

Emmanuel Obo

18/SNG 02/065

Computer Engineering

$$1) \quad r = x_i + y_j + z_k$$

$$r = t_i + t^2_j + t^3_k$$

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

$$A + t = \left| \frac{dr}{dt} \right| = 1 + 2j + 3k$$

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

$$T = \frac{\frac{dr}{dt}}{\left| \frac{dr}{dt} \right|} = 1 + \frac{2j}{\sqrt{14}} + 3k$$

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

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

$$G = 16t^4$$

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

$$\left[\frac{16t^5}{5} + C \right]_0^1$$

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