

## Tema 2. 1º Bachillerato A

1. Escribe el desarrollo de  $(2x - 5y)^8$
2. Resuelve:  $\sqrt{x+6} = 2\sqrt{x+1} - 1$
3. Resuelve:  $\left. \begin{array}{l} x^2 + 6x + 8 \geq 0 \\ x^2 + 6x \leq 0 \end{array} \right\}$
4. Resuelve:  
$$\left. \begin{array}{l} 2x + y + 3z = 4 \\ 3x + 4y + 4z = 3 \\ x - 2y + 2z = 5 \end{array} \right\}$$
5. Resuelve:  $\left. \begin{array}{l} 2x + y > 5 \\ -x + 4y \leq 3 \\ x \geq -2 \\ y < 1 \end{array} \right\}$
6. Resuelve  $\frac{\log 2 + \log(11-x^2)}{\log(5-x)} = 2$
7. Resuelve  $9^{1+x} - 28 \cdot 3^x = 0$
8. Calcula un polinomio de tercer grado que tiene como raíz 2,  $(x+1)$  es un factor, el valor del polinomio para  $x = -2$  es 4 y  $P(0)$  es -6.
9. Calcula  $(5x^6 + 4x^3 - x^2 + 3x - 7) : (2x - 1) =$
10. Un hombre le dijo a su hijo: "Cuando transcurra la tercera parte de los años que yo tengo, tú tendrás la mitad de mi edad actual". "Sí,- contestó el hijo-, pero hace sólo 4 años tu edad era 11 veces la mía". ¿Cuál es la edad actual del padre y del hijo?

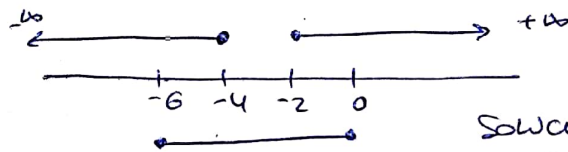
TEMA 2. 1.A (2020) (2)

$$\begin{aligned} (1) (2x-5y)^8 &= \binom{8}{0} (2x)^8 (-5y)^0 + \binom{8}{1} (2x)^7 (-5y)^1 + \binom{8}{2} (2x)^6 (-5y)^2 + \binom{8}{3} (2x)^5 (-5y)^3 + \\ &+ \binom{8}{4} (2x)^4 (-5y)^4 + \binom{8}{5} (2x)^3 (-5y)^5 + \binom{8}{6} (2x)^2 (-5y)^6 + \binom{8}{7} (2x)^1 (-5y)^7 + \binom{8}{8} (2x)^0 (-5y)^8 \\ &= 256x^8 - 8 \cdot 128 x^7 \cdot 5y + 28 \cdot 64 x^6 \cdot 25y^2 - 56 \cdot 32 x^5 \cdot 125y^3 + 70 \cdot 16 x^4 \cdot 625y^4 - 56 \cdot 8 x^3 \cdot 3125y^5 \\ &+ 28 \cdot 4 x^2 \cdot 15625y^6 - 8 \cdot 2x \cdot 78125y^7 + 390625 = \\ &= 256x^8 - 5120x^7y + 44800x^6y^2 - 224000x^5y^3 + 700000x^4y^4 - 1400000x^3y^5 \\ &+ 1750000x^2y^6 - 1250000xy^7 + 390625y^8 \end{aligned}$$

$$\begin{aligned} (2) (\sqrt{x+6})^2 &= (2\sqrt{x+1} - 1)^2 \rightarrow x+6 = 4(x+1) - 4\sqrt{x+1} + 1 \\ x+6 - 4x - 4 - 1 &= -4\sqrt{x+1} \Rightarrow (-3x+1)^2 = (-4\sqrt{x+1})^2 \rightarrow \\ 9x^2 - 6x + 1 &= 16(x+1) \rightarrow 9x^2 - 6x - 16x + 1 - 16 = 0 \rightarrow 9x^2 - 22x - 15 = 0 \end{aligned}$$

$x_1 = 3$  ✓,  $x_2 = -5/9$  NO.

