Cálculo II
Lista 2 - Funções de Várias Variáveis

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Lista 1.4 (pg. 26)

- 2
  $D_A = 1300 - 50x + 20y$
  $D_B = 1700 + 12x - 20y$
  $R_x = x.D_A$
  $R_y = y.D_B$
  $R_T = x.D_A + y.D_B$

$$R_T = 1300x - 50x^2 + 20xy + 1700y + 12xy - 20y^2$$

$$R_T = 32xy - 50x^2 - 20y^2 + 1300x + 1700y$$

- 3.a
  $z = 3 - x - y$

$$D(z) = \mathbb{R}^2$$

$$Im(z) = \mathbb{R}$$

- 3.b
  $f(x, y) = 1 + x^2 + y^2$

$$D(f(x, y)) = \mathbb{R}^2$$

$$Im(f(x, y)) = [1, \infty)$$

- 3.c
  $z = \sqrt{9 - (x^2 + y^2)}$
  $x^2 + y^2 \leq 3^2$
  $x^2 + y^2 - 9 \leq 0$

$$D(z) = \{(x, y) \in \mathbb{R}^2 / x^2 + y^2 \leq 9\}$$

$\sqrt{9 - (x^2 + y^2)} \rightarrow \sqrt{9 - 9} = 0$
$x^2 + y^2 \geq 0 \rightarrow \sqrt{9 - 0} = 3$

$$Im(z) = [0, 3]$$

- 3.d
  $w = e^{x^2+y^2+z^2}$

$$D(w) = \mathbb{R}^3$$

$$Im(w) = [1, \infty)$$

- 3.j
  $f(x, y) = 4 - x^2 - y^2$

$$D(f(x, y)) = \mathbb{R}^2$$

$$Im(f(x, y)) = (-\infty, 4]$$

- 4.b
  $w = \dfrac{1}{x^2 + y^2 + z^2}$