

1. Simplifica las siguientes expresiones algebraicas

Factorizar el polinomio de segundo grado $\frac{x^5 + 6x^4 + 9x^3}{x^3 + 3x^2}$	$= \frac{x^3(x^2 + 6x + 9)}{x^2(x+3)} = \frac{x^3(x+3)(x+3)}{x^2(x+3)} = \frac{x(x+3)}{1} = x(x+3)$ $\circledast$ $x = \frac{-6 \pm \sqrt{36 - 4(1)(9)}}{2} \rightarrow x = \begin{cases} -3 \rightarrow (x+3) \\ -3 \rightarrow (x+3) \end{cases}$
$\frac{x^3 - x}{x^3 + 3x^2 + 2x}$	$x^2 - 4 = 0 \rightarrow x = \sqrt{4} \rightarrow x = \pm 2 \left\{ \begin{array}{l} (x-2) \\ (x+2) \end{array} \right.$ identidad notable $\frac{x(x^2 - 4)}{x(x^2 + 3x + 2)} = \frac{x(x+2)(x-2)}{x(x+2)(x+1)} = \frac{(x-2)}{(x+1)}$ $\hookrightarrow x = \frac{-3 \pm \sqrt{9 - 4(1)(2)}}{2} \rightarrow x = \begin{cases} \frac{-3+1}{2} = -1 \\ \frac{-3-1}{2} = -2 \end{cases}$
$\frac{x^3 - x^2 - 2x}{x^3 - 3x^2 + 2x}$	$x = \frac{-1 \pm \sqrt{1 - 4(1)(-2)}}{2} \rightarrow x = \begin{cases} \frac{1+3}{2} = 2 \\ \frac{1-3}{2} = -1 \end{cases}$ suma de segundo grado $\frac{x(x^2 - x - 2)}{x(x^2 - 3x + 2)} = \frac{x(x-2)(x+1)}{x(x-2)(x-1)} = \frac{(x+1)}{(x-1)}$ $\hookrightarrow x = \frac{3 \pm \sqrt{9 - 4(1)(2)}}{2} \rightarrow x = \begin{cases} \frac{3+1}{2} = 2 \\ \frac{3-1}{2} = 1 \end{cases}$
$\frac{x^3 - 3x^2 + 3x - 1}{x^3 - 2x^2 + x}$ $\hookrightarrow x(x^2 - 2x + 1) = x(x-1)^2$	Por tanto, resultado del Puffini $\frac{(x-1)(x-1)(x-1)}{x(x-1)^2} = \frac{x-1}{x}$

$$\frac{x^4 - 2x^3 - 3x^2}{x^4 - 9x^2}$$

$$\frac{x^2(x^2 - 2x - 3)}{x^2(x^2 - 9)} = \frac{x^2(x-3)(x+1)}{x^2(x+3)(x-3)} = \frac{x+1}{x+3}$$

identidad notable $(a+b)(a-b) = a^2 - b^2$

$$x^2 - 2x - 3 = 0$$

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