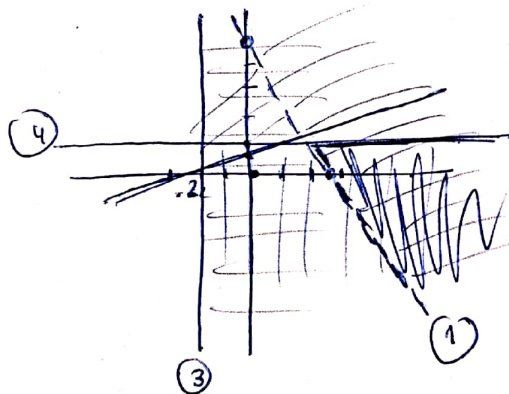
$$\begin{aligned} (3) \begin{cases} x^2 + 6x + 8 \geq 0 \\ x^2 + 6x \leq 0 \end{cases} &\begin{cases} (1) (x+4)(x+2) \geq 0 \\ (2) x(x+6) \leq 0 \end{cases} \\ &\begin{array}{c|ccc} (1) & -\infty & -4 & -2 & +\infty \\ \hline (x+4) & & - & + & + \\ (x+2) & & - & - & + \\ \hline I & + & + & - & + \end{array} \\ &x \in (-\infty, -4] \cup [-2, +\infty) \\ &\begin{array}{c|ccc} (2) & -\infty & -6 & 0 & +\infty \\ \hline x & & - & - & + \\ x+6 & & - & + & + \\ \hline I & + & + & - & + \end{array} \\ &x \in [-6, 0] \end{aligned}$$



SOLUCIÓN:  
 $x \in [-6, -4] \cup [-2, 0]$

$$\begin{aligned} (4) \begin{cases} 2x + y + 3z = 4 \\ 3x + 4y + 4z = 3 \\ x - 2y + 2z = 5 \end{cases} &\begin{cases} \xrightarrow{3E_1 - 2E_2} \\ E_1 - 2E_3 \end{cases} \begin{cases} 2x + y + 3z = 4 \\ -5y + z = 6 \\ 5y - z = -6 \end{cases} \begin{cases} \xrightarrow{E_2 + E_3} \\ \end{cases} \begin{cases} 2x + y + 3z = 4 \\ -5y + z = 6 \\ 0z = 0 \end{cases} \text{SCI} \\ &\boxed{z = \lambda} \quad \begin{cases} -5y + \lambda = 6 \\ y = \frac{6 - \lambda}{-5} \end{cases} \quad \begin{cases} 2x + \frac{6 - \lambda}{-5} + 3\lambda = 4 \\ x = \frac{-16\lambda + 26}{10} \end{cases} \\ \text{Solución: } &\text{SCI} \left( \frac{-16\lambda + 26}{10}, \frac{6 - \lambda}{-5}, \lambda \right) \quad \forall \lambda \in \mathbb{R} \end{aligned}$$

$$\begin{aligned} (5) \begin{cases} 2x + y > 5 \\ -x + 4y \leq 3 \\ x \geq -2 \\ y < 1 \end{cases} &\begin{cases} (1) 2x + y = 5 \\ x | 0 \quad y | 5 \\ (2) -x + 4y = 3 \\ x | 0 \quad y | 3/4 \end{cases} \end{aligned}$$



$$(6) \frac{\log 2 + \log(11-x^2)}{\log(5-x)} = 2 \rightarrow \log 2 + \log(11-x^2) = 2 \log(5-x) \Rightarrow$$

$$\log [2(11-x^2)] = \log (5-x)^2 \Rightarrow 22-2x^2 = 25-10x+x^2 \rightarrow 3x^2-10x+3=0$$

$$\begin{cases} \rightarrow x_1 = 3 \quad \checkmark \\ \rightarrow x_2 = \frac{1}{3} \quad \checkmark \end{cases}$$

$$(7) 9^{1+x} - 28 \cdot 3^x = 0 \rightarrow (3^2)^{1+x} - 28 \cdot 3^x = 0 \rightarrow 3^{2+2x} - 28 \cdot 3^x = 0 \Rightarrow$$

