

CONTROL TEMA 4 1º BACHILLERATO B

1. Resuelve:
$$\begin{cases} 2x + y - z = 0 \\ 2x - y + 3z = 12 \\ x - 3y + 4z = 21 \end{cases} \text{ (1,5 puntos)}$$

2. Resuelve:
$$\begin{cases} 3x + 2y - 2z = 4 \\ 4x + y - z = 7 \\ x + 4y - 4z = -2 \end{cases} \text{ (1,5 puntos)}$$

3. Resuelve:
$$\begin{cases} x - y = 8 \\ x^2 + y^2 = 160 \end{cases} \text{ (1,5 puntos)}$$

4. Resuelve:
$$\begin{cases} \sqrt{3(x+y)} + x = 12 \\ 2x - y = 6 \end{cases} \text{ (1,5 puntos)}$$

5. Resuelve:
$$\begin{cases} 4x + y \leq 20 \\ y \geq 8 \\ x + 2y \geq 12 \end{cases} \text{ (1,5 puntos)}$$

6. Resuelve:
$$\begin{cases} 3x - 2(x + 4) \leq 5 \\ x + 3(2x - 1) > 4 \end{cases} \text{ (1,25 puntos)}$$

7. Resuelve:
$$\begin{cases} -x^2 + x + 2 > 0 \\ x^2 - 2 + 3(x^2 - 1) \geq 4 \end{cases} \text{ (1,25 puntos)}$$

$$\begin{cases} 2x + y - z = 11 \\ 2x - y + 3z = -11 \\ x - 3y + 4z = -23 \end{cases}$$

$$\begin{aligned} & \textcircled{1} \quad \begin{cases} 2x+y-z=11 \\ (1,5) \quad \begin{cases} 2x-y+3z=-11 \\ x-3y+4z=-23 \end{cases} \end{cases} \xrightarrow{\begin{matrix} E_1 - E_2 \\ E_1 - 2E_3 \end{matrix}} \begin{cases} 2x+y-z=11 \\ 2y-4z=22 \\ 7y-9z=57 \end{cases} \xrightarrow{7E_2 - 2E_3} \begin{cases} 2x+y-z=11 \\ 2y-4z=22 \\ -10z=40 \end{cases} \\ & \hspace{15em} \text{SCD} \end{aligned}$$

$$\begin{aligned} & \boxed{z=-4} \\ & 2y-4(-4)=22 \rightarrow 2y=22-16 \rightarrow 2y=6 \\ & \quad \quad \quad \boxed{y=3} \\ & 2x+3+4=11 \rightarrow 2x=4 \rightarrow \boxed{x=2} \end{aligned}$$

Solución (2, 3, -4)

$$\begin{aligned} & \textcircled{2} \quad \begin{cases} 3x+2y-2z=4 \\ (1,5) \quad \begin{cases} 4x+y-z=7 \\ x+4y-4z=-2 \end{cases} \end{cases} \xrightarrow{\begin{matrix} 4E_1 - 3E_2 \\ E_1 - 3E_3 \end{matrix}} \begin{cases} 3x+2y-2z=4 \\ 5y-5z=-5 \\ -10y+10z=10 \end{cases} \xrightarrow{2E_2 + E_3} \begin{cases} 3x+2y-2z=4 \\ 5y-5z=-5 \\ 0z=0 \end{cases} \\ & \hspace{15em} \text{SCI} \end{aligned}$$

$$\begin{aligned} z=\lambda & \rightarrow 5y-5\lambda=-5 \rightarrow y=\frac{-5+5\lambda}{5}=-1+\lambda \\ 3x+2(-1+\lambda)-2\lambda=4 & \rightarrow 3x-2+2\lambda-2\lambda=4 \rightarrow 3x=6 \\ & \Rightarrow x=2 \end{aligned}$$

