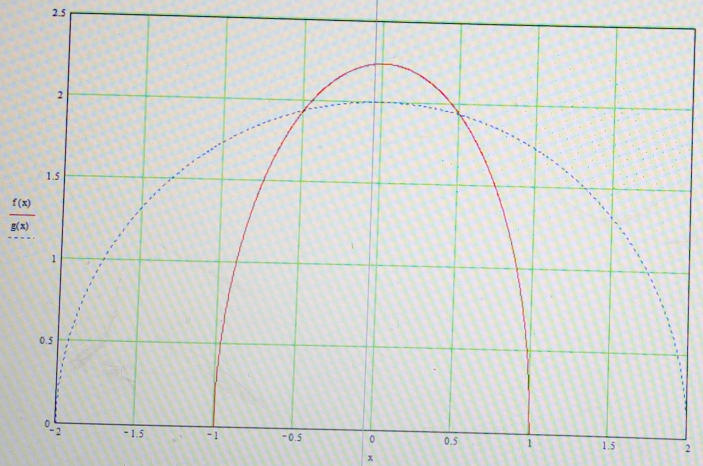


$$x^2 + y^2 = 4$$

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

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

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

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

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

$$\frac{dy}{dx} = \frac{-10 \left(\frac{1}{2}\right)}{2 \sqrt{\frac{15}{4}}}$$

$$\frac{dy}{dx} = \frac{-5}{\sqrt{15}}$$

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

$$\frac{dy}{dx}$$

$$\theta = \tan^{-1} \frac{-5}{\sqrt{15}}$$

$$\theta = -52.24$$

$$3 \quad x^2 + y^2 = 4$$

Immerentiare

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

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

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

$$= \frac{-2 \left(\frac{1}{2}\right)}{2 \left(\sqrt{\frac{15}{4}}\right)}$$

$$\frac{dy}{dx} = \frac{-1}{\sqrt{15}}$$

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

Substitute x in circle

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

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

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

$$y^2 = \frac{16-1}{4}$$

$$y = \sqrt{\frac{15}{4}} = 1.9365$$

$$\theta_2 = \tan^{-1} \left(\frac{-1}{\sqrt{15}}\right)$$

$$\theta_2 = -14.48$$

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1 $x^2 + y^2 = 4$ --- (i)

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

solution

$y^2 = 5(1 - x^2)$ --- (iii)

Substitute for y^2 in eqn (i)

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

$x^2 - 5x^2 = -1$

$-4x^2 = -1$

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

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

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

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

Substitute $x = \frac{1}{2}$ into eqn (i)

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

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

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

$y^2 = \frac{15}{4}$

$y = \sqrt{\frac{15}{4}}$

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

Differentiate using implicit differentiation

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