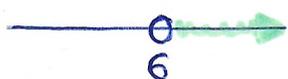


1911

$$a) 4x + 15 < 7x - 3 \Rightarrow 15 + 3 < 7x - 4x \Rightarrow 18 < 3x \Rightarrow \frac{18}{3} < x \Rightarrow 6 < x$$



$$\text{Sol: } x \in (6, \infty)$$

$$b) 2(3x - 5) > 7x + 4 \Rightarrow 6x - 10 > 7x + 4 \Rightarrow -4 - 10 > 7x - 6x \Rightarrow -14 > x$$



$$\text{Sol: } x \in (-\infty, -14)$$

$$c) 3 \cdot (x - 5) - 5 > 5(x + 1) - 1 \Rightarrow 3x - 15 - 5 > 5x + 5 - 1 \Rightarrow -15 - 5 - 5 + 1 > 5x - 3x$$

$$\Rightarrow -24 > 2x \Rightarrow -\frac{24}{2} > x \Rightarrow -12 > x$$



$$\text{Sol: } x \in (-\infty, -12)$$

$$d) 1 - 7x > 2(x - 4) - 18 \Rightarrow 1 - 7x > 2x - 8 - 18 \Rightarrow 1 + 8 + 18 > 2x + 7x$$

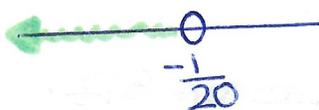
$$\Rightarrow 27 > 9x \Rightarrow \frac{27}{9} > x \Rightarrow 3 > x$$



$$\text{Sol } x \in (-\infty, 3)$$

$$e) x - 2(x + 3) > -5 + 19x \Rightarrow x - 2x - 6 > -5 + 19x \Rightarrow -6 + 5 > 19x + 2x - x \Rightarrow$$

$$\Rightarrow -1 > 20x \Rightarrow -\frac{1}{20} > x$$



$$\text{Sol } x \in (-\infty, -\frac{1}{20})$$

$$f) \frac{x-3}{2} - 2x > 2 - x \Rightarrow \frac{x-3}{2} - \frac{4x}{2} > \frac{4}{2} - \frac{2x}{2} \Rightarrow x - 3 - 4x > 4 - 2x$$

$$\Rightarrow -3 - 4 > 4x - 2x - x \Rightarrow -7 > x$$



$$\text{Sol } x \in (-\infty, -7)$$

$$g) \frac{5x-2}{2} - 3(x-1) \geq \frac{x+6}{10} \Rightarrow \frac{5x-2}{2} - 3x + 3 \geq \frac{x+6}{10} \Rightarrow$$

$$\Rightarrow \frac{25x-10}{10} - \frac{30x}{10} + \frac{30}{10} \geq \frac{x+6}{10} \Rightarrow 25x - 10 - 30x + 30 \geq x + 6$$

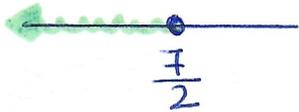
$$\Rightarrow -10 + 30 - 6 \geq 30x - 25x + x \Rightarrow 14 \geq 6x \Rightarrow \frac{14}{6} \geq x \Rightarrow \frac{7}{3} \geq x$$



$$\text{Sol } x \in (-\infty, \frac{7}{3}]$$

$$h) \frac{3x-1}{2} - \frac{2x+3}{3} \leq \frac{x+5}{6} \Rightarrow \frac{9x-3}{6} - \frac{4x+6}{6} \leq \frac{x+5}{6} \Rightarrow 9x-3-4x-6 \leq x+5$$

$$9x-4x-x \leq 5+3+6 \Rightarrow 4x \leq 14 \Rightarrow x \leq \frac{14}{4} \Rightarrow x \leq \frac{7}{2}$$



$$\text{Sol } x \in (-\infty, \frac{7}{2}]$$

$$i) \frac{3x-4}{5} - \frac{1-5x}{2} \geq x+5 \Rightarrow \frac{6x-8}{10} - \frac{5-25x}{10} \geq \frac{10x+50}{10}$$

$$\Rightarrow 6x-8-5+25x \geq 10x+50 \Rightarrow 6x+25x-10x \geq 50+8+5$$

$$\Rightarrow 21x \geq 63 \Rightarrow x \geq \frac{63}{21} \Rightarrow x \geq 3$$



