

TEMA 3. 1ª A

(1)
$$\begin{cases} x+y+5z=0 \\ 2x+4y-10z=-2 \\ -2x+4y+30z=-1 \end{cases} \rightarrow \left(\begin{array}{ccc|c} 1 & 1 & 5 & 0 \\ 2 & 4 & -10 & -2 \\ -2 & 4 & 30 & -1 \end{array} \right) \xrightarrow{\substack{2F_1 - F_2 \\ 2F_1 + F_3}} \left(\begin{array}{ccc|c} 1 & 1 & 5 & 0 \\ 0 & -2 & 20 & -2 \\ 0 & 6 & 40 & -1 \end{array} \right)$$

$$\xrightarrow{3F_2 + F_3} \left(\begin{array}{ccc|c} 1 & 1 & 5 & 0 \\ 0 & -2 & 20 & -2 \\ 0 & 0 & 100 & 20 \end{array} \right)$$

SCD $100z=20 \rightarrow z = \frac{20}{100} \rightarrow z = \frac{1}{5}$

$-2y + 20z = -2 \rightarrow -2y + 20 \cdot \frac{1}{5} = -2 \rightarrow -2y = -4$

$y = -\frac{3}{2}$

SCD

Sol: $(\frac{1}{2}, -\frac{3}{2}, \frac{1}{5})$

$x+y+5z=0 \rightarrow x + (-\frac{3}{2}) + 5(\frac{1}{5}) = 0$

$x = \frac{3}{2} - 1 = \frac{1}{2} \rightarrow x = \frac{1}{2}$

(2)
$$\begin{cases} x-3y+2z=1 \\ 3x-2y+z=3 \\ -12x+y+4z=-9 \end{cases} \rightarrow \left(\begin{array}{ccc|c} 1 & -3 & 2 & 1 \\ 3 & -2 & 1 & 3 \\ -12 & 1 & 4 & -9 \end{array} \right) \xrightarrow{\substack{3F_1 - F_2 \\ 12F_1 + F_3}} \left(\begin{array}{ccc|c} 1 & -3 & 2 & 1 \\ 0 & -7 & 5 & 0 \\ 0 & -35 & 25 & +3 \end{array} \right) \rightarrow$$

$$\xrightarrow{-5F_2 + F_3} \left(\begin{array}{ccc|c} 1 & -3 & 2 & 1 \\ 0 & -7 & 5 & 0 \\ 0 & 0 & 0 & +3 \end{array} \right)$$
 SI \nexists Solución

(3)
$$\begin{cases} x-3y+5z=2 \\ x+2y+z=1 \\ x-13y+13z=4 \end{cases} \rightarrow \left(\begin{array}{ccc|c} 1 & -3 & 5 & 2 \\ 1 & 2 & 1 & 1 \\ 1 & -13 & 13 & 4 \end{array} \right) \xrightarrow{\substack{F_1 - F_2 \\ F_1 - F_3}} \left(\begin{array}{ccc|c} 1 & -3 & 5 & 2 \\ 0 & -5 & 4 & 1 \\ 0 & 13 & -8 & -2 \end{array} \right)$$

$$\xrightarrow{2F_2 + F_3} \left(\begin{array}{ccc|c} 1 & -3 & 5 & 2 \\ 0 & -5 & 4 & 1 \\ 0 & 0 & 0 & 0 \end{array} \right)$$
 SCD $z = \lambda$

$-5y + 4z = 1 \rightarrow -5y + 4\lambda = 1 \rightarrow y = \frac{1-4\lambda}{-5} = \frac{4\lambda-1}{5}$

$x - 3y + 5z = 2 \rightarrow x = 3\left(\frac{4\lambda-1}{5}\right) + 5\lambda = 2$

$x = 2 - 3\lambda + 3\left(\frac{4\lambda-1}{5}\right) = \frac{10 - 25\lambda + 12\lambda - 3}{5}$

Solución

$(\frac{7-13\lambda}{5}, \frac{4\lambda-1}{5}, \lambda) \forall \lambda \in \mathbb{R}$

$x = \frac{7-13\lambda}{5}$

(4)
$$\begin{cases} \sqrt{x-1} + 3 = y \\ xy = 60 \end{cases} \rightarrow (\sqrt{x-1})^2 = (y-3)^2 \rightarrow x-1 = y^2 - 6y + 9$$

$x = y^2 - 6y + 10$

$xy = 60 \rightarrow (y^2 - 6y + 10)y = 60 \rightarrow y^3 - 6y^2 + 10y - 60 = 0$

$$\begin{array}{r|rrrr} 1 & -6 & 10 & -60 \\ & 6 & 0 & 60 \\ \hline 1 & 0 & 10 & 0 \end{array}$$

$y^2 + 10 = 0 \rightarrow \nexists$ Sol.