Solución (2, -1+λ, λ) ∀ λ ∈ ℝ

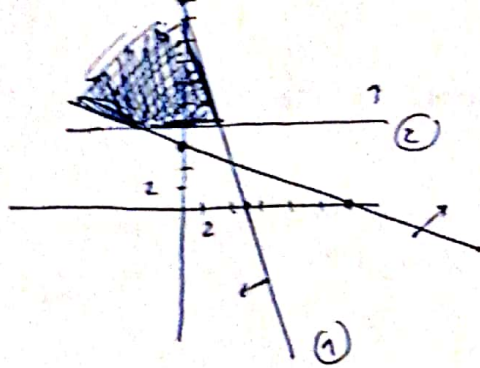
$$\begin{aligned} & \textcircled{3} \quad \begin{cases} x-y=8 \\ (1,5) \quad \begin{cases} x^2+y^2=160 \end{cases} \end{cases} \begin{cases} x=8+y \\ (8+y)^2+y^2=160 \rightarrow 64+16y+y^2+y^2=160 \\ 2y^2+16y-96=0 \end{cases} \begin{cases} y_1=4 \\ y_2=-12 \end{cases} \end{aligned}$$

$$\begin{aligned} \text{Si } y_1=4 & \rightarrow x_1=8+4=12 \\ \text{Si } y_2=-12 & \rightarrow x_2=8-12=-4 \end{aligned}$$

$$\begin{aligned} & \textcircled{4} \quad \begin{cases} \sqrt{3(x+y)}+x=12 \\ (1,5) \quad \begin{cases} 2x-y=6 \end{cases} \end{cases} \begin{cases} y=2x-6 \\ \sqrt{3(x+2x-6)}+x=12 \\ (\sqrt{3(3x-6)})^2=(12-x)^2 \\ 9x-18=144-24x+x^2 \\ x^2-33x+162=0 \end{cases} \begin{cases} x_1=27 \\ x_2=6 \end{cases} \\ & \text{Si } x_1=27 \rightarrow y_1=2 \cdot 27-6=48 \quad (27, 48) \\ & \text{Si } x_2=6 \rightarrow y_2=2 \cdot 6-6=6 \quad (6, 6) \end{aligned}$$

(5) ① $4x + y \leq 20$
 (1,5) ② $y \geq 8$
 ③ $x + 2y \geq 12$

① $\begin{array}{r|l} x & 0 \ 5 \\ y & 20 \ 0 \end{array}$
 ② $\begin{array}{r|l} x & 0 \ 12 \\ y & 6 \ 0 \end{array}$



(6) $3x - 2(x+4) \leq 5$
 (1,25) $x + 3(2x-1) \geq 4$

$3x - 2x - 8 \leq 5 \implies x \leq 13$
 $x + 6x - 3 \geq 4 \implies 7x \geq 7 \implies x \geq 1$

Solución $x \in (1, 13]$

(7) $-x^2 + x + 2 > 0$
 (1,25) $x^2 - 2 + 3(x^2 - 1) \geq 4$

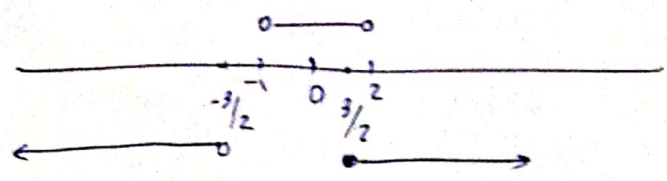
① $-x^2 + x + 2 = -(x-2)(x+1) > 0$
 ② $x^2 - 2 + 3x^2 - 3 \geq 4 \implies 4x^2 - 9 \geq 0 \implies 4(x - \frac{3}{2})(x + \frac{3}{2}) \geq 0$

①	$-\infty$	-1	2	$+\infty$
$(x-2)$	-	-	+	-
$(x+1)$	-	+	+	-
Π	-	+	-	+

$x \in (-1, 2)$

②	$-\infty$	$-\frac{3}{2}$	$\frac{3}{2}$	$+\infty$
$(x - \frac{3}{2})$	-	-	+	-
$(x + \frac{3}{2})$	-	+	+	-
Π	+	-	+	-

$x \in (-\infty, -\frac{3}{2}] \cup [\frac{3}{2}, +\infty)$



Solución $x \in [\frac{3}{2}, 2)$