

# Problema 0

## PRELIMINARES

Ej 1 - Calcular:

$$a) \left( \frac{5}{6} + \frac{2}{3} \right) - \left( \frac{3}{4} + \frac{1}{6} \right) = \frac{5}{6} + \frac{2}{3} - \left( \frac{9+2}{12} \right) = \frac{5}{6} + \frac{2}{3} - \frac{11}{12} =$$

$$= \frac{2 \cdot 5 + 4 \cdot 2 - 1 \cdot 11}{12} = \frac{10 + 8 - 11}{12} = \frac{7}{12} \checkmark$$

$$b) \left( \frac{2}{3} + \frac{1}{5} \right) \frac{5}{2} + \frac{5}{6} = \frac{2}{3} \cdot \frac{5}{2} + \frac{1}{5} \cdot \frac{5}{2} + \frac{5}{6} = \frac{2 \cdot 5}{3 \cdot 2} + \frac{1 \cdot 5}{5 \cdot 2} + \frac{5}{6} =$$

distribuir con  
reglas de los signos

$$= \frac{5}{3} + \frac{1}{2} + \frac{5}{6} = \frac{4 \cdot 5 + 6 \cdot 1 + 2 \cdot 5}{12} = \frac{20 + 6 + 10}{12} = \frac{36}{12} = 3 \checkmark$$

$$c) \left( \frac{4}{3} - \frac{2}{9} \right)^{-1} \cdot \left( \frac{5}{6} + \frac{1}{2} \right)^2$$

si  $a \neq 0$

$$a^{-1} = \frac{1}{a} ; a^{-n} = \frac{1}{a^n}$$

Cuando no se pone nada, es un producto.

$$= \left( \frac{3 \cdot 4 - 1 \cdot 2}{9} \right)^{-1} \cdot \left( \frac{1 \cdot 5 + 3 \cdot 1}{6} \right)^2 = \left( \frac{10}{9} \right)^{-1} \cdot \left( \frac{8}{6} \right)^2 = \left( \frac{9}{10} \right) \cdot \left( \frac{4}{3} \right)^2 =$$

$$\left( \frac{a}{b} \right)^2 = \frac{a^2}{b^2}$$

$$\left( \frac{a}{b} \right) \cdot \left( \frac{c}{d} \right) = \frac{a \cdot c}{b \cdot d}$$

$$= \frac{1 \cdot 9}{1 \cdot 10} \cdot \frac{4^2}{3^2} = \frac{9}{10} \cdot \frac{16}{9} = \frac{9 \cdot 16}{10 \cdot 9} = \frac{16}{10} = \frac{8}{5} \checkmark$$

$$\frac{a}{b} \cdot \frac{c}{d} = \frac{a \cdot c}{b \cdot d}$$

$$d) (4 + 5^3 - 9) : (10^2 - 70) =$$

$$5^3 = 5^2 \cdot 5 = 25 \cdot 5 = 125 \checkmark$$

$$= \frac{(4 + 125 - 9)}{10^2 - 70} = \frac{125 - 5}{100 - 70} = \frac{120}{30} = 4 \checkmark$$

$$e) \left(\frac{1}{8} + \frac{2}{5}\right) \left(\frac{5}{2} : \frac{1}{4}\right) = \left(\frac{5+16}{40}\right) \cdot \left(\frac{5}{\frac{1}{4}}\right) = \frac{21}{40} \cdot \frac{5 \cdot 4}{2 \cdot 1} = \frac{21}{40} \cdot 10 = \frac{21}{4} \checkmark$$

$$f) \frac{3^2(5+1,2) - 5,8}{(\frac{1}{2} + 5^2) : (3+2,1)} = \frac{9 \cdot 6,2 - 5,8}{(\frac{1}{2} + 25)} = \frac{50}{5,1} = \frac{1+50}{2} = 50,5$$

$$\left. \begin{array}{r} 6,2 \\ 9 \\ \hline 55,8 \\ - 5,8 \\ \hline 50,0 \end{array} \right\}$$

$$= \frac{50}{\frac{51}{2}} = \frac{50 \cdot 2}{51} = \frac{100}{51} = \frac{100 \cdot 0,1}{51 \cdot 1} = \frac{10}{5,1} \checkmark$$

$$g) \left(\frac{\sqrt{9+16}}{15} + \frac{2}{3}\right)^{1/2} = \left(\frac{\sqrt{25}}{15} + \frac{2}{3}\right)^{1/2} = \left(\frac{5}{15} + \frac{2}{3}\right)^{1/2} = 1^{1/2} = \sqrt{1} = 1 \checkmark$$

$$a^{p/q} = \sqrt[q]{a^p}$$

$$a^{1/2} = \sqrt{a^1} = \sqrt{a} \quad (\text{el 2 no se pone en la raíz cuadrada})$$



