

ENG 281.

NAME: PAUL SELWAN BAKO

MATRIC No: 16/ENG02/053

DEPARTMENT: COMPUTER

COLLEGE: ENGINEERING

DATE: 11TH OCTOBER, 2017.

COURSE: MATHEMATICS.

$$\begin{aligned}x &= \cos t + t \sin t \\ \frac{dx}{dt} &= -\sin t + \sin t + t \cos t \\ &= t \cos t\end{aligned}$$

$$\begin{aligned}y &= \sin t - t \cos t \\ \frac{dy}{dt} &= \cos t - \cos t + t \sin t \\ &= t \sin t\end{aligned}$$

$$\frac{dy}{dx} = \frac{dy}{dt} \div \frac{dx}{dt}$$

$$= \frac{t \sin t}{t \cos t}$$

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

$$\frac{d^2y}{dx^2} = \frac{d}{dx} \left(\frac{dy}{dx} \right) \times \frac{dy}{dx} = \frac{d}{dx} (\tan t) \times \frac{1}{t \cos t}$$

$$= \sec^2 t \times \frac{\sec t}{t}$$

$$= \frac{\sec^3 t}{t}$$