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MATRICULA: 2020000315

MATEMÁTICA BÁSICA

SEMESTRE: 2020.2

1. a) $f(x) = 2x$
 $f(3) = 3 = 2x \rightarrow x = \frac{3}{2}$ "

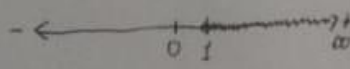
b) $f(\sqrt{2})$ $\begin{cases} f(x) = x - 3 \\ \sqrt{2} = x - 3 \\ x = \sqrt{2} + 3 \end{cases}$ "

c) $f(\sqrt{5} - 2)$ $\begin{cases} f(x) = 2x \\ \sqrt{5} - 2 = 2x \\ x = \frac{\sqrt{5} - 2}{2} \rightarrow x = \frac{\sqrt{5}}{2} \end{cases}$ "

d) $f(-0,5)$ $\begin{cases} f(x) = 2x \\ -0,5 = 2x \\ x = \frac{-0,5}{2} \rightarrow x = -\frac{0,5}{2} \end{cases}$ "

2. a) $D = \{x \in \mathbb{R} / x \leq 2\}$
 $\text{Im}g = \{y \in \mathbb{R} / y \leq 1\}$

b) $D = \{x \in \mathbb{R} / -3 \leq x \leq 3\}$
 $\text{Im}g = \{y \in \mathbb{R} / y \leq 1\}$

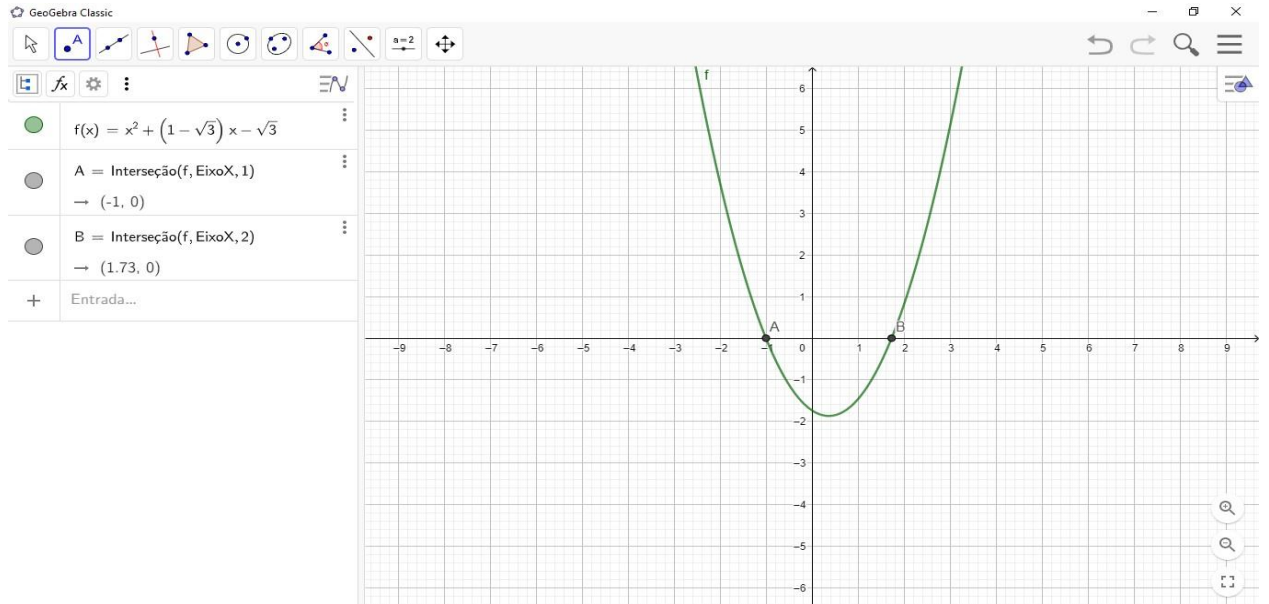
3. a) $f(x) = \frac{2}{\sqrt{x-1}}$ $\begin{matrix} x-1 > 0 \\ x > 1 \end{matrix}$
 $(1, \infty)$ 

b) $g(x) = \sqrt[3]{x^2 - 1}$
 $Dg(x) = \{\mathbb{R}\}$

4. $f(x) = ax + b$
 $\begin{matrix} f(3) = 0 & a \cdot 3 + b = 0 \\ f(-1) = -2 & 3a + b = 0 \\ f(7) = 5 & a \cdot (-1) + b = -2 \\ & -1a + b = -2 \cdot (-1) \\ & -1a + b = 2 \\ & 1a - b = 2 \end{matrix}$
 $a = \frac{2}{4}$
 $b = \frac{6}{4}$
 $\begin{matrix} 3a + b = 0 & 3 \cdot (\frac{2}{4}) + b = 0 \\ 1a - b = 2 & 3 \cdot \frac{2}{4} + b = 0 \\ 4a = 2 & b = 3 \cdot \frac{2}{4} \\ a = \frac{2}{4} & b = \frac{6}{4} \end{matrix}$
 $f(x) = \frac{2}{4}x + \frac{6}{4}$
 $\frac{2}{4} \cdot (7) + \frac{6}{4} = \frac{14}{4} + \frac{6}{4} = \frac{20}{4} = 5$

