



Question

If $\vec{r}(t) = x(t)\vec{i} + y(t)\vec{j} + z(t)\vec{k}$ is a curve in space and $x(t)^2 + y(t)^2 + z(t)^2 = 1$, what can you conclude about $\vec{r}'(0)$?

- A. $\vec{r}'(0)$ is normal to a sphere of radius 1 centered at the origin.
- B. $\vec{r}'(0) = \vec{0}$ because $|\vec{r}(t)|$ is constant.
- C. $\vec{r}'(0)$ is tangent to a sphere of radius 1 centered at the origin.
- D. $\vec{r}'(0) = 2x(0)x'(0)\vec{i} + 2y(0)y'(0)\vec{j} + 2z(0)z'(0)\vec{k}$.