

1. Escribe el desarrollo de $(2x - 5y)^7 =$
2. Resuelve: $\sqrt{2x-1} - \sqrt{2x-4} = 3$
3. Resuelve:
$$\left. \begin{array}{l} \log(x+y) + \log(x-y) = \log 33 \\ 2^x \cdot 2^y = 2^{11} \end{array} \right\}$$
4. Resuelve:
$$\left. \begin{array}{l} 3x - 5y > 2 \\ -2x + 6y \leq 0 \\ x \geq -1 \\ y < 2 \end{array} \right\}$$
5. Resuelve: $\binom{x+3}{2} + \binom{x-1}{2} = 4$
6. Resuelve:
$$\left. \begin{array}{l} x + 2y - 3z = 5 \\ 2x - 3y + z = 3 \\ 4x + y - 5z = 13 \end{array} \right\}$$
7. Los estudiantes de una clase están preparando una excursión. La agencia de viajes les da un presupuesto de 1620 euros. En el último momento, dos estudiantes se ponen enfermos y, al no poder ir de excursión, el resto ha de pagar 4,80 euros más cada uno. ¿Cuántos estudiantes había?
8. Calcula un polinomio de grado 3 que verifique que 3 es una raíz, $(x-1)$ es un factor, el valor numérico del polinomio para $x=2$ es -5 y $P(0)=9$
9. Resuelve:
$$\left\{ \begin{array}{l} x^2 - 6x + 8 < 0 \\ \frac{x+1}{x^2-9} < 0 \end{array} \right.$$
10. Resuelve $3x^4 - 14x^2 + 3 = x^2 - 9$

TEMA 2. 1º Bachillerato A

① Escribe el desarrollo de $(2x - 5y)^7 =$

$$\begin{aligned} (2x-5y)^7 &= \binom{7}{0} (2x)^7 + \binom{7}{1} (2x)^6 (-5y) + \binom{7}{2} (2x)^5 (-5y)^2 + \binom{7}{3} (2x)^4 (-5y)^3 + \\ &+ \binom{7}{4} (2x)^3 (-5y)^4 + \binom{7}{5} (2x)^2 (-5y)^5 + \binom{7}{6} (2x) (-5y)^6 + \binom{7}{7} (-5y)^7 = \\ &= 128x^7 - 2240x^6y + 16800x^5y^2 - 70000x^4y^3 + 175000x^3y^4 - 262500x^2y^5 \\ &+ 218750xy^6 - 78125y^7 \end{aligned}$$

② $\sqrt{2x-1} - \sqrt{2x-4} = 3$

$$\sqrt{2x-1} = 3 + \sqrt{2x-4} \Rightarrow (\sqrt{2x-1})^2 = (3 + \sqrt{2x-4})^2 \Rightarrow 2x-1 = 9 + 2x-4 + 6\sqrt{2x-4} \Rightarrow$$

$$-6 = 6\sqrt{2x-4} \Rightarrow -1 = \sqrt{2x-4} \Rightarrow (-1)^2 = (\sqrt{2x-4})^2 \Rightarrow 1 = 2x-4 \Rightarrow \boxed{x = \frac{5}{2}}$$

No vale la solución $\sqrt{2 \cdot \frac{5}{2} - 1} - \sqrt{2 \cdot \frac{5}{2} - 4} = 2 - 1 = 1 \neq 3$

③ $\log(x+y) + \log(x-y) = \log 33$ $\left\{ \begin{array}{l} \log[(x+y)(x-y)] = \log 33 \\ 2^x \cdot 2^y = 2^{11} \end{array} \right.$

$$\begin{cases} (x+y)(x-y) = 33 \\ x+y = 11 \end{cases}$$

$$\left\{ \begin{array}{l} x^2 - y^2 = 33 \\ x+y = 11 \end{array} \right. \left\{ \begin{array}{l} x = 11-y \\ (11-y)^2 - y^2 = 33 \end{array} \right.$$

$$121 - 22y + y^2 - y^2 = 33$$

$$121 - 22y = 33$$

$$88 = 22y \rightarrow \boxed{y = 4 \Rightarrow x = 7}$$

④ $3x - 5y > 2$

$$-2x + 6y \leq 0$$

$$x \geq -1$$

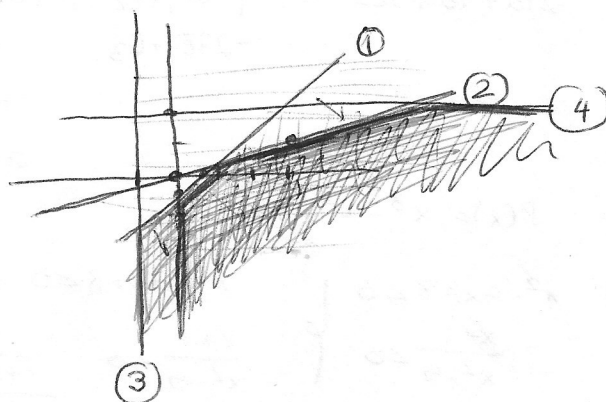
$$y < 2$$

① $3x - 5y = 2$

$$\begin{array}{r|rr} x & 0 & 2/3 \\ y & -2/5 & 0 \end{array}$$

② $-2x + 6y = 0$

$$\begin{array}{r|rr} x & 0 & 3 \\ y & 0 & 1 \end{array}$$



⑤ $\binom{x+3}{2} + \binom{x-1}{2} = 4$

$$\frac{(x+3)!}{2!(x+3-2)!} + \frac{(x-1)!}{2!(x-1-2)!} = 4 \Rightarrow \frac{(x+3)(x+2)(x+1)!}{2(x+1)!} + \frac{(x-1)(x-2)(x-3)!}{2(x-3)!} = 4$$