5. $V_m = \frac{\Delta s}{\Delta t}$ $S = 870 \cdot t_f$
 $S = 400 \cdot t_c$
 $S = 400 \cdot 9$
 $S = 3600 \text{ Km}$
 $t_f = t_c - 5$
 $t_c = 9 \text{ horas}$
 $t_f = 4 \text{ horas}$
 $870 t_c (t_c - 5) = 400 t_c$
 $870 t_c - 4350 = 400 t_c$
 $870 t_c - 400 t_c = 4350$
 $470 t_c = 4350$
 $t_c = \frac{4350}{470}$
 $t_c = 9 \text{ horas}$

6. $f(x) = x^2 + (1 - \sqrt{3})x - \sqrt{3}$
 $S = (-1; \sqrt{3})$



$$7. f(x) = x^2 - 4x + 1 \quad Y_v = \frac{-\Delta}{4a}$$

$$\Delta = b^2 - 4ac$$

$$\Delta = (-4)^2 - 4 \cdot 1 \cdot 1$$

$$\Delta = 16 - 4$$

$$\Delta = 12$$

$$Y_v = \frac{-12}{4} = -3$$

Para valor de mínimo, pois, $Y = -3 < 0$,

Ponto mínimo $(0, 4)$

$$D = \{x \in \mathbb{R} / x = \mathbb{R}\}$$

$$\text{Im}g = \{y \in \mathbb{R} / y \geq -3\}$$

$$8. f(x) = \frac{|x-1|}{1-x}$$

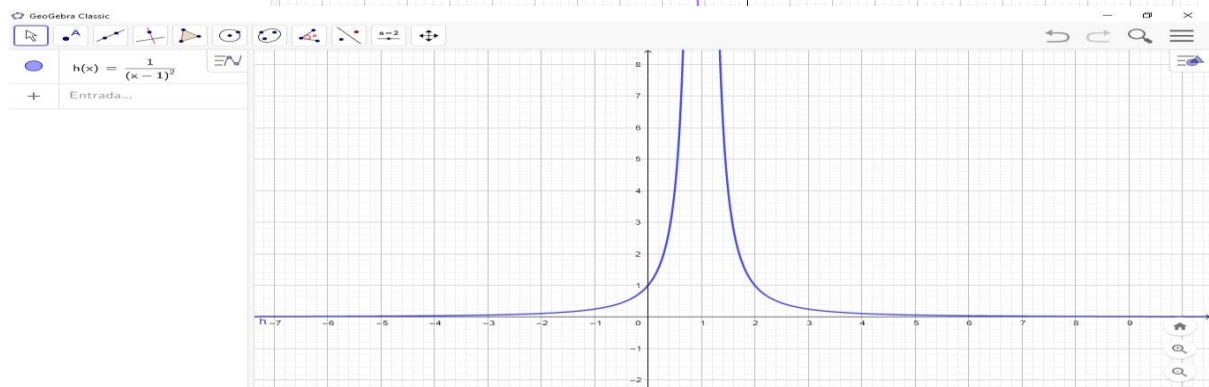
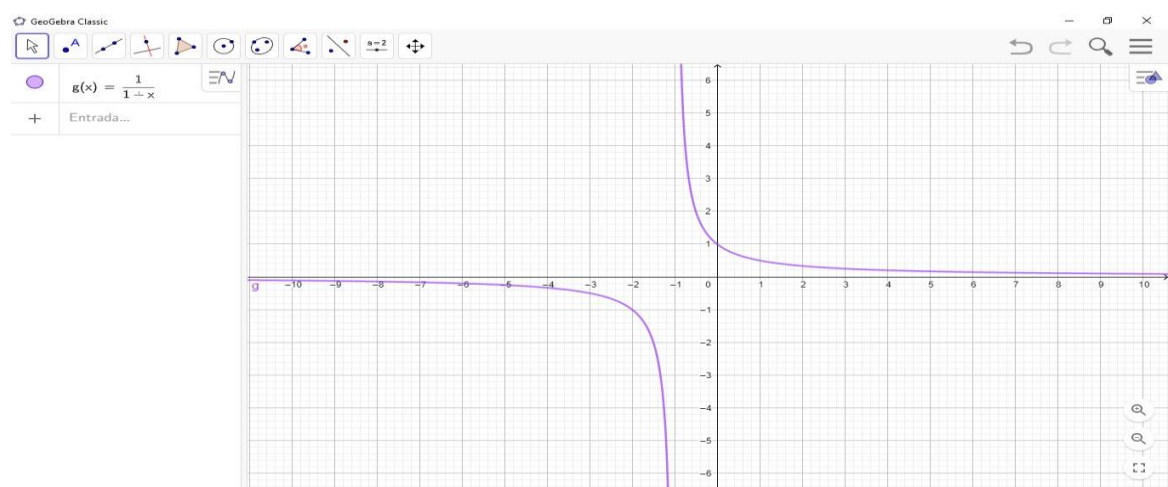
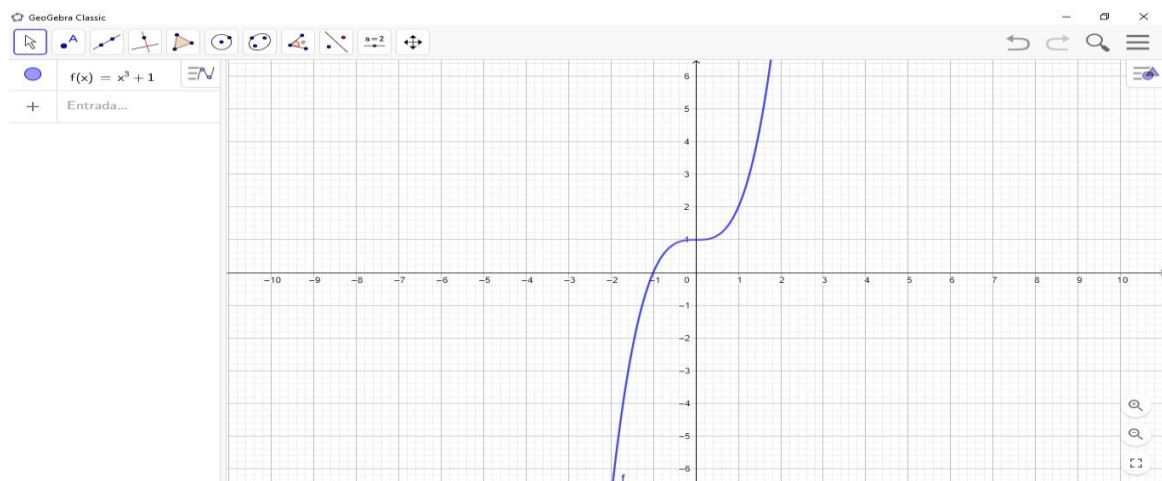
$$D = \{x \in \mathbb{R} / x = \mathbb{R} \neq 1\}$$

