<div align="center">

**Partial Differentiation**
*Limits*

</div>

**Question**

Evaluate the given limit. If the limit does not exist, explain why.

$$\lim_{(x,y)\to(0,0)} \frac{y^3}{x^2 + y^2}$$

**Answer**

$$\left| \frac{y^3}{x^2 + y^2} \right| \le \frac{y^2}{x^2 + y^2}|y| \le |y| \to 0$$

as $(x, y) \to (0, 0)$.

$$\Rightarrow \lim_{(x,y)\to(0,0)} \frac{y^3}{x^2 + y^2} = 0$$