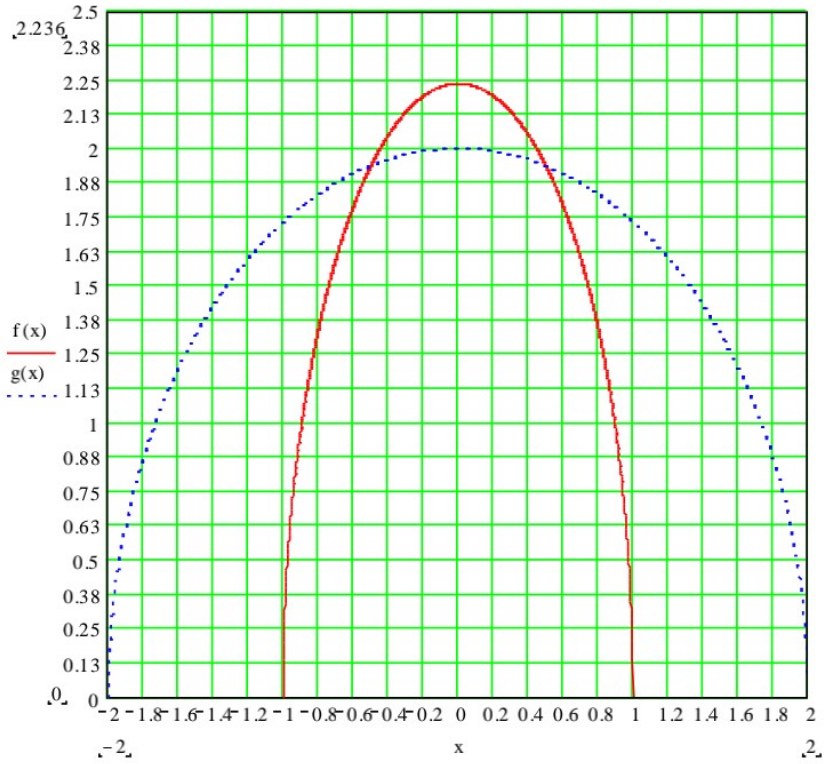
$f(x) := \sqrt{5 - 5x^2}$

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



IKEJIAKU UJU. DIVINE

18/ENG03/047

COMPUTER ENGINEERING

Solution

solving both equations simultaneously

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

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

$$4x^2 = 1$$

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

$$x = 1/2 = 0.5$$

Since $x = 0.5$

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

$$y = \sqrt{4 - (0.5)^2}$$

$$y = \sqrt{4 - 0.25}$$

$$y = \sqrt{3.75}$$

$$y = 1.9365$$

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

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

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

$$\frac{dy}{dx} = \frac{0.5}{1.9365} = 0.2582$$

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

$$0.2582 = \tan\theta$$

$$\theta_1 = \tan^{-1}(0.2582)$$

$$\theta_1 = 14.5^0$$

$y^2 = 5 - 3x^2$

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

$\frac{dy}{dx} = \frac{-10x}{2y} = -\frac{5x}{y}$

$\frac{dy}{dx} = -\frac{5(0.5)}{1.7365} = -\frac{2.5}{1.7365}$

$\frac{dy}{dx} = 1.291$

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

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

$\theta_2 = 52.2^\circ$

$\theta_1 = 14.5^\circ$

$\theta_2 = 52.5^\circ$

$\theta = \theta_2 - \theta_1$

$= 52.5^\circ - 14.5^\circ$

$= 37.7^\circ$