

Efectua les operacions següents:

$$a) \left(\frac{1}{x-2} - \frac{x-3}{x^2-4} \right) \cdot \frac{x+2}{x} - \frac{x}{2}$$

$$b) \left(\frac{6}{1-x} - \frac{5x}{x-1} \right) : \frac{x^2-1}{2} + \frac{3}{x}$$

$$c) \left(x+1 + \frac{x^2}{1-x} \right) : \left(1 - \frac{x}{1+x} \cdot \frac{x+1}{x^3} \right) + \frac{4}{x^2-1}$$

$$d) \left(\frac{1}{x} + \frac{1}{3x} \right) \cdot \left(\frac{x-1}{x} - \frac{x-2}{2x} \right) - \frac{1}{x^2-1}$$

$$\begin{aligned} a) \left(\frac{5}{(x+2) \cdot (x-2)} \right) \cdot \frac{x+2}{x} - \frac{x}{2} &= \frac{5}{x \cdot (x-2)} - \frac{x}{2} = \\ &= \frac{10 - x^2 \cdot (x-2)}{2x \cdot (x-2)} = \frac{10 - x^3 + 2x^2}{2x \cdot (x-2)} \end{aligned}$$

$$\begin{aligned} b) \left(\frac{-5x-6}{x-1} \right) : \frac{(x+1) \cdot (x-1)}{x} + \frac{3}{x} &= \frac{-5x^2-6x}{(x+1) \cdot (x-1)^2} + \frac{3}{x} = \\ &= \frac{-5x^3-6x^2+3 \cdot (x+1) \cdot (x-1)^2}{x \cdot (x+1) \cdot (x-1)^2} = \frac{-2x^3-3x^2-3x-3}{x \cdot (x+1) \cdot (x-1)^2} \end{aligned}$$

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

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