

RADICACIÓN

Problema 59:

Simplifica:

$$\left(\frac{x^{(a-1)\cdot(a+1)}}{x^{2a} \cdot x^{-1}}\right)^{\frac{1}{a}} \div \left(\frac{x^{a+b}}{x^b}\right)^a \cdot \left(\frac{x^{b-a}}{x^b}\right)^{a-b}$$

Solución Problema 59:

$$\begin{aligned} \left(\frac{x^{(a-1)\cdot(a+1)}}{x^{2a} \cdot x^{-1}}\right)^{\frac{1}{a}} \div \left(\frac{x^{a+b}}{x^b}\right)^a \cdot \left(\frac{x^{b-a}}{x^b}\right)^{a-b} &= \left(\frac{x^{a^2-1}}{x^{2a} \cdot x^{-1}}\right)^{\frac{1}{a}} \div \left(\frac{x^a \cdot \cancel{x^b}}{\cancel{x^b}}\right)^a \cdot \left(\frac{\cancel{x^b} \cdot x^{-a}}{\cancel{x^b}}\right)^{a-b} = \left(\frac{x^{a^2-1}}{x^{2a} \cdot x^{-1}}\right)^{\frac{1}{a}} \div (x^a)^a \cdot (x^{-a})^{a-b} = \\ &= \left(\frac{x^{a^2} \cdot \cancel{x^{-1}}}{x^{2a} \cdot \cancel{x^{-1}}}\right)^{\frac{1}{a}} \div x^{a^2} \cdot (x^{-a})^{a-b} = \left(\frac{x^{a^2}}{x^{2a}}\right)^{\frac{1}{a}} \div x^{a^2} \cdot (x^{-a})^{a-b} = \left(\frac{x^{\frac{a^2}{a}}}{x^{\frac{2a}{a}}}\right) \div x^{a^2} \cdot (x^{-a})^{a-b} = \frac{x^a}{x^2} \div x^{a^2} \cdot (x^{-a})^{a-b} = \end{aligned}$$

$$\frac{x^a}{x^2} \div x^{a^2} \cdot x^{-a^2+ab} = \frac{x^a}{x^2} \div \cancel{x^{a^2}} \cdot \cancel{x^{-a^2}} \cdot x^{ab} = \frac{x^a}{x^2} \div x^{ab} = \frac{x^a}{x^2 \cdot x^{ab}} = \frac{\cancel{x^a}}{x^2 \cdot \cancel{x^a} \cdot x^b} = \frac{1}{x^2 \cdot x^b} = \frac{1}{x^{2+b}}$$

Luego,

$$\left(\frac{x^{(a-1)\cdot(a+1)}}{x^{2a} \cdot x^{-1}}\right)^{\frac{1}{a}} \div \left(\frac{x^{a+b}}{x^b}\right)^a \cdot \left(\frac{x^{b-a}}{x^b}\right)^{a-b} = \frac{1}{x^{2+b}}$$