Name:

1. Consider the function

$$f(x, y) = 10^{-(x^2+y^2)}$$

Sketch the level curves for this function for the values $c = 1$, $c = 1/10$, and $c = 1/100$. Indicate clearly in your diagram which curves correspond to which values of c.

2. Sketch the graph of the function from the previous problem.

3. Consider the function

$$f(x, y) = \frac{xy}{x^2 + 3y^2}.$$

- Is $(0, 0)$ in the domain of this function? Why or why not?

- What is the value of this function along the line $y = x$?

- What is the value of this function along the line $y = 0$?

- Either compute $\lim_{(x,y)\to(0,0)} f(x, y)$ or explain clearly why this limit doesn't exist.