

Examen de Matemáticas 1º de Bachillerato CS

Octubre 2020

Problema 1 Simplifica todo lo que puedas

$$3\sqrt{72} - \frac{1}{4}\sqrt{1250} + 2\sqrt{1568}, \quad \frac{\sqrt{5^3 \cdot 3}}{\sqrt[3]{5^2 \cdot 2}}$$

Solución:

$$3\sqrt{72} - \frac{1}{4}\sqrt{1250} + 2\sqrt{1568} = \frac{271\sqrt{2}}{4}, \quad \frac{\sqrt{5^3 \cdot 3}}{\sqrt[3]{5^2 \cdot 2}} = \sqrt[6]{\frac{3}{20}}$$

Problema 2 Racionalizar las siguientes expresiones:

$$\frac{4}{2 - \sqrt{3}}; \quad \frac{7}{\sqrt[7]{2^5}}; \quad \frac{\sqrt{3}}{\sqrt{6} - \sqrt{2}}$$

Solución:

$$\frac{4}{2 - \sqrt{3}} = 8 + 4\sqrt{3}; \quad \frac{7}{\sqrt[7]{2^5}} = \frac{7\sqrt[7]{25}}{2}, \quad \frac{\sqrt{3}}{\sqrt{6} - \sqrt{2}} = \frac{3\sqrt{2} + \sqrt{6}}{4}$$

Problema 3 Resolver las ecuaciones:

1. $\log(3 - x) - \log(x - 2) = 2$
2. $\log(9 - x^2) - \log(x - 5) = 1 + \log(2x)$
3. $2\log(4 - x) - 2 = \log(x + 7)$
4. $6^{x^2+3x-26} = 36$

Solución:

$$1. \log(3 - x) - \log(x - 2) = 2 \implies \log \frac{3 - x}{x - 2} = \log 100 \implies$$

$$101x = 203 \implies x = \frac{203}{101}.$$

$$2. \log(9 - x^2) - \log(x - 5) = 1 + \log(2x) \implies \log \frac{9 - x^2}{x - 5} = \log(20x) \implies$$
$$21x^2 - 100x - 9 = 0 \implies x = 4,8503, \quad x = -0,088(\text{no vale}).$$

$$3. 2\log(4 - x) - 2 = \log(x + 7) \implies x^2 - 108x - 884 = 0 \implies x =$$
$$115,644, (\text{no vale}), \quad x = -7,644.$$

4.

$$6^{x^2+3x-26} = 36 \implies x^2 + 3x - 28 = 0 \implies \begin{cases} x = 4 \\ x = -7 \end{cases}$$

Problema 4 Factoriza los siguientes polinomios:

1. $P(x) = x^3 + 9x^2 + 11x - 21$

2. $Q(x) = 2x^3 - 5x^2 - 22x - 15$

3. $R(x) = x^6 - 7x^5 + 12x^4 + 14x^3 - 59x^2 + 57x - 18$

Solución:

1. $P(x) = x^3 + 9x^2 + 11x - 21 = (x - 1)(x + 3)(x + 7)$

2. $Q(x) = 2x^3 - 5x^2 - 22x - 15 = (x + 1)(x - 5)(2x + 3)$

3. $R(x) = x^6 - 7x^5 + 12x^4 + 14x^3 - 59x^2 + 57x - 18 = (x - 1)^3(x + 2)(x - 3)^2$

Problema 5 Resolver y simplificar:

$$\frac{3x - 1}{10} - \frac{2x + 1}{2} = 1 - \frac{x - 2}{5}$$

Solución:

$$\frac{3x - 1}{10} - \frac{2x + 1}{2} = 1 - \frac{x - 2}{5} \implies x = -4$$

Problema 6

$$x^4 - 15x^2 - 16 = 0$$

Solución:

Hacemos $z = x^2 \implies z^2 - 15z - 16 = 0 \implies z = 16$ y $z = -1$.

$$z = 16 = x^2 \implies x = \pm 4$$

$$z = -1 = x^2 \implies \text{no tiene solución}$$