

Show all work. 5 points each.

1. Show $\lim_{(x,y) \rightarrow (0,0)} \frac{-xy}{x^2 + 2y^2}$ does not exist by evaluating along the paths $y = 0$ and $y = x$.

2. Determine if $u(x, y) = x^4 - 6x^2y^2 + y^4$ is a solution to $u_{xx} + u_{yy} = 0$. Be sure to show u_x and u_y