

Multiplying

Radical Expressions

Date: _____
 Quiz On: _____

After this lesson and practice, I will be able to ...

- multiply radical expressions. (LT 3)

Warm Up: Simplify each expression. Assume all variables are positive (this means that you do not need to use _____ in the simplified expression).

A) $\sqrt{50x^5}$

B) $\sqrt[3]{54n^8}$

Multiplying Radical Expressions (LT 3)

In your studies this year, you have already learned several properties of multiplying and dividing square roots. These same properties can be used to multiply and divide any radical expression.

Property 1: Multiplying Radical Expressions – If $\sqrt[n]{a}$ and $\sqrt[n]{b}$ are real numbers, then $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$
Cannot use this property if the indexes don't match

Example 2: Multiply. Simplify if possible. Assume all variables are positive.

A) $\sqrt{2} \cdot \sqrt{8}$
 $\sqrt{16}$
 $\boxed{4}$

B) $\sqrt[3]{-5} \cdot \sqrt[3]{25}$
 $\sqrt[3]{-125}$
 $\boxed{-5}$

C) $\sqrt[3]{25xy^8} \cdot \sqrt[3]{5x^4y^3}$
 $\sqrt[3]{25 \cdot 5x \cdot x^4 y^8 y^3}$
 $\sqrt[3]{125x^5y^{11}}$
 $\sqrt[3]{5 \cdot 5 \cdot 5 x \cdot x \cdot x \cdot x \cdot x y \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y}$
 $5xy^3 \sqrt[3]{x^2y^2} = \boxed{5xy^3 \sqrt[3]{x^2y^2}}$

Example 3: Simplify each radical expression. Assume all variables are positive.

A) $\sqrt{3} \cdot \sqrt{27}$
 $\sqrt{81}$
 $\boxed{9}$

B) $\sqrt[3]{3} \cdot \sqrt[3]{-9}$
 $\sqrt[3]{-27}$
 $\boxed{-3}$

C) $\sqrt[3]{54x^2y^3} \cdot \sqrt[3]{5x^3y^4}$
 $\sqrt[3]{54 \cdot 5x^2 \cdot x^3 y^3 y^4}$
 $\sqrt[3]{270x^5y^7}$
 $\sqrt[3]{2 \cdot 3 \cdot 3 \cdot 3 \cdot 5 x \cdot x \cdot x \cdot x \cdot x y \cdot y \cdot y \cdot y \cdot y}$
 $3xy^2 \sqrt[3]{10x^2y} = \boxed{3xy^2 \sqrt[3]{10x^2y}}$