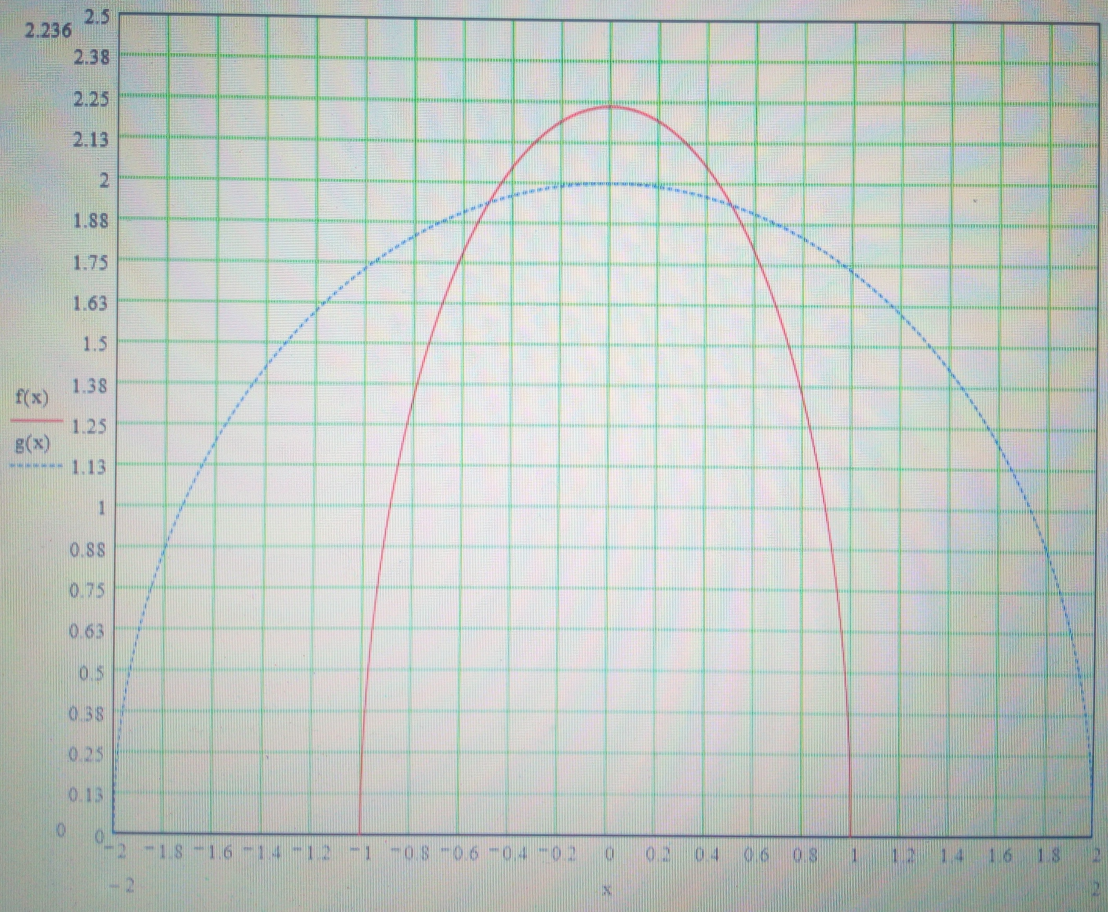
2.236
2.5
2.38
2.25
2.13
2
1.88
1.75
1.63
1.5
1.38
1.25
1.13
1
0.88
0.75
0.63
0.5
0.38
0.25
0.13
0
f(x)
g(x)
−2 −1.8 −1.6 −1.4 −1.2 −1 −0.8 −0.6 −0.4 −0.2 0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 1.8 2
−2
x
2

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18/ENG02/1044
COMPUTER ENGINEERING
CNG 291
ENGINEERING MATHEMATICS

$5x^2 + y^2 = 5$ ——— ①
$x^2 + y^2 = 4$ ——— ②

eq ① − eq ②

$4x^2 = 1$

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

$x = 1/2$

Substituting x in eq ②

$x^2 + y^2 = 4$

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

$y^2 = 4 - 1/4$

$y = \sqrt{15/4}$

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

Co-ordinates of Point of intersection

$(x, y) = (1/2, \sqrt{15}/2) = (0.5, 1.9365)$

In order to plot the graph, we make y the subject of the formula for both equations

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

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

$y = \sqrt{5(1 - x^2)}$

$x^2 + y^2 = 4$

$y^2 = 4 - x^2$

$y = \sqrt{4 - x^2}$

Angle of intersection

Angle 1 (θ_1)

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

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

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

$dy/dx = -5x/y$

Substituting x and y

$dy/dx = -5(1/2) / (\sqrt{15}/2) = -1.2910$

$dy/dx = \tan\theta_2$

$\tan\theta = -1.2910$

$\theta = \tan^{-1} -1.2910 = -52.24°$

Angle 2 (θ_2)

$x^2 + y^2 = 4$

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

$dy/dx = -2x/2y$

$dy/dx = -x/y$

Substituting x & y

$dy/dx = -1/2 \div \sqrt{15}/2$

$= -1/2 \times 2/\sqrt{15} = -1/\sqrt{15} \times \sqrt{15}/\sqrt{15} = -\sqrt{15}/15 = -0.2582$

$dy/dx = \tan\theta_2$

$\tan\theta_2 = -0.2582$

$\theta_2 = \tan^{-1} -0.2582$

$= -14.48°$

$\therefore \theta = \theta_2 - \theta_1$

$= -14.48° - (-52.24°)$

$= 37.76°$