

MATH 241 Spring, 2010 Quiz #1 Name: _____

1. Sketch the surface $z = 1 - y^2$ in (x, y, z) -space.
2. Find the terminal point Q of $\mathbf{v} = \langle 1, 2, -3 \rangle = \hat{\mathbf{i}} + 2\hat{\mathbf{j}} - 3\hat{\mathbf{k}}$ if the initial point P is $(-2, 1, 4)$. Also find the length of \mathbf{v} .
3. Compute the orthogonal projection of $\mathbf{w} = \langle 1, -1, 2 \rangle$ on $\mathbf{v} = \langle 1, 2, -3 \rangle$ (that is, $\mathbf{a} = \text{proj}_{\mathbf{v}} \mathbf{w}$, the component of \mathbf{w} in the direction of \mathbf{v}). Then compute the component of \mathbf{w} that is orthogonal to \mathbf{v} ; call this vector \mathbf{b} . Finally, verify that \mathbf{a} is orthogonal to \mathbf{b} .