13.1, number 23: **Find parametric equations for the line that is tangent the curve parameterized by $\overrightarrow{r}(t) = (\sin t)\,\overrightarrow{i} + (t^2 - \cos t)\,\overrightarrow{j} + e^t\,\overrightarrow{k}$ 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 $\overrightarrow{r}'(0)$. We see that $\overrightarrow{r}'(t) = \cos t\,\overrightarrow{i} + (2t + \sin t)\,\overrightarrow{j} + e^t\,\overrightarrow{k}$. Thus $\overrightarrow{r}'(0) = \overrightarrow{i} + \overrightarrow{k}$ and the tangent line is

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