

[11.2,3] - Reading Assignment

After reading sections 11.2 and 11.3 ...

1. When talking about limits for functions of several variables, why isn't it sufficient to say

$$\lim_{(x,y) \rightarrow (0,0)} f(x,y) = L \quad (1)$$

if $f(x,y)$ gets close to L as we approach $(0,0)$ along the x axis and along the y axis. (*Hint*: consider path independence.)

2. Show that $\lim_{(x,y) \rightarrow (0,0)} (x^2 + y^2) = 0$.
3. Consider $\lim_{(x,y) \rightarrow \infty} \left(\frac{xy}{3x^2 + 2y^2} \right)$. Why does the limit not exist?
4. Suppose the $f(x,y)$ is continuous everywhere. Assume that $f_x(1,1) = 2$, $f_y(1,1) = -2$, and $f_{xy}(1,1) = 3$. Can you compute $f_{yx}(1,1)$ from this information alone?
5. Muddy questions? Questions you wonder about?