C. INECUTII DE GRADUL I

1) $-2(2x + 1) + 2 \geq -(x + 2)\cdot(-7) - 3$

$-4x - 2 + 2 \geq +7x + 14 - 3 \Rightarrow -4x - 7x \geq 11 \Rightarrow -11x \geq 11 \ /\cdot(-1) \Rightarrow 11x \leq -11 \ /:11 \Rightarrow x \leq -1 \Rightarrow$

$\Rightarrow \mathbf{x \in (-\infty ; -1]}$

2) $-2(x - 3) - 4 < -(-x + 6)$

$-2x + 6 - 4 < x - 6 \Rightarrow -2x - x < -6 -6 +4 \Rightarrow -3x < -8 \ /\cdot(-1) \Rightarrow 3x > 8 \ /:3 \Rightarrow x > \frac{8}{3} \Rightarrow$

$\Rightarrow \mathbf{x \in (\frac{8}{3} ; +\infty)}$

3) $||x^2 - 1| + |x^2 + 4x + 3| + |x^2 - x - 2|| \leq 0$

Deoarece un modul nu poate fi negativ $\Rightarrow$ inecuatia devine:

$|x^2 - 1| + |x^2 + 4x + 3| + |x^2 - x - 2| = 0$

Deoarece modulul este intotdeauna pozitiv si o suma de termeni pozitivi este "0" daca fiecare termen este "0" $\Rightarrow$

$x^2 - 1 = 0$ $\Rightarrow x^2 = 1 \Rightarrow x = \pm\sqrt{1} \Rightarrow \mathbf{x_1 = 1} \quad \mathbf{x_2 = -1}$

$x^2 + 4x + 3 = 0$ $\Rightarrow x^2 + x + 3x + 3 = 0 \Rightarrow x(x + 1) + 3(x + 1) = 0 \Rightarrow (x + 1)(x + 3) = 0 \Rightarrow$

$x + 1 = 0 \Rightarrow \mathbf{x_1 = -1}$

$x + 3 = 0 \Rightarrow \mathbf{x_2 = -3}$

$x^2 - x - 2 = 0$ $\Rightarrow x^2 - 1 - x - 1 = 0 \Rightarrow (x - 1)(x + 1) - (x + 1) = 0 \Rightarrow (x + 1)(x - 1 - 1) = 0 \Rightarrow$

$\Rightarrow (x + 1)(x - 2) = 0 \Rightarrow$

$x + 1 = 0 \Rightarrow \mathbf{x_1 = -1}$

$x - 2 = 0 \Rightarrow \mathbf{x_2 = 2}$

Deoarece -1 este solutie comuna pentru cele 3 ecuatii $\Rightarrow$ solutia inecuatiei este $x = -1$

4) $\sqrt{9 - 6x + x^2} \leq 4$

$\sqrt{(3 - x)^2} \leq 4 \Rightarrow |3 - x| \leq 4 \Rightarrow \mathbf{-4 \leq 3 - x \leq 4} \Rightarrow -4 - 3 \leq -x \leq 4 - 3 \Rightarrow -7 \leq -x \leq 1 \ /\cdot(-1) \Rightarrow$

$\Rightarrow 7 \geq x \geq -1 \Rightarrow \mathbf{x \in [-1 ; 7]}$

5) $\frac{x^2 - x - 12}{x + 3} \geq 0$

$\frac{x^2 - 9 - x - 3}{x + 3} \geq 0 \Rightarrow \frac{(x-3)(x+3) - (x+3)}{x + 3} \geq 0 \Rightarrow \frac{(x+3)(x-3-1)}{x + 3} \geq 0 \Rightarrow x - 4 \geq 0 \Rightarrow x \geq 4 \Rightarrow \mathbf{x \in [4 ; +\infty)}$

http://eprofu.ro/matematica