

Problemas de Matemáticas 4º de ESO
Noviembre 2002

1 Inecuaciones:

1. $x^2 - 7x - 30 = (x + 3)(x - 10) < 0$ Sol: $(-3, 10)$
2. $x^2 - 15x + 44 = (x - 4)(x - 11) > 0$ Sol: $(-\infty, 4) \cup (11, +\infty)$
3. $x^2 + 3x - 4 = (x + 4)(x - 1) > 0$ Sol: $(-\infty, -4) \cup (1, +\infty)$
4. $x^2 + x - 6 = (x - 2)(x + 3) > 0$ Sol: $(-\infty, -3) \cup (2, +\infty)$
5. $x^2 - 10x - 11 = (x + 1)(x - 11) < 0$ Sol: $(-1, 11)$
6. $x^2 - 9x + 20 = (x - 4)(x - 5) < 0$ Sol: $(4, 5)$
7. $x^2 + 5x - 14 = (x - 2)(x + 7) < 0$ Sol: $(-7, 2)$
8. $x^2 + 3x - 54 = (x + 9)(x - 6) < 0$ Sol: $(-9, 6)$
9. $x^2 + 3x - 40 = (x + 8)(x - 5) > 0$ Sol: $(-\infty, -8) \cup (5, +\infty)$
10. $x^2 + 9x + 14 = (x + 2)(x + 7) > 0$ Sol: $(-\infty, -7) \cup (-2, +\infty)$
11. $x^2 - 3x - 4 = (x + 1)(x - 4) > 0$ Sol: $(-\infty, -1) \cup (4, +\infty)$
12. $x^2 - 11x + 18 = (x - 2)(x - 9) > 0$ Sol: $(-\infty, 2) \cup (9, +\infty)$
13. $x^2 - 12x - 13 = (x + 1)(x - 13) > 0$ Sol: $(-\infty, -1) \cup (13, +\infty)$
14. $x^2 + 14x - 15 = (x + 15)(x - 1) > 0$ Sol: $(-\infty, -15) \cup (1, +\infty)$
15. $x^2 - 11x - 42 = (x - 14)(x + 3) > 0$ Sol: $(-\infty, -3) \cup (14, +\infty)$
16. $x^2 - 7x + 6 = (x - 1)(x - 6) > 0$ Sol: $(-\infty, 1) \cup (6, +\infty)$
17. $x^2 - 13x + 22 = (x - 11)(x - 2) < 0$ Sol: $(2, 11)$
18. $x^2 + 13x - 14 = (x - 1)(x + 14) < 0$ Sol: $(-14, 1)$
19. $x^2 - 9x - 22 = (x + 2)(x - 11) < 0$ Sol: $(-2, 11)$
20. $\frac{x^2 - 4x - 21}{x + 10} = \frac{(x - 7)(x + 3)}{x + 10} \leq 0$ Sol: $(-\infty, -10) \cup [-3, 7]$
21. $\frac{x^2 + 4x - 77}{x + 8} = \frac{(x + 11)(x - 7)}{x + 8} \geq 0$ Sol: $[-11, -8) \cup [7, +\infty)$
22. $\frac{x^2 - 4x - 77}{x + 5} = \frac{(x - 11)(x + 7)}{x + 5} \geq 0$ Sol: $[-7, -5) \cup [11, +\infty)$

