

739

$$2\sqrt{x+5} - \sqrt{2x+1} = \sqrt{3x-3}$$

[4]

$$2\sqrt{x+5} = \sqrt{3x-3} + \sqrt{2x+1}$$

c.e.

$$\begin{cases} x+5 \geq 0 \\ 3x-3 \geq 0 \\ 2x+1 \geq 0 \end{cases} \begin{cases} x \geq -5 \\ x \geq 1 \\ x \geq -\frac{1}{2} \end{cases}$$

$$\Downarrow \\ x \geq 1$$

$$\begin{cases} x \geq 1 \end{cases}$$

$$4x+20 = 3x-3 + 2x+1 + 2\sqrt{6x^2-3x-3}$$

$$\begin{cases} x \geq 1 \end{cases}$$

$$2\sqrt{6x^2-3x-3} = -x+22$$

$$\begin{cases} x \geq 1 \end{cases}$$

$$-x+22 \geq 0$$

$$4(6x^2-3x-3) = (-x+22)^2$$

$$\begin{cases} x \geq 1 \end{cases}$$

$$\begin{cases} x \leq 22 \end{cases} \quad 1 \leq x \leq 22$$

$$24x^2 - 12x - 12 = x^2 + 484 - 44x$$

$$\begin{cases} x \geq 1 \end{cases}$$

$$\begin{cases} x \leq 22 \end{cases}$$

$$23x^2 + 32x - 496 = 0$$

$$\frac{\Delta}{4} = 256 + 11408 = 11664 = 108^2$$

$$x = \frac{-16 \pm 108}{23}$$

- ... N. Acc.

4 Acc. perché compresi fra 1 e 22

$$x = 4$$

$$\sqrt{x+3} = \sqrt{x+12} - \sqrt{3-x}$$

$$\left[-\frac{12}{5}; 0\right]$$

$$\sqrt{x+3} + \sqrt{3-x} = \sqrt{x+12}$$

$$\begin{cases} x+3 \geq 0 \\ 3-x \geq 0 \\ x+12 \geq 0 \end{cases} \begin{cases} x \geq -3 \\ -x \geq -3 \Rightarrow x \leq 3 \\ x \geq -12 \end{cases} \Rightarrow -3 \leq x \leq 3$$

$$\begin{cases} -3 \leq x \leq 3 \\ \cancel{x+3} + \cancel{3-x} + 2\sqrt{(x+3)(3-x)} = x+12 \end{cases} \begin{cases} -3 \leq x \leq 3 \\ 6 + 2\sqrt{9-x^2} = x+12 \end{cases}$$

$$\begin{cases} -3 \leq x \leq 3 \\ 2\sqrt{9-x^2} = x+6 \end{cases} \begin{cases} -3 \leq x \leq 3 \\ x+6 \geq 0 \\ 4(9-x^2) = (x+6)^2 \end{cases} \begin{cases} -3 \leq x \leq 3 \\ x \geq -6 \end{cases} \left. \begin{matrix} -3 \leq x \leq 3 \\ x \geq -6 \end{matrix} \right\} -3 \leq x \leq 3$$

$$5x^2 + 12x = 0$$

$$x(5x+12) = 0$$

$$x = 0 \vee x = -\frac{12}{5}$$

ensemble acc.

## ALTRO METODO DI RISOLUZIONE

729

$$\sqrt{4-x} + \sqrt{12-x} = 4$$

[3]

↓ elevo al quadrato senza condizioni

$$\cancel{4-x} + \cancel{12-x} + 2\sqrt{(4-x)(12-x)} = \cancel{16}$$

$$\cancel{2}\sqrt{48-4x-12x+x^2} = \cancel{2}x$$

↓ elevo ancora al quadrato

$$\cancel{x^2} - 16x + 48 = \cancel{x^2}$$

$$x = 3 \text{ CANDIDATA SOLUZIONE}$$

↓  
VA CONTROLLATA

Controllo:

$$\sqrt{4-3} + \sqrt{12-3} \stackrel{?}{=} 4$$

$$1 + 3 = 4 \text{ OK!}$$

$$\boxed{x=3}$$

706

$$\sqrt[3]{x(x^2+5)-1} - x = 0$$

 $\left[\frac{1}{5}\right]$ 

RADICE CUBICA

$$\sqrt[3]{x(x^2+5)-1} = x$$

↳ elevo al cubo senza condizioni

$$x(x^2+5)-1 = x^3$$

$$\cancel{x^3} + 5x - 1 = \cancel{x^3}$$

$$x = \frac{1}{5}$$

730

$$\sqrt[3]{5x-1} = \sqrt[3]{x+4}$$

 $\left[\frac{5}{4}\right]$ 

↳ elevo al cubo

$$5x-1 = x+4$$

$$4x = 5$$

$$x = \frac{5}{4}$$

734

$$\sqrt[3]{x^2-x} = \sqrt{x}$$

 $\left[0; \frac{3+\sqrt{5}}{2}\right]$ 

$$\begin{cases} x^2 - x \geq 0 \\ (x^2 - x)^2 = x^3 \end{cases}$$

$$\begin{matrix} x=0 & x=1 \\ \begin{cases} x(x-1) \geq 0 \\ x^4 + x^2 - 2x^3 - x^3 = 0 \end{cases} \end{matrix}$$

$$\begin{cases} x \leq 0 \vee x \geq 1 \\ x^4 - 3x^3 + x^2 = 0 \end{cases}$$

↳ elevo alla 6<sup>a</sup>

$$x^2(x^2-3x+1) = 0$$

$$x^2 = 0 \Rightarrow x = 0$$

∨

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

$$x = \frac{3 \pm \sqrt{5}}{2} = \begin{cases} \frac{3-\sqrt{5}}{2} \text{ N.A.C.} \\ \frac{3+\sqrt{5}}{2} \text{ perché } \\ \text{compreso} \\ \text{tra } 0 \text{ e } 1 \end{cases}$$

$$\Delta = 9 - 4 = 5$$

$$x = 0 \vee x = \frac{3+\sqrt{5}}{2}$$