

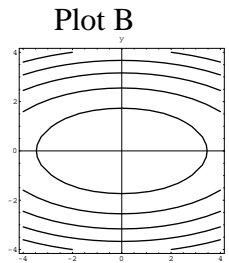
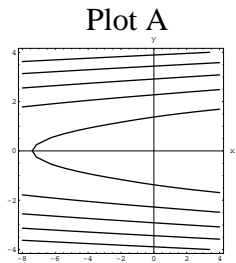
Math 220 Worksheet 3

To be done in teams without books or notes.

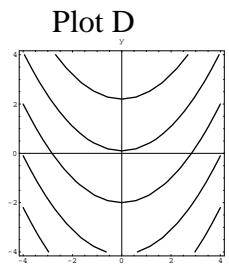
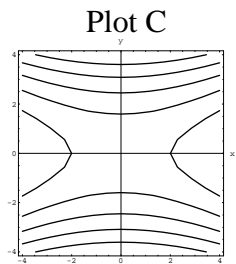
Names: _____

1. (2.5 minutes, 1996, Exam 1) Consider the function $g : \mathbf{R}^3 \rightarrow \mathbf{R}$ with formula $g(x, y, z) = x^2 - y^2 + z$. Identify (by giving their name) the level surfaces of g . Draw a rough sketch of the level surface that corresponds to $w = g(x, y, z) = 0$.

2. (5 minutes, 1999 Exam 1) Which of the following sets of level curves can be those for the surface whose equation is $z = x^2 - 4y^2$? Explain!



Answer: _____



Reasoning:

3. (2.5 minutes) What is the name of the quadric surface whose equation is $\frac{x^2}{16} - \frac{y^2}{9} + \frac{z^2}{16} = 1$?
(Give as precise an answer as you can.)

Answer: _____

4. (1997 Exam 1) Consider the function $f : \mathbf{R}^2 \rightarrow \mathbf{R}$ with formula $f(x, y) = (x^2 + y^2)/4$.
- (a) (2.5 minutes) Find the equation of the tangent plane to the graph of f at the point $(1, -1, 1/2)$.

- (b) (2.5 minutes) What point on the tangent plane has $x = 0.98$ and $y = -1.04$?

5. (5 minutes, 1995 Exam 1) Find formulas for $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$ if $f(x, y) = x^2y^3 \sin xy$.