

Let $f(x, y) = \frac{6x^3y}{2x^4 + y^4}$, and consider $\lim_{(x,y) \rightarrow (0,0)} f(x, y)$.

1. Find the limit as you approach the origin along the x -axis.
2. Find the limit as you approach the origin along the y -axis.
3. Find the limit as you approach the origin along the line $y = x$.
4. Find the limit as you approach the origin along the line $y = mx$.
5. Use a 3-D plot, a contour plot, and a density plot to explain the behavior of f near the origin.