Written Homework for 12.4 – 12.5

Neatness and organization is important. Use proper notation throughout and show work where needed. Be sure to label all graphs clearly, including axes, intercepts, and important values (if possible).

1. Sketch an accurate graph of $f(x, y) = a - bx + y$ where a = your age and b = the last non-zero digit in your phone number.

2. A plane passes through the points $(2,1,0)$, $(0,1,3)$, and $(1,0,1)$.

A. Find two vectors lying on the plane.
B. Find a vector perpendicular to the plane.
C. Find an equation of the plane.
D. Find an equation of a plane that is perpendicular to the plane in part C.

3. Using the guidelines given in class, find the level surfaces of $f(x, y, z) = \ln(10 - x^2 - y^2 - z^2)$.

4. Suppose a cone has height 5 and radius 5 with its base on the xz – plane and its vertex on the positive y – axis. Find a function $g(x, y, z)$ so that the cone is one level surface of g.