MATH 2415 TEST 3

Name: _____

Testing conditions:
- 50-minute time limit;
- notes, books, and calculators are allowed;
- inter-student communication, telecommunication, and internet access are not allowed.

Exercise	Point Possible	Score
1	50	
2	50	
Total	100	

1. [50 points] If $z = f(x, y)$, $f_x(3, 3) = 1$, $f_y(3, 3) = -2$, $x = r \cos \theta$, and $y = r \sin \theta$, then what is $\partial z / \partial \theta$ at $r = 3\sqrt{2}$ and $\theta = \pi/4$?

2. [50 points] $f(x, y) = x^3 - 9xy + y^3$ has two exactly critical points. Where are they? After you find them, classify each critical point as saddle point, local minimum, or local maximum.