**Math 155A - Fall 2022 - Quiz #10 - October 27**

**Name:**

**PID:**

**1.** A cone $\mathcal{C}$ is defined by $y = 2\sqrt{x^2 + z^2}$, so that it is centered around the positive $y$-axis. It can equivalently be defined as

$$\mathcal{C} = \{\langle y^2 = x^2 + z^2\rangle : y \geq 0\}.$$

Suppose $\langle x, y, z\rangle$ lies on $\mathcal{C}$. Give a formula for a normal vector (not necessarily a unit vector) at $\langle x, y, z\rangle$ on $C$. Choose the direction of the normal vector to point outward from the cone, i.e., away from the $y$-axis and somewhat downward.

**2.** A parametric surface is defined by $\mathbf{f}(u, v) = \langle u, uv, v\rangle$. Give a formula for a normal vector at the point $\mathbf{f}(u, v)$. Your answer does not need to be a unit vector.