Quotient Property for Radicals

If $\sqrt[n]{a}$ and $\sqrt[n]{b}$ are real numbers, where b $\neq$ 0, and n is a positive integer greater than 1,

then $\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}$

Concept: The *n*th root of a quotient can be written as the *n*th root of the numerator divided by the *n*th root of the denominator.

$$\sqrt{\frac{144x^2}{36y^2}} = \frac{\sqrt{144x^2}}{\sqrt{36y^2}} = \frac{12x}{6y} = \frac{2x}{y} \qquad \frac{\sqrt{72}}{\sqrt{2}} = \sqrt{\frac{72}{2}} = \sqrt{36} = 6$$

TRY:

$$\sqrt[3]{\frac{a^3b^4}{125}}$$

$$\sqrt[4]{\frac{x^5y^4}{z^{12}}}$$

$$\sqrt[4]{\frac{a^7b}{81c^{16}}}$$

$$\sqrt[3]{\frac{-27y^{36}}{1000}}$$