Derivatives and Integrals of Vector Functions

Question

Consider the space curve parametrized by $x = \cos(t), y = \sin(t)$, and $z = t$. Which of the following is an equation of the tangent line to the curve at the point where $t = \pi/4$?

A. $\vec{r}(t) = \left\langle \frac{-1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, 1 \right\rangle + t \left\langle -\sin(t), \cos(t), 1 \right\rangle$

B. $\vec{r}(t) = \left\langle \frac{-1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, 1 \right\rangle + t \left\langle \frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, \frac{\pi}{4} \right\rangle$

C. $\vec{r}(t) = \left\langle \frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, \frac{\pi}{4} \right\rangle + t \left\langle \frac{-1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, 1 \right\rangle$

D. $\vec{r}(t) = \left\langle \frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, \frac{\pi}{4} \right\rangle + t \left\langle -1, 1, \frac{1}{\sqrt{2}} \right\rangle$

E. More than one of the above.