8

$$E=\frac{(7x+2)}{2}-1{,}5-\frac{(4x-1)}{3}-\frac{0{,}75x}{6}$$

$$E=\frac{(7x+2)}{2}-\frac{3}{2}-\frac{(4x-1)}{3}-\frac{x}{8}$$

$$mmm(2,3,8)=24$$

$$E=\frac{12\cdot(7x+2)-12\cdot 3-8\cdot(4x-1)-3x}{24}$$

$$E=\frac{84x+24-36-32x+8-3x}{24}$$

$$1{,}5=\frac{15}{10}=\frac{3}{2}$$

$$0{,}75=\frac{75}{100}=\frac{3}{4}$$

$$\frac{0{,}75x}{6}=\frac{\frac{3}{4}\cdot x}{6}=\frac{\cancel{3}^{1}}{4}\cdot x\cdot\frac{1}{\cancel{6}_{2}}=\frac{x}{8}$$

$$\boxed{E=\frac{49x-4}{24}}$$

$$E=\frac{49x}{24}-\frac{4}{24}$$

$$E=\frac{49x}{24}-\frac{1}{6}$$

1

a) $0{,}5-0{,}9-\frac{7}{5}$ b) $3^3-2^4\cdot 3$ c) $3^{-1}-\left(\frac{1}{3}\right)^2$

$\boxed{\text{d) } -\underbrace{\sqrt[3]{-8}}_{-2}+\underbrace{16^{\frac{1}{4}}}_{2}-\underbrace{\left(-\frac{1}{2}\right)^{-2}}_{4}+\underbrace{27^{-\frac{1}{3}}}_{\frac{1}{3}}}$ e) $\sqrt{12}-\sqrt{48}$

f) $\dfrac{\frac{1}{5}}{\left(1-\frac{4}{5}\right)^2}$ g) $\dfrac{0{,}\bar{6}-6}{3^{-2}}$

$\sqrt[3]{-8}=-2$

$a\in\mathbb{R}$ e $a\neq 0$ $\quad a^{-n}=\dfrac{1}{a^n}$, $n\in\mathbb{N}^*$

$a>0 \quad a^{\frac{p}{q}}=\sqrt[q]{a^p}$, $p\in\mathbb{Z}$ e $q\in\mathbb{N}^*$

$(a^m)^n=a^{m\cdot n}$

$16^{\frac{1}{4}}=\left(2^4\right)^{\frac{1}{4}}=2^{4\cdot\frac{1}{4}}=2^1=2$

ou

$\sqrt[4]{16}=\sqrt[4]{2^4}=2$

$27^{-\frac{1}{3}}=\left(3^3\right)^{-\frac{1}{3}}=3^{3\cdot\left(-\frac{1}{3}\right)}=3^{-1}=\dfrac{1}{3}$

ou $\dfrac{1}{27^{\frac{1}{3}}}=\dfrac{1}{\sqrt[3]{27}}=\dfrac{1}{3}$

$\left(-\frac{1}{2}\right)^{-2}=\dfrac{1}{\left(-\frac{1}{2}\right)^2}=\dfrac{1}{\frac{1}{4}}=4$

$\therefore$ d) $\underbrace{-(-2)}_{2}+2-4+\dfrac{1}{3}=\dfrac{1}{3}$

e) $\sqrt{2^2\cdot 3}-\sqrt{2^4\cdot 3}=\sqrt{2^2}\cdot\sqrt{3}-\sqrt{2^4}\cdot\sqrt{3}=$

$=2\sqrt{3}-2^2\cdot\sqrt{3}=-2\sqrt{3}$

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

k) $\dfrac{\frac{3}{4}+\frac{1}{6}}{1-\frac{3}{4}\cdot\frac{1}{6}}$ l) $\dfrac{1+\frac{1}{2}}{1-\frac{1}{2}}+\dfrac{1+\frac{1}{4}}{1-\frac{1}{4}}$

k) $\dfrac{\frac{3}{4}+\frac{1}{6}}{\frac{1}{1}-\frac{1}{8}} = \dfrac{\frac{\overset{9}{3\cdot 3}+\overset{2}{1\cdot 2}}{12}}{\frac{1\cdot 8-1\cdot 1}{8}} = \dfrac{\frac{11}{12}}{\frac{7}{8}} = \dfrac{11}{\cancel{12}_{3}}\cdot\dfrac{\cancel{8}^{2}}{7} = \dfrac{22}{21}$

