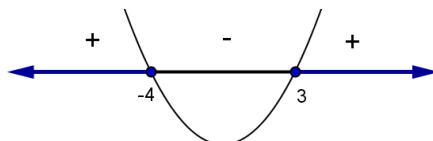


Resuelve las siguientes inecuaciones:

a) $x^2 + x - 12 \geq 0$

➤ Ceros: $x^2 + x - 12 = 0 \Rightarrow x = \frac{-1 \pm \sqrt{1+48}}{2} = \frac{-1 \pm 7}{2} = \begin{cases} x = 3 \\ x = -4 \end{cases}$

➤ $a = 1 > 0 \Rightarrow \cup$

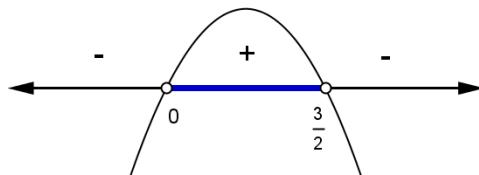


Solución: $x \in (-\infty, -4] \cup [3, +\infty)$

b) $-2x^2 + 3x > 0$

➤ Ceros: $-2x^2 + 3x = 0 \Rightarrow x \cdot (-2x + 3) = 0 \Rightarrow \begin{cases} x = 0 \\ -2x + 3 = 0 \Rightarrow x = \frac{3}{2} \end{cases}$

➤ $a = -2 < 0 \Rightarrow \cap$

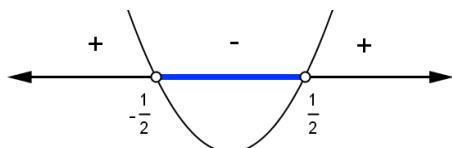


Solución: $x \in \left(0, \frac{3}{2}\right)$

c) $4x^2 - 1 < 0$

➤ Ceros: $4x^2 - 1 = 0 \Rightarrow 4x^2 = 1 \Rightarrow x^2 = \frac{1}{4} \Rightarrow x = \pm \frac{1}{2}$

➤ $a = 4 > 0 \Rightarrow \cup$

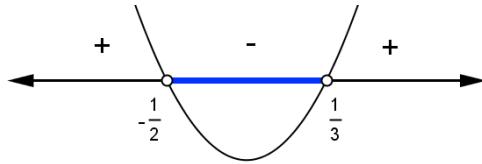


Solución: $x \in \left(-\frac{1}{2}, \frac{1}{2}\right)$

d) $6x^2 + x < 1 \Rightarrow 6x^2 + x - 1 < 0$

➤ Ceros: $6x^2 + x - 1 = 0 \Rightarrow x = \frac{-1 \pm \sqrt{1+24}}{12} = \frac{-1 \pm 5}{12} = \begin{cases} x = \frac{1}{3} \\ x = -\frac{1}{2} \end{cases}$

➤ $a = 6 > 0 \Rightarrow \cup$

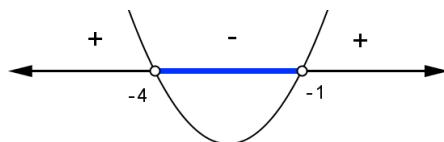


Solución: $x \in \left(-\frac{1}{2}, \frac{1}{3}\right)$

e) $-2x^2 - 10x - 8 > 0 \Rightarrow -2x^2 - 10x - 8 > 0 \xrightarrow{\cdot(-2)} x^2 + 5x + 4 < 0$ ¡Cuidado al dividir por un número negativo cambia el sentido de la desigualdad!

