ESERCIZI IN PIÙ

LE EQUAZIONI IRRAZIONALI

Risolvi le seguenti equazioni irrazionali nell'incognita x.

1 $\dfrac{3\sqrt{x}}{4+\sqrt{x}} + \dfrac{2\sqrt{x}}{3\sqrt{x}-1} = \dfrac{16x}{(4+\sqrt{x})(3\sqrt{x}-1)}$ $[0; 1]$

2 $\sqrt{52x^2-3} + x = \dfrac{52x^2-3+7x}{\sqrt{52x^2-3}}$ $[\pm 1]$

3 $\dfrac{4}{\sqrt{25x^2+4}} - \sqrt{25x^2+4} = 3x$ $\left[0; -\dfrac{3}{10}\right]$

4 $\sqrt{5x-a^2} - \sqrt{5x-6a^2} = a \qquad (a>0)$ $[2a^2]$

5 $\sqrt{6x+96a^2} = 3a + \sqrt{5x-3a^2} \qquad (a \geq 0)$ $[a \neq 0, \nexists\, x \in \mathbb{R}; a = 0, x = 0]$

6 $\sqrt{x\left(\dfrac{8}{3}+x\right) + a(3a-2x)} = (x-a) + \sqrt{2x + \dfrac{2}{3}(x+3a^2)} \qquad (a \geq 0)$ $[a]$

7 $2x^2 = +\dfrac{3}{2}x + \sqrt{(2x^2-2x)(2x^2+2x) + \dfrac{x^2}{4}}$ $[0; 1]$

8 $1 + \sqrt{11x^2\left(\dfrac{x^2}{2}+1\right) + 3\left(\dfrac{x^4}{4}-1\right)} = \dfrac{5}{2}x^2$ [impossibile]

9 $\dfrac{4x-1}{\sqrt{8x^2-1}} + 2\sqrt{2}x = \sqrt{8x^2-1}$ [impossibile]

10 $\dfrac{3\sqrt{x}}{7+\sqrt{x}} + \dfrac{2}{2\sqrt{x}-3} = \dfrac{13x}{(7+\sqrt{x})(2\sqrt{x}-3)}$ $[1]$

11 $\dfrac{9x+15}{\sqrt{27x^2+5}} = 3\sqrt{27}x + 3\sqrt{27x^2+5}$ $\left[0; -\dfrac{7}{9}\right]$

12 $\sqrt{4x\left(\dfrac{5}{2}+x\right) + 2(2-a)} - 2x = 1 + \sqrt{6x+3-2a} \qquad (a>0)$ $\left[\dfrac{1}{3}a - \dfrac{1}{2}\right]$

13 $\dfrac{14x}{\sqrt{(x+\sqrt{2})(x-\sqrt{2})}} + 3x = 5x\sqrt{x^2-2}$ $[0; -\sqrt{6}; \sqrt{6}]$

14 $\dfrac{4}{\sqrt{100x^2+2}} - 10x = \sqrt{100x^2+2}$ $\left[\dfrac{1}{\sqrt{150}}\right]$

15 $\sqrt{2x-3} + \sqrt{x-1} = \sqrt{3x-4}.$ $\left[x \geq \dfrac{3}{2}\right]$

16 $\sqrt{4x-3} + \sqrt{5x+2} = \sqrt{9x-1}$ $\left[\dfrac{3}{4}\right]$

17 $\sqrt{x+2} + \sqrt{2x+1} = 2\sqrt{\dfrac{3}{4}x + \dfrac{3}{4}}$ $\left[-\dfrac{1}{2}\right]$

18 $\sqrt{8x+2}+\sqrt{\frac{1}{2}x-\frac{1}{2}}=\sqrt{4x+\frac{3}{2}}+\sqrt{\frac{9}{2}x}$ $[\nexists\, x \in \mathbb{R}]$

19 $\sqrt{-x-7}-\sqrt{6x+2}=\sqrt{3x-1}+\sqrt{2x-4}$ $[\nexists\, x \in \mathbb{R}]$

20 $\sqrt{8x+7}+\sqrt{-1-3x}=\sqrt{x+2}+\sqrt{4(x+1)}$ $\left[-\frac{3}{4};-\frac{5}{7}\right]$

21 $\sqrt{x-\frac{1}{4}}+\sqrt{4x+\frac{5}{3}}=\sqrt{1+5\left(x+\frac{1}{12}\right)}$ $\left[\frac{1}{4}\right]$

22 $\sqrt{\frac{1}{3}x+\frac{7}{3}}+\sqrt{6x+3}=\sqrt{\frac{10}{3}x+2}+\sqrt{3x+\frac{10}{3}}$ $\left[-\frac{3}{8};\frac{1}{9}\right]$