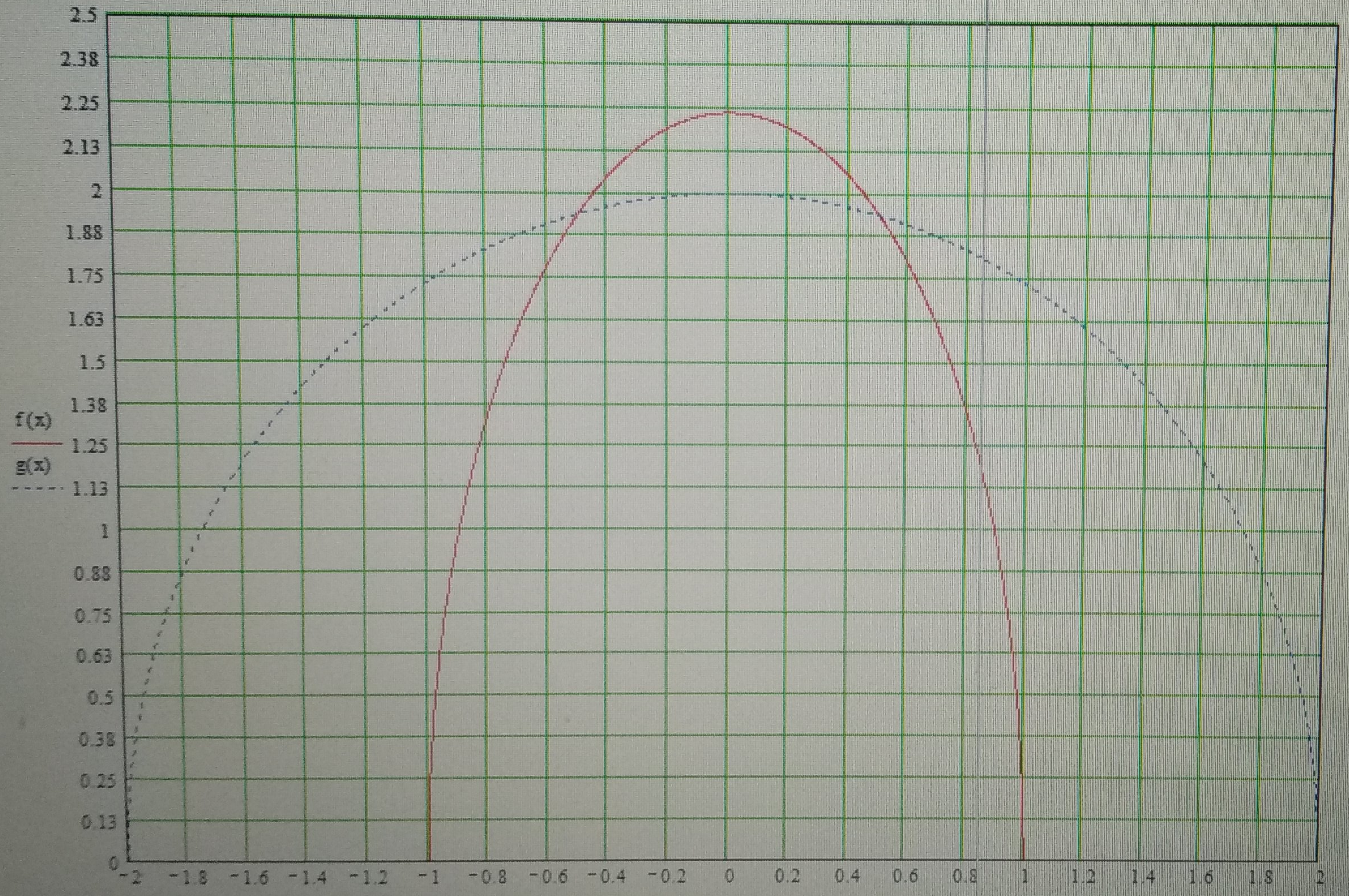
Normal | Arial | 10

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

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



FIDUDUSOLA FISEYE SAMUEL

18/ENG06/023

MECHANICAL ENGINEERING.

Assignment:

$5x^2+y^2=5 \quad —(i)$

$x^2+y^2=4 \quad —(ii)$

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

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

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

$4x^2-1=0$

$x=\frac{1}{2}$ or $x=-\frac{1}{2}$

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

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

differenciating $5x^2+y^2-5$

$10x+2y\frac{dy}{dx}=0$

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

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

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

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

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

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

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

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

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

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

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

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 $m_2 = \sqrt{15}/3$

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

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

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

The angle between them $\Rightarrow$

$$180 - 37.76 = 142.24^\circ$$