

Problema 1 Resolver las siguientes inecuaciones:

$$\frac{x^2 - 2x - 15}{x - 1} \leq 0, \quad \frac{x - 1}{x^2 + 3x + 2} \geq 0$$

Solución:

$$\frac{x^2 - 2x - 15}{x - 1} \leq 0 \implies (-\infty, -3] \cup (1, 5]$$

$$\frac{x - 1}{x^2 + 3x + 2} \geq 0 \implies (-2, -1) \cup [1, \infty)$$

Problema 2 Resolver:

1. $x^5 + 3x^4 - 4x^3 - 12x^2 + 3x + 9 = 0$

2. $\frac{x + 1}{x^2 + 4x - 5} - \frac{1}{x + 5} = \frac{x}{x - 1}$

Solución:

1. $x^5 + 3x^4 - 4x^3 - 12x^2 + 3x + 9 = 0 \implies x = -3, x = \pm 1, x = \pm\sqrt{3}$

2. $\frac{x + 1}{x^2 + 4x - 5} - \frac{1}{x + 5} = \frac{x}{x - 1} \implies x = -5, 372281323, x = 0, 3722813232$

Problema 3 Calcular:

1. $\sqrt{x + 1} - \sqrt{x - 1} = 1$

2. $\begin{cases} x^2 - 2y^2 = 1 \\ x + y = 2 \end{cases}$

Solución:

1. $\sqrt{x + 1} - \sqrt{x - 1} = 1 \implies x = \frac{5}{4}$

2. $\begin{cases} x^2 - 2y^2 = 1 \\ x + y = 2 \end{cases} \implies \begin{cases} x_1 = \sqrt{7} + 4 = 6.645751311 \\ y_1 = -\sqrt{7} - 2 = -4.645751311 \\ x_2 = 4 - \sqrt{7} = 1.354248688 \\ y_2 = \sqrt{7} - 2 = 0.6457513110 \end{cases}$

Problema 4 Calcular:

1. $\log(x^2 + 2) - \log x = 1$

2. $4^{x-1} + 2^x - 1 = 0$

Solución:

1. $\log(x^2 + 2) - \log x = 1 \implies x = 0,2041684766, x = 9,795831523$

2. $4^{x-1} + 2^x - 1 = 0 \implies x = -0,2715533031$

Problema 5 Resolver el siguiente sistema:

$$\begin{cases} 2x - y + 2z = 1 \\ x + y - z = 3 \\ 3x + 2y + z = 5 \end{cases}$$

Solución:

$$\begin{cases} 2x - y + 2z = 1 \\ x + y - z = 3 \\ 3x + 2y + z = 5 \end{cases} \implies \begin{cases} x = \frac{13}{8} \\ y = \frac{1}{2} \\ z = -\frac{7}{8} \end{cases}$$