23. $\frac{x^2-x-6}{x+3} = \frac{(x+2)(x-3)}{x+3} \leq 0$ Sol: $(-\infty, -3) \cup [-2, 3]$
24. $\frac{x^2+3x-40}{x-7} = \frac{(x+8)(x-5)}{x-7} \geq 0$ Sol: $[-8, 5] \cup (7, +\infty)$
25. $\frac{x^2-3x-70}{x+2} = \frac{(x+7)(x-10)}{x+2} \geq 0$ Sol: $[-7, -2) \cup [10, +\infty)$
26. $\frac{x^2-12x-13}{x+6} = \frac{(x+1)(x-13)}{x+6} \leq 0$ Sol: $(-\infty, -6) \cup [-1, 13]$
27. $\frac{x^2-17x+52}{x+8} = \frac{(x-4)(x-13)}{x+8} \leq 0$ Sol: $(-\infty, -8) \cup [4, 13]$
28. $\frac{x^2-7x-30}{x-11} = \frac{(x+3)(x-10)}{x-11} \geq 0$ Sol: $[-3, 10] \cup (11, +\infty)$
29. $\frac{x^2-x-2}{x+3} = \frac{(x-2)(x+1)}{x+3} \geq 0$ Sol: $(-3, -1] \cup [2, +\infty)$
30. $\frac{x^2+7x+10}{x-2} = \frac{(x+5)(x+2)}{x-2} \leq 0$ Sol: $(-\infty, -5] \cup [-2, 2)$
31. $\frac{x^2-6x-7}{x+2} = \frac{(x+1)(x-7)}{x+2} \leq 0$ Sol: $(-\infty, -2) \cup [-1, 7]$
32. $\frac{x^2-x-12}{x+1} = \frac{(x+3)(x-4)}{x+1} \geq 0$ Sol: $[-3, -1) \cup [4, +\infty)$
33. $\frac{x^2-3x-18}{x-5} = \frac{(x-6)(x+3)}{x-5} \geq 0$ Sol: $[-3, 5) \cup [6, +\infty)$
34. $\frac{x^2+3x-4}{x-3} = \frac{(x+4)(x-1)}{x-3} \leq 0$ Sol: $(-\infty, -4] \cup [-1, 3)$
35. $\frac{x^2-11x+24}{x+7} = \frac{(x-3)(x-8)}{x+7} \leq 0$ Sol: $(-\infty, -7) \cup [3, 8]$
36. $\frac{x^2+4x-5}{x+1} = \frac{(x+5)(x-1)}{x+1} \geq 0$ Sol: $[-5, -1) \cup [1, +\infty)$
37. $\frac{x^2+3x-54}{x+2} = \frac{(x+9)(x-6)}{x+2} \leq 0$ Sol: $(-\infty, -9] \cup (-2, 6]$

2 Ecuaciones exponenciales:

1. $2^{x-2} + 2^{x+1} - 1 = 0$ Sol: $x = -1, 169925001$
2. $3^{x+1} + 3^x - 3^{x-1} = 2$ Sol: $x = -0, 5517286062$
3. $2^{x-2} - 2^x + 2^{x-1} = 0$ Sol: No tiene solución.
4. $3^{x-2} + 2 \cdot 3^x = 1$ Sol: $x = -0, 6801438331$
5. $4^{x-1} - 3 \cdot 4^x + 4^{x-2} = 0$ Sol: No tiene solución.
6. $2^{2x-1} + 2^{x+1} - 2 = 0$ Sol: $x = -0, 2715533031$
7. $5^{2x-1} + 3 \cdot 5^x - 2 = 0$ Sol: $x = -0, 2778665354$
8. $3^{2x-2} + 3^{x-1} - 1 = 0$ Sol: $x = -1, 011034949$

9. $2^{2x+1} - 3 \cdot 2^{x-1} - 3 = 0$ Sol: $x = 0,7275884076$
10. $2^{2x-1} - 3 \cdot 2^{x+2} - 2 = 0$ Sol: $x = 4,594878436$
11. $7^{2x-1} - 7^{x+1} - 2 = 0$ Sol: $x = 2,002970617$
12. $6^{2x-1} - 6^{x-1} - 4 = 0$ Sol: $x = 0,9437163029$
13. $5^{4x-1} - 5^{2x+1} - 3 = 0$ Sol: $x = 0,4606479652$
14. $4^{4x-1} - 4^{2x+1} - 7 = 0$ Sol: $1,034204992$
15. $7^{4x+1} + 3 \cdot 7^{2x} - 5 = 0$ Sol: $x = -0,1076980693$
16. $3^{4x+1} + 2 \cdot 3^{2x-2} - 2 = 0$ Sol: $x = -0,1129051332$
17. $2^{4x+2} + 3 \cdot 2^{2x} - 1 = 0$ Sol: $x = -1$
18. $5^{4x-2} + 5^{2x} - 1 = 0$ Sol: $x = -0,01174112826$