niamo le soluzioni dell'equazione assegnata: $x = 1$, $x = 2$, $x = 10$.

ESERCIZI

Risolvere le seguenti disequazioni di 1° grado:

1) $3(x - 1) < 5x + 3$. $[x > -3]$

2) $4(1 + x) - (1 + 3x) > -5$. $[x > -8]$

3) $4(2x-1) > 5+3(1-2x)$. $\left[x > \frac{6}{7}\right]$

4) $\frac{x-1}{3} - \frac{1}{2} < 2(x+1) + \frac{1}{3}$. $\left[x > -\frac{19}{10}\right]$

5) $\frac{1+3x}{3} - \frac{1}{4}x + \frac{1}{4} < \frac{x+6}{6} - \frac{1}{3}$. $\left[x < \frac{1}{7}\right]$

6) $\frac{2+3x}{4} > 1 + \frac{x-2}{3}$. $\left[x > -\frac{2}{5}\right]$

7) $\frac{(x+1)^2}{3} + \frac{x^2-1}{2} \geq \frac{3}{2}(x+1)^2 + 3x - \frac{2}{3}x^2 + \frac{11}{3}$. $[x \leq -1]$

8) $\frac{1-x}{4} - \frac{2x-1}{2} > \frac{3x-1}{4} - 5\left(x + \frac{1}{3}\right)$. $\left[x > -\frac{8}{9}\right]$

9) $\frac{1}{2} - \frac{1}{3}[x - 2(1-3x)] + \frac{x+1}{5} - \frac{x-1}{6} < 0$. $\left[x > \frac{2}{3}\right]$

10) $2(x-1)^2 - 2(x-1) > 2(x+1)(x-2)$. $[x < 2]$

11) $(x+1)^2 > [7-(2-x)]x - 2$. $[x < 1]$

12) $\frac{(2x+1)(3x-1)}{6} - \frac{1}{9} < x^2 - \frac{1}{9} - \left(x + \frac{1}{6}\right)$. $[x < 0]$

13) $\frac{1}{5}(x+5)(1-5x) + (x+5)^2 < 3 + \frac{3}{5}x$. $[x < -5]$

14) $\frac{3x-7}{8} - \frac{x+5}{4} \geq \frac{x}{3} - 4$. $[x \leq 9]$

15) $\frac{6x+5}{3} - 1 < \frac{4x-1}{2}$. [nessuna soluzione]

16) $\frac{1}{3}x + \frac{1}{6} + 2x - \left(x - \frac{1}{2}\right) < 0$. $\left[x < -\frac{1}{2}\right]$

17) $\frac{2}{3}(x-4) + 1 \geq \frac{4}{3}x - \frac{1}{2}x$. $[x \leq -10]$

18) $\frac{1}{5}(x-2) - 1 \leq 1 + 2x - \left(x + \frac{1}{2}\right)$. $\left[x \geq -\frac{19}{8}\right]$

19) $(x-1)^2 + 9x(x-1) \geq x^2 - 4x + 4 - (1+3x)(1-3x)$.

$\left[x \leq -\frac{2}{7}\right]$

20) $\frac{x^2-1}{2} - \frac{2x-3}{4} > \frac{(2x+1)(x-3)}{4}$.

$\left[x > -\frac{4}{3}\right]$

21) $10x^2 + \frac{2(2x-3)-1+7x}{4} + 10x\left(\frac{1}{5} - x\right) - 3 > 0$. $[x > 1]$

22) $(x^2-4)(x-1) - x^3 + x^2 \geq \frac{5}{2}x - 1$.

$\left[x \leq \frac{10}{13}\right]$

23) $\frac{2x-1}{5} - 1 > x - \frac{3}{5}x + \frac{1}{2}$. [nessuna soluzione]

24) $(x-1)^2 + 2x - 3 > (x-2)(x+2) - \frac{1}{2}$. $[\forall x \in \mathbb{R}]$

25) $3(2-x) - 4 > 4(2x+1)$.

$\left[x < -\frac{2}{11}\right]$

26) $(x-2)^2 > (x-1)(x+2) - 6x$. $[x > -6]$

27) $(2x-1)(x+2) - (x-3)(x+1) \leq (x-2)(x+3)$.

$\left[x \leq -\frac{7}{4}\right]$

28) $(x+3)^2 + 2x - 3 < x(x-3) - 5$. $[x < -1]$

29) $\frac{3}{4}x - \frac{2}{3} > \frac{1}{2}(3x-5)$.

