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Tópicos de Matemática Elementar 1

Parte 1 - Conjunto dos Números Racionais

Equações e Inequações de 1ª ordem

Frações

Exercício 1

1.) $24x - 3 = 2x$ $(=)$

$(=)\ 24x = 2x + 3$ $(=)$

$(=)\ 24x - 2x = 3$ $(=)$

$(=)\ 22x = 3$ $(=)$

$(=)\ x = \dfrac{3}{22}$ //

2.) $-x + 3 + 2x = 4x + 15$ $(=)$

$(=)\ -x + 3 + 2x - 4x = 15$ $(=)$

$(=)\ -x + 2x - 4x = 15 - 3$ $(=)$

$(=)\ -3x = 12$ $(=)$

$(=)\ -x = \dfrac{12}{3}$ $(=)$

$(=)\ x = -\dfrac{12}{3}$ $(:3)$ $(=)$

$(=)\ x = -4$ //

3.) $x + 1 = x - 1$ $(=)$

$(=)\ x - x + 1 = -1$ $(=)$

$(=)\ x - x = -1 - 1$ $(=)$

$(=)\ x - x = -2$ $(=)$

$(=)\ 0 = -2$ // Falso

4.) $x = x$ $(=)$

$(=)\ x - x = 0$ $(=)$

$(=)\ 0 = 0$ // Verdadeiro

Exercício 2

1.) $2x + 1 \leq 24$ ⟺

⟺ $2x \leq 24 - 1$ ⟺

⟺ $2x \leq 23$ ⟺

⟺ $x \leq \frac{23}{2}$ // $\quad CS = \left]-\infty, \frac{23}{2}\right]$

2.) $-x + 3 \geq x + 1$ ⟺

⟺ $-x + 3 - x \geq +1$ ⟺

⟺ $-x - x \geq 1 - 3$ ⟺

⟺ $-2x \geq -2$ ⟺
   $\quad(2)\qquad(2)$

⟺ $\frac{-2x}{2} \geq \frac{-2}{2}$ ⟺

⟺ $-x \geq -1$ ⟺

⟺ $x \leq 1$ // $\quad CS = \left]-\infty, 1\right]$

3.) $\frac{x}{3} + 1 < x - 1$ ⟺

⟺ $\frac{x}{3} - x + 1 < -1$ ⟺

⟺ $\frac{x}{3} - x < -1 - 1$ ⟺

⟺ $3 \cdot \frac{1}{3} \cdot x - x < -1 - 1$ ⟺
   $\qquad\qquad(3)\quad(3)\quad(3)$

⟺ $x - 3x < -3 - 3$ ⟺

⟺ $-2x < -6$ ⟺

⟺ $2x > 6$ ⟺

⟺ $x > \frac{6}{2}$ ⟺
   $\qquad(:2)$

⟺ $x > 3$ // $\quad CS = \left]3, +\infty\right[$

$CA \quad\begin{array}{|l|} \hline 3 \times \frac{1}{3} = \frac{3}{3} = 1 \\ \\ 3 \times \frac{1}{3} = 1 \\ \hline \end{array}$

Exercício 3

1.) $\dfrac{12}{7} - \dfrac{3}{7} = \dfrac{9}{7}$

2.) $\dfrac{10}{3} - \dfrac{8}{3} + \dfrac{2}{3} = \dfrac{4}{3}$

3.) $-\dfrac{2}{9}_{(4)} + \dfrac{3}{4}_{(9)} = -\dfrac{8}{36} + \dfrac{27}{36} = \dfrac{19}{36}$ //

4.) $\dfrac{1}{2} \times \dfrac{25}{3} = \dfrac{1 \times 25}{2 \times 3} = \dfrac{25}{6}$ //

Exercício 4

1.) $\dfrac{7}{6} + x = \dfrac{11}{6}$ $(=)$

$(=)\ x = \dfrac{11}{6} - \dfrac{7}{6}$ $(=)$

$(=)\ x = \dfrac{4}{6}_{(:2)}$ $(=)$

$(=)\ x = \dfrac{2}{3}$ //

2.) $\dfrac{3}{4} + x = 1$ $(=)$

$(=)\ \dfrac{3}{4} + x = \dfrac{4}{4}$ $(=)$

$(=)\ x = \dfrac{4}{4} - \dfrac{3}{4}$ $(=)$

$(=)\ x = \dfrac{1}{4}$ //

3.) $x - \dfrac{2}{9} = \dfrac{3}{4}$ $(=)$

$(=)\ x = \dfrac{3}{4}_{(9)} + \dfrac{2}{9}_{(4)}$ $(=)$

$(=)\ x = \dfrac{27}{36} + \dfrac{8}{36}$ $(=)$

$(=)\ x = \dfrac{35}{36}$ //