$y = 6 \rightarrow xy = 60 \rightarrow x = \frac{60}{6} = 10$

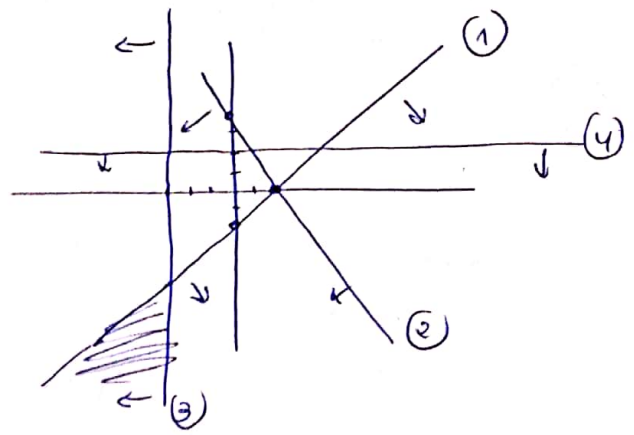
Solución (10, 6)

(5) $x - y \geq 2$
 (1,5) $2x + y \leq 4$
 $x + 3 \leq 0$
 $y - 7 \leq 0$

(1) $x - y = 2$
 $\begin{array}{r|rr} x & 2 & 2 \\ y & -2 & 0 \end{array}$

(2) $2x + y = 4$
 $\begin{array}{r|rr} x & 2 & 2 \\ y & 4 & 0 \end{array}$

(3) $x = -3$
 (4) $y = 7$



(6) $5 \cdot 3^{x+2} - 2^{y+1} = 7$
 (1,25) $2 \cdot 3^{x+1} + 2^y - 2 = 3$

$5 \cdot 3^x \cdot 3^2 - 2^y \cdot 2 = 7$
 $2 \cdot 3^x \cdot 3 + \frac{2^y}{2^2} = 3$

$3^x = A$
 $2^y = B$

$45A - 2B = 7$
 $6A + \frac{B}{4} = 3$

$45A - 2B = 7$
 $24A + B = 12$

\rightarrow

$45A - 2B = 7$
 $48A + 2B = 24$

$93A = 31$
 $A = \frac{31}{93} = \frac{1}{3}$

$6 \cdot \frac{1}{3} + \frac{B}{4} = 3$
 $2 + \frac{B}{4} = 3$
 $\frac{B}{4} = 1 \rightarrow B = 4$

$3^x = A = \frac{1}{3} \rightarrow x = -1$
 $2^y = B = 4 \rightarrow y = 2$

(7) $-3x^2 - 3x + 6 > 0$
 (1,5) $\frac{x^2 - 5x + 4}{x^2 - 2x - 3} \geq 0$

$-3(x+2)(x-1) > 0$

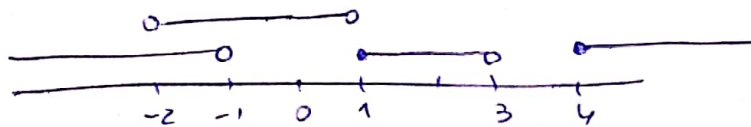
	$-\infty$	-2	1	$+\infty$
$(x+2)$	-	+	+	
$(x-1)$	-	-	+	
-3	-	-	-	
\bar{f}	-	+	-	

$x \in (-2, 1)$

$\frac{x^2 - 5x + 4}{x^2 - 2x - 3} \geq 0 \rightarrow \frac{(x-1)(x-4)}{(x+1)(x-3)} \geq 0$

	$-\infty$	-1	1	3	4	$+\infty$
$(x-1)$	-	-	+	+	+	
$(x-4)$	-	-	-	-	+	
$(x+1)$	-	+	+	+	+	
$(x-3)$	-	-	-	+	+	
\bar{f}	+	-	+	-	+	

$x \in (-\infty, -1) \cup [1, 3) \cup [4, +\infty)$



Solución $(-2, 1)$

CONTROL TEMA 3 1ºBACHILLERATO A

1. Resuelve:
$$\left. \begin{array}{l} x + y + 5z = 0 \\ 2x + 4y - 10z = -7 \\ -2x + 4y + 30z = -1 \end{array} \right\} (1,5 \text{ puntos})$$
2. Resuelve:
$$\left. \begin{array}{l} x - 3y + 2z = 1 \\ 3x - 2y + z = 3 \\ -12x + y + z = -9 \end{array} \right\} (1,5 \text{ puntos})$$
3. Resuelve:
$$\left. \begin{array}{l} x - 3y + 5z = 2 \\ x + 2y + z = 1 \\ x - 13y + 13z = 4 \end{array} \right\} (1,5 \text{ puntos})$$
4. Resuelve:
$$\left. \begin{array}{l} \sqrt{x-1} + 3 = y \\ xy = 60 \end{array} \right\} (1,25 \text{ puntos})$$
5. Resuelve:
$$\left. \begin{array}{l} x - y \geq 2 \\ 2x + y \leq 4 \\ x + 3 \leq 0 \\ y - 2 \leq 0 \end{array} \right\} (1,5 \text{ puntos})$$
6. Resuelve:
$$\left. \begin{array}{l} 5 \cdot 3^{x+2} - 2^{y+1} = 7 \\ 2 \cdot 3^{x+1} + 2^{y-2} = 3 \end{array} \right\} (1,25 \text{ puntos})$$
7. Resuelve:
$$\left. \begin{array}{l} -3x^2 - 3x + 6 > 0 \\ \frac{x^2 - 5x + 4}{x^2 - 2x - 3} \geq 0 \end{array} \right\} (1,5 \text{ puntos})$$