

Tema 2. 1º Bachillerato A

1. Resuelve: $\sqrt{x+3} + \sqrt{x+6} = \frac{3}{\sqrt{x+3}}$

2. Resuelve $\frac{9^{x+1}}{3} + 27 = 3^{x+4} + \frac{3^{x+2}}{9}$

3. Calcula la siguiente división

$$(3x^5 - 4x^4 - 3x^3 + 7x - 1) : (4x - 2)$$

4. Resuelve: $4x^6 + 7x^3 - 2 = 0$

5. (2) Resuelve las siguientes inecuaciones:

a) $\frac{x^2 - 5x + 4}{4 - 9x^2} \geq 0$

b) $\frac{2(x-2)}{3} - \frac{3-5x}{4} \leq 2x - \frac{x+1}{5}$

6. Resuelve: $\frac{x+9}{x} - \frac{10+2x}{2x+4} = \frac{12x+12}{x^2+2x}$

7. $\log(x+1) - \log\sqrt{x-1} = \log(x-2)$

8. Opera y simplifica el resultado:

$$\frac{3-3x}{3x-2x^2-x^3} - \frac{x^2-4}{x^2+x-6} - \frac{x-x^2}{3x^2-5x+2} : \frac{2x^2-x}{6x^2-7x+2} =$$

9. EL producto de dos números impares consecutivos es 323. Calcula esos números.

TEMA 2. 1.ª PARTE

① $\sqrt{x+3} + \sqrt{x+6} = \frac{3}{\sqrt{x+3}} \rightarrow (\sqrt{x+3})^2 + \sqrt{x+3} \cdot \sqrt{x+6} = 3 \rightarrow x+3 + \sqrt{x^2+9x+18} = 3$
 $\rightarrow (\sqrt{x^2+9x+18})^2 = (-x)^2 \rightarrow x^2+9x+18 = x^2 \rightarrow 9x+18=0 \rightarrow x = -\frac{18}{9} = -2$
 $\rightarrow \boxed{x = -2}$

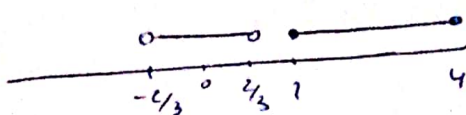
② $\frac{9^{x+1}}{3} + 27 = 3^{x+4} + \frac{3^{x+2}}{9} \rightarrow \frac{(3^2)^{x+1}}{3} + 27 = 3^x \cdot 3^4 + \frac{3^x \cdot 3^2}{9}$
 $\rightarrow \frac{3^{2x+2}}{3} + 27 = 3^x \cdot 81 + 3^x \rightarrow \frac{(3^x)^2 \cdot 3^2}{3} + 27 = 3^x \cdot 81 + 3^x \xrightarrow{3^x = t}$
 $\rightarrow 3t^2 + 27 = 81t + t \rightarrow 3t^2 - 82t + 27 = 0 \rightarrow \begin{cases} t_1 = 27 \rightarrow 3^x = 27 \rightarrow \boxed{x = 3} \\ t_2 = \frac{1}{3} \rightarrow 3^x = 3^{-1} \rightarrow \boxed{x = -1} \end{cases}$

③ $3x^5 - 4x^4 - 3x^3 \quad +7x-1 \quad \overline{4x-2}$
 $\begin{array}{r} 3x^5 - 4x^4 - 3x^3 \\ -3x^5 + \frac{6}{4}x^4 \\ \hline -\frac{10}{4}x^4 - 3x^3 \\ +\frac{10}{4}x^4 - \frac{20}{16}x^3 \\ \hline -\frac{17}{4}x^3 \\ +\frac{17}{4}x^3 - \frac{34}{16}x^2 \\ \hline -\frac{34}{16}x^2 + 7x \\ \frac{24}{16}x^2 - \frac{68}{64}x \\ \hline \frac{95}{16}x - 1 \\ -\frac{95}{16}x + \frac{190}{64} \\ \hline \frac{63}{32} \end{array}$
 $C(x) = \frac{3}{4}x^4 - \frac{5}{8}x^3 - \frac{17}{16}x^2 - \frac{17}{32}x + \frac{95}{64}$
 $R(x) = \frac{63}{32}$

④ $4x^6 + 7x^3 - 2 = 0 \rightarrow \boxed{x^3 = t} \Rightarrow 4t^2 + 7t - 2 = 0 \rightarrow \begin{cases} t_1 = -2 \\ t_2 = \frac{1}{4} \end{cases}$
 $x^3 = -2 \rightarrow x = \sqrt[3]{-2}$
 $x^3 = \frac{1}{4} \rightarrow x = \sqrt[3]{\frac{1}{4}}$

