Esercizi per chi va in terza

Risolvi le seguenti equazioni:

1) $\dfrac{2x}{x+4} - \dfrac{8}{x+4} = 2 + \dfrac{1}{x}$

2) $\dfrac{(x+1)^2 - 1}{4x^2 - 4x + 1} + 1 = \dfrac{2x+1}{1-2x}$

3) $\dfrac{6}{x^2 - 1} + \dfrac{3}{x+1} = 1 + \dfrac{2}{x-1}$

4) $\dfrac{x^2 - x - 2}{x - 2} = \dfrac{\left(x+\sqrt{2}\right)\left(x-\sqrt{2}\right)}{x}$

5) $\dfrac{\left(x - \dfrac{1}{2}\right)^2 + 2x}{3} = \dfrac{4x - \dfrac{23}{6}}{2}$

6) $a^2 x^2 + (ab+1)(ab - 2ax + 1) = 0$

7) $(ax-1)^2 - x^2 = x^2 \left(b^2 - 1\right)$

Risolvi le seguenti disequazioni:

8) $6x^2 - x > 0$

9) $25 - x^2 \geq 0$

10) $12x^2 - 4x - 1 < 0$

11) $2x^2 - 6x + 2 > 0$

12) $12 - x^2 \geq 0$

13) $3x^2 + 12 < 0$

14) $2x^2 - \dfrac{1}{3}x - \dfrac{1}{3} > 0$

15) $x^2 - 10x + 25 \geq 0$

16) $-\dfrac{1}{2}x^2 < 0$

17) $-3 - x^2 < 0$

18) $-x^2 + 3x + 4 \geq 0$

19) $\dfrac{1-x}{x+2} > \dfrac{2}{x-1}$

20) $\dfrac{x-2}{x+2} < \dfrac{x+1}{x-1}$

21) $\dfrac{x-2}{x^2 - 1} < 1$

22) $\dfrac{x-2}{2x-3} > 2$

23) $\dfrac{3-x}{2x+1} + 1 > 0$

24) $\dfrac{x}{x-2} < 2$

25) $\dfrac{1+x}{x-2} < 3$

26) $\dfrac{1-x}{1+x} + \dfrac{1}{4} > \dfrac{3}{x}$

27) $\dfrac{9x+4}{x+1} > 6$

Risolvi le seguenti equazioni irrazionali:

28) $x - \sqrt{x^2 - 16} = \dfrac{16}{\sqrt{x^2 - 16}}$

29) $\sqrt{4x^2 + 12x - 7} = x + 1$

30) $\sqrt{x^2 - 4x + 5} - \sqrt{2x - 3} = 0$

31) $\dfrac{5}{11 + 2\sqrt{4x-3}} = \dfrac{3}{1 + 4\sqrt{4x-3}}$

Risolvi i sistemi di equazioni di 1°:

32) $\begin{cases} a - b - c = -2 \\ b - c - \dfrac{a}{2} = 2 \\ \dfrac{1}{3}(a - 2b) + 2c = 0 \end{cases}$

33) $\begin{cases} 2a = -3c - 3b \\ 6c - b = -4a \\ 6a - 1 = -b - 6c \end{cases}$

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