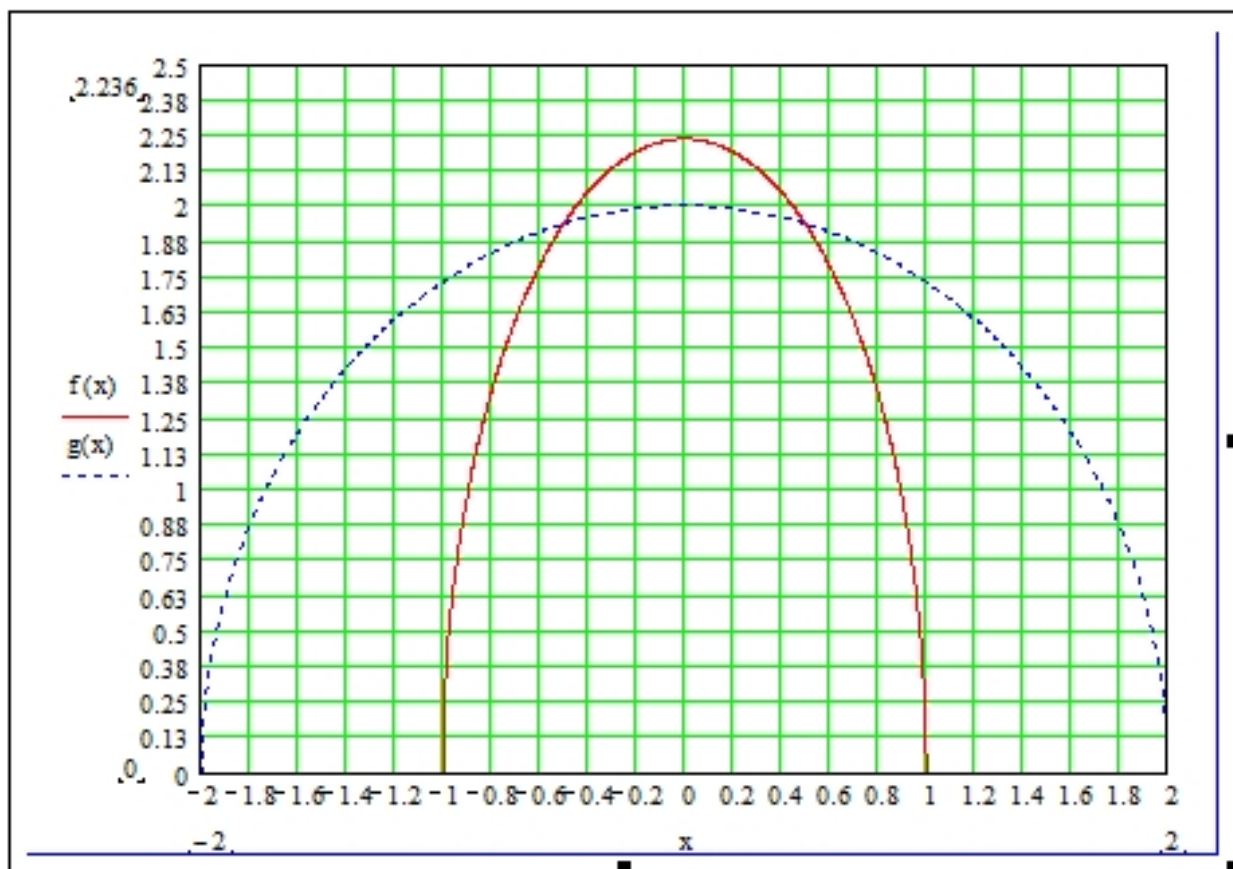


$$f(x) := \sqrt{5 - 5x^2} \qquad g(x) := \sqrt{4 - x^2}$$



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 ELECT/ELECT.

1)  $5x^2 + y^2 = 5$  — ①

$x^2 + y^2 = 4$  — ②

Solve the simultaneous equations

$1 \times 5x^2 + y^2 = 5$

$1 \times x^2 + y^2 = 4$

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

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

$4x^2 = 1$

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

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

Substitute  $x$  for  $\frac{1}{2}$  in equation ②

$5\left(\frac{1}{2}\right)^2 + y^2 = 5$

$5 \times \frac{1}{4} + y^2 = 5$

$\frac{5}{4} + y^2 = 5$

$y^2 = 5 - \frac{5}{4}$

$y^2 = \frac{20-5}{4} = \frac{15}{4}$

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

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

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

Differentiate equation 1

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

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

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

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

Substitute  $x$  and  $y$

$\frac{dy}{dx} = \frac{-5\left(\frac{1}{2}\right)}{\frac{\sqrt{15}}{2}}$

$= -1.291$

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

$\theta = \tan^{-1} \frac{dy}{dx}$

$\theta = \tan^{-1}(-1.291)$   
 $= -52.239$

Differentiate 2

$x^2 + y^2 = 4$

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

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

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

$\frac{dy}{dx} = \frac{-\frac{1}{2}}{\frac{\sqrt{15}}{2}} = -0.258$

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

$\theta = \tan^{-1} \frac{dy}{dx}$

$\theta = \tan^{-1}(-0.258)$

$\theta = -14.4775$

$\theta_2 - \theta_1 = -52.239 + 14.4775$

$= -37.7615$