

Lesson 6.3 Binomial Radical Expressions (Clickers)

Essential Understanding: You can combine like radicals using properties of real numbers.

Property Combining Radical Expressions: Sums and Differences

Use the Distributive Property to add or subtract like radicals.

$$a\sqrt[n]{x} + b\sqrt[n]{x} = (a + b)\sqrt[n]{x}$$

$$a\sqrt[n]{x} - b\sqrt[n]{x} = (a - b)\sqrt[n]{x}$$

Ex. What is the simplified form of each expression?

a. $3\sqrt{5x} - 2\sqrt{5x}$ b. $6x^2\sqrt{7} + 4x\sqrt{5}$ c. $12\sqrt[3]{7xy} - 8\sqrt[5]{7xy}$

1 Simplify:

$$7\sqrt[3]{5} - 4\sqrt[3]{5}$$

2 Simplify:

$$6\sqrt[5]{2x} + 2\sqrt[3]{2x}$$

Ex. Simplify: $\sqrt{12} + \sqrt{75} - \sqrt{3}$

Ex. Simplify: $(4 + 2\sqrt{2})(5 + 4\sqrt{2})$

A conjugate is when the binomials are the same but their signs are different. Multiplying conjugates cancels the 'outside', 'inside' terms of FOIL.

Ex. $(5 - \sqrt{7})(5 + \sqrt{7})$

3 Simplify:

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

4 Simplify:

$$(3 + \sqrt{5})(1 + \sqrt{5})$$

Rationalizing the denominator of a radical expressions means getting the radical out of the denominator.

Ex. Rationalize the denominator.

a. $\frac{\sqrt{x}}{\sqrt{2}}$

b. $\frac{\sqrt{5}}{\sqrt{8x}}$

5 Rationalize the denominator: $\frac{\sqrt{5}}{\sqrt{3}}$

6 Rationalize the denominator:

$$\frac{\sqrt{7}}{\sqrt{3x}}$$