

TADESE VICTOR ADEDAMOLA

ELECT/ELECT ENGINEERING

19/ENG04/055

MAT 102 ASSIGNMENT

$$1) \quad x = 8t^3 \quad y = 4t^3 - 7t \quad z = t + 3$$

$$r = xi + yj + zk$$

$$r = (8t^3)i + (4t^3 - 7t)j + (t + 3)k$$

$$(i) \quad \text{Velocity} = \frac{dr}{dt} = 24t^2i + (12t^2 - 7)j + k$$

$$(ii) \quad \text{Acceleration} = \frac{d^2r}{dt^2} = 48ti + 24tj$$

$$2) \quad r = 3ti + t^3j + t^2k$$

$$\frac{dr}{dt} = 3i + 3t^2j + 2tk$$

$$\text{at } t = 1, \quad \frac{dr}{dt} = 3i + 3j + 2k$$

$$\left| \frac{dr}{dt} \right| = \sqrt{9 + 9 + 4} = \sqrt{22}$$

$$= \frac{dr/dt}{\left| dr/dt \right|} = \frac{3i + 3j + 2k}{\sqrt{22}}$$

$$\left| \frac{dr}{dt} \right| = \sqrt{22}$$