

1. Escribe el desarrollo de $(4x - 3y)^8 =$
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. Sean los siguientes polinomios:

$$P(x) = 5x^3 - 5x^2 + 3x - 6, Q(x) = -4x^3 + 3x^2 - 6x + 7$$

$$R(x) = -3x^4 + 8x^2 - 5x - 6$$

Calcula $P(x) + Q(x) - R(x) \cdot Q(x) =$

10. Calcula $(5x^6 + 4x^3 - x^2 + 3x - 7) : (2x^2 - x + 3) =$

TEMA 2

$$\begin{aligned} \textcircled{1} (4x-3y)^8 &= \binom{8}{0}(4x)^8(-3y)^0 + \binom{8}{1}(4x)^7(-3y)^1 + \binom{8}{2}(4x)^6(-3y)^2 + \binom{8}{3}(4x)^5(-3y)^3 + \\ &+ \binom{8}{4}(4x)^4(-3y)^4 + \binom{8}{5}(4x)^3(-3y)^5 + \binom{8}{6}(4x)^2(-3y)^6 + \binom{8}{7}(4x)^1(-3y)^7 + \binom{8}{8}(4x)^0(-3y)^8 \\ &= 1 \cdot 65536x^8 \cdot 1 - 8 \cdot 16384x^7 \cdot 3y + 28 \cdot 4096x^6 \cdot 9y^2 - 56 \cdot 1024x^5 \cdot 27y^3 + \\ &+ 70 \cdot 256x^4 \cdot 81y^4 - 56 \cdot 64x^3 \cdot 243y^5 + 28 \cdot 16x^2 \cdot 729y^6 - 8 \cdot 4x \cdot 2187y^7 + \\ &+ 1 \cdot 1 \cdot 6561y^8 = \\ &= 65536x^8 - 393216x^7y + 1032192x^6y^2 - 1548288x^5y^3 + 1451520x^4y^4 \\ &- 870912x^3y^5 + 326592x^2y^6 - 69984xy^7 + 6561y^8 \end{aligned}$$

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

$$\begin{aligned} x_1 &= 3 \quad \checkmark \\ x_2 &= -\frac{5}{9}x \end{aligned}$$

$$\textcircled{3} \begin{cases} x^2+6x+8 \geq 0 \\ x^2+6x \leq 0 \end{cases}$$

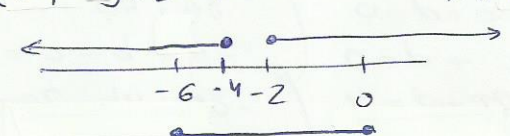
	$-\infty$	-4	-2	$+\infty$
$x+2$	-	-	+	
$x+6$	-	+	+	
P	+	-	+	

	$-\infty$	-6	0	$+\infty$
x	-	-	+	
$x+6$	-	+	+	
P	+	-	+	

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

$$x \in [-6, 0]^+$$

SOLUCIÓN



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

$$\textcircled{4} \begin{cases} 2x+y+3z=4 \\ 3x+4y+4z=3 \\ x-2y+2z=5 \end{cases} \xrightarrow{F_1 \leftrightarrow F_3} \begin{cases} x-2y+2z=5 \\ 3x+4y+4z=3 \\ 2x+y+3z=4 \end{cases} \xrightarrow{\begin{matrix} 3E_1-E_2 \\ 2E_1-E_3 \end{matrix}}$$

$$\begin{cases} x-2y+2z=5 \\ -10y+2z=12 \\ -5y+z=6 \end{cases}$$

$$\xrightarrow{E_2-2E_3} \begin{cases} x-2y+2z=5 \\ -10y+2z=12 \\ 0z=0 \end{cases} \text{ SCI}$$

$$z = \lambda \quad -10y + 2\lambda = 12 \rightarrow y = \frac{12-2\lambda}{-10} = \frac{\lambda-6}{5}$$

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

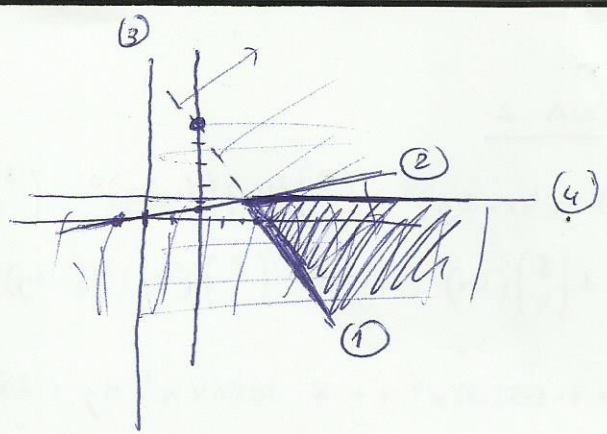
$$x = 5 - 2\lambda + 2\left(\frac{12-2\lambda}{-10}\right) = \frac{-50 + 20\lambda + 24 - 4\lambda}{-10}$$

