

Topic: 5.2 Multiplying and Dividing Radicals

EQ: How do you multiply and divide nth root radicals?

**MUST HAVE SAME INDEX!!**

$$a^n \sqrt[n]{x} \cdot b^n \sqrt[n]{y} = a \cdot b^n \sqrt[n]{x \cdot y}$$

(add exponents)

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

(subtract exponents)

~~135 \* 2^3~~  
135 ÷ 3^3 = 5

$$-1 \sqrt[3]{9x^2y^2} \cdot 2 \sqrt[3]{15x^{15}y}$$

$$-1 \cdot 2 \sqrt[3]{9 \cdot 15 x^2 x^{15} y^2 y}$$

$$-2 \sqrt[3]{135 x^{17} y^3}$$

$$-2 \sqrt[3]{3 \cdot 5 \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y}$$

(x^3)^3

$$-2 \cdot 3 \cdot x \cdot x \cdot x \cdot x \cdot x \cdot y \sqrt[3]{5x^2}$$

$$-6x^5 y \sqrt[3]{5x^2}$$

$$\sqrt{11}(2\sqrt{11} - \sqrt{5})$$

$$2\sqrt{11}^2 - \sqrt{55}$$

$$2 \cdot 11 - \sqrt{55}$$

$$22 - \sqrt{55}$$

$$\frac{\sqrt{50x^6}}{\sqrt{2x^4}}$$

$$\sqrt{\frac{50x^6}{2x^4}} = \sqrt{25x^2}$$

$$= \sqrt{5^2 x^2}$$

$$5x$$

$$\frac{\sqrt[3]{12ab^3c^2}}{\sqrt[3]{10a^4bc}}$$

$$\sqrt[3]{\frac{12a^1b^3c^2}{10a^4b^1c^1}}$$

$$\sqrt[3]{\frac{6b^2c^1}{5a^3}}$$

$$\frac{1}{a} \sqrt[3]{\frac{6b^2c}{5}}$$

$$3^4 \sqrt[4]{18a^9} * \sqrt[4]{6ab^2}$$

$$3^4 \sqrt[4]{18 \cdot 6 a^9 a^1 b^2}$$

$$3^4 \sqrt[4]{108 (a^2)^4 a^2 b^2}$$

$$= 3 a^2 \sqrt[4]{108 a^2 b^2}$$

$$(7 + \sqrt{3})(1 - \sqrt{2})$$

$$7 - 7\sqrt{2} + \sqrt{3} - \sqrt{6}$$

$$\frac{4\sqrt{20ab}}{2\sqrt{45a^2b^3}}$$

## RATIONALIZE THE DENOMINATOR!

$$\frac{2-6\sqrt{10}}{10-\sqrt{5}}$$

$$\frac{9}{6+4\sqrt{2}}$$

$$\frac{\sqrt{6}-10\sqrt{2}}{\sqrt{17}}$$

$$\frac{8}{5\sqrt{2}+3\sqrt{6}}$$

**Summary:**