20-10-19

Apena Adeoluwasemipe Kareem
18/ENG05/010
Mechatronics

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

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

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

$5x^2 - x^2 - 1 = 0$

$4x^2 - 1 = 0$

$x = 1/2$ or $x = -1/2$

at $x = 1/2$, $y = \sqrt{15}/2$

at $x = -1/2$, $y = \sqrt{15}/2$

$\frac{dy}{}$

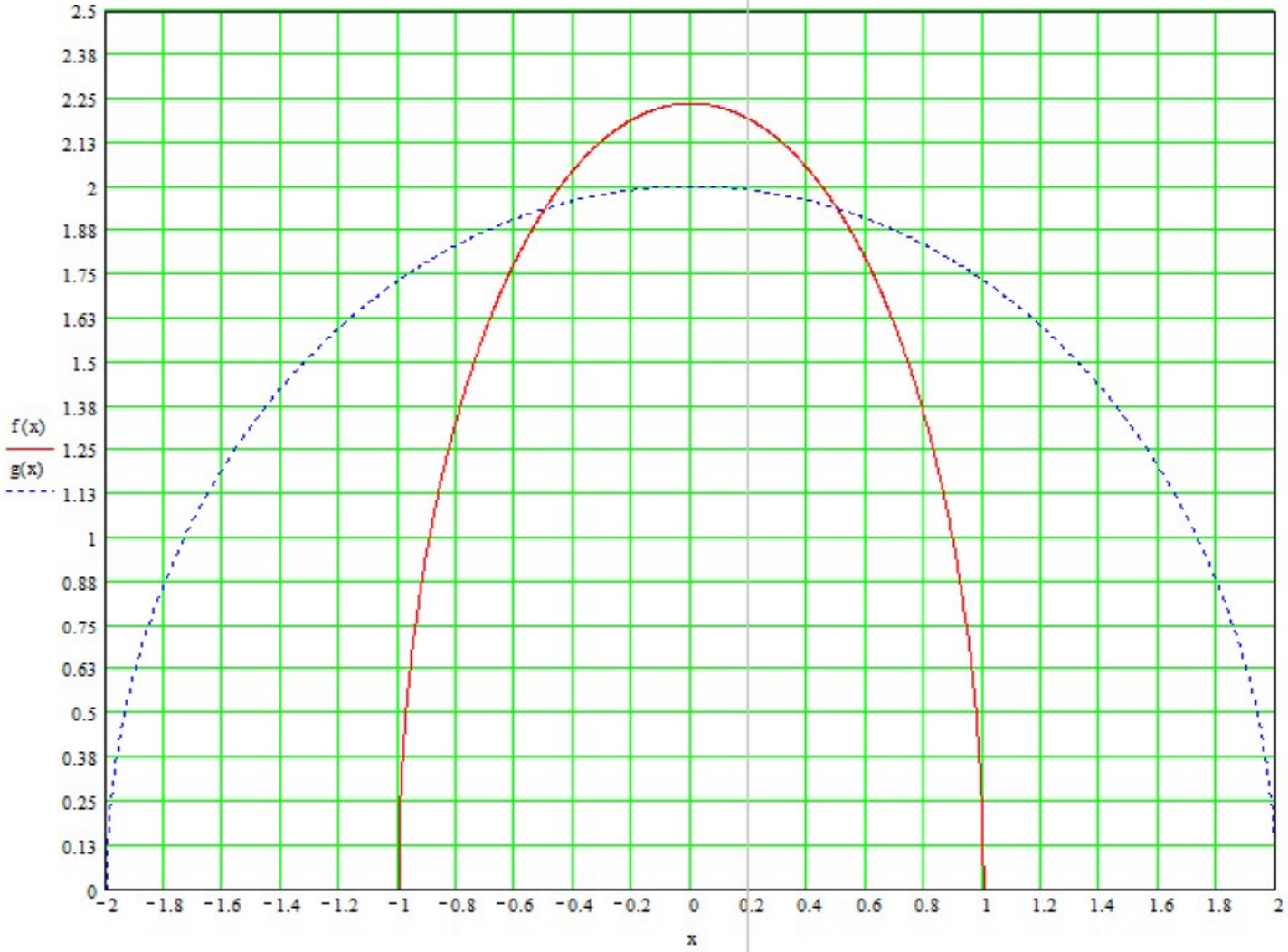
d:1]

ormat Math Symbolics Window Help

100%

al 10

$f(x) := \sqrt{5 - 5x^2}$ $g(x) := \sqrt{4 - x^2}$




M...

$$\tan(\theta_2 - \theta_1) = \frac{m_2 - m_1}{1 + m_2 m_1}$$

when $m_2 = \frac{-\sqrt{15}}{15}$ and $m_1 = \frac{\sqrt{15}}{3}$

$$\tan(\theta_2 - \theta_1) = \frac{\frac{-\sqrt{15}}{15} + \frac{\sqrt{15}}{3}}{1 + \left(\frac{\sqrt{15}}{15}\right)\left(\frac{-\sqrt{15}}{3}\right)} = \frac{\sqrt{15}}{5}$$

when $m_2 = \frac{\sqrt{15}}{15}$ and $m_2 = \frac{\sqrt{15}}{3}$

$$\tan(\theta_2 - \theta_1) = \frac{\frac{\sqrt{15}}{15} - \sqrt{15}/3}{1 + (15/15)(15/3)} = \frac{-15}{5}$$

$\tan^{-1}(\sqrt{15}/5) = 37.76^\circ$

$\tan^{-1}(-\sqrt{15}/5) = -37.76^\circ$

The angle between them

$180 - 37.76 = 142.24^\circ$

$5x^2 - x^2 - 1 = 0$

$4x^2 - 1 = 0$

$x = 1/2$ or $x = -1/2$

at $x = 1/2$, $y = \frac{\sqrt{15}/2}{}$

at $x = -1/2$, $y = \frac{\sqrt{15}/2}{}$

$dy/dx$ of $5x^2 + y^2 - 5$

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

$\frac{dy}{dx} = \frac{-10x}{2y} = \frac{-5x}{y}$

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

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

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

at $x = 1/2$ and $y = \sqrt{15}/2$

$\frac{-5x}{y} = \frac{-5(1/2)}{\sqrt{15}/2} = -\frac{\sqrt{15}}{3}$

at $x = 1/2$ and $y = \sqrt{15}/2$

$\frac{-x}{y} = \frac{+1/2}{\sqrt{15}/2} = \frac{\sqrt{15}}{15}$