7.4C Dividing Radicals

A. Method

We use the "root of a fraction rule" in reverse to start the problem.

B. Examples

Example 1:   Simplify $\dfrac{\sqrt{15xy}}{\sqrt{3y}}$.

Solution

$$\frac{\sqrt{15xy}}{\sqrt{3y}} = \sqrt{\frac{15xy}{3y}}$$

Ans $\boxed{\sqrt{5x}}$

Example 2:   Simplify $\dfrac{\sqrt{8x^5y^3}}{\sqrt{18x^2yz^2}}$.

Solution

$$\frac{\sqrt{8x^5y^3}}{\sqrt{18x^2yz^2}} = \sqrt{\frac{8x^5y^3}{18x^2yz^2}}$$

Thus we have

$$\sqrt{\frac{4x^3y^2}{9z^2}}$$

Now convert back:

$$\frac{\sqrt{4x^3y^2}}{\sqrt{9z^2}}$$

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Simplifying the radicals, we have

Ans $\boxed{\dfrac{2xy\sqrt{x}}{3z}}$

Example 3:   Simplify $\dfrac{\sqrt[3]{135a^{11}b^2c^3}}{\sqrt[3]{40a^2b^5c}}$.

Solution

$$\frac{\sqrt[3]{135a^{11}b^2c^3}}{\sqrt[3]{40a^2b^5c}} = \sqrt[3]{\frac{135a^{11}b^2c^3}{40a^2b^5c}}$$

Using the quotient rule on the inside, we get

$$\sqrt[3]{\frac{27a^9b^{-3}c^2}{8}}$$

Getting rid of the negative exponent, we get

$$\sqrt[3]{\frac{27a^9c^2}{8b^3}}$$

Now convert back:

$$\frac{\sqrt[3]{27a^9c^2}}{\sqrt[3]{8b^3}}$$

Now simplify each radical to get

Ans $\boxed{\dfrac{3a^3\sqrt[3]{c^2}}{2b}}$