

Show all work. 5 points each.

1. Evaluate the limit $\lim_{(x,y) \rightarrow (0,0)} \frac{y^4}{x^4 + 3y^4}$ along the paths $y = 0$ and $y = x$ to show that the limit does not exist.

2. Find the first partial derivatives of the function $u = te^{\frac{w}{t}}$.