

Math 241 Exam 3 Spring 2002

PRINT Your Name: _____

There are 10 problems on 6 pages. Each problem is worth 5 points. SHOW your work. **CIRCLE** your answer. **NO CALCULATORS!**

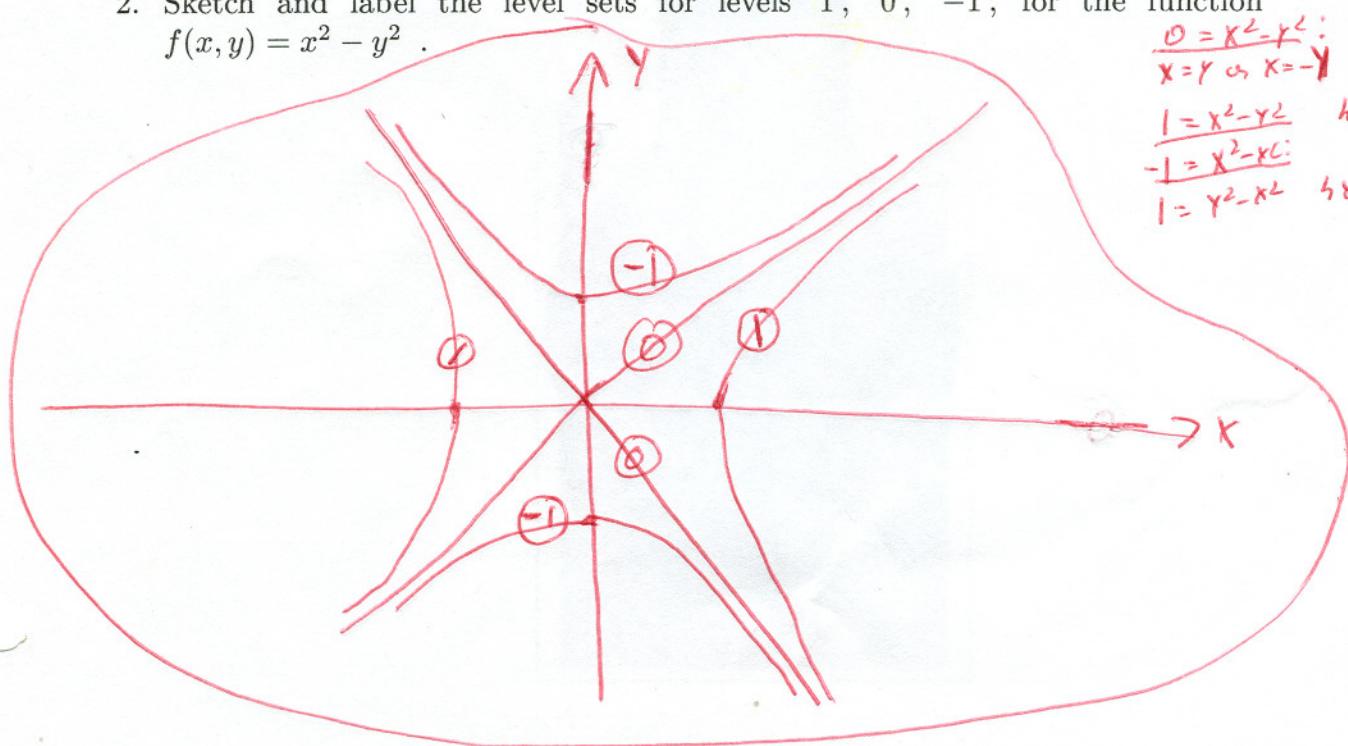
I will put your exam outside my office door after I have graded it. You may pick it up any time before class on Monday. If I know your e-mail address, I will e-mail your score on Exam 3 to you.

1. Let $f(x, y) = 2x^2y^3 - x^3y^5$. Find $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$.

$$\frac{\partial f}{\partial x} = 4x^2y^3 - 3x^2y^5$$

$$\frac{\partial f}{\partial y} = 6x^2y^2 - 5x^3y^4$$

2. Sketch and label the level sets for levels 1, 0, -1, for the function $f(x, y) = x^2 - y^2$.



$$\begin{aligned} 0 &= x^2 - y^2: \\ x = y \text{ or } x = -y & \quad \text{2 lines} \\ 1 &= x^2 - y^2 \quad \text{hyperbola} \\ -1 &= x^2 - y^2 \quad \text{hyperbola} \\ 1 &= y^2 - x^2 \end{aligned}$$