

EJERCICIO 4(d)

$$\frac{2x^4 - 6x^3 + 6x^2 - 2x}{6x^3 - 12x^2 + 6x} \xrightarrow{\text{Factorizar}} \frac{\cancel{2x} \cdot (x-1)^3}{\cancel{6x} \cdot (x-1)^2} \xrightarrow{\text{Simplificar}} \frac{x-1}{3}$$

$$* P(x) = 2x^4 - 6x^3 + 6x^2 - 2x = 2x \cdot (x^3 - 3x^2 + 3x - 1)$$

Posibles raíces enteras = $\{\pm 1\}$

$$\begin{array}{r|rrrr} 1 & 1 & -3 & +3 & -1 \\ & & 1 & -2 & 1 \\ \hline & 1 & -2 & 1 & 0 \end{array} \Rightarrow 1 \text{ es raíz y } (x-1) \text{ factor} \Rightarrow P(x) = 2x \cdot (x-1) \cdot \underbrace{(x^2 - 2x + 1)}_{\text{IN}} \rightarrow$$

$$\Rightarrow P(x) = 2x \cdot (x-1) \cdot (x-1)^2 \Rightarrow \boxed{P(x) = 2x \cdot (x-1)^3}$$

$$* \boxed{Q(x) = 6x^3 - 12x^2 + 6x = 6x \cdot (x^2 - 2x + 1) = 6x(x-1)^2}$$

EJERCICIO 6(f)

$$* \boxed{x^2 - 3x - 10 = (x-5)(x+2)}$$

$$x^2 - 3x - 10 = 0 \Rightarrow x = \frac{3 \pm \sqrt{(-3)^2 - 4 \cdot 1 \cdot (-10)}}{2 \cdot 1} = \frac{3 \pm \sqrt{9+40}}{2} =$$

$$= \frac{3 \pm 7}{2} \rightarrow 5 \text{ es raíz y } (x-5) \text{ factor}$$

$$\rightarrow -2 \text{ es raíz y } (x+2) \text{ factor}$$

$$* \boxed{x^3 - 2x^2 - 4x + 8 = (x-2)^2(x+2)}$$

Posibles raíces enteras = $\{\pm 1, \pm 2, \pm 4, \pm 8\}$

$$\begin{array}{r|rrrr} 2 & 1 & -2 & -4 & +8 \\ & & 2 & 0 & -8 \\ \hline & 1 & 0 & -4 & 0 \end{array} \Rightarrow 2 \text{ es raíz y } (x-2) \text{ factor} \Rightarrow (x-2) \cdot \underbrace{(x^2 - 4)}_{\text{IN}} =$$

$$= (x-2)(x-2)(x+2) = \underline{\underline{(x-2)^2(x+2)}}$$

$$* \boxed{x^2 - 4 = (x+2) \cdot (x-2)}$$

$$* \boxed{3 - x = -(x-3)}$$

$$* \boxed{6x - 2x^2 = -2x^2 + 6x = -2x \cdot (x-3)}$$

$$* \boxed{2x^2 - 4x = 2x \cdot (x-2)}$$

$$\begin{aligned} \frac{x^2 - 3x - 10}{x^3 - 2x^2 - 4x + 8} \cdot \frac{x^2 - 4}{x-5} &= \frac{\cancel{(x+2)} \cancel{(x-5)}}{\cancel{(x-2)}^2 \cancel{(x+2)}} \cdot \frac{\cancel{(x+2)} \cancel{(x-2)}}{\cancel{(x-5)}} = \\ &= \frac{x+2}{3-x} \cdot \frac{6x - 2x^2}{2x^2 - 4x} = \frac{x+2}{-(x-3)} \cdot \frac{-2x \cdot (x-3)}{2x \cdot (x-2)} = \\ &= \frac{x+2}{x-2} = \frac{x+2}{x-2} : \frac{x+2}{x-2} = 1 \end{aligned}$$

EJERCICIO 8(d)

$$\frac{x}{x^2 - 1} - \frac{3}{x+1} - \frac{x+2}{x^2 + x - 2} = (\text{Factorizamos los denominadores})$$

$$= \frac{x}{(x+1)(x-1)} - \frac{3}{(x+1)} - \frac{x+2}{(x-1)(x+2)} =$$

↑
Simplificar

$$= \frac{x}{(x+1)(x-1)} - \frac{3}{(x+1)} - \frac{1}{(x-1)} =$$

$$= \frac{x - 3(x-1) - (x+1)}{(x+1)(x-1)} =$$

$$= \frac{x - 3x + 3 - x - 1}{(x+1)(x-1)} = \frac{-3x + 2}{(x+1)(x-1)} = \frac{2 - 3x}{x^2 - 1}$$

$$x^2 + x - 2 = 0$$

$$x = \frac{-1 \pm \sqrt{1+8}}{2} = \frac{-1 \pm 3}{2} \rightarrow \begin{matrix} 1 \\ -2 \end{matrix}$$

EJERCICIO 10(d)

$$\begin{aligned}& \left(\frac{1}{x-2} - \frac{x-3}{x^2-4} \right) \cdot \frac{x+2}{5} - \frac{2}{x} = \\& = \left(\frac{1}{(x-2)} - \frac{x-3}{(x+2)(x-2)} \right) \cdot \frac{x+2}{5} - \frac{2}{x} = \\& = \frac{x+2 - (x-3)}{(x-2)(x+2)} \cdot \frac{x+2}{5} - \frac{2}{x} = \\& = \frac{x+2 - x + 3}{(x-2)(x+2)} \cdot \frac{x+2}{5} - \frac{2}{x} = \\& = \frac{\cancel{5}}{(x-2)\cancel{(x+2)}} \cdot \frac{\cancel{(x+2)}}{\cancel{5}} - \frac{2}{x} = \\& = \frac{1}{x-2} - \frac{2}{x} = \\& = \frac{x - 2(x-2)}{x(x-2)} = \frac{x - 2x + 4}{x(x-2)} = \frac{4-x}{x(x-2)} = \frac{4-x}{x^2-2x}\end{aligned}$$