Wisdom Friday Johnny
Civil Engineering
19/ENG03/015

MAT 102 Assignment

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

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

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

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

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

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

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

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

$G = 16t^4$

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

$= \left| \frac{16t^5}{5} + c \right|_0$

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