Cont. Ex 1 - Prática 0

$$\begin{aligned}
 \text{h)} \quad \left(\frac{4}{9}\right)^{-1/2} + \left(\frac{1}{16}\right)^{3/4} &= \frac{1}{\left(\frac{4}{9}\right)^{1/2}} + \sqrt[4]{\left(\frac{1}{16}\right)^3} \\
 &= \frac{\frac{1/1}{1}}{4^{1/2}} + \frac{\sqrt[4]{1^3}}{\sqrt[4]{16^3}} = \frac{\sqrt{9}}{\sqrt{4}} + \frac{1}{\underbrace{\left(\sqrt[4]{16}\right)^3}_2} = \frac{3}{2} + \frac{1}{2^3} = \frac{3}{2} + \frac{1}{8} = \\
 &= \frac{4 \cdot 3 + 1}{8} = \left(\frac{13}{8}\right) \checkmark
 \end{aligned}$$

$$\begin{aligned}
 \text{i)} \quad \left(-\frac{1}{5}\right)^0 + \sqrt[3]{\frac{-27}{8}} &= 1 + \frac{\sqrt[3]{-27}}{\sqrt[3]{8}} = 1 + \frac{(-3)}{2} = 1 - \frac{3}{2} = \left(-\frac{1}{2}\right) \checkmark \\
 \underbrace{\hspace{2cm}}_{a^0 = 1, \forall a \in \mathbb{R}; a \neq 0}
 \end{aligned}$$

$$\begin{aligned}
 \text{j)} \quad \left[\left(\frac{1}{5}\right)^3 \left(\frac{1}{5}\right)^4\right]^{2/7} &= \left[\left(\frac{1}{5}\right)^{3+4}\right]^{2/7} = \left[\left(\frac{1}{5}\right)^7\right]^{2/7} = \left(\frac{1}{5}\right)^{7 \cdot \frac{2}{7}} = \left(\frac{1}{5}\right)^2 = \left(\frac{1}{25}\right) \checkmark \\
 \underbrace{a^n \cdot a^m = a^{n+m}}_{\hspace{10em}} & \quad \underbrace{(a^p)^q = a^{p \cdot q}}
 \end{aligned}$$

$$\begin{aligned}
 \text{k)} \quad \left[\left(\frac{2}{5}\right)^6 : \left(\frac{2}{5}\right)^4\right]^{-1} &= \frac{\left[\left(\frac{2}{5}\right)^6\right]^{-1}}{\left[\left(\frac{2}{5}\right)^4\right]^{-1}} = \left[\left(\frac{2}{5}\right)^{6-4}\right]^{-1} = \left[\left(\frac{2}{5}\right)^2\right]^{-1} = \\
 \frac{a^m}{a^n} = a^{m-n} & \quad \left[\left(\frac{2}{5}\right)^2\right]^{-1} = \\
 &= \left(\frac{4}{25}\right)^{-1} = \left(\frac{25}{4}\right) \checkmark
 \end{aligned}$$

$$\begin{aligned}
 2) \quad (8^{4/9})^{-3/2} &= 8^{4/9 \cdot (-3/2)} = 8^{-\frac{4 \cdot 3}{9 \cdot 2}} = 8^{-\frac{12}{18}} = 8^{-2/3} \\
 &= \frac{1}{8^{2/3}} = \frac{1}{\sqrt[3]{8^2}} \\
 &= \frac{1}{(\sqrt[3]{8})^2} = \frac{1}{2^2} = \left(\frac{1}{4}\right) \checkmark
 \end{aligned}$$

$(a^p)^q = a^{p \cdot q}$

Exercício 2. Reduzir a uma só fração

$$a) \frac{4}{1} - \frac{5}{x} = \frac{4 \cdot x - 5 \cdot 1}{x} = \frac{4x - 5}{x} \checkmark$$

$$b) \frac{2}{1} - \frac{3}{2x+1} = \frac{(2x+1) \cdot 2 - 1 \cdot 3}{2x+1} = \frac{4x+2-3}{2x+1} = \frac{4x-1}{2x+1} \checkmark$$

$$c) \frac{2x\sqrt{x}}{1} - \frac{x^2}{2\sqrt{x}} = \frac{2\sqrt{x} \cdot 2x\sqrt{x} - 1 \cdot x^2}{2\sqrt{x}} = \frac{4x(\sqrt{x})^2 - x^2}{2\sqrt{x}} =$$

$$= \frac{4x^2 - x^2}{2\sqrt{x}} = \frac{3x^2}{2\sqrt{x} \cdot x} = \frac{3x}{2\sqrt{x}} \quad \circ \quad \frac{3x\sqrt{x}}{2\sqrt{x}\sqrt{x}} = \frac{3x\sqrt{x}}{2x} = \frac{3}{2}\sqrt{x} \checkmark$$

$$d) \frac{x}{x-4} + \frac{-3}{4-x} = \frac{(-1) \cdot x + (-3) \cdot 1}{(-1)(x-4)} = \frac{-x-3}{-(x-4)} = \frac{x+3}{x-4} \checkmark$$