$$x = \frac{16\lambda - 26}{-10} = \frac{13 - 8\lambda}{5}$$

$$\left(\frac{13-8\lambda}{5}, \frac{\lambda-6}{5}, \lambda\right) \quad \forall \lambda \in \mathbb{R}$$

$$\begin{cases} (5) 2x + y > 5 \\ (2) -x + 4y \leq 3 \\ (3) x > -2 \\ (4) y < 1 \end{cases}$$

$$\begin{array}{l|l} (1) x & 0 & 5/2 \\ y & 5 & 0 \\ \hline (2) x & 0 & -3 \\ y & 3/4 & 0 \end{array}$$



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

$$\log [2 \cdot (11-x^2)] = \log (5-x)^2$$

$$22 - 2x^2 = 25 - 10x + x^2 \Rightarrow -3x^2 + 10x - 3 = 0 \begin{cases} x_1 = 3 \\ x_2 = \frac{1}{3} \end{cases}$$

Valen las dos

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

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

$$\uparrow \\ 3^x = t$$

$$\rightarrow t_1 = 0 \rightarrow 3^x = 0 \Rightarrow x = -\infty$$

$$t_2 = \frac{28}{9} \rightarrow 3^x = \frac{28}{9} \Rightarrow x = \frac{\log \frac{28}{9}}{\log 3} = 1,033$$

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

$$P(2) = 0 \Rightarrow 8a + 4b + 2c + d = 0$$

$$P(-1) = 0 \Rightarrow -a + b - c + d = 0$$

$$P(-2) = 4 \Rightarrow -8a + 4b - 2c + d = 4$$

$$P(0) = -6 \Rightarrow d = -6$$

$$\begin{cases} 8a + 4b + 2c = 6 \\ -a + b - c = 6 \\ -8a + 4b - 2c = 10 \end{cases}$$

$$\xrightarrow{E_1 + 8E_2}$$

$$E_1 + E_3$$

$$\begin{cases} 8a + 4b + 2c = 6 \\ 12b - 6c = 42 \\ 8b = 16 \end{cases}$$

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

$$12b - 6c = 42 \rightarrow c = \frac{42 - 24}{-6} = \frac{18}{-6} = -3$$

$$\boxed{b = 2}$$

$$8a + 8 - 6 = 6 \rightarrow a = \frac{4}{8} = \frac{1}{2}$$

$$\boxed{P(x) = \frac{1}{2}x^3 + 2x^2 - 3x - 6}$$

$$\begin{aligned}
 & \textcircled{9} [(5x^3 - 5x^2 + 3x - 6) + (-4x^3 + 3x^2 - 6x + 7)] - [(-3x^4 + 8x^2 - 5x - 6) \cdot (-4x^3 + 3x^2 - 6x + 7)] = \\
 & = (x^3 - 2x^2 - 3x + 1) - [12x^7 - 9x^6 + 18x^5 - 21x^4 - 32x^5 + 24x^4 - 48x^3 + 56x^2 + 20x^4 - 15x^3 + 30x^2 - 35x + 24x^3 - 18x^2 + 36x - 42] = \\
 & = -12x^7 + 9x^6 + 14x^5 - 23x^4 + 40x^3 - 70x^2 - 4x + 43
 \end{aligned}$$

$$\begin{array}{r}
 \textcircled{10} \quad 5x^6 \qquad \qquad \qquad + 4x^3 - x^2 + 3x - 7 \quad \overline{) 2x^2 - x + 3} \\
 - 5x^6 + \frac{5}{2}x^5 - \frac{15}{2}x^4 \\
 \hline
 \frac{5}{2}x^5 - \frac{15}{2}x^4 + 4x^3 \\
 - \frac{5}{2}x^5 + \frac{5}{4}x^4 - \frac{15}{4}x^3 \\
 \hline
 -\frac{25}{4}x^4 + \frac{1}{4}x^3 - x^2 \\
 + \frac{25}{4}x^4 - \frac{25}{8}x^3 + \frac{75}{8}x^2 \\
 \hline
 -\frac{23}{8}x^3 + \frac{67}{8}x^2 + 3x \\
 + \frac{23}{8}x^3 - \frac{23}{16}x^2 + \frac{69}{16}x \\
 \hline
 \frac{111}{16}x^2 + \frac{117}{16}x - 7 \\
 - \frac{111}{16}x^2 + \frac{111}{32}x - \frac{333}{32} \\
 \hline
 \frac{345}{32}x - \frac{557}{32}
 \end{array}$$