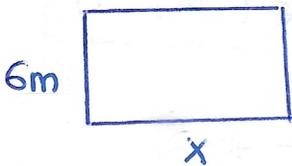
$$\text{Sol } x \in [3, \infty)$$

Ej 2  $x$ : nota 3º examen  $\frac{6,2+8,1+x}{3} \geq 7,5 \Rightarrow \frac{6,2+8,1+x}{3} \geq \frac{22,5}{3}$

$$\Rightarrow 6,2+8,1+x \geq 22,5 \Rightarrow x \geq 22,5-6,2-8,1 \Rightarrow x \geq 8,2$$

Tiene que sacar al menos un 8,2.

Ej 3



$$2x + 2 \cdot 6 < 30 \Rightarrow 2x < 30 - 12$$

$$\Rightarrow 2x < 18 \Rightarrow x < 9$$

El largo mide menos de 9m.

Ej 4

Compañía A  $40€ + 0,3€/min \cdot x$

Compañía B  $60€ + 0,2€/min \cdot x$

$$40 + 0,3 \cdot x > 60 + 0,2x$$

$$0,3x - 0,2x > 60 - 40$$

$$0,1x > 20$$

$$x > \frac{20}{0,1} \Rightarrow x > 200$$

Si se habla 200 minutos o más es más económica la B y en ese caso se pagaría  $60 + 0,2 \cdot 200 = 100€$

Ej 5Empresa A  $40 + 0,3 \cdot x$ Empresa B  $0,5 \cdot x$ 

$$40 + 0,3x < 0,5x$$

$$40 < 0,5x - 0,3x$$

$$40 < 0,2x$$

$$\frac{40}{0,2} < x \Rightarrow 200 < x$$

Si se recorren más de 200 km es mejor la empresa A

Ej 6

x: número

$$3x \leq 2x + 20$$

$$3x - 2x \leq 20$$

$$x \leq 20$$

Los números menores o iguales a 20

Ej 7Madre  $x + 25$ Hija  $x$ 

$$x + 25 > 2 \cdot x + 10$$

$$25 - 10 > 2x - x$$

$$15 > x$$

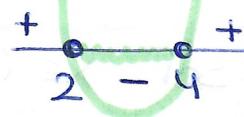
Mientras la hija tenga menos de 15 años.

Ej 8

a)  $x^2 - 6x + 8 \leq 0$

$$x^2 - 6x + 8 = 0$$

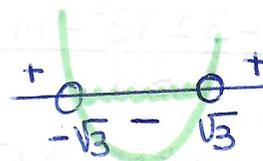
$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4 \cdot 1 \cdot 8}}{2 \cdot 1} = \frac{6 \pm \sqrt{4}}{2} = \frac{6 \pm 2}{2} \rightarrow x = 4$$



Sol  $x \in [2, 4]$

b)  $2x^2 < 6 \Rightarrow 2x^2 - 6 < 0$

$$2x^2 - 6 = 0 \Rightarrow 2x^2 = 6 \Rightarrow x^2 = 3 \Rightarrow x = \pm\sqrt{3}$$



Sol  $x \in (-\sqrt{3}, \sqrt{3})$

c)  $x^2 - 2x + 3 < 0$

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

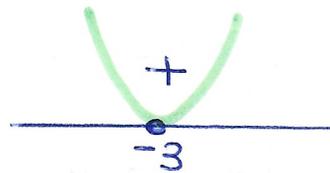
$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4 \cdot 1 \cdot 3}}{2 \cdot 1} = \frac{2 \pm \sqrt{-8}}{2} \nexists$$

