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$x^2+y^2=4$ ... (i)

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

Solution

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

Substitute for y^2 in eqn (1)

$x^2+5(1-x)^2=4$

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

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

$-4x^2=-1$

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

$x^2=1/4$

$x=\sqrt{1/4}$

$x=1/2$

Substitute $x=1/2$ into eqn (i)

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

$1/4+y^2=4$

$y^2=4-1/4$

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

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

(3)

$x^2+y^2=4$

(differentiate)

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

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

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

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

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

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

$\theta_2=-14.48$

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

Differentiate Using Implicit differentiation

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

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

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

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

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

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

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

$\theta = -52.24$

Substitute x in eqn(ii)

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

$1/4 + y^2 = 4$

$y^2 = 4 - 1/4$

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


2.5
2.38
2.25
2.13
2
1.88
1.75
1.63
1.5
1.38
1.25
1.13
1
0.88
0.75
0.63
0.5
0.38
0.25
0.13
0
−2
−1.8
−1.6
−1.4
−1.2
−1
−0.8
−0.6
−0.4
−0.2
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
x