Quiz # 8– Math 2163, Calculus III – Oct. 26, 2007

Show all your work neatly and concisely, and indicate your final answer clearly.

1. Reduce the equation to one of the standard forms and sketch it:

$$z^2 = 4x^2 + 9y^2 + 36$$

Solution: The standard form comes from:

$$\begin{aligned} & z^2 = 4x^2 + 9y^2 + 36 \\ \Rightarrow \quad & -4x^2 - 9y^2 + z^2 = 36 \\ \Rightarrow \quad & \frac{-4x^2 - 9y^2 + z^2}{36} = \frac{36}{36} \\ \Rightarrow \quad & -\frac{x^2}{3^2} - \frac{y^2}{4^2} + \frac{z^2}{6^2} = 1 \end{aligned}$$

It is a hyperboloid of two sheets, with z-axis as its axis. The graph looks like the following: