

o MATI - matemática

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- Semana 8: Propriedades de potenciação

①

$$\frac{(3^5)^2 \cdot 3^{5^2}}{(3^3)^2} = 3^a \rightarrow \frac{3^{10} \cdot 3^{25}}{3^6} = 3^a$$

$$\frac{3^{10+25}}{3^6} = 3^a \rightarrow \frac{3^{35}}{3^6} = 3^a$$

$$3^{35-6} = 3^a \rightarrow 3^{29} = 3^a \rightarrow a = 29 \quad E //$$

②

$$[2^9 : (2^2 \cdot 2)^3]^{-3} \rightarrow \left[\frac{2^9}{(2^2 \cdot 2)^3} \right]^{-3}$$

$$\frac{2^{-27}}{(2^2 \cdot 2)^{-9}} \rightarrow \frac{2^{-27}}{2^{-18} \cdot 2^{-9}}$$

$$\frac{2^{-27}}{2^{-18+(-9)}} \rightarrow \frac{2^{-27}}{2^{-27}} = 2^0 = 1 \quad D //$$

③

$$ab^x \Rightarrow a = 1000 \quad b = 100 \quad x = 0,4$$

$$1000 \cdot (100)^{0,4}$$

$$10^3 \cdot (10^2)^{0,4} \rightarrow 10^3 \cdot 10^{0,8}$$

$$10^{3+0,8} = 10^{3,8} \quad C //$$

④

$$\frac{4^{22}}{2}, \quad 4 = 2^2$$

$$\frac{(2^2)^{22}}{2} = \frac{2^{44}}{2} = 2^{44-1} = 2^{43} \quad E //$$

⑤

$$\frac{0,1 \cdot (0,001)^{-1} \cdot 10^{-1}}{10 \cdot (0,0001)}$$

$$0,1 = 1 \cdot 10^{-1}$$

$$0,0001 = 1 \cdot 10^{-4}$$

$$0,001 = 1 \cdot 10^{-3}$$

$$\frac{10^{-1} \cdot 10^{-3} \cdot 10^{-1}}{10 \cdot 10^{-4}} \rightarrow \frac{10^{-1-3-1}}{10^1 \cdot 10^{-4}} = \frac{10^{-5}}{10^{-3}} = 10^{-5-(-3)} = 10^{-2} //$$

1 / 1

$$\textcircled{6} \frac{e^x}{e^{x-2}} = e^{x-(x-2)} = e^2 \quad C //$$

$\textcircled{7}$

$$y^{5y} = 243 \quad y^{-y} = ?$$

$$\begin{array}{r|l} 243 & 3 \\ 81 & 3 \\ 27 & 3 \\ 9 & 3 \\ 3 & 3 \\ 1 & 3^5 \end{array}$$

$$\Rightarrow y^{5y} = 3^5 \quad \cdot \sqrt[5]{}$$

$$\sqrt[5]{y^{5y}} = \sqrt[5]{3^5}$$

$$y^y = 3$$

$$y^{-y} = \frac{1}{y^y} = \frac{1}{3} \quad (A) //$$

$$\textcircled{8} \quad 5^x = m \quad 5^y = n$$

$$(0,04)^{-x+2y} \Rightarrow (0,04)^{-x} \cdot (0,04)^{2y}$$

$$\left(\frac{100}{4}\right)^x \cdot \left(\frac{4}{100}\right)^{2y} \Rightarrow 25^x \cdot \left(\frac{4}{100}\right)^{2y}$$

$$(5^2)^x \cdot \left(\frac{4}{100}\right)^{2y} \Rightarrow m^2 \cdot (4 \cdot 10^{-2})^{2y}$$

$$m^2 \cdot [4 \cdot (2 \cdot 5)^{-2}]^{2y} \Rightarrow m^2 \cdot (2^2 \cdot 2^{-2} \cdot 5^{-2})^{2y}$$

$$m^2 \cdot (1 \cdot 5^{-2})^{2y}$$

$$m^2 \cdot 5^{-4y} \Rightarrow m^2 \cdot n^{-4} \quad E //$$

$\textcircled{9}$

$$a) (3^x)^y = 3^{x \cdot y} = 3^{xy}$$

$$b) (2^x \cdot 3^y)^2 = 2^{2x} \cdot 3^{2y} \quad (\checkmark)$$

$$c) (2^x - 3^x)^y = 2^{xy} - 3^{xy}$$

$$d) 5^x + 3^x = 5^x + 3^x \rightarrow \text{bases diferentes não pode realizar a soma}$$

$$e) 3 \cdot 2^x = 3 \cdot 2^x \rightarrow \text{a multiplicação só pode ser realizada se ambos possuírem o mesmo expoente}$$