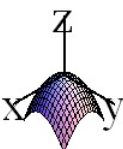

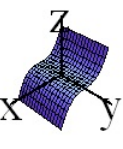
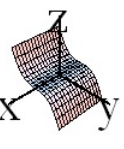
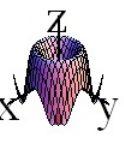
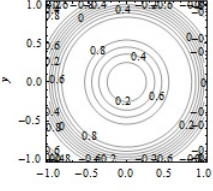
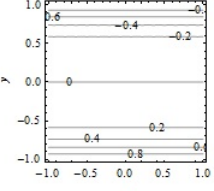
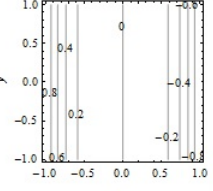
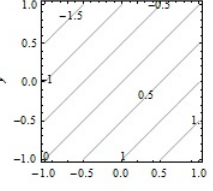
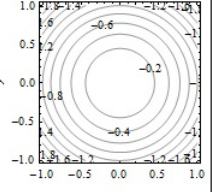


Math 2130 Homework 1: 12.1-12.5

Complete the following exercises on separate sheets of paper. Be sure to read over the presentability guidelines (on the 2130 webpage) first.

- (1) How are the xz plane and x axis oriented relative to each other? How are the xz plane and y axis oriented relative to each other?
- (2) How far is the point $(1, 2, 3)$ from the xz plane? From the point $(3, 2, 1)$?
- (3) Construct a table for the function $f(x, y) = x^y$ for $x = 1, 2, 3$ and $y = 1, 2, 3$.
- (4) What point do these graphs have in common?
 - (a) $f(x, y) = 9$
 - (b) $g(x, y) = (x + y)^2$
 - (c) $h(x, y) = 3^x$
- (5) Write out the order that these functions occur in each row of the following table:

$$A(x, y) = -x^2 - y^2 \quad B(x, y) = x - y \quad C(x, y) = \sin(\pi(x^2 + y^2)) \quad D(x, y) = -x^3 \quad E(x, y) = -y^3$$

				
$\begin{array}{c} x \\ -1 \ 0 \ 1 \\ y \ 1 \ 1 \ 1 \\ 0 \ 0 \ 0 \ 0 \\ 1 \ -1 \ -1 \ -1 \end{array}$	$\begin{array}{c} x \\ -1 \ 0 \ 1 \\ y \ -1 \ -2 \ -1 \ -2 \\ 0 \ -1 \ 0 \ -1 \\ 1 \ -2 \ -1 \ -2 \end{array}$	$\begin{array}{c} x \\ -1 \ 0 \ 1 \\ y \ -1 \ 1 \ 0 \ -1 \\ 0 \ 1 \ 0 \ -1 \\ 1 \ 1 \ 0 \ -1 \end{array}$	$\begin{array}{c} x \\ -1 \ 0 \ 1 \\ y \ -1 \ 0 \ 0 \ 0 \\ 0 \ 0 \ 0 \ 0 \\ 1 \ 0 \ 0 \ 0 \end{array}$	$\begin{array}{c} x \\ -1 \ 0 \ 1 \\ y \ -1 \ 0 \ 1 \ 2 \\ 0 \ -1 \ 0 \ 1 \\ 1 \ -2 \ -1 \ 0 \end{array}$
				

- (6) For the function $f(x, y) = x^3 - y$, describe the intersection of its graph with:
 - (a) The xz plane
 - (b) The xy plane
 - (c) The plane $y = 1$
- (7) Find an equation of the plane through the points $(0, 0, 0)$, $(0, 1, 1)$, $(1, 2, 1)$.
- (8) What shapes do the level surfaces of $f(x, y, z) = x^2 + y^2 - z^2$ look like?