

Using our formal definition of the limit, prove that  $\lim_{(x,y) \rightarrow (0,0)} f(x,y) = L$  if:

1.  $f(x,y) = \frac{7x^2y^2}{\sqrt{x^2+y^2}}$  and  $L = 0$

2.  $f(x,y) = \frac{4x^3y}{(x^2+y^2)^{3/2}}$  and  $L = 0$

3.  $f(x,y) = \frac{5x^3y}{2x^2+y^2}$  and  $L = 0$

4.  $f(x,y) = \frac{x^3\sqrt[4]{y}}{x^2+y^2}$  and  $L = 0$

5.  $f(x,y) = \frac{xy}{\sqrt[3]{x^2+y^2}}$  and  $L = 0$

6.  $f(x,y) = \sinh^5(x^2+y^2)$  and  $L = 0$