

Good day Ma, Sorry but I would like to inform you that I had forgotten to put my serial number in my previous assignments. My Matric Number is 19/ENG041052 and my serial number is 015. Please do not disregard my assignments. Thank you

$$\textcircled{1} \frac{d^2y}{dt^2} = 6t - 1$$

$$t = 1$$

$$\frac{d^2y}{dt^2} = 5$$

at  $t=1$  we have a minimum curve

$$\text{at } t = \frac{2}{3}$$

$$\frac{d^2y}{dt^2} = 6\left(\frac{2}{3}\right) - 1 = -5$$

we have a maximum curve

$$\textcircled{2} \text{ If } 2y^2 - 5x^4 - 2 - 7y^3 = 0$$

$$\frac{d(2y^2)}{dx} - \frac{d(5x^4)}{dx} - \frac{d(2)}{dx} - \frac{d(7y^3)}{dx} = 0$$

$$4y \frac{dy}{dx} - 20x^3 - 0 - 21y^2 \frac{dy}{dx} = 0$$

$$-20x^3 + \frac{dy}{dx} (4y - 21y^2) = 0$$

$$\frac{dy}{dx} = \frac{20x^3}{4y - 21y^2}$$

$$\textcircled{3} 4x^2 + 2xy^3 - 5y^2 = 0$$

$$\frac{dy}{dx} = 0 \quad \frac{d(4x^2)}{dx} + \frac{d(2xy^3)}{dy} - \frac{d(5y^2)}{dx} = 0$$

$$8x + 6xy^2 \frac{dy}{dx} + 2y^3 - 10y \frac{dy}{dx} = 0$$

$$\frac{dy}{dx} (6xy^2 - 10y) = 10y - 8x - 2y^3$$

$$\frac{dy}{dx} = \frac{10y - 8x - 2y^3}{6xy^2 - 10y} \quad \text{where } x=1 \text{ and } y=2$$

$$\frac{dy}{dx} = -6$$

Oyeleye Ibrahim-Nrass Oluwaseyi  
Elect / Elect Engineering

19/ENH04/052

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MAT104

$$\textcircled{1} \textcircled{1} \quad y = t^3 - \frac{t^2}{2} - 2t + 4$$

$$\frac{dy}{dt} = 0$$

$$\frac{dy}{dt} = 3t^2 - 2 \cdot \frac{t}{2} - 2$$

$$\frac{dy}{dt}$$

$$\frac{dy}{dt} = 3t^2 - t - 2$$

$$\frac{dy}{dt}$$

$$0 = 3t^2 - t - 2$$

$$0 = 3t^2 - 3t + 2t - 2$$

$$3t(t-1) + 2(t-1)$$

$$(3t+2)(t-1)$$

$$t = -\frac{2}{3} \quad t = 1$$

$$\textcircled{11} \quad \text{at } t = -\frac{2}{3}$$

$$y = \left(-\frac{2}{3}\right)^3 - \frac{\left(-\frac{2}{3}\right)^2}{2} - 2\left(-\frac{2}{3}\right) + 4$$

$$y = -\frac{8}{27} - \frac{2}{4} + \frac{4}{3} + 4$$

$$y = 4.537$$

$$\text{at } t = 1$$

$$y = -\frac{8}{27} (1)^3 - (1)^2/2 - 2 + 4$$

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

$$y = 2.5$$

$$\left(-0.667, 4.537\right)$$

$$\left(1, 2.5\right)$$