

ESERCIZI IN PIÙ

I SISTEMI DI DISEQUAZIONI

Risolvi i seguenti sistemi di disequazioni.

$$1 \quad \begin{cases} \frac{5x+9}{x^2-4} - \frac{x+3}{2-x} \leq -2 \\ \frac{3x^2(x-4)(x+1)^3}{(3x^2-7x+4)(x^2+5)} \geq 0 \\ \frac{3}{x-5} \leq 0 \end{cases} \quad \left[-\frac{7}{3} \leq x < -2 \vee x = -1 \vee x = 0 \vee 1 < x < \frac{4}{3} \right]$$

$$2 \quad \begin{cases} \frac{5x^3(x^2-1)^2}{x^2+8} \leq 0 \\ (x^3+27)(x^4-4x^2) < 0 \\ \frac{-5}{x+2} < 1 \end{cases} \quad [x < -7 \vee -2 < x < 0 \vee x = 1]$$

$$3 \quad \begin{cases} 4x^2 - 4\sqrt{3}x + 3 \leq 0 \\ \frac{x^3 - 4x}{1 - x^2} < 0 \\ \frac{2x^2 - 3x}{x+1} \geq x - 10 \end{cases} \quad \left[x = \frac{\sqrt{3}}{2} \right]$$

$$4 \quad \begin{cases} \frac{-5}{x-4} \geq 0 \\ \frac{-2x^2(x-2)^3}{x^2-6x+9} > 0 \\ \frac{3x^2 - 3\sqrt{2}x - \sqrt{3}x + \sqrt{6}}{x^2+1} \geq 0 \end{cases} \quad \left[x < 0 \vee 0 < x \leq \frac{\sqrt{3}}{3} \vee \sqrt{2} \leq x < 2 \right]$$

$$5 \quad \begin{cases} \frac{-4x^2 - 3x + 1}{(x^2+9)(x^2-x+6)} \geq 0 \\ 3x \geq x^2 \\ \frac{3}{x^2-3x} + \frac{2}{x} \leq \frac{1}{x^2} \end{cases} \quad \left[0 < x \leq \frac{1}{4} \right]$$

$$6 \quad \begin{cases} \left(x + \frac{5}{2}\right)^2 + \frac{8x^2-13}{4} > 3(x+1)\left(x - \frac{1}{3}\right) + 2 \\ x\left(1 - \frac{2-x}{3}\right) - \frac{7x-10}{12x-15} + 1 \geq \frac{1}{3}\left(x + \frac{1}{2}\right)^2 + \frac{1}{4} \end{cases} \quad \left[-\frac{2}{3} < x \leq 0 \vee x > \frac{5}{4} \right]$$

$$7 \quad \begin{cases} \frac{3x-4}{2} + \frac{9x^2-4}{5} \leq x\left(x - \frac{1}{10}\right) + \frac{1}{5}(2x+1)^2 \\ \frac{x+3}{2x-4} + x + 5 + \frac{x-1}{2} \geq 2\left(\frac{x+3}{2}\right)^2 - \frac{x(x+3)}{2} \end{cases} \quad \left[x \leq -3 \vee 2 < x \leq \frac{15}{4} \right]$$

$$8 \quad \begin{cases} \frac{2(x-3)^2 + 3x - 16}{2x-1} + 11 \geq \frac{(2x-4)(3x-9)}{6} - \frac{(x^2+6x)(2x-12)}{2x+12} \\ \frac{(x+1)^2 + x - 4}{4x+12} \leq \frac{x(x-2)}{6x-3} + \frac{2x^2+x+2}{24x-12} \end{cases} \quad \left[-3 < x < \frac{1}{2} \vee x = \frac{3}{2} \right]$$

$$9 \quad \begin{cases} \frac{x^2+5x-1}{2-x} - \frac{7}{2x-4} \geq \frac{x(6+x-x^2)}{x^2-4} \\ \frac{6x^2+x-1}{4x^2-1} + 3 \leq \frac{x^2-x(x+5)}{2x-1} \end{cases} \quad \left[\frac{2}{7} \leq x < \frac{1}{2} \right]$$

$$10 \quad \begin{cases} \frac{2x^2-(x+1)(2x+1)}{3x-5} \leq \frac{2(x+2)^2-8}{6x^2-10x} + 7 \\ \frac{4-6x}{5(2x-1)+1} \geq \frac{3(x-4)(x+4)-(x+1)(5+3x)}{3x+2(x-1)} \end{cases} \quad \left[x \leq -11 \vee \frac{2}{5} < x \leq \frac{6}{5} \vee x > \frac{5}{3} \right]$$

$$11 \quad \begin{cases} \frac{x-1}{x-2} > 0 \\ \frac{x^2+25}{x^2-4x} < 0 \end{cases} \quad [0 < x < 1 \vee 2 < x < 4]$$

$$12 \quad \begin{cases} x(x-2) - x^2 + 4 < 3(x-2)(x-3) \\ \frac{1}{x} < x \end{cases} \quad \left[2 < x < \frac{7}{3} \right]$$

$$13 \quad \begin{cases} x^3 + x^2 - 9x - 9 > 0 \\ \frac{x^2 + 4x - 5}{x^2 - 2x + 1} < 0 \\ \frac{6}{5-x} - x \leq 0 \end{cases} \quad [\text{impossibile}]$$

$$14 \quad \begin{cases} \frac{-x+2}{x^2-x-1} < 0 \\ \frac{9x^2-6x}{2x-3} \geq 0 \\ \frac{1}{x} + \frac{x+1}{x+2} > 0 \end{cases} \quad \left[0 < x \leq \frac{2}{3} \vee \frac{3}{2} < x < \frac{1+\sqrt{5}}{2} \vee x > 2 \right]$$

$$15 \quad \begin{cases} \frac{1}{x^2-x+1} - \frac{5}{2x+2} + \frac{2x^2-3x+1}{x^3+1} > 0 \\ \frac{x^3-x}{x^2+1} \geq 0 \end{cases} \quad [\text{impossibile}]$$