Problem 1. Find the tangent line to \( \mathbf{r}(t) = (2 \cos t, 2 \sin t, 3t) \) at \( (\sqrt{2}, \sqrt{2}, 3\pi/4) \).

Problem 2. Find the length of the curve \( \mathbf{r}(t) = (\cos(t^2), \sin(t^2), t^2) \), \( 0 \leq t \leq \sqrt{2\pi} \).
Problem 3. *Find the curvature of the parabola* $y = x^2$ *at* $(2, 4)$.

Problem 4. *Find the curvature of* $\mathbf{r}(t) = \langle 2 \cos t, 2 \sin t, 3t \rangle$. 