

# Práctico 0

## Sección 1

Ej 1: Escribir la expresión reducida de los siguientes números,

Expresión reducida:  $\frac{7}{5} \checkmark$ ,  $\frac{12}{7} = \frac{3 \times 4}{7}$

+  $\frac{6}{4} = \frac{\cancel{2} \times 3}{\cancel{2} \times 2} = \frac{3}{2} \checkmark$   
 no es reducida      es reducido

Ejemplos:  $\frac{12}{8}$  (circled),  $\frac{19}{15}$ ,  $\frac{7}{17} \checkmark$   
 $\times \parallel \frac{3}{2} \checkmark$

Prop:  $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$

a)  $\left(\frac{2}{3}\right) \left(\frac{3}{4}\right)^2 \left(\frac{4}{5}\right)^3 = \left(\frac{2}{3}\right) \cdot \left(\frac{3^2}{4^2}\right) \cdot \left(\frac{4^3}{5^3}\right)$  +6x4  
 $= \left(\frac{2}{3}\right) \cdot \left(\frac{9}{16}\right) \cdot \left(\frac{64}{125}\right) = \frac{2 \times \cancel{9}^{3 \times 2} \times 64}{\cancel{3} \times 16 \times 125} = \frac{2 \times 3 \times \cancel{64}^{16 \times 4}}{\cancel{16} \times 125}$   
 $= \frac{2 \times 3 \times 4}{125} = \frac{2 \times 3 \times 4}{5 \times 5 \times 5} \checkmark$  Está reducida.

$= \frac{24}{125}$  es una fracción irreducible.

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

d)  $\left(\frac{\frac{1}{6}}{\frac{2}{5}}\right)^{-2} = \left(\frac{2/5}{1/6}\right)^2$

Prop:  $\frac{a/b}{c/d} = \frac{a \cdot d}{b \cdot c}$

$= \left(\frac{2 \cdot 6}{5 \cdot 1}\right)^2 = \left(\frac{12}{5}\right)^2 = \frac{12^2}{5^2} = \frac{144}{25} \checkmark$

$$\frac{7}{4} + \frac{5}{3} \neq \frac{7+5}{4+3} \quad \left| \frac{7}{3} + \frac{4}{3} = \frac{7+4}{3} \right.$$

$$= \frac{11}{3}$$

(1)

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

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

$$= \frac{25}{6} + \frac{1}{6} = \frac{25+1}{6} = \frac{26}{6} = \frac{13}{3} \quad \checkmark \text{ es irreducible.}$$

Ejercicio 2: calcular:

(a)  $\left| \frac{1}{3} - \frac{2}{5} \right| + \left| \frac{-1}{3} + \frac{2}{5} \right|$

$$= \left| \frac{5}{3 \times 5} - \frac{3 \times 2}{3 \times 5} \right| + \left| \frac{(-1) \times 5 + 2 \times 3}{3 \times 5} \right|$$

$$= \left| \frac{5 - 6}{15} \right| + \left| \frac{-5 + 6}{15} \right| = \left| \frac{-1}{15} \right| + \left| \frac{1}{15} \right|$$

$$= \frac{1}{15} + \frac{1}{15} = \frac{1+1}{15} = \frac{2}{15} \quad \checkmark$$

Recordamos:

$$|n| = \begin{cases} n & \text{si } n \geq 0 \\ -n & \text{si } n < 0 \end{cases}$$

Ej:  $|3| = 3$ ,  $|-7| = 7$

(b)  $\frac{3}{4!} + \frac{1}{3!}$

$$= \frac{3}{24} + \frac{1}{6} = \frac{1}{8} + \frac{1}{6}$$

$$= \frac{3}{8 \times 3} + \frac{4}{4 \times 6} = \frac{3}{24} + \frac{4}{24} = \frac{3+4}{24} = \frac{7}{24}$$

Recordar:  $n! = n \cdot (n-1) \cdot (n-2) \cdot \dots \cdot 2 \cdot 1$

Ej:  $4! = 4 \cdot 3 \cdot 2 \cdot 1 = 24$

$3! = 3 \cdot 2 \cdot 1 = 6 \quad \checkmark$

$$\begin{aligned} \text{Ej 3, parte e)} \prod_{k=1}^3 (2k+1) &= (2(1)+1) \cdot (2(2)+1) \cdot (2(3)+1) \\ &= (2+1)(4+1)(6+1) \\ &= 3 \cdot (5)(7) = 15 \cdot 7 = 105 \end{aligned}$$

## Sección 2: Polinomios

Recordar:  $ax^2+bx+c$ , tiene raíces  $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

Ej 1: Buscar raíces:

$$\text{e)} (x^2-1)(x^2-6) = 0 \iff \begin{array}{l} \underline{x^2-1=0} \quad \text{ó} \quad \underline{x^2-6=0} \\ \uparrow \qquad \qquad \qquad \uparrow \\ x^2=1 \qquad \qquad \qquad x^2=6 \\ \uparrow \qquad \qquad \qquad \uparrow \\ x = \pm\sqrt{1} = \pm 1 \qquad \qquad x = \pm\sqrt{6} \end{array}$$

$\Rightarrow$  Las raíces del polinomio son  $1, -1, \sqrt{6}, -\sqrt{6}$ .

i)  $x^6 - x^3 - 2 \implies$  Tiene raíz evidente  $-1$

Hacemos Ruffini:

	1	0	0	-1	0	0	-2
-1		-1	1	-1	2	-2	2
	1	-1	1	-2	2	-2	0

$$x^6 - x^3 - 2 = (x - (-1)) (x^5 - x^4 + x^3 - 2x^2 + 2x - 2)$$

Hacemos un cambio de variable:  $y = x^3$

$$y = x^3 \Rightarrow y^2 = (x^3)^2 = x^6 \quad \checkmark$$

$$x^6 - x^3 - 2 = y^2 - y - 2$$

Usamos la fórmula para grado 2:

$$y = \frac{1 \pm \sqrt{1 - 4(1)(-2)}}{2} = \frac{1 \pm \sqrt{9}}{2}$$

$$= \frac{1 \pm 3}{2} \begin{cases} \rightarrow \frac{1+3}{2} = \frac{4}{2} = 2 \\ \rightarrow \frac{1-3}{2} = \frac{-2}{2} = -1 \end{cases}$$

Tenemos  $y = 2$  e  $y = -1$

$$\text{Teniamos } y = x^3 \Rightarrow x^3 = 2 \text{ o } x^3 = -1$$

$$\Rightarrow x = \sqrt[3]{2} \text{ o } x = \sqrt[3]{-1} = -1$$

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