Sol  $x \in \emptyset$

$$c) x^2 + 6x + 9 \geq 0$$

$$x^2 + 6x + 9 = 0$$

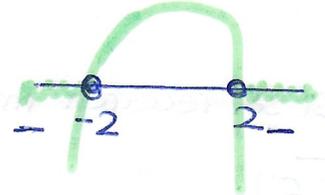
$$x = \frac{-6 \pm \sqrt{6^2 - 4 \cdot 1 \cdot 9}}{2 \cdot 1} = \frac{-6 \pm 0}{2} = -3$$



$$\text{Sol } x \in \mathbb{R}$$

$$e) 1 - x^2 \leq -3 \Rightarrow 1 - x^2 + 3 \leq 0 \Rightarrow -x^2 + 4 \leq 0$$

$$-x^2 + 4 = 0 \Rightarrow x^2 = 4 \Rightarrow x = \pm \sqrt{4} \Rightarrow x = \pm 2$$

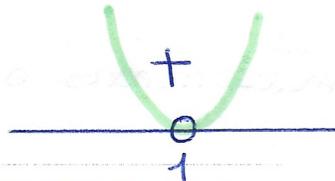


$$\text{Sol } x \in (-\infty, -2] \cup [2, \infty)$$

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

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

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4 \cdot 1 \cdot 1}}{2 \cdot 1} = \frac{2 \pm 0}{2} = 1$$

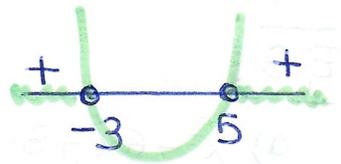


$$\text{Sol } x \in \emptyset$$

$$g) 3x^2 - 2x \geq 2x^2 + 15 \Rightarrow 3x^2 - 2x - 2x^2 - 15 \geq 0 \Rightarrow x^2 - 2x - 15 \geq 0$$

$$x^2 - 2x - 15 = 0$$

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4 \cdot 1 \cdot (-15)}}{2 \cdot 1} = \frac{2 \pm \sqrt{64}}{2} = \frac{2 \pm 8}{2} \begin{cases} x=5 \\ x=-3 \end{cases}$$

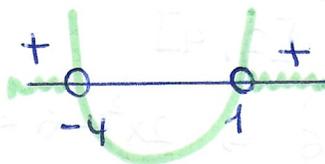


$$\text{Sol } x \in (-\infty, -3] \cup [5, \infty)$$

$$h) 2x^2 + 5x > 8 - x \Rightarrow 2x^2 + 5x - 8 + x > 0 \Rightarrow 2x^2 + 6x - 8 > 0$$

$$2x^2 + 6x - 8 = 0 \Rightarrow x^2 + 3x - 4 = 0$$

$$x = \frac{-3 \pm \sqrt{3^2 - 4 \cdot 1 \cdot (-4)}}{2 \cdot 1} = \frac{-3 \pm 5}{2} \begin{cases} x=-4 \\ x=1 \end{cases}$$



$$\text{Sol } x \in (-\infty, -4) \cup (1, \infty)$$

$$i) -7(4x+1)(-x+2) < 0 \Rightarrow -7(-4x^2 + 8x - x + 2) < 0 \Rightarrow 28x^2 - 49x - 14 < 0$$

$$-7(4x+1)(-x+2) = 0$$

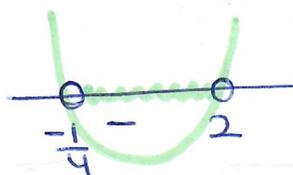
$$4x+1=0$$

$$4x=-1$$

$$x = -\frac{1}{4}$$

$$-x+2=0$$

$$x=2$$



$$\text{Sol } x \in \left(-\frac{1}{4}, 2\right)$$