

MATH 2415 TEST 3

Name: _____

Date: February 26, 2013.

Exercise	Point Possible	Score
1	15	
2	15	
3	30	
4	20	
5	20	
Total	100	

1. [15 points] True or false? If $f(x, y) \rightarrow 7$ as $(x, y) \rightarrow (2, 5)$ along every straight line through $(2, 5)$, then $\lim_{(x,y) \rightarrow (2,5)} f(x, y) = 7$.

2. [15 points] True or false? If the partial derivatives g_x and g_y of a function g of two variables exist at every point (x, y) , then g is continuous at every point (x, y) .

3. [30 points] Find the linear approximation of the function $f(x, y, z) = \sqrt{x^2 + y^2 + z^2}$ at $(x, y, z) = (3, 2, 6)$ and use it to approximate the number $\sqrt{(3.02)^2 + (1.97)^2 + (5.99)^2}$.

4. [20 points] If $v(x, y) = e^{xy}$, $x = 200$, $y = 0$, $dx = 3$, and $dy = 4$, then what is dv ?

5. [20 points] Given $h(5, y) = y^2$ and $h(5.1, y) = y^2 + (0.3)y^3$, estimate $\frac{\partial^2 h}{\partial x \partial y}(5, 2)$.