➤ Ceros: $x^2 + 5x + 4 = 0 \Rightarrow x = \frac{-5 \pm \sqrt{25 - 16}}{2} = \frac{-5 \pm 3}{2} = \begin{cases} x = -1 \\ x = -4 \end{cases}$

➤ $a = 1 > 0 \Rightarrow \cup$

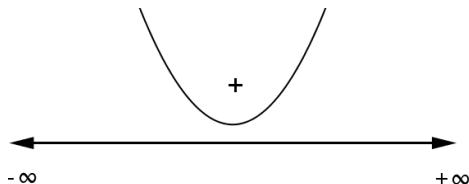


Solución: $x \in (-4, -1)$

f) $2x^2 + x + 1 < 0$

➤ Ceros: $2x^2 + x + 1 = 0 \Rightarrow x = \frac{-1 \pm \sqrt{1 - 8}}{2} \Rightarrow \text{No solución real}$

➤ $a = 2 > 0 \Rightarrow \cup$

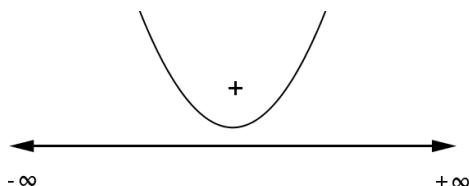


Solución: La inecuación no tiene solución

g) $x^2 + 3x + 9 > 0$

➤ Ceros: $x^2 + 3x + 9 = 0 \Rightarrow x = \frac{-3 \pm \sqrt{9 - 36}}{2} \Rightarrow \text{No solución real}$

➤ $a = 1 > 0 \Rightarrow \cup$

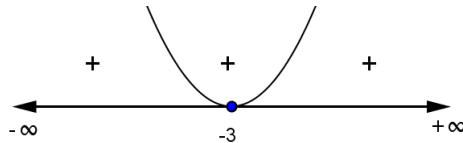


Solución: \mathbb{R}

h) $x^2 + 6x + 9 \leq 0$

➤ Ceros: $x^2 + 6x + 9 = 0 \Rightarrow x = \frac{-6 \pm \sqrt{36 - 36}}{2} = \frac{-6 \pm 0}{2} = \begin{cases} x = -3 \\ x = -3 \end{cases}$

➤ $a = 1 > 0 \Rightarrow \cup$

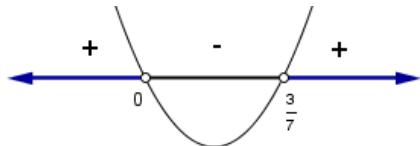


Solución: $x = -3$

i) $7x^2 > 3x \Rightarrow 7x^2 - 3x > 0$

➤ Ceros: $7x^2 - 3x = 0 \Rightarrow x \cdot (7x - 3) = 0 \Rightarrow \begin{cases} x = 0 \\ 7x - 3 = 0 \Rightarrow x = \frac{3}{7} \end{cases}$

➤ $a = 7 > 0 \Rightarrow \cup$

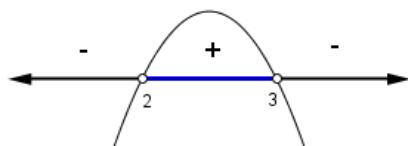


Solución: $x \in (-\infty, 0) \cup \left(\frac{3}{7}, +\infty \right)$

j) $-x^2 + 5x > 6 \Rightarrow -x^2 + 5x - 6 > 0$

➤ Ceros: $-x^2 + 5x - 6 = 0 \Rightarrow x = \frac{-5 \pm \sqrt{25 - 24}}{-2} = \frac{-5 \pm 1}{-2} = \begin{cases} x = 2 \\ x = 3 \end{cases}$

➤ $a = -1 < 0 \Rightarrow \cap$

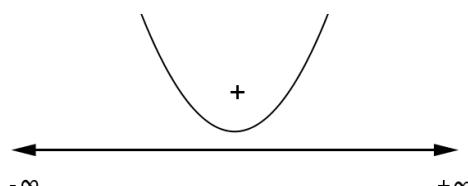


Solución: $x \in (2, 3)$

k) $(x - 2)^2 + 5 \leq 2 \Rightarrow x^2 - 4x + 4 + 5 - 2 \leq 0 \Rightarrow x^2 - 4x + 7 \leq 0$

