Please PRINT your name _____

No calculators, cell phones, computers, notes, etc.

Circle your answer. | Make your work correct, complete and coherent. |

Please take a picture of your quiz (for your records) just before you turn the quiz in. I will e-mail your grade and my comments to you. I will return your quiz when I next see you.

The quiz is worth 5 points. The solutions will be posted on my website later today.

Quiz 4, October 2, 2024

Find parametric equations for the line that is tangent the curve parameterized by
$\vec{r}(t) = (\sin t)\,\vec{i} + (t^2 - \cos t)\,\vec{j} + e^t\,\vec{k}$ at $t = 0$.

Answer: The point on the curve at time $t = 0$ is

$$(\sin(0), 0^2 - \cos(0), e^0) = (0, -1, 1).$$

A vector tangent to the curve (and parallel to the tangent line) at time 0 is $\vec{r}\,'(0)$. We see that $\vec{r}\,'(t) = \cos t\,\vec{i} + (2t + \sin t)\,\vec{j} + e^t\,\vec{k}$. Thus $\vec{r}\,'(0) = \vec{i} + \vec{k}$ and the tangent line is

$$\boxed{x = t,\ y = -1,\ z = 1 + t}.$$