

Examen de Matemáticas 1º de Bachillerato CS

Problema 1 Simplifica todo lo que puedas

$$5\sqrt{108} - \frac{2}{3}\sqrt{675} + 2\sqrt{147}, \quad \frac{\sqrt[3]{6\sqrt{2}}}{\sqrt[3]{6}}$$

Solución:

$$5\sqrt{108} - \frac{2}{3}\sqrt{675} + 2\sqrt{147} = 34\sqrt{3}, \quad \frac{\sqrt[3]{6\sqrt{2}}}{\sqrt[3]{6}} = \sqrt[6]{2}$$

Problema 2 Racionalizar las siguientes expresiones:

$$\frac{1}{2 + \sqrt{5}}; \quad \frac{2}{\sqrt[6]{7^5}}; \quad \frac{\sqrt{3}}{\sqrt{5} - \sqrt{2}}$$

Solución:

$$\frac{1}{2 + \sqrt{5}} = -2 + \sqrt{5}; \quad \frac{2}{\sqrt[6]{7^5}} = \frac{2\sqrt[6]{7}}{7}, \quad \frac{\sqrt{3}}{\sqrt{5} - \sqrt{2}} = \frac{\sqrt{15} + \sqrt{6}}{3}$$

Problema 3 Resolver las ecuaciones:

1. $\log(3 - x) - \log(x + 2) = 1$
2. $\log(7 - x^2) - \log x = 1 + \log(x - 1)$
3. $2\log(5 - x) - 1 = \log x$
4. $5^{x^2 - 5x - 4} = 25$

Solución:

$$1. \log(3 - x) - \log(x + 2) = 1 \implies \log \frac{3 - x}{x + 2} = \log 10 \implies$$

$$11x = -17 \implies x = -\frac{17}{11}.$$

$$2. \log(7 - x^2) - \log x = 1 + \log(x - 1) \implies \log \frac{7 - x^2}{x} = \log 10(x - 1) \implies$$

$$11x^2 - 10x - 7 = 0 \implies x = 1, 372682267, \quad x = -0, 4635913580(\text{no vale}).$$

$$3. 2\log(5 - x) - 1 = \log x \implies x^2 - 20x + 25 = 0 \implies x = 1, 339745962, \quad x = 18, 66025403(\text{no vale}).$$

4.

$$5^{x^2-5x-4} = 25 \implies x^2 - 5x - 6 = 0 \implies \begin{cases} x = 6 \\ x = -1 \end{cases}$$

Problema 4 Factoriza los siguientes polinomios:

1. $P(x) = x^3 - 10x^2 + 23x - 14$

2. $Q(x) = x^3 - 12x^2 + 45x - 50$

3. $R(x) = 3x^5 - 4x^4 - 13x^3 + 18x^2 + 4x - 8$

Solución:

1. $P(x) = x^3 - 10x^2 + 23x - 14 = (x - 1)(x - 2)(x - 7)$

2. $Q(x) = x^3 - 12x^2 + 45x - 50 = (x - 2)(x - 5)^2$

3. $R(x) = 3x^5 - 4x^4 - 13x^3 + 18x^2 + 4x - 8 = (x - 1)^2(x + 2)(x - 2)(3x + 2)$

Problema 5 Resolver y simplificar:

$$\frac{x - 5}{8} - \frac{x - 2}{6} = 2 - \frac{x + 3}{12}$$

Solución:

$$\frac{x - 5}{8} - \frac{x - 2}{6} = 2 - \frac{x + 3}{12} \implies x = 49$$

Problema 6

$$x^4 - 13x^2 + 36 = 0$$

Solución:

$$\text{Hacemos } z = x^2 \implies z^2 - 13z + 36 = 0 \implies z = 9 \text{ y } z = 4.$$

$$z = 9 = x^2 \implies x = \pm 3$$

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