

## Quiz 5

$$1) \mathbf{r}' = \cos t \mathbf{i} - \sin t \mathbf{j} + \mathbf{k}$$

$$\mathbf{r}'' = -\sin t \mathbf{i} - \cos t \mathbf{j}$$

$$\sqrt{\cos^2 t + \sin^2 t + 1^2} = \sqrt{1^2 + 1^2} = \sqrt{2}$$

$$\sqrt{(\cos^2 t + \sin^2 t + 1)^3} = \sqrt{2}^3$$

$$\frac{\sqrt{2}}{\sqrt{2}^3}$$

$$\begin{pmatrix} i & j & k \\ \cos t & -\sin t & 1 \\ -\sin t & -\cos t & 0 \end{pmatrix} = i(\cos t) - j(\sin t) - k(1)$$

$$2) \mathbf{r}' = i + 2j + 0k \leftarrow \text{velocity}$$

$$|\mathbf{r}'| = \sqrt{2^2 + 1^2} \leftarrow \text{speed}$$

$$\mathbf{r}'' = 0i + 0j + 0k \leftarrow \text{acceleration}$$