

# Exercícios de casa resolvidos

Extensivo — Caderno 4 — Matemática I

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$$10. \frac{1}{x^2+1} - \frac{1}{x^2-1} \leq 2$$

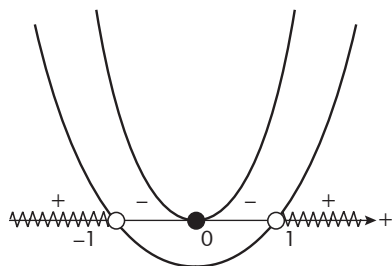
$$\frac{1}{x^2+1} - \frac{1}{x^2-1} - 2 \leq 0$$

$$\frac{1 \cdot (x^2-1) - 1 \cdot (x^2+1) - 2 \cdot (x^2+1) \cdot (x^2-1)}{(x^2+1) \cdot (x^2-1)} \leq 0$$

$$\frac{-2x^4}{(x^2+1) \cdot (x^2-1)} \leq 0$$

$$\frac{2x^4}{(x^2+1) \cdot (x^2-1)} \geq 0$$

Como  $x^2 + 1 > 0$ , para todo  $x \in \mathbf{R}$ , basta analisar  $\frac{2x^4}{(x^2-1)} \geq 0$ , isto é:

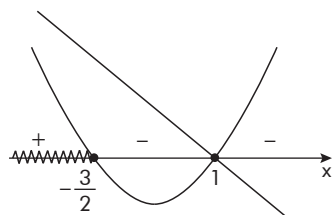


$$V = \{x \in \mathbf{R} / x < -1 \text{ ou } x = 0 \text{ ou } x > 1\}$$

$$15. (x^2 - 1)^2 - (x^2 + x - 2)^2 \geq 0$$

$$[(x^2 - 1) + (x^2 + x - 2)] \cdot [(x^2 - 1) - (x^2 + x - 2)] \geq 0$$

$$(2x^2 + x - 3) \cdot (-x + 1) \geq 0$$



$$V = \left\{ x \in \mathbf{R} / x \leq -\frac{3}{2} \text{ ou } x = 1 \right\}$$

Assim,  $a = -\frac{3}{2}$  e  $b = 1$  e, portanto,  $b - a = +\frac{3}{2} + 1 = \frac{5}{2}$ .

**Resposta: E**







