Substitute x in equation (ii).

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

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

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

$$y^2 = \frac{16-1}{4} \quad = y = \sqrt{15/4} = 1.9365$$

(3) $x^2 + y^2 = 4$

differentiate

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

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

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

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

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

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

$$\theta_2 = -14.48,$$

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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 equation (i)

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

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

$-4x^2 = -1$

$x^2 = -1/-4$

$x^2 = 1/4$.

$x = \sqrt{1/4}$

$x = 1/2$

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

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

$1/4 + y^2 = 4$

$y^2 = 4 - 1/4$

$y^2 = 15/4$

$y = \sqrt{15/4}$.

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

differentiate using implicit differentiation.

$10x + 2y\, dy/dx = 0$

$10x + 2y\, dy/dx = 0$

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

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

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

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

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

~~$\theta = \tan$~~

$\theta = -52.24$

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$x^2 + y^2 = 4$

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

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

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