1. Compute
\[ \int_C (e^x \sin(y) - y)dx + (e^x \cos(y) - x - 2)dy \]
where \( C \) consists of the straight line segment from \((0, 0)\) to \((1, 4)\), then the line segment from \((1, 4)\) to \((16, 493)\), then the line segment from \((16, 493)\) to \((1, 1)\).

2. Compute
\[ \iint_S zdS, \]
where \( S \) is the part of the paraboloid \( z = x^2 + y^2 \) lying under the plane \( z = 6 \).

3. Evaluate
\[ \iint_S \text{curl}(\mathbf{F}) \cdot d\mathbf{S}, \]
where
\[ \mathbf{F}(x, y, z) = yzi + xyz^2j + z^3e^{xy}k \]
and \( S \) is the part of the sphere \( x^2 + y^2 + z^2 = 5 \) that lies above the plane \( z = 1 \). Orient \( S \) upward (take an outer normal on \( S \)).