Resolução das atividades complementares - MAT7_05NUM06

1) Calcule as potências abaixo:

a) $3^{-3} \times 9^2$

b) $\left(\frac{1}{4^{-2}}\right) \times 2^6$

c) $\left(\frac{3}{2}\right)^4 \times \left(\frac{1}{2^{-3}}\right)$

2) Simplifique ao máximo a seguinte expressão:

$$25^3 \times 9^{-3} \times \frac{1}{27^2} \times 5^{-3}$$

3) [Desafio] Calcule as seguintes expressões:

$$25^{-5} \times 9 \times \frac{1}{27^{-2}} \times 15^2$$

$$2^{-2} \times 4^{-3} \times \frac{1}{27^{-2}} \times 3^{-2}$$

Respostas:

1)

a) $3^{-3} \times 9^2 = 3^{-3} \times \left(3^2\right)^2 = 3^{-3} \times 3^4 = 3^{-3+4} = 3$

b) $\left(\frac{1}{4^{-2}}\right) \times 2^6 = \frac{2^6}{2^{-4}} = 2^{6-(-4)} = 2^{6+4} = 2^{10}$

c) $\left(\frac{3}{2}\right)^4 \times \left(\frac{1}{2^{-3}}\right) = \frac{3^4}{2^4} \times \left(\frac{1}{2^{-3}}\right) = \frac{3^4}{2^4 \times 2^{-3}} = \frac{3^4}{2}$

2)

$$25^3 \times 9^{-3} \times \frac{1}{27^2} \times 5^{-3} = \left(5^2\right)^2 \times \left(3^2\right)^{-3} \times \frac{1}{\left(3^3\right)^2} \times 5^{-3} = 5^4 \times 5^{-3} \times 3^{-6} \times \frac{1}{3^6}$$

$$= 5^{4-3} \times \frac{3^{-6}}{\left(3^3\right)^2} = 5 \times \frac{3^{-6}}{3^6} = 5 \times 3^{-6-6} = 5 \times 3^{-12}$$

3)

$$25^{-5} \times 9 \times \frac{1}{27^{-2}} \times 15^2 = \left(5^2\right)^{-5} \times 3^2 \times \frac{1}{\left(3^3\right)^{-2}} \times (3 \times 5)^2 = 5^{-10} \times \frac{3^2}{3^{-6}} \times 3^2 \times 5^2$$

$$= 5^{-10} \times 5^2 \times \frac{3^2 \times 3^2}{3^{-6}} = 5^{-8} \times \frac{3^4}{3^{-6}} = 5^{-8} \times 3^{4-(-6)} = 5^{-8} \times 3^{4+6} = 5^{-8} \times 3^{10}$$

$$2^{-2} \times 4^{-3} \times \frac{1}{27^{-2}} \times 3^{-2} = 2^{-2} \times \left(2^2\right)^{-3} \times \frac{1}{\left(3^3\right)^{-2}} \times 3^{-2} = 2^{-2} \times 2^{-6} \times \frac{1}{3^{-6}} \times 3^{-2}$$

$$= 2^{-8} \times \frac{3^{-2}}{3^{-6}} = 2^{-8} \times 3^{-2-(-6)} = 2^{-8} \times 3^{-2+6} = 2^{-8} \times 3^4$$