8-2 Multiplying and Dividing Radical Expressions

Product Property of Radicals

If $\sqrt[n]{a}$ and $\sqrt[n]{b}$ are real numbers, and $n \ge 2$ is an integer, then

$$\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$$

Simplify

$$\sqrt{5} \cdot \sqrt{3}$$

$$\sqrt{5 \cdot 3} = \sqrt{15}$$

$$\sqrt[3]{2} \cdot \sqrt[3]{13}$$

$$\sqrt{11} \cdot \sqrt{7}$$

Multiply

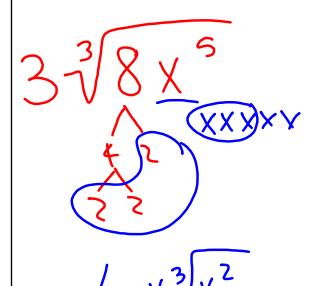
$$\sqrt[5]{6c} \cdot \sqrt[5]{7c^2}$$

$$\sqrt[7]{5p} \cdot \sqrt[7]{4p^3}$$

Multiply and Simplify. Assume all variables are greater than zero.

$$3\sqrt[3]{4x}\cdot\sqrt[3]{2x^4}$$

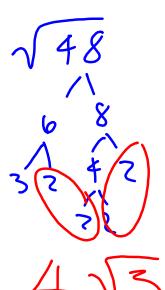
$$\sqrt[4]{27a^2b^5} \cdot \sqrt[4]{6a^3b^6}$$



Multiply and Simplify. Don't forget to look for absolute value!

$$\sqrt{6} \cdot \sqrt{8}$$

$$4\sqrt[3]{8a^2b^5}\cdot\sqrt[3]{6a^2b^4}$$



Quotient Property of Radicals

If $\sqrt[n]{a}$ and $\sqrt[n]{b}$ are real numbers, $b \neq 0$, $n \geq 2$ is an integer, then

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

Simplify the following radicals
$$\sqrt{\frac{18}{25}}$$

$$\sqrt[3]{\frac{6z^3}{125}}$$

$$\sqrt[3]{\frac{4}{81b^4}}$$

$$\sqrt[4]{\frac{10a^2}{81b^4}}$$

$$\sqrt[3]{\frac{6z^3}{125}}$$

$$\sqrt[3]{\frac{4}{10a^2}}$$

$$\sqrt[3]{\frac{6z^3}{125}}$$

$$\sqrt[3]{\frac{10a^2}{31b^4}}$$

$$\sqrt[3]{\frac{6z^3}{125}}$$

$$\sqrt[3]{\frac{10a^2}{31b^4}}$$

Simplify the following radicals

$$\sqrt{\frac{13}{49}} = \sqrt{\frac{13}{13}}$$

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$$\sqrt{\frac{13}{49}} = \sqrt{\frac{13}{13}}$$

$$\sqrt{\frac{13}{49}} = \sqrt{\frac{13}{16}}$$

Simplify assuming all variables are greater than or equal to zero.

$$\frac{\sqrt{24a^3}}{\sqrt{6a}}$$

$$\frac{-2\sqrt[3]{54a}}{\sqrt[3]{2a^4}}$$

$$\sqrt{\frac{24a^3}{6a^4}}$$

$$-2\sqrt[3]{54a^4}$$

$$-2\sqrt[3]{\frac{54a^4}{2a^4}}$$

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

$$-2\sqrt[3]{2a^4}$$

Simplify and assume all variables are greater than zero.

$$\frac{\sqrt{12a^5}}{\sqrt{3a}}$$

$$\sqrt{4a^4}$$

$$\sqrt{2a^2}$$

$$\frac{\sqrt[3]{-24x^2}}{\sqrt[3]{3x}}$$

$$\sqrt[3]{-8} \times = -2\sqrt[3]{x}$$

Rationalize the following

$$\frac{1}{\sqrt{3}}$$

$$\frac{\sqrt{5}}{\sqrt{8}}$$

$$\frac{5}{\sqrt{10x}}$$