

PLAY CÁLCULO – AVALIAÇÃO POR MÓDULOS – 02

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MÓDULO 1 (FRAÇÕES)

Efetue simplificando quando possível: $\frac{22}{-16}$

| | |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | $\frac{1}{3} - \frac{1}{2} + \frac{11}{3} - \frac{5}{2} = \frac{2-3+22-15}{6} = \frac{6}{6} = \boxed{1}$ ✓ |
| 2 | $\frac{(-14)}{2} \cdot \frac{(-18)}{5} \div \frac{(-25)}{(-25)} = \frac{(-4)}{5} \cdot \frac{(-18)}{5} \cdot \frac{(-25)}{5} = \frac{35 \cdot (-18)}{5 \cdot 6 \cdot (-1) \cdot 9} = \frac{10 \cdot (-54)}{540} = \boxed{-1}$ ✓ |

MÓDULO 2 (POTENCIAÇÃO)

Efetue simplificando quando possível: $\frac{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5}{2 \cdot 4 \cdot 8 \cdot 16 \cdot 32}$

| | |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | $\frac{2^{100} \cdot 4^3}{2} \cdot \frac{32^3}{2^{77}} = 2^{99} \cdot \frac{(2^2)^3}{2^{77}} \cdot (2^5)^3 = 2^{22} \cdot 2^6 \cdot 2^{15} = 2^{28} \cdot 2^{15} = \boxed{2^{43}}$ ✓ |
| 2 | $\frac{10^0 \cdot 10^3 \cdot (0,01)^{-3}}{0,001} = \frac{10^3 \cdot (10^{-2})^{-3}}{10^{-3}} = \boxed{10^{-6}}$ ✓ |

MÓDULO 3 (RADICAÇÃO)

Efetue simplificando quando possível:

| | |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | $\sqrt{\frac{17}{58}} \cdot \sqrt{\frac{29}{34}} = \frac{\sqrt{17}}{\sqrt{58}} \cdot \frac{\sqrt{29}}{\sqrt{34}} = \frac{\sqrt{17 \cdot 29}}{\sqrt{58 \cdot 34}} = \frac{\sqrt{493}}{\sqrt{1978}} = \frac{\sqrt{17 \cdot 29}}{\sqrt{2 \cdot 17 \cdot 58}} = \frac{\sqrt{17 \cdot 29}}{\sqrt{2 \cdot 17 \cdot 2 \cdot 29}} = \frac{\sqrt{17 \cdot 29}}{2 \sqrt{17 \cdot 29}} = \frac{1}{2}$ ✓ |
| 2 | $\sqrt[3]{3} \sqrt[3]{5} = \sqrt[3]{3^3 \cdot 5^2}$ |

MÓDULO 4 (EXPR. NUMÉRICAS)

Efetue simplificando quando possível:

| | | | |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | $8^{-\frac{2}{3}} + \sqrt{0,25} + 4 \cdot (0,5)^4 =$ $(2^3)^{-\frac{2}{3}} + \sqrt{25^{-100}} + 4 \cdot 5^{-40}$ $2^{-\frac{2}{3}} + 25^{-\frac{100}{2}} + 2^2 \cdot 5^{-40}$ $2^{\frac{2}{3} \cdot 2} + (5^2)^{\frac{100}{2}} \cdot 5^{-40}$ $2^{\frac{4}{3}} + 5^{-100} \cdot 5^{-40}$ $2^{\frac{4}{3}} + 5^{-140} \rightarrow \boxed{3\sqrt{2} + 5^{-140}}$ | $3\sqrt{\left(\frac{1}{8}\right)^2} + \sqrt{\frac{25}{100}} + \frac{4}{1} \cdot \frac{625}{10000}$ $3\sqrt{\frac{1}{64}} + \frac{5}{10} + \frac{2500}{10000} : 25$ $\frac{1}{4} + \frac{1}{2} + \frac{1}{4}$ $\frac{1+2+1}{4} = \frac{4}{4} = 1$ | $\begin{array}{r} 6 \\ 8 \\ 4 \\ 2 \end{array} \Bigg \begin{array}{l} 2 \\ 2 \\ 2 \\ 2 \end{array}$ |
| 2 | $-\sqrt[3]{-8} + 16^{\frac{-1}{4}} - \left(-\frac{1}{2}\right)^{-2} + 8^{\frac{-4}{3}} =$ $-(-2) + (2^4)^{-\frac{1}{4}} - (-2^{-1})^{-2} + (2^3)^{\frac{-4}{3}}$ $2 + (2^{-1}) - (-2^2) + (2^{-4})$ $2 + \frac{1}{2} + 4 + \frac{1}{16}$ $6 + \frac{1}{2} + \frac{1}{16} \rightarrow \frac{98 + 8 + 1}{16} = \frac{105}{16}$ | | $\begin{array}{r} 4096 \\ 2048 \\ 1024 \\ 512 \\ 256 \\ 128 \\ 64 \\ 32 \\ 16 \\ 8 \\ 4 \\ 2 \end{array} \Bigg \begin{array}{l} 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \end{array}$ |

