MATE 3063 assignment 2: section 14.1

1. Find and sketch the domain of the function:

   (a) $f(x,y) = \sqrt{x-1} + \ln(y+2)$.

   (b) $f(x,y) = \ln(9 - x^2 - y^2)$.

   (c) $f(x,y) = \sqrt{4-x^2} - \sqrt{1-y^2}$.

   Each of these involves solving a single, or a system of, inequalities. Follow the graphical method shown in class, breaking down the steps.

2. Sketch the graph of the function:

   (a) $f(x,y) = 2y$.

   (b) $f(x,y) = 10 - 4x - 2y$.

   (c) $f(x,y) = \sqrt{4-x^2-y^2}$. What symmetries does the graph have?

3. Problem 32 of text: do all, write the solution for two. Give reasons for your choice: see comment on hw1.

4. Problem 35 of text.

5-6. Choose two of 45–52 (and do more on your own). You must show the level value by each level curve.

7-9. Problems 53-66: choose three of the syllabus problems.

10. Describe the level surfaces:

   (a) $g(x,y,z) = x + 3y - 2z$.

   (b) $g(x, y, z) = x^2 - y^2 - z^2$. How does the level value affect the number of sheets the surface has? (Specify a certain interval).

11. Problem 71 p.903.