

Activity 1: \mathbb{R}^3 and graphs of functions from \mathbb{R}^2 to \mathbb{R}

Names: _____ Date: September 10, 2009 Score: _____

Please explain your work.

1. (4 pts) Without the use of a graphing calculator, graph the function

$$f(x, y) = -3 + \exp(x^2 + y^2)$$

2. (4 pts) A square pyramid has base 2500 m^2 and height 75 m . How far is it from the top to a bottom corner?

3. (4 pts) Sketch and describe the points which satisfy

$$(x - 3)^2 + (y + 2)^2 + (z + 5)^2 > 49$$

4. Consider the region defined by

$$\begin{aligned}1 &\leq x \leq 3 \\ -1 &\leq y \leq 4 \\ 5 &\leq z \leq 9\end{aligned}$$

(a) (4 pts) Find the smallest sphere centered at $(2, 0, 6)$ to contain the region.

(b) (4 pts) Find the largest sphere centered at $(2, 0, 6)$ to be contained in the region.