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

$$x^2 + 2y^2 = 0 \Rightarrow x^2 = -2y^2$$
$$\geq 0 \quad \geq 0 \qquad \geq 0 \quad \geq 0$$

$$\Rightarrow x = 0 \text{ e } y = 0$$

$$(-2)\cdot y^2 \leq 0$$
$$<0 \quad \geq 0$$

$x = 0 \Rightarrow f(x,y) = 0$

$y = 0 \Rightarrow f(x,y) = 0$

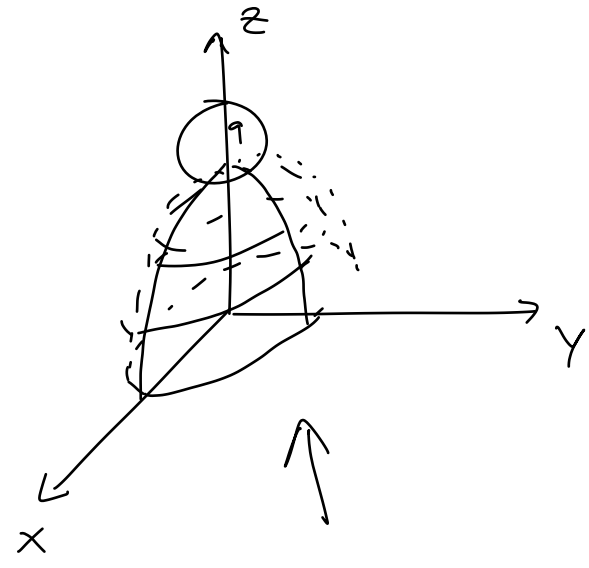
$$x = -y \Rightarrow f(x,y) = \frac{2(-y)y}{(-y)^2+2y^2} = \frac{-2y^2}{3y^2} = -\frac{2}{3}$$

$$x = y \Rightarrow f(x,y) = \frac{2x\cdot x}{x^2+2x^2} = \frac{2x^2}{3x^2} = \frac{2}{3}$$

$$D = \mathbb{R}^2 - \{(0,0)\}$$

$$D = \{(x,y) \in \mathbb{R}^2 \mid x \neq 0 \text{ e } y \neq 0\}$$

$$f(x,y) = 9 - x^2 - 9y^2, \quad z = 9 - x^2 - 9y^2$$



plano xz: $(x,0,z)$

$z = 9 - x^2 \Rightarrow z = -x^2 + 9$ (parábola)

plano yz: $(0,y,z)$

$z = 9 - 9y^2 \Rightarrow z = -9y^2 + 9$ (parábola)

plano xy: $(x,y,0)$ $z = 0$

$$0 = 9 - x^2 - 9y^2 \Rightarrow x^2 + 9y^2 = 9 \overset{(\div 9)}{\Rightarrow} \boxed{\frac{x^2}{3^2} + \frac{y^2}{1^2} = 1} \quad \text{(elipse)}$$

$z = 1$:

$$1 = 9 - x^2 - 9y^2 \Rightarrow x^2 + 9y^2 = 8 \overset{(\div 8)}{\Rightarrow} \frac{x^2}{8} + \frac{9y^2}{8} = 1 \Rightarrow \frac{x^2}{(\sqrt{8})^2} + \frac{y^2}{\left(\sqrt{\frac{8}{9}}\right)^2} = 1$$