N° 665

$$x(x - 2\sqrt{2}) = (x - \sqrt{2})(x + 2\sqrt{2})$$

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

$$-2\sqrt{2}\,x - 2\sqrt{2}\,x + \sqrt{2}\,x = -4$$

$$-4\sqrt{2}\,x + \sqrt{2}\,x = -4$$

$$-3\sqrt{2}\,x = -4$$

$$x = \frac{-4}{-3\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\cancel{4}^2\sqrt{2}}{\cancel{6}_3} = \frac{2\sqrt{2}}{3}$$

670 $\dfrac{x}{\sqrt{5}+1} + \dfrac{1}{\sqrt{5}-1} = x(\sqrt{5}+1)$

si può risolvere velocemente come $4 \cdot (\sqrt{5}+1)$

$$\frac{x(\sqrt{5}-1) + \sqrt{5}+1}{(\sqrt{5}+1)(\sqrt{5}-1)} = \frac{x(\sqrt{5}+1)^2(\sqrt{5}-1)}{(\sqrt{5}+1)(\sqrt{5}-1)}$$

$5 - 1 = 4$

$$\sqrt{5}\,x - x + \sqrt{5} + 1 = x\,(\overset{6}{\overbrace{5+1}} + 2\sqrt{5})(\sqrt{5}-1)$$

$$\sqrt{5}\,x - x + \sqrt{5} + 1 = x(6\sqrt{5} - 6 + 10 - 2\sqrt{5})$$

$$\sqrt{5}\,x - x + \sqrt{5} + 1 = x(4\sqrt{5} + 4)$$

$$\sqrt{5}\,x - x + \sqrt{5} + 1 = 4\sqrt{5}\,x + 4x$$

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

$$\sqrt{5}x - x - 4\sqrt{5}x - 4x = -\sqrt{5} - 1$$

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

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

$$x(3\sqrt{5} + 5) = \sqrt{5} + 1$$

$$x = \frac{\sqrt{5} + 1}{3\sqrt{5} + 5} \cdot \frac{3\sqrt{5} - 5}{3\sqrt{5} - 5} = \frac{15 - 5\sqrt{5} + 3\sqrt{5} - 5}{\underset{(3\sqrt{5})^2 - 5^2}{45 - 25}} =$$

$$= \frac{10 - 2\sqrt{5}}{20} = \frac{\overset{1}{\cancel{2}}(5 - \sqrt{5})}{\underset{10}{\cancel{20}}} =$$

$$= \boxed{\frac{5 - \sqrt{5}}{10}}$$

674 $\dfrac{1}{x^2-2} + \dfrac{1}{x^2-2x\sqrt{2}+2} = \dfrac{2}{x^2+2x\sqrt{2}+2}$

$\underbrace{(x-\sqrt{2})(x+\sqrt{2})}$ $\qquad (x-\sqrt{2})^2 \qquad\qquad (x+\sqrt{2})^2$

$$\frac{\overbrace{\underbrace{x^2-2}_{(x-\sqrt{2})(x+\sqrt{2})}} + (x+\sqrt{2})^2}{(x-\sqrt{2})^2(x+\sqrt{2})^2} = \frac{2(x-\sqrt{2})^2}{(x-\sqrt{2})^2(x+\sqrt{2})^2}$$

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

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

$$2\sqrt{2}x + 4\sqrt{2}x = 4$$

$$6\sqrt{2}x = 4$$

$$x = \frac{4}{6\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}} = \frac{\overset{1}{\cancel{4}}\sqrt{2}}{\underset{3}{\cancel{12}}} = \frac{\sqrt{2}}{3} \qquad \text{dopo controllo CE}$$

676 $\dfrac{1}{x^3 - 3x^2\sqrt{2} + 6x - 2\sqrt{2}} = \dfrac{x}{x^2 - 2x\sqrt{2} + 2} + \dfrac{1}{\sqrt{2} - x}$ C.E.

$\quad\quad\quad (x-\sqrt{2})^3 \quad\quad\quad\quad\quad (x-\sqrt{2})^2$ $x \neq \sqrt{2}$

$$\frac{1}{(x-\sqrt{2})^3} = \frac{x(x-\sqrt{2}) - (x-\sqrt{2})^2}{(x-\sqrt{2})^3}$$

$$1 = x^2 - \sqrt{2}\,x - (x^2 - 2\sqrt{2}\,x + 2)$$

$$1 = x^2 - \sqrt{2}\,x - x^2 + 2\sqrt{2}\,x - 2$$

$$\sqrt{2}\,x - 2\sqrt{2}\,x = -2 - 1$$

$$\frac{-\sqrt{2}\,x}{-\sqrt{2}} = \frac{-3}{-\sqrt{2}}$$

$$x = \frac{3}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{3\sqrt{2}}{2} \quad\quad \text{dopo controllo C.E.}$$