

TEGBOBO JOSH UA Civil Engineering

19/ENUG03/013

MAT 102 ASSIGNMENT

1)  $r = x_i + y_j + k$

$$r = t_i + t_j^2 + t^3 k$$

$$\frac{dr}{dt} = i + 2tj + 3t^2 k$$

At  $t=1$   $\frac{dr}{dt} = i + 2j + 3k$

$$\left| \frac{dr}{dt} \right| = \sqrt{(1)^2 + (2)^2 + (3)^2} = \sqrt{14}$$

$$T = \frac{dr/dt}{\left| \frac{dr}{dt} \right|} = \frac{i + 2j + 3k}{\sqrt{14}}$$

2)  $A = 4t^3 j + 5k, B = 2t^2 i + 4t j$

$$G = A \times B = (4t^3 j + 5k) \times (2t^2 i + 4t j)$$

$$G = 16t^4 i$$

$$\Rightarrow \int_0^1 16t^4 dt$$

$$\Rightarrow \int_0^1 \frac{16t^5}{5} + C$$

$$\Rightarrow \frac{16}{5}$$