FALL 2025 MATH 147: QUIZ 1

Name:

1. For the function $f(x, y)$, the point $(a, b) \in \mathbb{R}^2$, and the real number $L \in \mathbb{R}$, give the epsilon-delta definition for $\lim_{(x,y)\to(a,b)} f(x, y) = L$. (2 points)

2. For $\lim_{(x,y)\to(0,0)} \frac{x^3 y}{x^6+2y^2}$, show that the limit along any line through the origin exists and equals zero, but if we take the limit along the curve $y = x^3$, the limit is not zero. What conclusion can you draw from this?. (4 points)

3. Use polar coordinates to evaluate the limit $\lim_{(x,y)\to(0,0)} \frac{x^3+x^5}{x^2+y^2}$. (4 points)