Math 128, Spring 2008
Quiz 1, Section A

Name: ______________________

Show all work clearly and in order, and circle your final answers. Justify your answers algebraically whenever possible. Please write down all relevant mathematics. You have 20 minutes.

1. Draw and label the level curves for the function:

$$f(x,y) = e^{x^2+y^2}$$

corresponding to the heights $1, e, 2e$.

JB $z = e^{x^2+y^2}$

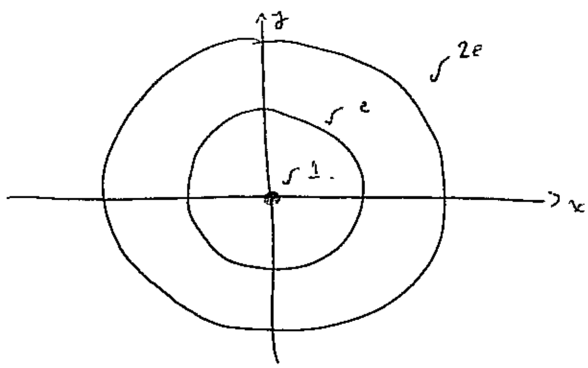
$\ln z = x^2+y^2$ } circle of Radius $\ln(z)$

$z=1: \quad 0 = x^2+y^2$

$z = e: \quad 1 = x^2+y^2$

$z = 2e \quad \ln(2e) = x^2+y^2.$

Level Curves



2. Let $f(x,y) = \ln(x^2+y^2)$. First compute

$$\frac{\partial f}{\partial x} + \frac{\partial f}{\partial y}$$

then evaluate it at the point $(x,y) = (1,1)$.

$\frac{\partial f}{\partial x} = \frac{2x}{x^2+y^2}$

$\frac{\partial f}{\partial y} = \frac{2y}{x^2+y^2}.$

$\frac{\partial f}{\partial x} + \frac{\partial f}{\partial y} = \frac{2(x+y)}{x^2+y^2}.$

at $(1,1)$ is: $\frac{2(1+1)}{1+1} = 2$

Math 128, Fall 2007
Quiz 1, Section B   Name: ____________________

Show all work clearly and in order, and circle your final answers. Justify your answers algebraically whenever possible. Please write down all relevant mathematics. You have 20 minutes.

1. Draw and label the level curves for the function:

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

corresponding to the heights $1, 2, 3$.

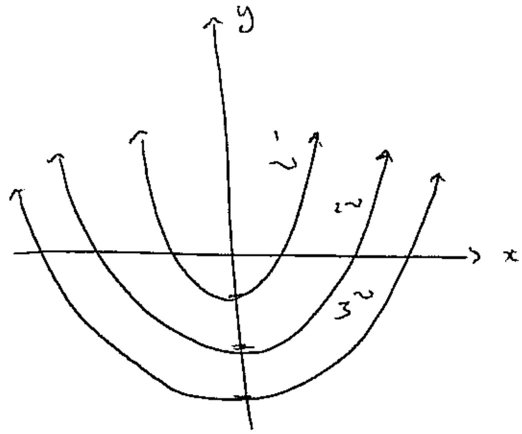
$z = x^2 - y$.

$y = x^2 - z$. $\to$ A parabola.

$z = 1$: $y = x^2 - 1$

$z = 2$: $y = x^2 - 2$

$z = 3$: $y = x^2 - 3$



2. Let $f(x, y) = e^{x^2+y^2}$. Compute

$$\frac{\partial f}{\partial x} + \frac{\partial f}{\partial y}$$

then evaluate it at the point $(x, y) = (0, 1)$.

$\frac{\partial f}{\partial x} = 2x\, e^{x^2+y^2}$

$\frac{\partial f}{\partial y} = 2y\, e^{x^2+y^2}$

$\frac{\partial f}{\partial x} + \frac{\partial f}{\partial y} = e^{x^2+y^2}\,(2x+2y)$

at $(0,1)$ this is:

$e^1\,(2) = 2e$.

Math 128, Fall 2007
Quiz 1, Section D

Name: ______________________________

Show all work clearly and in order, and circle your final answers. Justify your answers algebraically whenever possible. Please write down all relevant mathematics. You have 20 minutes.

1. Draw and label the level curves for the function:

$$f(x, y) = e^{y-x}$$

corresponding to the heights e, e^2, e^3.

$z = e^{y-x}$

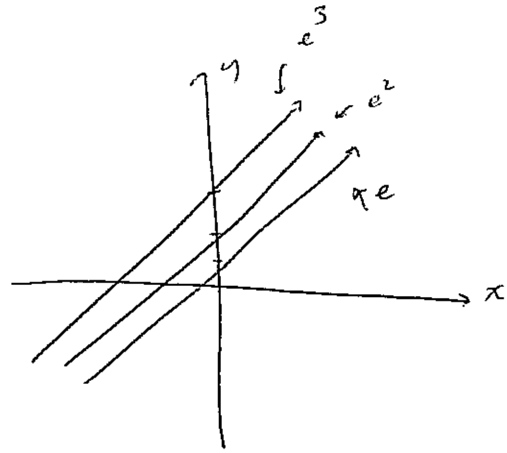
$\ln(z) = y - x.$

$y = +x + \ln(z)$ a line.

$z = e, \quad y = x + 1$

$z = e^2, \quad y = x+2$

$z = e^3, \quad y = x+3.$



2. Let $f(x, y) = e^{xy}$. Compute

$$\frac{\partial f}{\partial x} + \frac{\partial f}{\partial y}$$

then evaluate it at the point $(x, y) = (1, 1)$.

$\frac{\partial f}{\partial x} = y e^{xy}$

$\frac{\partial f}{\partial y} = x e^{xy}$

$\frac{\partial f}{\partial x} + \frac{\partial f}{\partial y} = (x+y)\, e^{xy}$

at $(1,1)$ this is: $2e$