

# MA1 102 Assignment

1.)  $r = xi + yj + zk$

$$r = ti + t^2j + t^3k$$

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

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

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

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

$$\frac{dr}{dt}$$

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

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

$$G = 16t^4$$

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

$$= \left[ 16t^5 \right]_0^1 + c$$

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

16/5

$$\frac{dy}{dx} = \frac{4t^3 - 4t}{12t^2 - 2t} = \frac{4t(t^2 - 1)}{2t(6t - 1)}$$

$$\therefore \frac{dy}{dx} = \frac{2(t^2 - 1)}{6t - 1}$$