MÓDULO 5 (EXPR. ALGÉBRICAS)

Encontre as soluções das inequações seguintes:



| | |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | $5x - 5 < 7x + 2$ $-7 < 2x$ $x > -7/2$ |
| 2 | $0 < \frac{x}{3} - \frac{(x-2)}{5} < 2$ $0 < \frac{2x+6}{15} < 2$ $0 < 2x+6 < 2 \cdot 15$ $-6 < 2x < 30-6$ $-\frac{6}{2} < x < \frac{24}{2}$ $-3 < x < 12$ |

$$\Delta = b^2 - 4 \cdot a \cdot c$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2 \cdot a}$$

MÓDULO 6 (EXPR. POLINOMIAIS)

Ache as raízes dos polinômios seguintes:

| | | | |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | $4x^2 - 12x + 9 = 0$ $\Delta = b^2 - 4 \cdot a \cdot c$ $\Delta = 12^2 - 4 \cdot 4 \cdot 9$ $\Delta = 144 - 144$ $\Delta = 0$ | $x = \frac{-(-12) \pm 0}{2 \cdot 4} \rightarrow \frac{12}{8} = \frac{3}{2}$ $\hookrightarrow x = \frac{-(-12)}{8} = \frac{12}{8} = \frac{3}{2}$ |  |
| 2 | $(2x - 3)(x + 7) = 0$ $2x^2 + 14x - 3x - 21 = 0$ $2x^2 + 11x - 21 = 0$ $\Delta = b^2 - 4 \cdot a \cdot c$ $\Delta = 11^2 - 4 \cdot 2 \cdot (-21)$ $\Delta = 121 + 168$ $\Delta = 289$ | $x = \frac{-b \pm \sqrt{\Delta}}{2 \cdot a}$ $x = \frac{-11 \pm \sqrt{289}}{2 \cdot 2}$ | $x_1 = \frac{-11 + 17}{4} \Rightarrow x_1 = \frac{6}{4} \Rightarrow x_1 = \frac{3}{2}$ $x_2 = \frac{-11 - 17}{4} \Rightarrow x_2 = \frac{-28}{4} \Rightarrow x_2 = -7$  |

$$2x - 3 = 0 \quad | \quad x + 7 = 0$$

$$2x = 3 \quad | \quad x = -7$$

$$x = \frac{3}{2} \quad | \quad x = -7$$

MÓDULO 7 (DIV. DE POLINÔMIOS)

Efetue as divisões simplificando quando possível:

| | | |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| 1 | $\frac{3x^4 + 2x^3 - 7x^2 + 3x - 4}{x^2 + 2x - 3} =$ $\begin{array}{r} 3x^4 + 2x^3 - 7x^2 + 3x - 4 \\ - (3x^4 + 6x^3 + 9x^2) \\ \hline -4x^3 + 2x^2 + 3x - 4 \\ + (4x^3 + 8x^2 - 12x) \\ \hline 10x^2 - 9x - 4 \\ - (10x^2 + 20x + 30) \\ \hline -29x + 26 \end{array}$ | $\frac{3x^4}{x^2} = 3x^2$ |
| 2 | $\frac{x^4 + 2x - 3}{x^2 + x + 1} =$ $\begin{array}{r} x^4 + 0x^3 + 0x^2 + 2x - 3 \\ - (x^4 + x^3 + x^2) \\ \hline -x^3 - x^2 + 2x - 3 \\ + (x^3 + x^2 + x) \\ \hline -x^2 - x - 3 \\ + (x^2 + x + 1) \\ \hline -3x - 3 \end{array}$ | |

MÓDULO 8 (FATORAÇÃO)

Fatore as expressões seguintes:

| | |
|---|-------------------------------------------------------------------------------|
| 1 | $x^2 - 2x - 3 =$ $1x^2 - 3x + 1x - 3$ $x(x-3) + 1(x-3)$ $(x+1)(x-3)$ |
| 2 | $2x^4 - 3^4 =$ |

MÓDULO 9 (FUNÇÕES RACIONAIS)

Efetue simplificando quando possível:

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|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | $\frac{1-x}{1+x} - \frac{2x}{1-x} = \frac{(1-x)(1-x) - 2x(1+x)}{(1+x) \cdot (1-x)} = \frac{1-x-x+x^2-2x-2x^2}{1+x^2} = \frac{1-4x-x^2}{1+x^2}$ |
| 2 | $\frac{x-1}{3} + \frac{1}{x} - \frac{x+3}{6} = \frac{6x(x-1) + 18 - 3x(x+3)}{18x} = \frac{6x^2 - 6x + 18 - 3x^2 - 9x}{18x} = \frac{3x^2 - 15x + 18}{18x} = \frac{x^2 - 5x + 6}{6x}$ $\frac{2x(x-1) + 6 - 3x(x+3)}{6x} = \frac{2x^2 - 2x + 6 - 3x^2 - 3x}{6x} = \frac{-x^2 - 5x + 6}{6x}$ |