$\left[x < \frac{22}{9}\right]$

30) $4(3x-5) - 2x > 2(5x+3)$. [nessuna soluzione]

31) $2(3x+7) - 3(x-3) \leq 1 - 2x - (3x+2)$. $[x \leq -3]$

32) $3(7x-5) + 10x \geq 5(5x+1) + 6x - 20$. $[\forall x \in \mathbb{R}]$

33) $4(3x+5) - 8x - 2(4-x) \leq 0$. $[x \leq -2]$

34) $\frac{3x-2}{3} - \frac{1}{4} - \frac{1}{12}x < \frac{x-3}{6}$.

$\left[x < \frac{5}{9}\right]$

35) $\frac{3x-2}{2} - \frac{4x-1}{3} \geq \frac{x-1}{5}$. $[x \leq -14]$

36) $\frac{6(x-2)+9x}{12} < \frac{4x-1}{8}$. $\left[x < \frac{7}{6}\right]$

37) $\frac{x+4}{4} - \frac{1}{2}(x-1) > \frac{2x-1}{2} + 3$. $\left[x < -\frac{4}{5}\right]$

38) $\frac{3(x-2)}{4} + \frac{5(1-x)}{2} \geq \frac{x+1}{8} - \frac{1}{4}$. $\left[x \leq \frac{3}{5}\right]$

39) $\frac{2x-3}{2} + \frac{2x+4}{3} < \frac{5x-2}{3}$. [nessuna soluzione]

40) $-\frac{x+2}{6} < 3 - \frac{1+2x}{3}$. $[x < 6]$

41) $\frac{4}{3}(2-x) - \frac{3}{4}(2x-1) \leq 4x - 7\left(x - \frac{1}{2}\right) - \frac{3}{4}$. $[x \leq -4]$

42) $\frac{8x+5}{9} - \frac{2x+23}{6} \leq \frac{x+4}{4} - \frac{x}{12}$. $[x \leq 11]$

43) $x - \frac{x-1}{2} \geq \frac{x-3}{4} - \frac{x-2}{3}$. $[x \geq -1]$

44) $\frac{3}{2}(x-4) + \frac{x+2}{4} \geq \frac{3}{10}\left(x - \frac{14}{3}\right) - \frac{2}{5}(2x-1)$. $[x \geq 2]$

Risolvere le seguenti disequazioni di 2° grado:

45) $2x^2 - 5x + 3 > 0$. $\left[x < 1 \text{ o } x > \frac{2}{3}\right]$

46) $4x^2 - 4x + 1 > 0$. $\left[\forall x \in \mathbb{R},\ x \neq \frac{1}{2}\right]$

47) $4x^2 - 4x + 1 \geq 0$. $[\forall x \in \mathbb{R}]$

48) $x^2 + 4 < 0$. [nessuna soluzione]

49) $-3x^2 + 4x - 2 < 0$. $[\forall x \in \mathbb{R}]$

50) $x^2 + 18x + 81 \leq 0$. $[x = -9]$

51) $4x^2 - 12x + 9 \geq 0$. $[\forall x \in \mathbb{R}]$

52) $(2x-5)(x-4) > 7 + (x-2)(x-3)$. $[x < 1 \text{ o } x > 7]$

53) $\frac{x^2+x}{4} \geq \frac{x-5}{12} + \frac{5(2x-1)}{6}$. $[x \leq 1 \text{ o } x \geq 5]$

54) $x^2 - 5x \leq 1$. $\left[\frac{5-\sqrt{29}}{2} \leq x \leq \frac{5+\sqrt{29}}{2}\right]$

55) $2x^2 - x - 1 < 0$. $\left[-\frac{1}{2} < x < 1\right]$

56) $3x^2 < x + 1$. $\left[\frac{1-\sqrt{13}}{6} < x < \frac{1+\sqrt{13}}{6}\right]$

57) $-27x^2 + 18x - 3 \geq 0$. $\left[x = \frac{1}{3}\right]$

58) $\frac{(x+6)^2 - (x+2)^2}{4} \geq \frac{(x+4)^2}{3} - 2x$. $[2 - 2\sqrt{3} \leq x \leq 2 + 2\sqrt{3}]$

59) $(2x-3)(2x+1) \geq \frac{(2x+1)^2}{4}$. $\left[x \leq -\frac{1}{2} \text{ o } x \geq \frac{13}{6}\right]$

60) $\frac{(2x-3)(x-4)}{18} + \frac{x-2}{3} > 0$. $\left[x < 0 \text{ o } x > \frac{5}{2}\right]$

61) $\frac{(x+2)^2}{4} - \frac{(x-2)(x+2)}{6} > \frac{4}{3}(x+1)$. $[\forall x \in \mathbb{R},\ x \neq 2]$

62) $x^2 + \left(\sqrt{3} - \sqrt{2}\right)x - \sqrt{6} \geq 0$. $\left[x \leq -\sqrt{3} \text{ o } x \geq \sqrt{2}\right]$

