

Assignment.

Angle between sides $x^2 + y^2 = 5$.

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

Solution

$$5 - 5x^2 = 4 - 2x^2$$

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

$$1 = 4x^2$$

$$4x^2 - 1 = 0$$

$$4x^2 = 1$$

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

$$\therefore x_1 = \sqrt{\frac{1}{4}} = \pm \frac{1}{2}$$

$$x_2 = \pm \frac{1}{2}$$

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

$$y_1 = \sqrt{5 - 5\left(\frac{1}{4}\right)}$$

$$y_1 = \pm 1.94$$

$$y_2 = \sqrt{5 - 5\left(\frac{1}{4}\right)}$$

$$y_2 = \pm 1.94$$

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

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

$$\frac{dy}{dx} = \frac{-10(0.5)}{2(1.94)}$$

$$\frac{dy}{dx} = -1.029$$

$$\theta_1 = \tan^{-1}(-1.029)$$

$$\theta_1 = -52.22^\circ$$

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

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

$$\frac{dy}{dx} = \frac{-2(0.05)}{2(1.94)}$$

$$= -0.26$$

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

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

\therefore The total angle $\theta_2 - \theta_1$

$$= -14.57^\circ + 52.22^\circ$$

$$= 37.65^\circ$$

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

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

