MTH 265, Quiz #6, Fall 2018   Name _____

Instructions: Show all work. Use exact answers unless otherwise asked to round.

1. Find ∇f and $\nabla^2 f$ for the function $f(x, y, z) = \frac{1}{2}xy^2\cos(y + z^3)$.

2. Find $\nabla \cdot \vec{F}$ and $\nabla \times \vec{F}$ for $\vec{F}(x, y, z) = \sin(xy)\,\hat{\imath} - \cos(yz)\,\hat{\jmath} + \tan(xz)\hat{k}$.

3. Determine if the vector field $\vec{F}(x, y, z) = (x + y)\hat{\imath} + (y - z)\hat{\jmath} + z^2\hat{k}$ is conservative.