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Solution to Assignment

$5x^2+y^2=5$ — ① $\Rightarrow$ $y^2=5-5x^2$

$x^2+y^2=4$ — ② $\quad y=\sqrt{5-5x^2}$

$y^2=4-x^2$ $\quad f(x)=\sqrt{5-5x^2}$

let $y=4-x^2$ into eq ①

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

$4x^2+4-5=0$

$4x^2-1=0$

$4x^2=1$

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

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

$y^2=4-x^2$

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

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

Using $x=\frac{1}{2}$ (Using Positive part than negative)

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

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

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

$y^2=3.75$

$y=1.936$

$\frac{dy}{dx}=5x^2+y^2=5$

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

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

$\frac{dy}{dx}=\frac{-10x}{2y}=\frac{-5x}{y}=\frac{-5(0.5)}{1.936}=-1.2913$

$x\to 0.5$

$\tan^{-1}-1.2913=-52.25^\circ$

$\frac{dy}{dx}=x^2+y^2=4$

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

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

$\frac{dy}{dx}=\frac{-2x}{2y}=\frac{-x}{y}=\frac{-0.5}{1.936}$

$x\to 0.5$

$=-0.2583$

$\tan^{-1}(0.2583)=-14.48$

∴ the total angle

$\theta_2-\theta_1=-14.48-(-52.5)$

$=38.02^\circ$