$\dfrac{\cancel{a}^{1}\cdot b}{\cancel{a}}$, $a\neq 0$ $\dfrac{a+b}{a}$ $\dfrac{a+ab}{a} = \dfrac{\cancel{a}\cdot(1+b)}{\cancel{a}} = 1+b$

$\dfrac{12\cdot 21}{35\cdot 11} \underset{\div 7}{\overset{\div 7}{=}} \dfrac{12\cdot 3\cdot\cancel{7}}{5\cdot\cancel{7}\cdot 11} = \dfrac{12\cdot 3}{5\cdot 11} = \dfrac{36}{55}$ | $\dfrac{12}{35}+\dfrac{21}{11} = \dfrac{12\cdot 11+21\cdot 35}{35\cdot 11}$

$$d)\left(\sqrt{5+\underbrace{\sqrt{9}}_{3}}^{\,a}-\sqrt{5-\underbrace{\sqrt{9}}_{3}}^{\,b}\right)^2=\left(\sqrt{8}-\sqrt{2}\right)^2=\left(\sqrt{2^3}-\sqrt{2}\right)^2=\left(2\sqrt{2}-\sqrt{2}\right)^2=\left(\sqrt{2}\right)^2=2$$

opção

$$\left(\sqrt{8}\right)^2-2\sqrt{8}\cdot\sqrt{2}+\left(\sqrt{2}\right)^2=$$

$$=8-2\sqrt{8\cdot 2}+2=10-2\sqrt[2]{2^4}=10-2\cdot 2=2$$

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par

$\sqrt[2]{9}$ é um único nº real positivo

pos

$x^2=9 \Rightarrow x=+\sqrt{9}$ ou $x=-\sqrt{9}$

$x=+3$ ou $x=-3$

$x^2=5 \Rightarrow x=\pm\sqrt{5}$

$x=+\sqrt{5}$ ou $x=-\sqrt{5}$

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

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

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

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

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

d) $\underline{x=0}$ ou $x-\frac{3}{2}=0$ ou $\frac{x}{2}-3=0$

$+\frac{3}{2}$ $\quad\downarrow$ $\quad +3$

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

$\frac{x}{2}\underbrace{-3+3}_{0}=0+3$

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

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

$x=6$

$S=\{0, \frac{3}{2}, 6\}$

a) $x - 4 > -11$ b) $2 + 2x \geq 8 + 5x$ c) $3 - \frac{1,\overline{4} \cdot x}{13} < x$

