

Name:

1. Show that $\lim_{(x,y) \rightarrow (0,0)} \frac{x^3 + x^2y}{x^2 + y^2} = 0$.

Note: a rigorous proof is not required, just a convincing argument. As with one-variable limits involving rational expressions, you might find that some algebraic manipulation will “simplify” the situation for you.

2. Show that $\lim_{(x,y) \rightarrow (0,0)} \frac{xy^3}{x^2 + y^6}$ does not exist.

Hint: one way to let (x, y) approach $(0, 0)$ is along the curve $x = y^3$.