SOLUCIÓN EXAMEN UDS. 6 Y 7, ECUACIONES Y SISTEMAS (3º ESO ACAD.)

1 Resuelve:

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

$3x - 9 - 10x - 2 = 1 - 9x$; $9x + 3x - 10x = 1 + 9 + 2$; $2x = 12$; $\underline{\underline{x = 6}}$

b) $2x^2 + 5x = 0$; $x(2x+5) = 0 \begin{cases} \underline{\underline{x=0}} \\ 2x+5=0 ; \ 2x = -5 ; \ \underline{\underline{x = -\frac{5}{2}}} \end{cases}$

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

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

2 Resuelve:

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

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

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

$x(x-6) = 0 \begin{cases} \underline{\underline{x=0}} \\ x-6=0 ; \ \underline{\underline{x=6}} \end{cases}$

3 Resuelve:

a) $\left.\begin{array}{l} 5x - 3y = 1 \\ 4x + 2y = 14 \end{array}\right\} \begin{array}{l} 10x - 6y = 2 \\ 12x + 6y = 42 \\ \hline 22x \quad = 44 \end{array}$; $x = \frac{44}{22}$; $\underline{\underline{x=2}}$ $\longrightarrow$ $5\cdot 2 - 3y = 1$; $3y = 9$; $\underline{\underline{y=3}}$

b) $\left.\begin{array}{l} 3(x+2) = y+7 \\ x + 2(y+1) = 0 \end{array}\right\} \left.\begin{array}{l} 3x + 6 = y + 7 \\ x + 2y + 2 = 0 \end{array}\right\} \left.\begin{array}{l} 3x - y = 1 \\ x + 2y = -2 \end{array}\right\} \begin{array}{l} 3(-2-2y) - y = 1 ; \\ x = -2 - 2y \end{array}$

$-6 - 6y - y = 1$; $-7y = 7$; $\underline{\underline{y=-1}}$ $\longrightarrow$ $x = -2 - 2(-1) = -2 + 2$; $\underline{\underline{x=0}}$

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4 Resuelve los problemas:

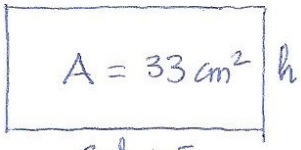
a) 2 mezclas de café $\begin{cases} A \rightarrow 6\,€/kg \\ B \rightarrow 8{,}5\,€/kg \end{cases}$

Queremos 20 kg de mezcla a 7 €/kg

$$\left.\begin{array}{l} 6\cdot x + 8{,}5\cdot y = 20\cdot 7 \\ x + y = 20 \end{array}\right\} \rightarrow x = 20 - y \quad 6\cdot(20-y) + 8{,}5y = 140\,;\ 120 - 6y + 8{,}5y = 140;$$

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

b)



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

$$h = \frac{-5 \pm \sqrt{25 - 4\cdot 2\cdot(-33)}}{2\cdot 2} = \frac{-5 \pm \sqrt{289}}{4} = \frac{-5 \pm 17}{4} = \begin{cases} 3 \\ \cancel{-\frac{11}{2}} \end{cases}$$

El rectángulo es de 11×3 cm².

$2\cdot 3 + 5 = 11$

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

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

$$\left.\begin{array}{l} x = y + 27 \\ x + 12 = 2y + 24 \end{array}\right\} \rightarrow (y+27) + 12 = 2y + 24\,;\ \underline{y = 15}$$

$x = 15 + 27;\ \underline{x = 42}$

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