Inequação 1º grau

a) $x - 4 > -11$ $+4$

$\overbrace{x - 4 + 4}^{0} > -11 + 4$

$x > -7$

$S = \{x \in \mathbb{R} \mid x > -7\}$

b) $2 + 2x \geq 8 + 5x$ $+(-2)$

$2 + 2x - 2 \geq 8 + 5x - 2$

$2x \geq 8 + 5x - 2$

$2x \geq 6 + 5x$ $-5x$

$2x - 5x \geq 6 + \underbrace{5x - 5x}_{0}$

$-3x \geq 6$ cuidado

$\times(-1)$ negativo

$(-1)(-3x) \leq (-1) \cdot 6$

$3x \leq -6$ $\div 3$ pos

$\frac{3x}{3} \leq \frac{-6}{3}$

$x \leq -2$

$S = \{x \in \mathbb{R} \mid x \leq -2\}$

$-3x \geq 6$ $\div 3$ pos

$-\frac{3x}{3} \geq \frac{6}{3}$

$-x \geq 2$ $x(-1)$ neg

$\boxed{x \leq -2}$

③

$\underbrace{x^3 - 10x^2 + 25x}$ → x é fator comum das parcelas

5^2

$x.(\underbrace{x^2 - 10x + 25}_{T.Q.P.})$

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

$x.(x^2 - 2 \cdot 5 \cdot x + 5^2)$

$x.(x-5)^2$

$\underbrace{x^2 + ax} + \underbrace{bx + ab}$

fatoração por agrupamento

$x.(x+a) + b.(x+a)$

$(x+a)(x+b)$

$$\frac{x^3+x^2-4x-4}{x^3+2x^2-x-2} = \frac{A}{B}$$

$$A = \underbrace{x^3+x^2}\underbrace{-4x-4} = x^2(x+1) - 4(x+1) = (x+1)\underbrace{(x^2-4)}_{\substack{\text{diferença}\\ \text{de quadrados}}} = (x+1)(x+2)(x-2)$$

$$4 = 2^2$$

$$\rightarrow a^2 - b^2 = (a+b)(a-b)$$

$$B = \underbrace{x^3+2x^2}\underbrace{-x-2} = x^2(x+2) - (x+2) = (x+2)\underbrace{(x^2-1)}_{x^2-1^2} = (x+2)(x+1)(x-1)$$

$$\frac{A}{B} = \frac{\cancel{(x+1)}\cdot\cancel{(x+2)}(x-2)}{\cancel{(x+2)}\cdot\cancel{(x+1)}(x-1)} = \frac{x-2}{x-1}$$

TQP

$$E = \frac{2a-2b}{25xy} : \frac{a^2-2ab+b^2}{50x^3} - \frac{\cancel{3}^{1}x}{(5a-5b)} \cdot \frac{5x}{\cancel{9}_{3}y} = \frac{2(a-b)}{25xy} : \frac{(a-b)^2}{50x^3} - \frac{1}{\cancel{5}_{2}(a-b)} \cdot \frac{\cancel{5}^{1}x}{3y}$$

$$E = \frac{2\cancel{(a-b)}^{1}}{\cancel{25}\cancel{x}y} \cdot \frac{\cancel{50}^{2}\cancel{x^3}^{x^2}}{(a-b)^2 !} - \frac{x}{3(a-b)y}$$

$$E = \frac{4x^2}{(a-b)y} - \frac{x}{3(a-b)y}$$

$$E = \frac{3\cdot 4x^2 - x\cdot 1}{3\cdot(a-b)y}$$

$$E = \frac{12x^2 - x}{3(a-b)y}$$

$$E = \frac{x\cdot(12x-1)}{3\cdot(a-b)y}$$

$$\frac{a-b}{(a-b)^2} = \frac{\cancel{(a-b)}}{\cancel{(a-b)}(a-b)} = \frac{1}{a-b}$$

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

$$\frac{x^4 - y^4}{x^3 - x^2y + xy^2 - y^3} = \frac{A}{B}$$

$$a^2 \pm 2ab + b^2$$

$$A = x^4 - y^4 = \underbrace{(\underset{a}{x^2})^2 - (\underset{b}{y^2})^2}_{\text{diferença de quadrados}} = \underset{a+b}{(x^2+y^2)}\underbrace{\underset{a-b}{(x^2-y^2)}}_{D.Q.} = (x^2+y^2)(x+y)(x-y)$$

$$B = \underbrace{x^3 - x^2y}_{\substack{\text{fator}\\\text{comum}\\x^2}} + \underbrace{xy^2 - y^3}_{\text{fator comum } y^2} = x^2\cdot(x-y) + y^2(x-y) = (x-y).(x^2+y^2)$$

$$\therefore \frac{A}{B} = \frac{\cancel{(x^2+y^2)}(x+y)\cancel{(x-y)}}{\cancel{(x-y)}\cancel{(x^2+y^2)}} = x+y$$

4a

$$\frac{2+2y-x-xy}{4-x^2} = \frac{A}{B}$$

$$A = \underbrace{2+2y}\underbrace{-x-xy} = 2\cdot(1+y) - x(1+y) = (1+y)(2-x)$$

$$B = 4 - x^2 = \underbrace{2^2 - x^2}_{DQ} = (2-x)(2+x)$$

$$\therefore \frac{A}{B} = \frac{(1+y)\cancel{(2-x)}}{\cancel{(2-x)}(2+x)} = \frac{1+y}{2+x}$$