$$3^2 \cdot 3^{2x} - 28 \cdot 3^x = 0 \Rightarrow 9(3^x)^2 - 28 \cdot 3^x = 0 \quad \boxed{3^x = t}$$

$$9t^2 - 28t = 0 \rightarrow t(9t - 28) = 0 \rightarrow \begin{cases} t_1 = 0 \\ t_2 = \frac{28}{9} \end{cases}$$

$$3^x = 0 \rightarrow \cancel{x}$$

$$3^x = \frac{28}{9} \rightarrow \log 3^x = \log \frac{28}{9} \rightarrow x \cdot \log 3 = \log \frac{28}{9}$$

$$\Rightarrow x = \frac{\log \frac{28}{9}}{\log 3}$$

$$(8) P(x) = ax^3 + bx^2 + cx + d$$

$$\text{Raiz } 2 \rightarrow P(2) = 0 \rightarrow$$

$$8a + 4b + 2c + d = 0$$

$$(x+1) \text{ factor} \rightarrow P(-1) = 0 \rightarrow$$

$$-a + b - c + d = 0$$

$$P(-2) = 4 \rightarrow$$

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

$$P(0) = -6 \rightarrow$$

$$\rightarrow$$

$$\boxed{d = -6}$$

$$8a + 4b + 2c = 6$$

$$-a + b - c = 6$$

$$-8a + 4b - 2c = 10$$

$$8a + 4b + 2c = 6$$

$$12b - 6c = 54$$

$$8b = 16$$

$$8a + 4b + 2c = 6$$

$$12b - 6c = 54$$

$$-48c = 240$$

$$\rightarrow \boxed{c = -5}$$

$$12b + 30 = 54 \rightarrow 12b = 24 \rightarrow \boxed{b = 2}$$

$$8a + 8 - 10 = 6 \rightarrow 8a = 8 \rightarrow \boxed{a = 1}$$

$$\boxed{P(x) = x^3 + 2x^2 - 5x - 6}$$

(9)

$$\begin{array}{r} 5/6 \\ -5x^6 + \frac{5}{2}x^5 \\ \hline \end{array}$$

$$\frac{5}{2}x^5$$

$$-5/2x^5 + 5/4x^4$$

$$5/4x^4 + 4x^3$$

$$-5/4x^4 + 5/8x^3$$

$$37/8x^3 - x^2$$

$$-37/8x^3 + 37/16x^2$$

$$21/16x^2 + 3x$$

$$-21/16x^2 + 21/32x$$

$$117/32x$$

$$-117/32x - 7$$

$$-117/32x + 117/64$$

$$-331/64$$

$$+4x^3 - x^2 + 3x - 7 \quad \overline{) 12x-1}$$

$$\frac{5}{2}x^5 + \frac{5}{4}x^4 + \frac{5}{8}x^3 + \frac{37}{16}x^2 + \frac{21}{32}x + \frac{117}{64}$$

$$C(x) = \frac{5}{2}x^5 + \frac{5}{4}x^4 + \frac{5}{8}x^3 + \frac{37}{16}x^2 + \frac{21}{32}x + \frac{117}{64}$$

$$R(x) = -\frac{331}{64}$$

(10) Padre  $x$        $y + \frac{x}{3} = \frac{x}{2}$        $\left\{ \begin{array}{l} 6y + 2x = 3x \\ x - 4 = 11(y - 4) \end{array} \right.$        $\left\{ \begin{array}{l} 6y - x = 0 \\ x - 11y = -40 \end{array} \right.$   
 Hijo  $y$

$$\begin{array}{l} x - 6y = 0 \\ x - 11y = -40 \end{array} \left\{ \begin{array}{l} x - 6y = 0 \\ \cdot (-1) \quad -x + 11y = 40 \end{array} \right. \quad \begin{array}{l} x - 6 \cdot 8 = 0 \\ \boxed{x = 48} \end{array}$$

$$\begin{array}{l} 5y = 40 \\ \boxed{y = 8} \end{array}$$

Padre	Hoy	Dentro $\frac{x}{3}$
	$x$	$x + \frac{x}{3}$
Hijo	$y$	$y + \frac{x}{3}$

Padre 48 años  
 Hijo 8 años.