63) $4\sqrt{3}x - 3 - 4x^2 < 0$. $\left[\forall x \in \mathbb{R},\ x \neq \frac{\sqrt{3}}{2}\right]$

64) $2(x-1) + 4x - 6 < (x+3)^2$. $[\forall x \in \mathbb{R}]$

65) $(3x-5)^2 > 12x - 5$. $\left[x < \frac{7-\sqrt{19}}{3} \text{ o } x > \frac{7+\sqrt{19}}{3}\right]$

66) $\frac{(8x-1)(x-2)}{6} - \frac{1}{4}(3x+2)^2 \geq 5x - \frac{2}{3}$. $\left[-\frac{130}{11} \leq x \leq 0\right]$

67) $x^2 - 3x + \frac{x}{2} > (2x-5)^2 + \frac{7}{3}x^2$. [nessuna soluzione]

68) $3\left(2x-\frac{1}{2}\right)^3+5x\le 6x\left(2x+\frac{1}{2}\right)^2-\frac{1}{4}$. $\left[x\le\frac{1}{60}\text{ o }x\ge\frac{1}{4}\right]$

69) $\left(\frac{6x-1}{2}\right)^2-\left(2x-\frac{1}{3}\right)(x+1)\le 6x+\frac{7}{12}$. $\left[0\le x\le\frac{32}{21}\right]$

70) $\frac{x-5}{5}-\frac{x-3}{3}+\frac{5}{6}<\frac{2x+3}{10}-\frac{1}{30}x^2$. $[2<x<8]$

71) $(x+1)^2+x^2-3x<x^2-25$. [nessuna soluzione]

72) $\frac{1}{6}(3x-1)(x-2)-4\ge x(x+3)$. $\left[-\frac{22}{3}\le x\le -1\right]$

73) $\frac{1}{3}(x+1)^3-\frac{1}{3}(x-2)^3\ge 2(x+2)$.

$$\left[x\le\frac{5-\sqrt{37}}{6}\text{ o }x\ge\frac{5+\sqrt{37}}{6}\right]$$

74) $\left(\frac{1}{2}x-\frac{3}{4}\right)x-\frac{1}{2}(x-3)+\frac{1}{4}(x-6)\le\left(\frac{x}{4}-\frac{2}{3}\right)x$.

$$\left[0\le x\le\frac{4}{3}\right]$$

75) $(x+3)\left[(x-1)^2-x^2-\frac{3}{4}x\right]+6\ge-\frac{1}{4}x(7x+29)$.

$$[-3\le x\le 3]$$

76) $x^2+6x-\frac{1}{4}(x+2)(2x-3)\le\frac{48+x}{8}$. $\left[-12\le x\le\frac{3}{4}\right]$

77) $\frac{1}{6}(x-12)^2-\frac{1}{9}x+\frac{1}{18}(x-9)x-5\ge\frac{1}{2}(x-14)^2$.

$$\left[\frac{79}{5}\le x\le 18\right]$$

78) $3+(3x-2)^2+(2x-1)^2<5x$. $\left[\frac{18}{13}<x<1\right]$

79) $\frac{1}{3}(x-2)^2+\frac{1}{2}(x-5)<\frac{1}{2}(x-3)+\frac{1}{2}(x-1)-2$.

[nessuna soluzione]

80) $x^2 + \frac{3}{2} - \frac{10}{3}x > \frac{2}{3}x - 2x^2 - 2\left(x + \frac{1}{2}\right)^2$. $[\forall x \in \mathbb{R}]$

81) $x^2 - x + \sqrt{2} \leq 2$. $\left[1 - \sqrt{2} \leq x \leq \sqrt{2}\right]$

82) $4x + 2\sqrt{3} \leq x^2$. $\left[x \leq 1 - \sqrt{3} \text{ o } x \geq 3 + \sqrt{3}\right]$

83) $(2 - \sqrt{3})x^2 + \sqrt{3} > 2(x - 1)$. $\left[\forall x \in \mathbb{R},\ x \neq 2 + \sqrt{3}\right]$

84) $x(x-1)^2 + x^2 \geq (x-1)^3 - x + 2$. $\left[x \leq -\frac{1}{2} \text{ o } x \geq 1\right]$

85) $\frac{x-1}{5} + \frac{1}{3} \leq \frac{1}{6}(x^2 - 5x + 6)$. $\left[x \leq 1 \text{ o } x \geq \frac{26}{5}\right]$

86) $2x - 2 - (x+3)^2 \leq -4x + 6$. $[\forall x \in \mathbb{R}]$

87) $3\left(2x - \frac{1}{2}\right)^3 + 5x \leq 6x\left(2x + \frac{1}{2}\right)^2 - \frac{1}{4}$. $\left[x \leq \frac{1}{60} \text{ o } x \geq \frac{1}{4}\right]$

... di disequazioni: