Problema: $AL0036$ **- Algebra letterale**

Testo *[AL0036]* [2 2 1] Semplifica le seguenti espressioni.

(a) $\sqrt{\dfrac{x+y}{x-y}-\dfrac{x-y}{x+y}}\cdot\sqrt{\dfrac{1}{1-\dfrac{y-x}{x+y}}}\cdot\sqrt[6]{\dfrac{(x-y)^2}{3x}}$

(b) $\dfrac{x\sqrt{y}}{x+y}\sqrt{\dfrac{y^2+xy}{x^2}}-\sqrt{\dfrac{x^2}{x+y}}\cdot\dfrac{2\sqrt{x^2y+y^3+2xy^2}}{\sqrt{4x^2y}}$

(c) $\sqrt[6]{\dfrac{x^2}{x+y}}\cdot\sqrt[6]{\dfrac{(x+y)^3}{y^2}}\cdot\sqrt[3]{\dfrac{y}{x(x+y)}}\cdot\sqrt[4]{\dfrac{y(x+y)}{x}}\cdot\sqrt[4]{\dfrac{x}{y}}$

Spiegazione In questo esercizio devi riconoscere ed usare i prodotti notevoli ed utilizzare le regole dei radicali.

Svolgimento Qui di seguito le soluzioni degli esercizi proposti

(a)

$$\sqrt{\frac{x+y}{x-y}-\frac{x-y}{x+y}}\cdot\sqrt{\frac{1}{1-\frac{y-x}{x+y}}}\cdot\sqrt[6]{\frac{(x-y)^2}{3x}}$$

$$\sqrt{\frac{(x+y)^2-(x-y)^2}{(x-y)(x+y)}}\cdot\sqrt{\frac{x+y}{x+y-y+x}}\cdot\sqrt[6]{\frac{(x-y)^2}{3x}}$$

$$\sqrt{\frac{(x+y+x-y)(x+y-x+y)}{(x-y)(x+y)}}\cdot\sqrt{\frac{x+y}{2x}}\cdot\sqrt[6]{\frac{(x-y)^2}{3x}}$$

$$\sqrt{\frac{4xy}{(x-y)(x+y)}}\cdot\sqrt{\frac{x+y}{2x}}\cdot\sqrt[6]{\frac{(x-y)^2}{3x}}$$

$$\sqrt{\frac{4xy}{(x-y)(x+y)}\cdot\frac{x+y}{2x}}\cdot\sqrt[6]{\frac{(x-y)^2}{3x}}$$

$$\sqrt{\frac{2y}{(x-y)}}\cdot\sqrt[6]{\frac{(x-y)^2}{3x}}$$

$$\sqrt[6]{\frac{8y^3}{(x-y)^3}}\cdot\sqrt[6]{\frac{(x-y)^2}{3x}}$$

$$\sqrt[6]{\frac{8y^3}{3x(x-y)}}$$

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(b)

$$\sqrt{x^2y\frac{y(y+x)}{x^2(x+y)^2}}-\sqrt{\frac{x^2}{x+y}}\cdot\frac{2\sqrt{y(x+y)^2}}{2\sqrt{x^2y}}$$

$$\sqrt{\frac{y^2}{(x+y)}}-\sqrt{\frac{x^2}{x+y}}\cdot\frac{\sqrt{y(x+y)^2}}{\sqrt{x^2y}}$$

$$\sqrt{\frac{y^2}{(x+y)}}-\sqrt{\frac{x^2}{x+y}}\frac{y(x+y)^2}{x^2y}$$

$$\sqrt{\frac{y^2}{(x+y)}}-\sqrt{x+y}$$

$$\sqrt{\frac{y^2(x+y)}{(x+y)^2}}-\sqrt{x+y}$$

$$\sqrt{x+y}\left(\frac{y}{x+y}-1\right)$$

$$-\frac{x}{x+y}\sqrt{x+y}$$

$$-\frac{x}{\sqrt{x+y}}$$

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(c)

$$\sqrt[6]{\frac{x^2}{x+y}}\cdot\sqrt[6]{\frac{(x+y)^3}{y^2}}\cdot\sqrt[3]{\frac{y}{x(x+y)}}\cdot\sqrt[4]{(x+y)}$$

$$\sqrt[6]{\frac{x^2}{x+y}\cdot\frac{(x+y)^3}{y^2}\cdot\frac{y^2}{x^2(x+y)^2}}\cdot\sqrt[4]{(x+y)}$$

$$\sqrt[4]{(x+y)}$$

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