

# Funções de várias variáveis

$$\left. \begin{array}{l} f(x) = x^2 \\ \mathbb{R} \rightarrow \mathbb{R} \\ \text{"Função real"} \end{array} \right\} \begin{array}{l} \vec{f}(t) = \langle t, t^2 \rangle \\ \mathbb{R} \rightarrow \mathbb{R}^2 \\ \text{Função vetorial} \end{array}$$

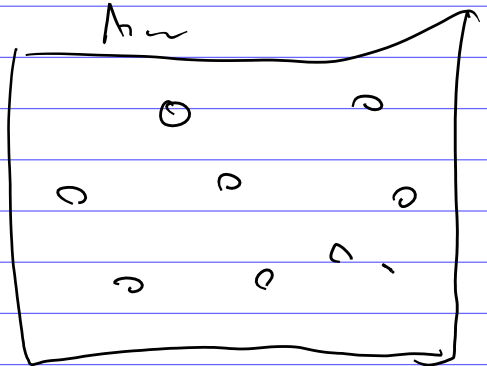
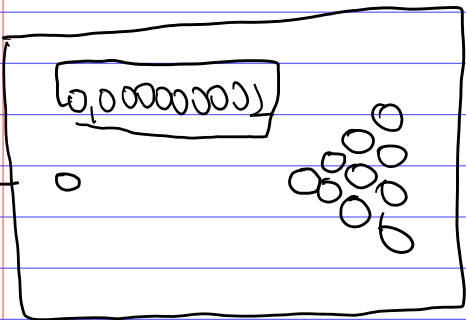
$$\left. \begin{array}{l} \mathbb{R}^2 \rightarrow \mathbb{R} \\ f(x,y) = xy \\ f(1,2) = 2 \\ f(3,3) = 9 \\ f(3,2) = 6 \end{array} \right\} \begin{array}{l} A = \frac{bh}{2} \\ A(b,h) = \frac{bh}{2} \end{array}$$

QtoTempoViverei(dia\_nascimento, renda\_familiar, país) =  $d_v$

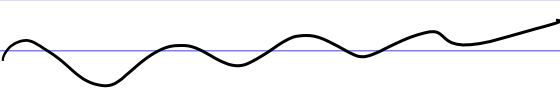
$$V_i = f(V_{i-1}, V_{i-2}, V_{i-3}, \dots)$$

$$B_{i-1}, \eta,$$

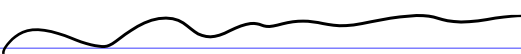
$$A \sim$$



$$x = 10,0000,321$$



$$y = T$$



$$y = A$$

## Domínio

$$f(x,y) = x + y$$

$$\begin{matrix} x \in \mathbb{R} \\ y \in \mathbb{R} \end{matrix}$$

$$D: \{(x,y) \in \mathbb{R}^2\}$$

↑  
Dupla é um elemento de  $\mathbb{R}^2$ .

$$f(3,3) = 3 + 3 = 9$$

$$f(0,3) = 0 + 3 = 3$$

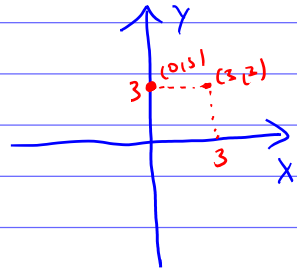
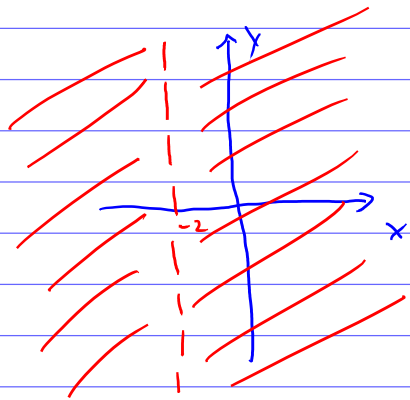


Gráfico do domínio de  $f$ .

$$g(x,y) = \frac{y}{x+2}$$

$$\begin{matrix} x+2 \neq 0 \\ x \neq -2 \end{matrix}$$

$$D: \{(x,y) \in \mathbb{R}^2 \mid x \neq -2\}$$



$$h(x,y) = \sqrt{9 - x^2 - y^2}$$

$$\begin{matrix} 9 - x^2 - y^2 \geq 0 \\ 9 \geq x^2 + y^2 \end{matrix}$$

$$D: \{(x,y) \in \mathbb{R}^2 \mid x^2 + y^2 \leq 9\}$$

$$\begin{aligned} h(-3,3) &= \sqrt{9 - (-3)^2 - (3)^2} \\ &= \sqrt{9 - 9 - 9} \\ &= \sqrt{-9} \\ h(-3,3) &\nexists \end{aligned}$$

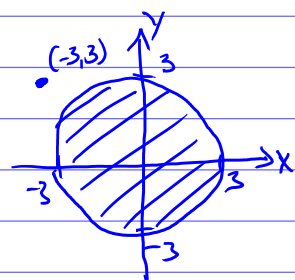


Gráfico do domínio de função

# Gráficos de função de várias variáveis

O gráfico de uma função  $f(x)$  é dado pelos pontos

$$\begin{pmatrix} x, f(x) \\ x, y \end{pmatrix}$$

O gráfico de uma função  $f(x, y)$  é dado pelos pontos

$$\begin{pmatrix} x, y, f(x) \\ z \end{pmatrix}$$

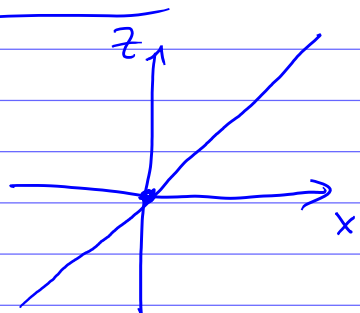
$$f(x, y) = xy$$

Tabela

$(x, y)$	$f(x, y)$
$(0, 0)$	0
$(0, 1)$	0
$(1, 0)$	0
$(1, 1)$	1
$\vdots$	$\vdots$

Imunevel

Plano  $f(x, y) = x$   
 $\Rightarrow z = x$

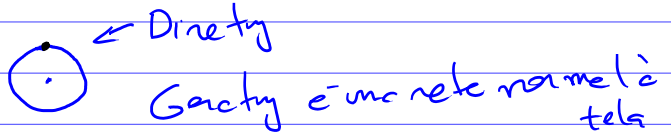


reta  $g(x) = x$   
 $\Rightarrow$

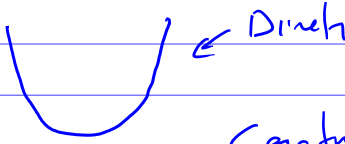
# Cilindro

Dirctng + Geotry.

## Cilindro Analto reb



## Cilindro Parabolico



$$g(x,y) = x^2$$