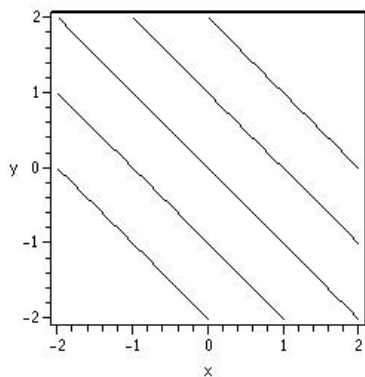


Math 303, Worksheet #1
Fall 2008

Name: _____

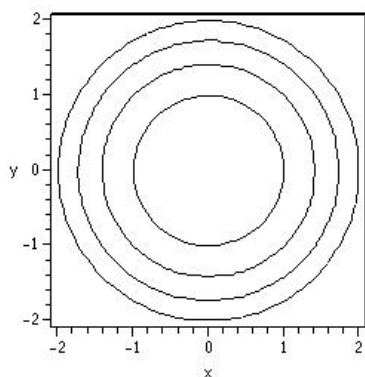
1. For each of the following functions, sketch and label the level curves for the given z values.

a. $f(x, y) = x + y, z = 0, \pm 1, \pm 2.$



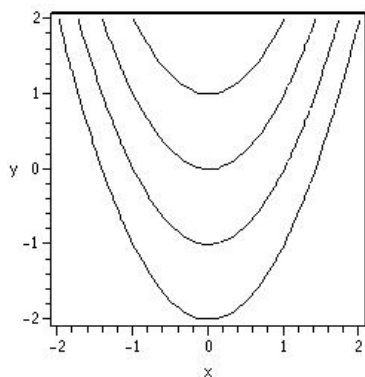
Here the z values are increasing as we go up and to the right.

b. $f(x, y) = x^2 + y^2, z = 1, 2, 3, 4.$



Here the z values are increasing as we go out away from the origin.

c. $f(x, y) = y - x^2, z = 0, \pm 1, \pm 2.$

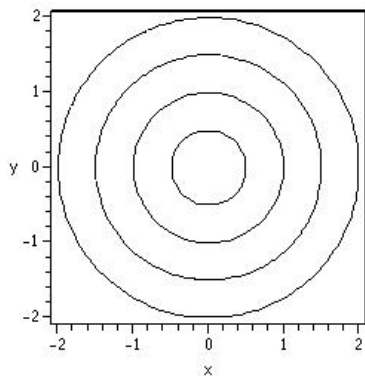


Here the z values are increasing as we go up. Apparently I didn't include the $z = 2$ contour line, because my scale wasn't large enough to fit it in.

2. Use Maple to graph each of the functions above, and convince yourself that the graph agrees with your expectations.

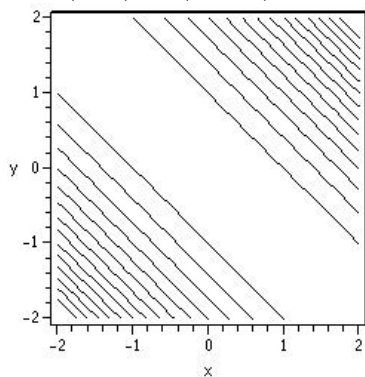
3. Graph each of the functions below, and use the graph to sketch and label a contour diagram.

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



I've drawn the $z = .5, 1, 1.5$ and 2 contour lines. Here the z values are increasing as we go out from the origin.

b. $f(x, y) = (x + y)^2$



I've drawn the $z = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13$ and 14 contour lines. Here the z values are increasing if we start on the line $y = -x$ and go up and to the right or down and to the left.

c. $f(x, y) = x^2 - y^2$