➤ Ceros: $x^2 - 4x + 7 = 0 \Rightarrow x = \frac{4 \pm \sqrt{16 - 28}}{2} \Rightarrow \text{No solución real}$

➤ $a = 1 > 0 \Rightarrow \cup$

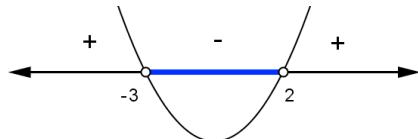


Solución: La inecuación no tiene solución

l) $\frac{3x-6}{5} < \frac{4x-2x^2}{10} \Rightarrow \frac{2(3x-6)}{10} < \frac{4x-2x^2}{10} \Rightarrow \frac{6x-12}{10} < \frac{4x-2x^2}{10} \Rightarrow 6x-12 < 4x-2x^2 \Rightarrow$
 $\Rightarrow 2x^2 + 2x - 12 < 0 \xrightarrow{:2} x^2 + x - 6 < 0$

➤ Ceros: $x^2 + x - 6 = 0 \Rightarrow x = \frac{-1 \pm \sqrt{1+24}}{2} = \frac{-1 \pm 5}{2} = \begin{cases} x = 2 \\ x = -3 \end{cases}$

➤ $a = 1 > 0 \Rightarrow \cup$

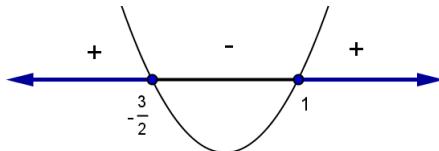


Solución: $x \in (-3, 2)$

m) $(x-2)^2 + 3x \geq -1 - (x+4)(x-2) \Rightarrow x^2 - 4x + 4 + 3x \geq -1 - (x^2 - 2x + 4x - 8) \Rightarrow$
 $\Rightarrow x^2 - x + 4 \geq -1 - x^2 + 2x - 4x + 8 \Rightarrow x^2 - x + 4 \geq -x^2 - 2x + 7 \Rightarrow 2x^2 + x - 3 \geq 0$

➤ Ceros: $2x^2 + x - 3 = 0 \Rightarrow x = \frac{-1 \pm \sqrt{1+24}}{4} = \frac{-1 \pm 5}{4} = \begin{cases} x = 1 \\ x = -\frac{3}{2} \end{cases}$

➤ $a = 2 > 0 \Rightarrow \cup$

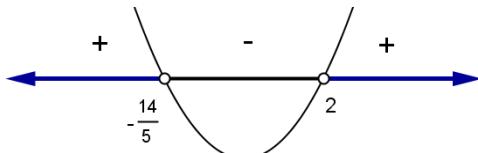


Solución: $x \in \left(-\infty, -\frac{3}{2}\right] \cup [1, +\infty)$

n) $\frac{x^2 - 2}{2} - \frac{3x - 1}{5} + x > 2 \Rightarrow \frac{5(x^2 - 2) - 2(3x - 1) + 10x}{10} > \frac{20}{10} \Rightarrow \frac{5x^2 - 10 - 6x + 2 + 10x}{10} > \frac{20}{10} \Rightarrow$
 $\Rightarrow \frac{5x^2 + 4x - 8}{10} > \frac{20}{10} \Rightarrow 5x^2 + 4x - 8 > 20 \Rightarrow 5x^2 + 4x - 28 > 0$

➤ Ceros: $5x^2 + 4x - 28 = 0 \Rightarrow x = \frac{-4 \pm \sqrt{16+560}}{10} = \frac{-4 \pm 24}{10} = \begin{cases} x = 2 \\ x = -\frac{14}{5} \end{cases}$

➤ $a = 5 > 0 \Rightarrow \cup$



Solución: $x \in \left(-\infty, -\frac{14}{5}\right) \cup (2, +\infty)$