$$\text{Im}g = \{y \in \mathbb{R} / y = 1 \text{ e } y = -1\}$$

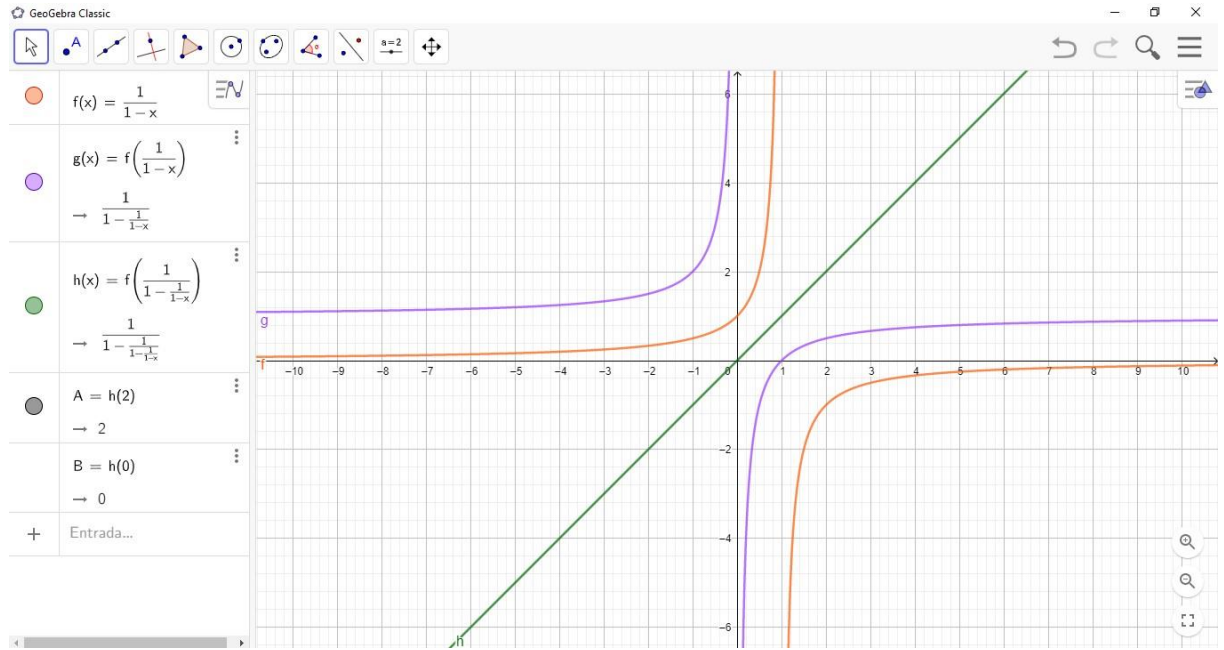
$$9. a) f(x) = x^3 + 1$$

$$b) g(x) = \frac{1}{1+x}$$

$$c) h(x) = \frac{1}{(x-1)^2}$$



10. $f(x) = \frac{1}{1-x}$



$$11. f(x) = \sqrt{1-x^2}$$

$$a) D = ? \quad A = \{x \in \mathbb{R} \mid f(x)\}$$

$$\sqrt{1-0^2} \rightarrow \sqrt{1} = 1$$

$$\sqrt{1-1^2} \rightarrow \sqrt{0} = 0$$

$$\sqrt{1-(-1)^2} \rightarrow \sqrt{0} = 0$$

$$\sqrt{1-(-2)^2} \rightarrow \sqrt{-3} \times$$

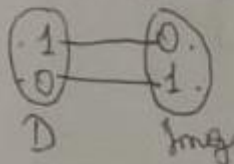
$$D = \{x \in \mathbb{R} \mid x = 1 \text{ e } x = 0\}$$

b) Imagem de f

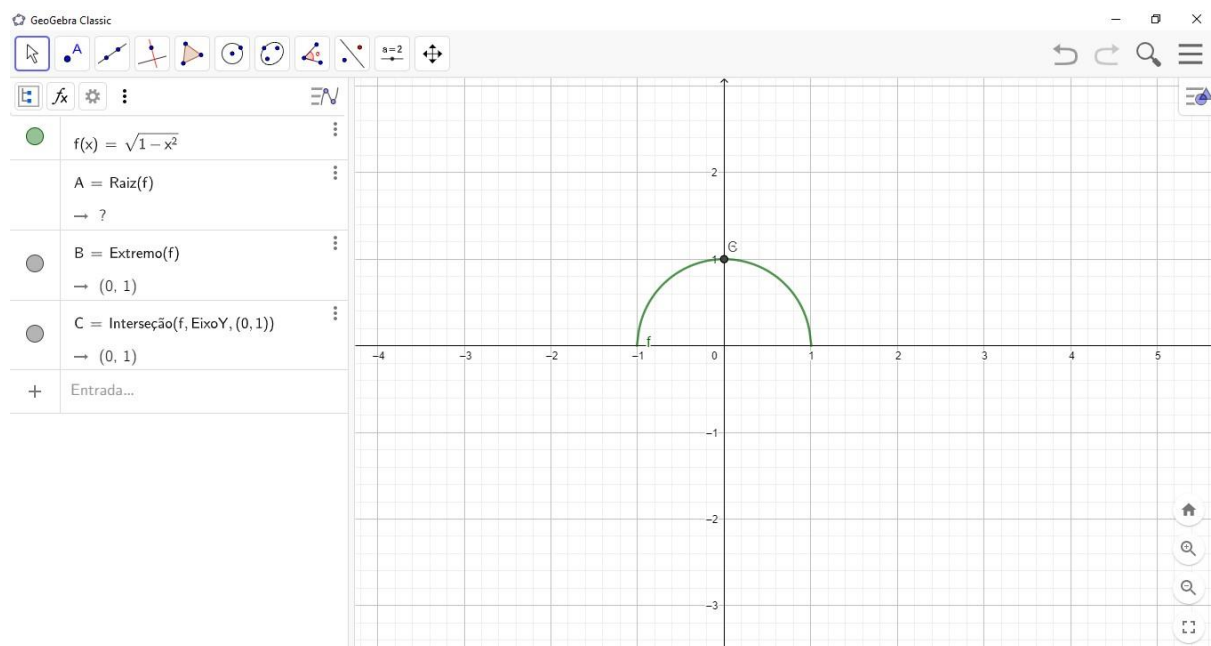
$$\text{Im} f = \{y \in \mathbb{R} \mid y = 0 \text{ e } y = 1\}$$

c) A função f é injetora? Por que?

Sim, porque ela tem elementos distintos do domínio na imagem.



d) Traça o gráfico da função f .



12. $f(x) = x^3 - 1$

