tarefa Cálculo Enviar

9c) $D(f) = \{\mathbb{R} \mid x \neq 0 \text{ e } x \neq 3\}$

9l) $x + 1 \neq 0$
$x \neq -1$

$\frac{1}{1}\sqrt{\frac{-2}{-2+1}} = \sqrt{\frac{-2}{-1}} = \sqrt{1}$

$D(f) = \{\mathbb{R} \mid x \neq -1\}$

16b) $f(x) = \frac{x^2}{x^4+1}$ $\frac{1}{1}$ $f(-x) = \frac{(-x)^2}{(-x)^4+1} = \frac{x^2}{x^4+1}$

Essa função é Par

16f) $f(x) = x \cdot |x|$ $\frac{1}{1}$ $f(-x) = (-x)|-x| \Rightarrow f(x) = -x \cdot |x|$
x^2
$f(-x) = -x^2$
$f(-x) = x^2$

Essa função e Par

33- $\Delta > 0$
$-b^2 - 4ac > 0$
$(2m-1)^2 - 4 \cdot (m) \cdot (m-2) > 0$
$(2m+1) \cdot (2m-1) - 4m \cdot (m-2) > 0$
$4m^2 + (-2m) + (-2m) + 1 - 4m^2 + 8m > 0$
$4m^2 - 2m - 2m + 1 - 4m^2 + 8m > 0$
$-4m^2 - 4m + 1 - 4m^2 + 2m > 0$
$-4m + 1 + 8m > 0$
$+4m + 1 > 0$
$4m > -1$
$m > -\frac{1}{4}$

$m \neq 0$ pois o termo "a", não pode ser igual a 0

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45 e) $\frac{x^2+3x-16}{-x^2+7x-10} \geq 1$

$\frac{x^2+3x-16}{-x^2+7x-10} - 1 \geq 0$

$\frac{x^2+3x-16-(-x^2+7x-10)}{-x^2+7x-10} \geq 0$

$\frac{x^2+3x-16+x^2-7x+10}{-x^2+7x-10} \geq 0$

I $\quad 2x^2-4x-6 \geq 0$

II $\quad -x^2+7x-10$

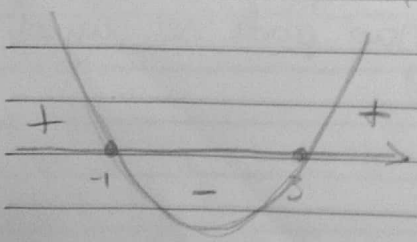
a = 2 $\quad \Delta = b^2-4ac$

b = -4 $\quad \Delta = 16-4\cdot 2\,(-6)$

c = -6 $\quad \Delta = 16+48$

$\Delta = 64 \ (>0)$

$\frac{-b \pm \sqrt{\Delta}}{2a} = \frac{4 \pm 8}{4}$ $\quad \frac{12}{4} = 3$ // $\quad \frac{-4}{4} = -1$ //



$-x^2+7x-10 \geq 0$

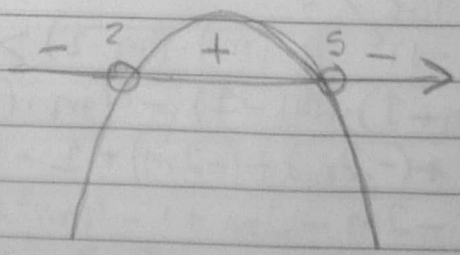
a = -1 $\quad \Delta = b^2-4ac$

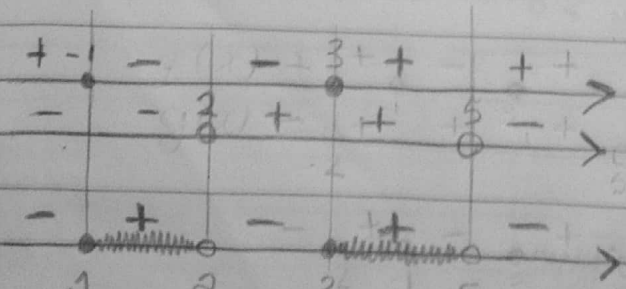
b = 7 $\quad \Delta = 49-4\cdot(-1)\cdot(-10)$

c = -10 $\quad \Delta = 49-40$

$\Delta = 9 \ (>0)$

$\frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-7 \pm 3}{-2}$ $\quad \frac{-4}{-2} = 2$ // $\quad \frac{-10}{-2} = 5$ //