⑤ a) $\frac{x^2-5x+4}{4-9x^2} \geq 0 \Rightarrow \frac{(x-1)(x-4)}{(2-3x)(2+3x)} \geq 0$

$x \in (-\frac{2}{3}, \frac{2}{3}) \cup [1, 4]$



	$-\infty$	$-\frac{2}{3}$	$\frac{2}{3}$	1	4	$+\infty$
$(x-1)$	-	-	-	+	+	
$(x-4)$	-	-	-	-	+	
$(2-3x)$	+	+	-	-	-	
$(2+3x)$	-	+	+	+	+	
I		-	+	-	+	-

$$b) \frac{2(x-2)}{3} - \frac{3-5x}{4} \leq 2x - \frac{x+1}{5} \Rightarrow \frac{40(x-2) - 15(3-5x)}{60} \leq \frac{120x - 12(x+1)}{60}$$

$$40x - 80 - 45 + 75x \leq 120x - 12x - 12 \Rightarrow 7x \leq 113 \Rightarrow x \leq \frac{113}{7}$$

$$x \in (-\infty, \frac{113}{7}]$$

$$⑥ \frac{x+9}{x} - \frac{10+2x}{2x+4} = \frac{12x+12}{x^2+2x} \xrightarrow{\text{MEME } 2 \cdot (x+2)} \frac{x+9}{x} - \frac{10+2x}{2(x+2)} = \frac{12x+12}{x(x+2)}$$

$$\frac{2(x+2)(x+9) - x(10+2x)}{2x(x+2)} = \frac{2(12x+12)}{2x(x+2)} \rightarrow 2x^2 + 22x + 36 - 10x - 2x^2 = 24x + 24$$

$$\rightarrow -12x = -12 \Rightarrow \boxed{x=1}$$

$$⑦ \log(x+1) - \log \sqrt{x-1} = \log(x-2) \Rightarrow \log \frac{x+1}{\sqrt{x-1}} = \log(x-2) \Rightarrow \left(\frac{x+1}{\sqrt{x-1}}\right)^2 = (x-2)^2$$

$$\frac{x^2+2x+1}{x-1} = x^2-4x+4 \rightarrow x^2+2x+1 = (x-1)(x^2-4x+4) \rightarrow$$

$$x^2+2x+1 = x^3-4x^2+4x-x^2+4x-4 \Rightarrow x^3-6x^2+6x-5=0$$

$$x^2-x+1=0 \rightarrow x = \frac{1 \pm \sqrt{1-4}}{2} \not\rightarrow \boxed{x=5} \checkmark$$

5	1	-6	6	-5
	5	-5	5	
	1	-1	1	0

$$⑧ \frac{3-3x}{3x-2x^2-x^3} - \frac{x^2-4}{x^2+x-6} - \frac{x-x^2}{3x^2-5x+2} : \frac{2x^2-x}{6x^2-7x+2} = \frac{2(x-1/2)}{6(x-2/3)(x-1/2)}$$

$$= \frac{3(1-x)}{-x(x-1)(x+3)} - \frac{(x+2)(x-2)}{(x-2)(x+3)} - \frac{x(1-x)}{3(x-1)(x-2/3)} : \frac{x(2x-1)}{6(x-2/3)(x-1/2)}$$

$$= \frac{3(x-1)}{x(x-1)(x+3)} - \frac{(x+2)(x-2)}{(x-2)(x+3)} + \frac{x(x-1)}{3(x-1)(x-2/3)} : \frac{2x(x-1/2)}{6(x-2/3)(x-1/2)}$$

$$= \frac{3}{x(x+3)} - \frac{x+2}{x+3} + \frac{6x(x-2/3)}{6x(x-2/3)} = \frac{3-x(x+2)+x(x+3)}{x(x+3)} = \frac{3-x^2-2x+x^2+3x}{x(x+3)}$$

$$= \frac{3+3}{x(x+3)} = \frac{1}{x}$$

$$⑨ (2x+1)(2x+3) = 323 \rightarrow 4x^2+6x+2x+3 = 323 \Rightarrow 4x^2+8x-320=0 \begin{cases} x_1 = 8 \\ x_2 = -10 \end{cases}$$

Solución $x=8 \rightarrow$ Números 17, 19
 $x=-10 \rightarrow$ Números -19, -17