

1 Resuelve:

a) $\frac{x-3}{2} - \frac{5x+1}{3} = \frac{1-9x}{6}$; $3(x-3) - 2(5x+1) = 1-9x$;

$3x-9-10x-2=1-9x$; $9x+3x-10x=1+9+2$; $2x=12$; $x=6$

b) $2x^2+5x=0$; $x(2x+5)=0$ $\left\{ \begin{array}{l} x=0 \\ 2x+5=0 ; 2x=-5 ; x=-\frac{5}{2} \end{array} \right.$

c) $-2x^2-x+3=0$; $x = \frac{1 \pm \sqrt{1-4 \cdot (-2) \cdot 3}}{2 \cdot (-2)} = \frac{1 \pm \sqrt{25}}{-4} = \frac{1 \pm 5}{-4} = \begin{cases} -\frac{3}{2} \\ 1 \end{cases}$

d) $100x^2-25=0$; $4x^2-1=0$; $4x^2=1$; $x^2=\frac{1}{4}$; $x=\pm\sqrt{\frac{1}{4}} = \begin{cases} \frac{1}{2} \\ -\frac{1}{2} \end{cases}$

2 Resuelve:

a) $(2x+1)^2 = 1+(x-1)(x+1)$; $4x^2+4x+1=1+x^2-1$; $3x^2+4x+1=0$

$x = \frac{-4 \pm \sqrt{16-4 \cdot 1 \cdot 3}}{2 \cdot 3} = \frac{-4 \pm \sqrt{4}}{6} = \frac{-4 \pm 2}{6} = \begin{cases} -\frac{1}{3} \\ -1 \end{cases}$

b) $\frac{x^2+1}{3} - 1 = \frac{x^2-4}{6} + x$; $2(x^2+1)-6 = x^2-4+6x$; $x^2-6x=0$;

$x(x-6)=0$ $\left\{ \begin{array}{l} x=0 \\ x-6=0 ; x=6 \end{array} \right.$

3 Resuelve:

a) $\begin{cases} 5x-3y=1 \\ 4x+2y=14 \end{cases} \rightarrow \begin{cases} 10x-6y=2 \\ 12x+6y=42 \end{cases} \rightarrow \begin{array}{r} 22x = 44 \\ x = \frac{44}{22} ; x=2 \end{array}$ $\rightarrow 5 \cdot 2 - 3y = 1 ; 3y = 9 ; y=3$

b) $\begin{cases} 3(x+2)=y+7 \\ x+2(y+1)=0 \end{cases} \rightarrow \begin{cases} 3x+6=y+7 \\ x+2y+2=0 \end{cases} \rightarrow \begin{cases} 3x-y=1 \\ x+2y=-2 \end{cases} \rightarrow \begin{cases} 3(-2-2y)-y=1 \\ x=-2-2y \end{cases}$

$-6-6y-y=1 ; -7y=7 ; y=-1$ $\rightarrow x=-2-2(-1)=-2+2 ; x=0$

4) Resuelve los problemas:

a) 2 mezclas de café $\begin{cases} A \rightarrow 6 \text{ €/kg} \\ B \rightarrow 8,5 \text{ €/kg} \end{cases}$

Queremos 20 kg de mezcla a 7 €/kg

$$\begin{cases} 6 \cdot x + 8,5 \cdot y = 20 \cdot 7 \\ x + y = 20 \end{cases} \rightarrow \begin{cases} 6 \cdot (20 - y) + 8,5y = 140 \\ 120 - 6y + 8,5y = 140 \end{cases}$$

$$2,5y = 20; y = \frac{20}{2,5}; y = 8 \text{ kg de B} \rightarrow x = 20 - 8; x = 12 \text{ kg de A}$$

b)

$$\begin{array}{|c|} \hline A = 33 \text{ cm}^2 \\ \hline \end{array} \begin{array}{l} h \\ 2 \cdot h + 5 \end{array}$$

$$h \cdot (2h + 5) = 33; 2h^2 + 5h - 33 = 0$$

$$h = \frac{-5 \pm \sqrt{25 - 4 \cdot 2 \cdot (-33)}}{2 \cdot 2} = \frac{-5 \pm \sqrt{289}}{4} = \frac{-5 \pm 17}{4} = \frac{12}{4} = 3$$

El rectángulo es de $11 \times 3 \text{ cm}^2$.

$$2 \cdot 3 + 5 = 11$$

c) Noelia le saca 27 años a Marcos (hoy). $\rightarrow x = y + 27$

Dentro de 12 años Noelia tendrá el doble que Marcos $\rightarrow x + 12 = 2(y + 12)$

$$x = y + 27$$

$$x + 12 = 2y + 24 \rightarrow (y + 27) + 12 = 2y + 24; y = 15$$

$$x = 15 + 27; x = 42$$