HEAVENS, DIVINE JOSEPH 18/MHS01/169 ELECT/ELECT ENGINEERING

$5x^2 + y^2 = 5$ ----(i)

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

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

Sub. for y^2 in eqn. (ii)

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

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

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

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

$x^2 = 1/4$

$x = \sqrt{1/4} = 1/2$

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

differentiate using implicit differentiation

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

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

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

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

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

$dy/dx = \tan\theta$

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

$\theta = -52.29$

Using matread: Point of Intersection:

(-0.5, 1.94) (0.5, 1.93)

Substituting x in eqn (ii)

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

$1/4 + y^2 = 4$

$y^2 = 4 - 1/4$

$y^2 = \frac{16-2}{4} = \frac{15}{4}$

$y = \sqrt{15/4} \Rightarrow$ ~~1.9365~~

$y = \frac{\sqrt{15}}{2} = 1.9365$

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

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

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

$dy/dx =$

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

$dy/dx = \tan\theta$

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

$\theta = -14.48.$


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