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1 find a unit vector tangent to the ~~sap~~ space curve $x = t$, $y = t^2$, $z = t^3$ at the point where $t = 1$

solution

$x = t$

$y = t^2$

$z = t^3$

when $t = 1$

let $P_{(x,y,z)}$ be any point on the curve and $\vec{r} = x + y + z$ any position vector of P

$\therefore \quad r = x + y + z$

$r = t + t^2 + t^3$

Since we have the value of $t = 1$ then we substitute $t = 1$

$\therefore \quad \vec{r} = t + t^2 + t^3$

$\vec{r} = 1 + (1)^2 + (1)^3$

$= 3^6$

$r = 18$

2 Given that $A = 4t^3 j + 5k$ and $B = 2t^2 i + 4t j$, If $G = A \times B$ find the integral of G from (0 to 1)

solution

$A = 4t^3 j + 5k$

$B = 2t^2 i + 4t j$

$G = A \times B$

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

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

$G = (t + j + 5k) \times (2t^2 i)$

divide both sides by $2t^2$

$\frac{t}{2t^2} + j + 5k \times \frac{2t^2 i}{2t^2}$

$\frac{1}{2t} + j + 5k = i$

$i = \frac{1}{2t} + j + 5k$

$\leq$