Name _____

Homework 1
Section 12.1

1. (5) Derive a formula for the distance between the point (a, b, c) and an arbitrary point on the z-axis.

2. (5) Write an equation for the set of points whose distance from the y-axis is 2. Describe this set in words (i.e. what does it look like?).

3. (2ea) Sketch the the natural domain of the following functions. Use solid lines for the portions of the boundary included in the domain, and dashed lines for portions not included.

   (a) $f(x,y) = \log\left(\dfrac{x^2+y^2}{y^2-x^2}\right)$

   (b) $f(x,y) = \sqrt{1-|x|-|y|}$

4. (3) Which of the following points is closest to the point $Q = (3, 2, -4)$?
$P_1 = (2, 4, 5)$ $P_2 = (-8, 1, -4)$ $P_3 = (8, -6, -3)$

5. (1ea) Given the following table of values for the function $f(x, y)$, determine the quantities below.

$x \setminus y$	-2	-1	0	2	3
-2	16	-3	-3	-10	2
0	0	9	20	18	-5
1	28	27	4	-6	23
2	-13	21	-11	7	1
3	-9	11	-11	9	2

(a) $f(0, 0)$

(b) $f(2, 3)$

(c) $f(-2, -1)$