

$$i) \frac{0,2 \cdot 0,3}{3,2 - 2}$$

$$j) \frac{5 - 1,25 \cdot 0,2}{(0,5)^2 + 3,6 \div 18}$$

$$k) \frac{\frac{3}{4} + \frac{1}{6}}{1 - \frac{3}{4} \cdot \frac{1}{6}}$$

$$l) \frac{1 + \frac{1}{2}}{1 - \frac{1}{2}} + \frac{1 + \frac{1}{4}}{1 - \frac{1}{4}}$$

$$j) 1,25 = \frac{125}{100} = \frac{5}{4}$$

$$0,2 = \frac{2}{10} = \frac{1}{5}$$

$$0,5 = \frac{5}{10} = \frac{1}{2}$$

$$(0,5)^2 = \left(\frac{1}{2}\right)^2 = \frac{1}{4}$$

$$3,6 = \frac{36}{10} = \frac{18}{5}$$

$$J = \frac{5 - \frac{5}{4} \cdot \frac{1}{5}}{\frac{1}{4} + \frac{18}{5} \cdot \frac{1}{18}}$$

$$J = \frac{5 - \frac{1}{4}}{\frac{1}{4} + \frac{1}{5}}$$

$$J = \frac{20 - 1}{4}$$

$$\frac{5 + 4}{4 \cdot 5}$$

$$J = \frac{\frac{19}{4}}{\frac{9}{4 \cdot 5}}$$

$$J = \frac{19 \cdot 4 \cdot 5}{4 \cdot 9}$$

$$J = \frac{95}{9}$$

$$L = \frac{\frac{2+1}{2}}{\frac{2-1}{2}} + \frac{\frac{4+1}{4}}{\frac{4-1}{4}}$$

$$L = \frac{\frac{3}{2}}{\frac{1}{2}} + \frac{\frac{5}{4}}{\frac{3}{4}} = \frac{3}{2} \cdot \frac{2}{1} + \frac{5}{4} \cdot \frac{4}{3}$$

$$L = 3 + \frac{5}{3} = \frac{3 \cdot 3 + 5}{3}$$

$$L = \frac{14}{3}$$

$$\frac{125}{100} = \frac{25 \cdot 5}{20 \cdot 5} = \frac{5}{4}$$

$$L = \frac{25 \cdot \frac{1}{5}}{20 \cdot \frac{1}{5}} = \frac{25}{20} = \frac{5 \cdot 5}{4 \cdot 5} = \frac{5}{4}$$

$$\frac{5}{4} \cdot \frac{1}{5} = \frac{1}{4}$$

⑥

$$x \cdot (x+1) \cdot (2x-1) \cdot (2x-4) = 0$$

Propriedade

$$ab = 0 \Rightarrow a = 0 \text{ ou } b = 0$$

$$\therefore \underline{x=0} \text{ ou } x+1=0 \text{ ou } 2x-1=0 \text{ ou } 2x-4=0$$

$$x=0 \text{ ou } x=-1 \text{ ou } x=\frac{1}{2} \text{ ou } x=2$$

$$U = \mathbb{Q} \quad S = \{0, -1, \frac{1}{2}, 2\}$$

$$U = \mathbb{Z} \quad S = \{0, -1, 2\}$$

$$U = \mathbb{N} \quad S = \{0, 2\}$$

a) $(2x-3)(5x+2)=0$ b) $x^2(20x-12)=0$

c) $3x(2x-1)\left(x+\frac{7}{6}\right)=0$ d) $x\left(x-\frac{3}{2}\right)\left(\frac{x}{2}-3\right)=0$

ver ex 6
tentar!

$$2x-3=0$$

↳ $\frac{3}{2}$ é sol. da eq,

pois $2 \cdot \frac{3}{2} - 3 = 0$ é v.

a) $(2x-3) \cdot (5x+2) = 0 \Rightarrow 2x-3=0$ ou $5x+2=0$

$$\left. \begin{array}{l} 2x-3=0 \\ 2x-3+3=+3 \end{array} \right\} +3$$

$$\left. \begin{array}{l} 2x=3 \\ 2 \neq 0 \end{array} \right\} \div 2$$

$$\frac{1 \cancel{2}x}{\cancel{2}} = \frac{3}{2}$$

$$x = \frac{3}{2}$$

$$\left. \begin{array}{l} 5x+2=0 \\ 5x+2+(-2)=0+(-2) \end{array} \right\} +(-2)$$

$$5x = -2$$

$$\frac{1 \cancel{5}x}{\cancel{5}} = -\frac{2}{5} \quad \left\} \div 5$$

$$x = -\frac{2}{5}$$

a) $S = \left\{ \frac{3}{2}; -\frac{2}{5} \right\}$

a) $(2x-3)(5x+2)=0$ b) $x^2(20x-12)=0$

c) $3x(2x-1)\left(x+\frac{7}{6}\right)=0$ d) $x\left(x-\frac{3}{2}\right)\left(\frac{x}{2}-3\right)=0$

$$E = \frac{1}{x+1}$$

É PROIBIDO DIVIDIR POR ZERO

Cond. existência $x+1 \neq 0 \Rightarrow x \neq -1$

• Resolva as equações do 2º grau em IR.

