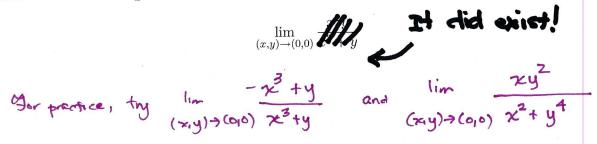
Instructions: Each problem is worth one point. There is no partial credit on this quiz. You get one point for taking this quiz.

1. Show that the following limit does not exist:



- 2. Consider the function $f(x,y) = \ln(x^2 + y^2 + 1)$.
 - (a) Compute the partial derivative $\frac{\partial f}{\partial x}$. $\frac{\partial f}{\partial x} = \frac{1}{\chi^2 + y^2 + 1} \cdot 2\chi = \frac{2\chi}{\chi^2 + y^2 + 1}$
 - (b) Is the function f increasing, decreasing, or constant in the positive x-direction at the point P(0,1). Explain briefly.

$$\frac{2f(0,1)}{3x}(0,1) = \frac{2(0)}{0^2+1^2+1} = 0$$
 .: Constant, in the positive re-direction

3. Give the formula for the differential dV for the volume of a box with square base $10 \times 10 \, \text{in}^2$ and height $h = 20 \, \text{in}$.

$$V = \chi^{2}h$$

$$dV = V_{\chi}(10, 20) dx + V_{\chi}(10, 20) dh$$

$$V_{\chi}(10, 20) = 2.10.20 = 400$$

$$dV = 400 d\chi + 100 dh$$

$$V_{\chi}(10, 20) = 10^{2} = 100$$

$$V_{\chi}(10, 20) = 10^{2} = 100$$