Soluciones y rúbrica 1º parcial Pendientes 1º

1 $(2x^2+1)(x^2-3) = (x^2+1)(x^2-1) - 8$

$2x^4 - 6x^2 + x^2 - 3 = x^4 - 1 - 8$

$2x^4 - 5x^2 - 3 - x^4 + 1 + 8 = 0$

$\boxed{x^4 - 5x^2 + 6 = 0}$ bicuadrada

$\left.\begin{matrix} t = x^2 \\ t^2 = x^4 \end{matrix}\right\}$ $\quad t^2 - 5t + 6 = 0$

$t = \dfrac{5 \pm \sqrt{25-24}}{2} = \dfrac{5 \pm 1}{2} \begin{cases} 3 \\ 2 \end{cases}$

para $x = \pm\sqrt{t} \Rightarrow \boxed{\begin{matrix} x_1 = +\sqrt{3}, \; x_2 = -\sqrt{3}, \\ x_3 = +\sqrt{2}, \; x_3 = -\sqrt{2} \end{matrix}}$ 1 pto

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2

a) $\log_x 169 = 2$; $x^2 = 169$; $x = \pm\sqrt{169} = \pm 13$ (0'25)

comprobación: $x = 13 \rightarrow \log_{13} 169 = 2$ Sí vale

$x = -13 \rightarrow$ No existe $\log_{-13}$ la base debe ser positiva

b) $\log_2 4^{-2} = x$; $2^x = 4^{-2}$; $2^x = (2^2)^{-2}$ (0'25)

$2^x = 2^{-4} \Rightarrow x = -4$ (0'25)

$\log_2 4^{-2} = -2 \log_2 4 = -2 \cdot 2 = -4$

Sí, vale

c) $\ln e^3 = x^2$; $e^{x^2} = e^3$; $x^2 = 3$; $x = \pm\sqrt{3}$ (0'25)

comprobación: $\ln e^3 = 3$

$3 = (\pm\sqrt{3})^2$ (0'25) Sí, valen ambas

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3 $\log(x-2)+1=\log(x-1)+\log 2$ (2)

$\log(x-2)+\log 10=\log(x-1)+\log 2$

$\log[(x-2)\cdot 10]=\log[(x-1)\cdot 2]$ → hasta aquí 1 pto

$10(x-2)=2(x-1)$

$10x-20=2x-2$

$10x-2x=20-2$

$8x=18$

$x=\frac{18}{8}=\frac{9}{4}$ → 0'25

comprobación

$\frac{9}{4}-2=\frac{9-8}{4}=\frac{1}{4}$; $\frac{9}{4}-1=\frac{9-4}{4}=\frac{5}{4}$

¿$\log\frac{1}{4}+1=\log\frac{5}{4}+\log 2$?

$\log 1-\log 4+1=\log 5-\log 4+\log 2$

0 $1-\log 4=\log 5+\log 2-\log 4$ 0'25

$\log 10-\log 4=\log 10-\log 4$

$\log\frac{10}{4}=\log\frac{10}{4}$? Sí vale.

4 $\begin{cases} 25^x\cdot 5^y=\frac{1}{5} \\ \sqrt{x+11}=y \end{cases}$; $5^{2x}\cdot 5^y=5^{-1}$; $5^{2x+y}=5^{-1}$

$x+11=y^2$; $x+11=y^2$

$2x+y=-1$ → 0'5

$x=y^2-11$ → 0'5

$2(y^2-11)+y=-1$

$2y^2+y-22+1=0$

$2y^2+y-21=0$

$y=\frac{-1\pm\sqrt{1+168}}{4}=$

$=\frac{-1\pm 13}{4}$ ③ y_1 → 0'25 ptos ⇒ $x_1=-2$

$-\frac{7}{2}=y_2$ $x_2=\frac{5}{4}$ → 0'25 ptos

Comprobación

$y = \sqrt{x+11}$ parte positiva de la raíz

$(-2,3) \rightarrow \sqrt{-2+11} = 3$?

$\sqrt{9} = 3$ Sí, Vale

$\left(\frac{5}{4}, -\frac{7}{2}\right) \rightarrow \sqrt{\frac{5}{4}+11} = \sqrt{\frac{5+44}{4}} = \sqrt{\frac{49}{4}} = \frac{7}{2} \neq -\frac{7}{2}$

No, Vale.

Solución $\boxed{(-2,3)}$ → (0'25).

5

$$\left(\begin{array}{ccc|c} 1 & 1 & -1 & 1 \\ 3 & 2 & -1 & 1 \\ 5 & 3 & 4 & 2 \end{array}\right) \xrightarrow[F_3 - 5F_1]{F_2 - 3F_1} \left(\begin{array}{ccc|c} 1 & 1 & -1 & 1 \\ 0 & -1 & 4 & -2 \\ 0 & -2 & 9 & -3 \end{array}\right)$$

$$\xrightarrow{F_3 - 2F_2} \left(\begin{array}{ccc|c} 1 & 1 & -1 & 1 \\ 0 & -1 & 4 & -2 \\ 0 & 0 & 1 & 1 \end{array}\right) \rightarrow \text{hasta aquí (1pto)}$$

$$\left.\begin{array}{r} x+y-z=1 \\ -y+4z=-2 \\ z=1 \end{array}\right\}$$

$\boxed{z=1}$ $\quad -y+4=-2$; $-y=-2-4$; $\boxed{y=6}$

$x+6-1=1$; $x=-6+1+1$; $x=-6+2$; $\boxed{x=-4}$

Solución $\boxed{(x,y,z) = (-4,6,1)}$ → (0'5 ptos).

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x = nº escarabajos
y = nº arañas

$\begin{array}{cc} 47 & \times 14 \\ \times 2 & -6 \\ \hline 94 & -84 \end{array}$

$$\left.\begin{array}{r} 6x+8y=94 \\ x+y=14 \end{array}\right\}$$ (1 pto)

$6x + 8y = 94$
$-6x - 6y = -84$
$2y = 10$; $\boxed{y=5}$;

(0'25) $x = 14 - y$; $\boxed{x=9}$

son 9 escarabajos y 5 arañas (0'25)