Math 250B Test One
Section X02

Time: 50 Minutes
Total: 23 Marks

Name:_____

1. [5 marks] Find all the critical points for the following function.
Give your answer(s) in the form (x, y).
$z = 2x^2 - x^2y + 6y^2 + y^3$

2. [4 marks] Find $\frac{\partial z}{\partial y}$ given $x^3 + z^6 - xy^2 = 9y^3z + 7$.

3. [4 marks] Find $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$ given:

$f = 2\ln(x^2 - y^3) + 3e^{xy} + 6\sin(x^4y^4) - 7\cos(2x - 3y)$

4. [5 marks] Find the equation of the tangent plane to
$z = \sqrt{x^2 + y^2 - 13}$ at the point on the surface where $x = 5$ and $y = -2$.

5. [5 marks] Let $f = \dfrac{6(\sqrt{y})}{x^5}$.
The maximum relative error in x is $\pm 3\%$.
The maximum relative error in y is $\pm 8\%$.
Estimate the maximum relative error in f.