## Directional Derivatives and the Gradient

## Question

If $x(t)^{2}+y(t)^{2}+z(t)^{2}=1$ for all $t$ and we differentiate both sides with respect to $t$, what do we get?
A. $2 x(t) x^{\prime}(t)+2 y(t) y^{\prime}(t)+2 z(t) z^{\prime}(t)=1$
B. $2 x(t)+2 y(t)+2 z(t)=0$
C. $2 x(t)+2 y(t)+2 z(t)=1$
D. $2 x(t) x^{\prime}(t)+2 y(t) y^{\prime}(t)+2 z(t) z^{\prime}(t)=0$