$$4x^2 - 49 = 0$$

$$x^2 + 9 = 0$$

$$x^2 - x - 12 = 0$$

$$\frac{x^2}{6} - \frac{2x}{3} = \frac{3x-10}{4}$$

$$\frac{x^2}{4} + \frac{2x}{3} = 0$$

$$\frac{(x-11)^2}{10} - \frac{(6x-1)^2}{5} = 7 - \frac{7x-3}{2}$$

$$a) 4x^2 - 49 = 0$$

$$4x^2 - 49 + 49 = 0 + 49 \quad \leftarrow +49$$

$$4x^2 = 49$$

$$\frac{4x^2}{4} = \frac{49}{4} \quad \leftarrow \div 4$$

$$x^2 = \left(\frac{49}{4}\right)$$

↳ objetivo: isolar x^2

e mº positivo

estrutura básica

$$ax + b = 0, a \neq 0$$

$x^2 \geq 0, \forall x \in \mathbb{R}$ qualquer x real

$$0^2 = 0 \geq 0$$

$$3^2 = 9 \geq 0$$

$$(-4)^2 = 16 \geq 0$$

$$x^2 = \frac{7^2}{2^2}$$

$$x^2 = \left(\frac{7}{2}\right)^2 \quad \leftarrow \text{ou}$$

$$x = \frac{7}{2} \quad \text{ou} \quad x = -\frac{7}{2}$$

$$\boxed{4 \cdot t} - 49 = 0$$

preparar

$$4 \cdot t = 49$$

$$t = \frac{49}{4} \quad \leftarrow \div 4$$

$$4 \cdot t - 49 = 0$$

$$\text{isolar } t \quad t = \frac{49}{4}$$

$$x = \sqrt{\frac{49}{4}} \quad \text{ou} \quad x = -\sqrt{\frac{49}{4}}$$

$$x = \frac{7}{2} \quad \text{ou} \quad x = -\frac{7}{2}$$

$$S = \left\{ \frac{7}{2}; -\frac{7}{2} \right\}$$

$$\bullet 4a + (-4a) = 0$$

• zero é elemento neutro da adição
 $a + 0 = a$

$$\bullet \frac{4}{4} = 1$$

1 é elemento neutro da mult.
 $a \cdot 1 = a$

$$x^2 + 9 = 0 \quad \underline{u = 12}$$

$x^2 = -9$
 não neg.
 $S = \emptyset$

$$\frac{x^2}{4} + \frac{2x}{3} = 0$$

$$\frac{3x^2 + 8x}{12} = 0$$

$$3x^2 + 8x = 0$$

$$x \cdot (3x + 8) = 0$$

$\times 12$

$$x = 0 \text{ ou } 3x + 8 = 0$$

$$x = 0 \text{ ou } x = -\frac{8}{3}$$

$$S = \left\{ 0, -\frac{8}{3} \right\}$$

$$x \cdot \left(\frac{x}{4} + \frac{2}{3} \right) = 0$$

$$x = 0 \text{ ou } \frac{x}{4} + \frac{2}{3} = 0$$

$$-\frac{2}{3} \rightarrow \frac{x}{4} = -\frac{2}{3}$$

$$\times 4 \rightarrow \frac{4 \cdot x}{4} = \left(-\frac{2}{3} \right) \cdot 4$$

$$x = -\frac{8}{3}$$

$$x^2 - x - 12 = 0$$

fórmula Báskara

$$\frac{x^2}{6} - \frac{2x}{3} = \frac{3x - 10}{4}$$

$$\frac{m^2 + m}{5m^2 + 10m + 5} = \frac{m \cdot (m + 1)}{5 \cdot \underbrace{(m^2 + 2m + 1)}_{\text{T. Q. P}}} = \frac{m \cdot \cancel{(m + 1)}}{5 \cdot \cancel{(m + 1)}^2} = \frac{m}{5(m + 1)}$$

$$a^2 + 2ab + b^2 = (a + b)^2$$

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

$$\text{mmc}(4, 2, 3) = 12$$

$$\frac{2}{5} = \frac{2}{5}$$

$$\frac{3 \cdot (x+1)}{12} = \frac{5 \cdot 6 - 4 \cdot (1-2x)}{12}$$

$$3(x+1) = 30 - 4(1-2x)$$

$$3x + 3 = 30 - 4 + 8x$$

$$3x + 3 = 26 + 8x$$

Eq. 1ª grau
objetivo
isolar x

$$\begin{array}{l} \left[-3 \right. \\ \rightarrow 3x = 26 + 8x - 3 \end{array}$$

$$3x = 23 + 8x \quad \left. \vphantom{3x} \right\} -8x$$

$$3x - 8x = 23$$

$$-5x = 23$$

$$\frac{1}{-5} x = \frac{23}{-5} \quad \left. \vphantom{\frac{1}{-5} x} \right\} \cdot (-5)$$

$$x = -\frac{23}{5}$$

$$-\frac{23}{5} = \frac{-23}{5} = \frac{23}{-5}$$

não é
costume
deixar
assim

$$f) \frac{(2x-3)}{6} - \frac{(1-x)}{3} \leq \frac{1}{1} - \frac{(x+1)}{12}$$

$$\text{mmc}(6, 3, 12) = 12$$

$$\frac{2 \cdot (2x-3) - 4(1-x)}{12} \leq \frac{1 \cdot 12 - 1 \cdot (x+1)}{12}$$

Como $12 > 0$, então

$$2 \cdot (2x-3) - 4 \cdot (1-x) \leq 12 - (x+1)$$

$$4x - 6 - 4 + 4x \leq 12 - x - 1$$

$$8x - 10 \leq 11 - x$$

$$8x \leq 11 - x + 10$$

inequação do 1º grau

objetivo isolar x

$$8x \leq 21 - x$$

$$8x + x \leq 21$$

$$9x \leq 21$$

$$\frac{9x}{9} \leq \frac{21}{9}$$

$$x \leq \frac{21}{9} \rightarrow x \leq \frac{7}{3}$$

$$S = \{ x \in \mathbb{R} \mid x \leq \frac{7}{3} \}$$