$S = \{x \in \mathbb{R} \mid -1 \leq x < 2$ ou $3 \leq x < 5\}$

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8d) $f \circ g \mid g \circ f \mid f \circ f \mid g \circ g$

$f(x) = \frac{x+1}{x} \quad / \quad g(x) = \frac{x+1}{x+2}$

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$f(g(x)) = \left(\frac{x+1}{x+2}\right) + \frac{1}{\left(\frac{x+1}{x+2}\right)} = \left(\frac{x+1}{x+2}\right) + \left(\frac{1 \cdot x+2}{x+1}\right) \Rightarrow$

$\frac{(x+2)\cdot(x+2) + (x+1)\cdot(x+1) \Rightarrow}{(x+2)\cdot(x+1)}$

$\frac{x^2+2x+2x+4+(x^2+x+x+1)}{x^2+x+2x+2}$

$\frac{(x^2+4x+4)+(x^2+2x+1)}{x^2+3x+2} = \frac{2x^2+6x+5}{x^2+3x+2}$

$f(g(x)) = \frac{2x^2+6x+5}{x^2+3x+2}$

$x^2+3x+2 \neq 0 \qquad D = \{x \in \mathbb{R} \mid x \neq -1 \text{ e } x \neq -2\}$

$\Delta = 9 - 8$

$\Delta = 1$

$\frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-3 \pm 1}{2} \begin{cases} -1 \\ -2 \end{cases}$

$x \neq -2$

2. $g \circ f \Rightarrow f(x) = x + \frac{1}{x} \quad | \quad g(x) = \frac{x+1}{x+2}$

$$g(f(x)) = \frac{x + \frac{1}{x} + 1}{x + \frac{1}{x} + 2} = \frac{\frac{x^2 + 1 + x}{x}}{\frac{x^2 + 1 + 2x}{x}} = \frac{x^2 + x + 1}{x} \cdot \frac{x}{x^2 + 2x + 1} = \frac{x^2 + x + 1}{x^2 + 2x + 1} \Rightarrow x^2 + 2x + 1 \neq 0$$

$\Delta = b^2 - 4ac$ $\quad \frac{-b}{2a} = \frac{-2}{2} = -1$

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

$\Delta = 4 - 4$

$\Delta = 0$

$D = \{x \in \mathbb{R} \mid x \neq -1 \text{ e } x \neq -2\}$

3 $f \circ f$ $\quad x \neq 0$

$$f(f(x)) = \left(x + \frac{1}{x}\right) + \frac{1}{x + \frac{1}{x}} \Rightarrow \frac{x^2 + 1}{x} + \frac{1}{\frac{x^2 + 1}{x}}$$

$$\frac{x^2 + 1}{x} + \frac{1}{1} \cdot \frac{x}{x^2 + 1} \Rightarrow \frac{x^2 + 1}{x} + \frac{x}{x^2 + 1} \Rightarrow$$

$$\frac{(x^2 + 1) \cdot (x^2 + 1) + (x^2)}{x \cdot (x^2 + 1)} \Rightarrow \frac{x^4 + x^2 + x^2 + 1 + x^2}{x \cdot (x^2 + 1)} \Rightarrow$$

$$\frac{x^4 + 3x^2 + 1}{x \cdot (x^2 + 1)} \Rightarrow \quad x \cdot (x^2 + 1) \neq 0$$

$x \neq 0$

$D = \{x \in \mathbb{R} \mid x \neq 0\}$

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$g \circ g$ $\quad x+2 \neq 0 \Rightarrow x \neq -2$

$$g(g(x)) = \frac{\left(\frac{x+1}{x+2}\right)+1}{\left(\frac{x+1}{x+2}\right)+2} \Rightarrow \frac{\frac{x+1}{x+2}+\frac{1}{1}}{\frac{x+1}{x+2}+2} \Rightarrow$$

$$\frac{\frac{x+1+x+2}{x+2}}{\frac{x+1+(x+2)\cdot 2}{x+2}} \Rightarrow \frac{\frac{2x+3}{x+2}}{\frac{x+1+2x+4}{x+2}} \Rightarrow \frac{\frac{2x+3}{x+2}}{\frac{3x+5}{x+2}} \Rightarrow$$

$$\left(\frac{2x+3}{x+2}\right) \cdot \left(\frac{x+2}{3x+5}\right) = \frac{2x+3}{3x+5} \quad (-2)$$

$3x+5 \neq 0$

$3x \neq -5$

$x \neq \frac{-5}{3}$

$$D = \{x \in \mathbb{R} \mid x \neq \tfrac{-5}{3} \text{ e } x \neq -2\}$$