

Name _____

Quiz 4

1. Prove that the following limit does not exist

$$\lim_{(x,y) \rightarrow (0,0)} \frac{8x^2y^2}{3x^4 + y^4}.$$

2. Prove that the following limit does not exist

$$\lim_{(x,y) \rightarrow (0,0)} \frac{(x+y)^6}{x^6 + y^6}$$

3. Prove that the following limit does exist

$$\lim_{(x,y) \rightarrow (0,0)} \frac{x^3 + xy^2}{x^2 + y^2}.$$

4. Let $f(x, y) = x^2e^{x^2+y^2}$ be a function in two variables.

(a) Compute $f_x(x, y)$ and $f_y(x, y)$.

(b) Give the equation of the tangent plane to the graph of the function $f(x, y)$ at the point corresponding to $(1, 1)$.