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1) Acceleration = $\frac{\Delta V}{t}$

Since we are dealing with position vectors:

let P(x,y,z) be any point on the given curve and $\vec{r} = x\hat{i} + y\hat{j} + 2\hat{k}$ be the position vector of P relative to O as origin

Substituting x, y, z in r

we have $\vec{r} = (t)\hat{i} + (5t^2 + 7)\hat{j} + (1+7)\hat{k}$

So acceleration vector $\vec{A}$

will be differentiated $\vec{r}$ with respect to t

$\therefore \vec{a} = \frac{d\vec{r}}{dt} = 2\hat{i} + 10\hat{j} + \hat{k}$ //

2 ~~If P = t~~

$(P \times Q) = (i - 9j - 4k \times 8i - 3j + 6k)$

$= 8i - 27j - 24k)$

$R \times P) = (i - 4j - 3k \times 1 - 9j - 4k)$

$= (0 - 36j - 12k)$

$(P \times Q)(R \times P) = (8i - 27j - 24k) - (0 - 36j - 12k)$

$= 972j + 288k$ //

3 $F = 5\cos 7t\,\hat{i} + 2e^{3t}\hat{j}, -4t^3k$

$R = 5\cos 7t\,i - 2e^{3t}j - 4t^{3k}$

$\int R\,dt = \frac{-5\sin 7t^1}{7} + \frac{2e^{4t}j}{4} - \frac{4t^{4k}}{4}$