

$$g) \frac{x^2 + 2x + 3}{x^2 - x + 1} \leq \frac{2}{3} \Rightarrow \frac{x^2 + 2x + 3}{x^2 - x + 1} - \frac{2}{3} \leq 0$$

$$\Rightarrow \frac{3x^2 + 6x + 9 - 2(x^2 - x + 1)}{3(x^2 - x + 1)} \leq 0 \Rightarrow \frac{3x^2 + 6x + 9 - 2x^2 + 2x - 2}{3(x^2 - x + 1)} \leq 0$$

$$\Rightarrow \frac{x^2 + 8x + 7}{3(x^2 - x + 1)} \leq 0.$$

• Numerador: $x^2 + 8x + 7 = 0 \Rightarrow x = \frac{-8 \pm \sqrt{64 - 28}}{2} \begin{cases} x_1 = -1 \\ x_2 = -7 \end{cases}$

• Denominador: $3(x^2 - x + 1) = 0 \Rightarrow x^2 - x + 1 = 0.$

$x = \frac{1 \pm \sqrt{1 - 4}}{2}$ Sol. por lo tanto $x^2 - x + 1$ no cambia

de signo en toda su dominio, es siempre.

$\begin{matrix} x^2 - x + 1 > 0 \\ 0' \\ x^2 - x + 1 < 0 \end{matrix} \left\{ \begin{array}{l} \text{Para saberlo le doy} \\ \text{un valor cualquiera:} \\ x = 0 \end{array} \right.$

$$0^2 - 0 + 1 = 1 > 0$$

Signo:

Signo:	$-\infty$	-7	-1	∞	
$x^2 + 8x + 7$	+		-		+
$x^2 - x + 1$	+	+	+	+	
	+	-	+		

Sol: $\forall x \in [-7, -1]$

$$\frac{-x^2-4}{x^2-x-6} \leq \frac{5}{6} \Rightarrow \frac{-x^2-4}{x^2-x-6} - \frac{5}{6} \leq 0 \Rightarrow \frac{6(-x^2-4) - 5(x^2-x-6)}{6(x^2-x-6)} \leq 0$$

$$\Rightarrow \frac{-6x^2-24-5x^2+5x+30}{6(x^2-x-6)} \leq 0 \Rightarrow \frac{-11x^2+5x+6}{6(x^2-x-6)} \leq 0$$

• Numerador: $-11x^2+5x+6=0 \Rightarrow x = \frac{-5 \pm \sqrt{25+264}}{-22} = \frac{-5 \pm 17}{-22} = \begin{cases} x_1 = 1 \\ x_2 = \frac{-12}{22} = \frac{-6}{11} \end{cases}$

• Denominador: $6(x^2-x-6)=0 \Rightarrow x^2-x-6=0$
 $x = \frac{1 \pm \sqrt{1+24}}{2} = \frac{1 \pm 5}{2} \begin{cases} x_1 = 3 \\ x_2 = -2 \end{cases}$

Signo:

	$-\infty$	-2	$-\frac{6}{11}$	1	3	∞
$-11x^2+5x+6$	-	-	+	-	-	-
x^2-x-6	+	-	-	-	+	+
	-	+	-	+	-	-

Sol: $\forall x \in (-\infty, -2) \cup \left[-\frac{6}{11}, 1\right] \cup (3, \infty)$.