Operazioni tra radicali

(1) Potenza di un radicale : $\left(\sqrt[n]{a}\right)^p = \sqrt[n]{a^p}$

(2) Radice di un radicale : $\sqrt[m]{\left(\sqrt[n]{a}\right)} = \sqrt[n \cdot m]{a}$

Andrebbero dimostrate ma siete salvi
Grazie Luca
(Applauso)

(3) Somma algebrica :▷ $k_1 \sqrt[n]{a} + k_2 \sqrt[n]{a} = (k_1 + k_2) \sqrt[n]{a}$

▷ $k_1 \sqrt[n]{a} + k_2 \sqrt[m]{b}$ Non si fa niente

Warning : la somma tra radicali ha senso (si fa come sopra) solo se i radicali sono uguali. In quel caso si fa la somma tra i coefficienti

Esempi :▷ $\left(\sqrt[5]{3}\right)^4 = \sqrt[5]{3^4} = \sqrt[5]{81}$

▷ $\sqrt{\sqrt{8}} = \sqrt[4]{8}$

▷ $\sqrt{\sqrt{7}} + 3\sqrt{7} - 2\left(\sqrt[4]{7}\right)^2 + \sqrt[4]{7}$

$\sqrt[4]{7} + 3\sqrt{7} - \underbrace{2\sqrt[4]{7^2}}_{\text{Propr. inv}} + \sqrt[4]{7}$

$2\sqrt[4]{7} + 3\sqrt{7} - 2\sqrt{7}$

$2\sqrt[4]{7} + \sqrt{7}$ Non posso fare altro perché i radicali sono diversi

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265 $\sqrt{2} + 3\sqrt{2} - 5\sqrt{2} = -\sqrt{2}$

$\dfrac{\sqrt{2^2 \cdot 2}}{\sqrt{5^2}} = \dfrac{\sqrt{2^2} \cdot \sqrt{2}}{\sqrt{5^2}} = \dfrac{2}{5}\sqrt{2}$

$2^2 \cdot 2$

274 $\sqrt{\dfrac{8}{25}} - \dfrac{1}{2}\sqrt{18} - \sqrt{\dfrac{2}{9}} = \sqrt{\dfrac{2^3}{5^2}} - \dfrac{1}{2}\sqrt{2 \cdot 3^2} - \sqrt{\dfrac{2}{3^2}}$

$= \dfrac{2}{5}\sqrt{2} - \dfrac{3}{2}\sqrt{2} - \dfrac{1}{3}\sqrt{2} = \dfrac{12 - 45 - 10}{30}\sqrt{2} = -\dfrac{43}{30}\sqrt{2}$

$= \dfrac{\sqrt{2}}{3}$

279 $8\sqrt{a} - \sqrt{\frac{a}{4}} - \sqrt{49a} + \frac{1}{2}\sqrt{a} =$

$\sqrt{\frac{a}{4}} = \frac{\sqrt{a}}{\sqrt{4}} = \frac{\sqrt{a}}{2}$

$8\sqrt{a} - \frac{\sqrt{a}}{2} - 7\sqrt{a} + \frac{1}{2}\sqrt{a} = \frac{16\sqrt{a} - \cancel{\sqrt{a}} - 14\sqrt{a} + \cancel{\sqrt{a}}}{2} = \sqrt{a}$

C.E.
$a \geq 0$
Bravo
Federico

280: $(\sqrt{7}+\sqrt{5})(\sqrt{7}-1) - \sqrt{35} + \sqrt{80} - [(1+\sqrt{5})-\sqrt{7}] =$

$7 - \cancel{\sqrt{7}} + \cancel{\sqrt{35}} - \sqrt{5} - \cancel{\sqrt{35}} + 4\sqrt{5} - 1 - \sqrt{5} + \cancel{\sqrt{7}} =$

$6 + 2\sqrt{5}$

305: $\sqrt{x^3 - 2x^2 + x} + \sqrt{x^3 + 6x^2 + 9x}$

C.E. $\begin{cases} x^3 - 2x^2 + x \geq 0 \\ x^3 + 6x^2 + 9x \geq 0 \end{cases}$

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

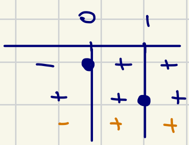
$\begin{cases} x(x-1)^2 \geq 0 \\ x(x+3)^2 \geq 0 \end{cases}$

$|x-1| \cdot \sqrt{x} + |x+3| \cdot \sqrt{x} =$

$\left(|x-1| + |x+3|\right)\sqrt{x}$

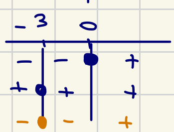
C.E.

$[|x-1| + x+3]\sqrt{x}$



(I) $f_1 \geq 0 \quad x \geq 0$ $\qquad x \geq 0$

$f_2 \geq 0 \quad (x-1)^2 \geq 0 \quad \forall x \in \mathbb{R}$



(II) $x \geq 0$ $\qquad x \geq 0$

$(x+3)^2 \geq 0 \quad \forall x \in \mathbb{R}$ $\qquad x = -3$

$\begin{cases} x \geq 0 \\ x \geq 0 \vee x = -3 \end{cases} \rightsquigarrow \boxed{x \geq 0}$

Caso 1: $x-1 \geq 0$, $x \geq 1$

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

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

Caso 2: $x-1 \leq 0$ $\quad 0 \leq x \leq 1$ $\quad (-x+1+x+3)\sqrt{x} = 4\sqrt{x}$