

NAMES: NMPANATH
MATHS NOS: 181 ENSUBJOU
DEPARTMENT: BIOMEDICAL ENG
COURSE CODE: ENG 281
COURSE TITLE: ENGINEERING MATHEMATICS I

$$5x^2 + y^2 = 5 \quad \text{--- (1)}$$

$$x^2 + y^2 = 4 \quad \text{--- (2)}$$

Make y^2 the subject of formula using eq (2) and sub it in eq (1)

$$y^2 = 4 - x^2 \quad \text{--- (3)}$$

Put eq (3) into eq (1)

$$5x^2 + y^2 = 5 \quad \text{and } y^2 = 4 - x^2$$

$$\text{then } 5x^2 + 4 - x^2 = 5$$

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

$$4x^2 - 1 = 0$$

$$4x^2 = 1$$

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

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

$$x = \sqrt{\frac{1}{4}} = \pm 0.5$$

$$x = \pm 0.5$$

Putting $\pm 1/2$ into eq (2)

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

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

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

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

$$y = \pm 1.936$$

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$$\therefore x = \pm 0.5 \text{ and } y = \pm 1.936$$

from eq (1)

$$dy/dx = 5x^2 + y^2 = 5$$

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

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

$$\int \frac{dy}{y} = \int \frac{-5x}{y} \quad \text{--- (4)}$$

Put x and y values into eq (4)

$$- \frac{5(0.5)}{1.536} = -1.2513$$

$\tan \theta = -1.2813$
 $\therefore \theta = \tan^{-1}(-1.2813)$
 $= \theta = -52.025^\circ$

from eq (3) $\frac{dy}{dx} = 4$
 ant $\frac{dy}{dx} = 0$

$$\frac{dy}{dx} = -2m = -\frac{2x}{y}$$
 (5)

put the values of x and y into eq (5)

$$\frac{dy}{dx} = \frac{-0.5}{1.536} = -0.25183$$

$\tan \theta = -0.25183$
 $\theta = \tan^{-1}(-0.25183)$

$\theta = -14.48^\circ$

c. The total angle, θ_T

$$\theta_T = \theta_1 - \theta_2$$

$$\theta_T = -14.48 - (-52.025)$$

$$= -14.48 + 52.025$$

$$\theta_T = 38.02^\circ$$

$\theta_T = 38.02^\circ$
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 from eq (3)
 $\frac{dy}{dx} = 4$
 $\frac{dy}{dx} = 0$
 $\theta = -14.48^\circ$
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$$f(x) := \sqrt{5 - 5x^2}$$

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

