1. $\lim_{(x,y)\to(1,0)} f(x,y)$

   $f(x,y) = \frac{(x-1)^2 y}{(x-1)^3+y3}$

   ### Pruebo por rectas

   - recta $x = 1$
     $\lim_{y\to 0} \frac{0}{y3} = 0$
   - recta $y = (x-1)$
     $\lim_{x\to 1} \frac{\cancel{(x-1)^3}}{2\cancel{(x-1)^3}} = \frac{1}{2}$

   Al dar distinto los limites se demuestra que $\nexists \lim_{(x,y)\to(1,0)} f(x,y)$

2. $\lim_{(x,y)\to(0,0)} f(x,y)$

   $f(x,y) = \frac{x\sin(y^2)}{x^2+y^2}$

   ### Pruebo por curvas

   - iterado $x = 0$
     $\lim_{y\to 0} f(0,y) =$
     $\lim_{y\to 0} \frac{0}{y^2} = 0$

   ### Intento demostrar por sandwich

   $\exists g(x,y) : \lim_{(x,y)\to(0,0)} g(x,y) = 0 \wedge 0 \le |f(x,y)| \le |g(x,y)|$

   $|\frac{x\sin(y^2)}{x^2+y^2}| =$

   $\frac{|x||\sin(y^2)|}{x^2+y^2} =$

   $\frac{|x||\sin(y^2)|}{x^2+y^2} \overset{|\sin(k)|\le|k|}{\le}$

   $\frac{|x|y^2}{x^2+y^2} =$

   $|x| \cdot \frac{y^2}{x^2+y^2}$

   $$x^2 \ge 0 \Rightarrow x^2+y^2 \ge y^2 \Rightarrow 1 \ge \frac{y^2}{x^2+y^2} : \star$$

   $|x| \cdot \frac{y^2}{x^2+y^2} \overset{\star}{\le}$

   $|x| \cdot 1 \overset{(x,y)\to(0,0)}{\to} = 0$

   $\Rightarrow 0 \le |f(x,y)| \le |x|$

   $\Rightarrow$ por sandwich $\lim_{(x,y)\to(0,0)} f(x,y) = 0$