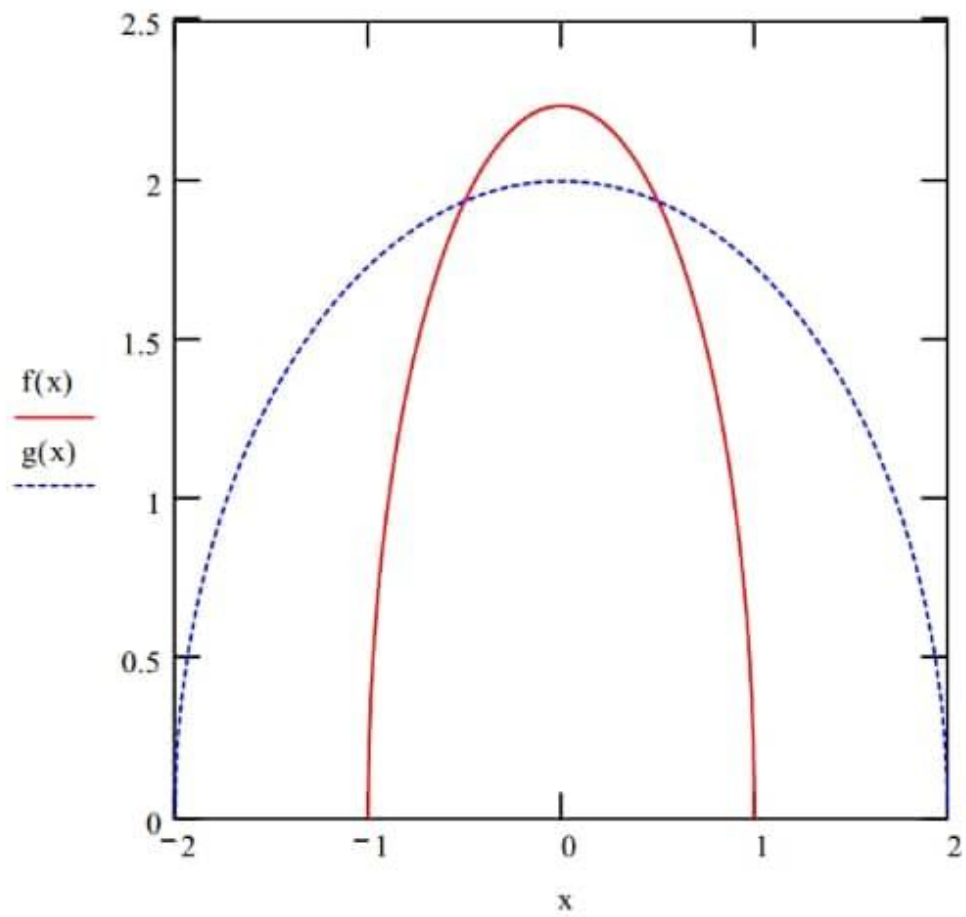


$$g(x) := \sqrt{4 - x^2}$$

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



Keshavda - Alwagun Busola

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Mechatronics Engineering

ENG 281

$$5x^2 + y^2 = 5 \quad \text{--- (1)}$$

$$x^2 + y^2 = 4 \quad \text{--- (2)}$$

Solving it simultaneously

$$1 \times 5x^2 + y^2 = 5$$

$$1 \times x^2 + y^2 = 4$$

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

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

$$4x^2 = 1$$

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

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

$$x = \sqrt{1/4} = 1/2$$

Substitute $x = 1/2$ in equ (2)

$$(1/2)^2 + y^2 = 4$$

$$1/4 + y^2 = 4$$

$$y^2 = 4 - 1/4$$

$$y^2 = 3^{3/4}$$

$$y = \sqrt{3^{3/4}}$$

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

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

differentiate equ (1)

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

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

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

2y

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

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

$$\sqrt{15/2}$$

$$= -1.291$$

$$\tan \theta_1 = \frac{dy}{dx}$$

$$\theta_1 = \tan^{-1} \frac{dy}{dx}$$

$$\theta_1 = \tan^{-1}(-1.291)$$

$$= -52.239$$

differentiate equ (2)

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

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

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

$$2y$$

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

$$= \frac{-1/2}{\sqrt{15/2}} = -0.298$$

$$\sqrt{15/2}$$

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

$$\theta_2 = \tan^{-1} \frac{dy}{dx} = -14.4775$$

$$\theta_2 - \theta_1 = -52.239(-\phi) - 14.775$$

$$= 52.239 + 14.4775$$

$$= 37.7615$$

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

$$= \underline{37.76^\circ}$$