$$\frac{x^2+5x+6}{2} + \frac{x^2-3x+2}{2} = 4 \Rightarrow x^2+5x+6+x^2-3x+2=8 \Rightarrow 2x^2+2x=0$$

$$\Rightarrow x(2x+2)=0 \begin{cases} \rightarrow x=0 \\ \rightarrow x=-1 \end{cases}$$

⑥ $x + 2y - 3z = 5$

$$2x - 3y + z = 3$$

$$4x + y - 5z = 13$$

$$\left\{ \begin{array}{l} \xrightarrow{2E_1 - E_2} \\ \xrightarrow{4E_1 - E_3} \end{array} \right.$$

$$x + 2y - 3z = 5$$

$$7y - 7z = 7$$

$$7y - 7z = 7$$

$$\left\{ \begin{array}{l} \xrightarrow{\quad} \\ \xrightarrow{E_2 - E_3} \end{array} \right.$$

$$x + 2y - 3z = 5$$

$$7y - 7z = 7$$

$$0z = 0$$

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$$\boxed{z = \lambda} \quad 7y - 7z = 7 \Rightarrow y = \frac{7+7\lambda}{7} = 1+\lambda \quad \boxed{y = 1+\lambda}$$

$$x + 2y - 3z = 5 \Rightarrow x + 2(1+\lambda) - 3\lambda = 5 \Rightarrow x + 2 + 2\lambda - 3\lambda = 5$$

$$\boxed{x = 3+\lambda}$$

$$(3+\lambda, 1+\lambda, \lambda) \quad \forall \lambda \in \mathbb{R}$$

7) $x = n^\circ$ estudiantes

$y = \text{€}$ cada uno

$$xy = 1620$$

$$(x-2)(y+4,80) = 1620$$

$$x = \frac{1620}{y}$$

$$\left(\frac{1620}{y} - 2\right)(y + 4,80) = 1620$$

$$1620 - 2y + \frac{7776}{y} - 9,60 = 1620$$

$$-2y^2 - 9,60y + 7776 = 0$$

$$\begin{cases} y_1 = 60 \\ y_2 = -64,8 \end{cases}$$

$$x = \frac{1620}{60} = 27 \quad \text{Había 27 alumnos}$$

$$\begin{cases} P(3) = 0 \Rightarrow 27a + 9b + 3c + d = 0 \\ P(1) = 0 \Rightarrow a + b + c + d = 0 \\ P(2) = -5 \Rightarrow 8a + 4b + 2c + d = -5 \\ P(0) = 9 \Rightarrow d = 9 \end{cases} \quad \begin{cases} 27a + 9b + 3c = -9 \\ a + b + c = -9 \\ 8a + 4b + 2c = -14 \end{cases}$$

$$P(x) = ax^3 + bx^2 + cx + d$$

$$a + b + c = -9$$

$$8a + 4b + 2c = -14$$

$$27a + 9b + 3c = -9$$

$$a + b + c = -9$$

$$-4b - 6c = 58$$

$$-18b - 24c = 234$$

$$a + b + c = -9$$

$$-4b - 6c = 58$$

$$-12c = 108$$

$$\boxed{c = -9}$$

$$-4b - 6(-9) = 58 \Rightarrow b = \frac{58 - 54}{-4} = -1 \quad \boxed{b = -1}$$

$$a + b + c = -9 \rightarrow a = -9 + 9 + 1 \Rightarrow a = 1$$

$$P(x) = x^3 - x^2 - 9x + 9$$

9) $x^2 - 6x + 8 < 0 \quad \left| \quad x^2 - 6x + 8 < 0 \rightarrow (x-2)(x-4) < 0 \Rightarrow x \in (2,4)$

$$\frac{x+1}{x^2-9} < 0$$

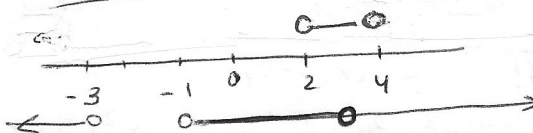
$$\frac{x+1}{x^2-9} < 0$$

	$-\infty$	-3	-1	3	∞
$x+1$	-	-	+	+	
$x-3$	-	-	-	+	
$x+3$	-	+	+	+	
f	-	+	-	+	

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

$$x \in (-\infty, 2) \cup (4, +\infty)$$

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



$$\text{Solución: } x \in (2, 3)$$

10) $3x^4 - 14x^2 + 3 = x^2 - 9 \Rightarrow 3x^4 - 15x^2 + 12 = 0 \Rightarrow x^2 = t$

$$3t^2 - 15t + 12 = 0 \rightarrow t_1 = 4 \rightarrow x = \pm 2$$

$$\rightarrow t_2 = 1 \rightarrow x = \pm 1$$