

By the end of the lesson, we will be able to:

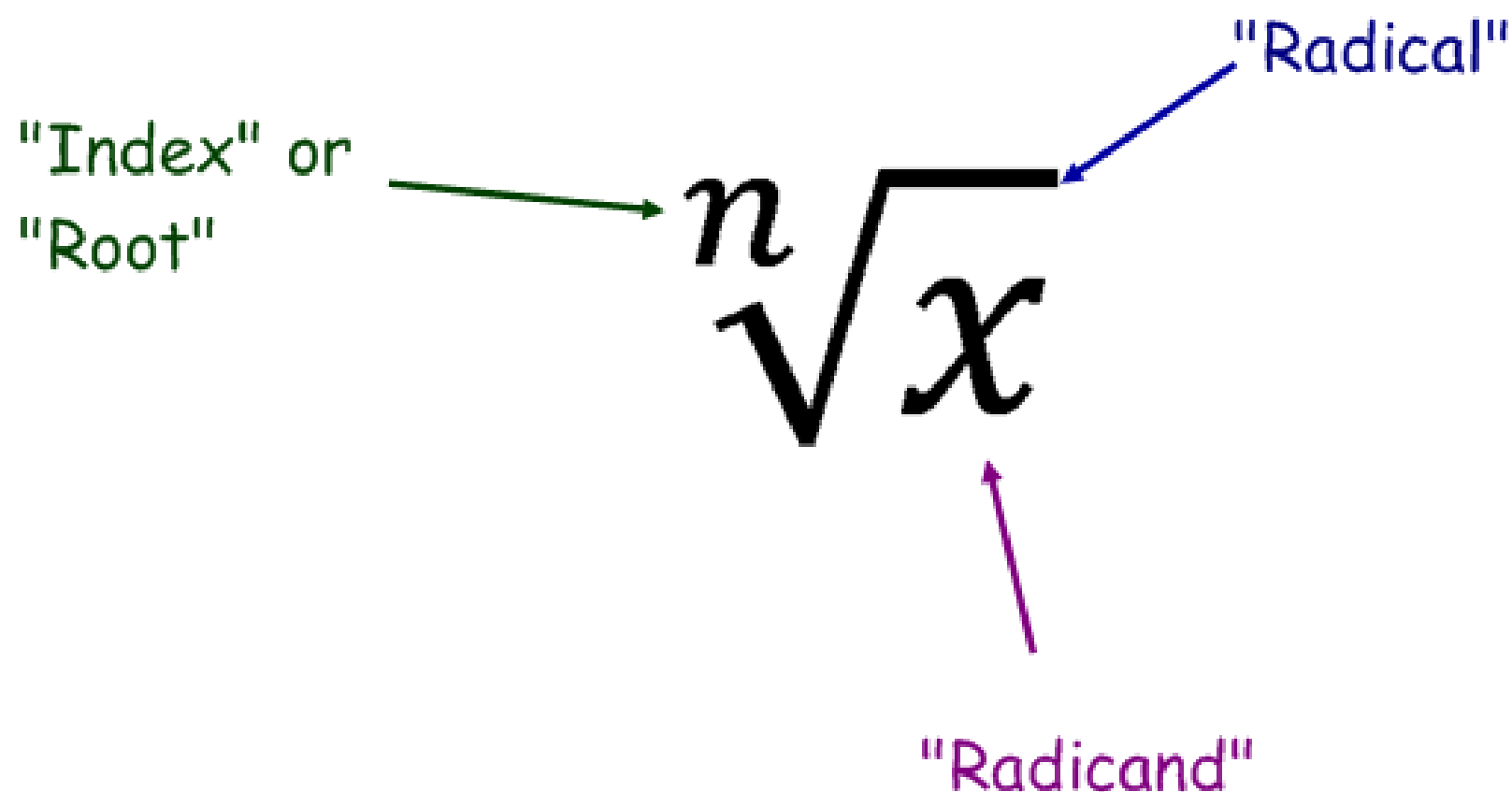
- ~Simplify Radical Expressions

- ~Add, Subtract, and Multiply Radical Expressions

Simplifying Radical Expressions

Simplifying radical expressions is similar to simplifying polynomials. You can **add**, **subtract**, and **multiply** using similar rules and procedures.

Parts of a Radical:



Adding and Subtracting Radicals

In order to add or subtract radicals, they must be like radicals.

This means that they must have the same **radicand** and **index**. The coefficient may be different.

To add like radicals, just add the coefficients (as if you were adding like terms.)

Sometimes radicals must be simplified first before you can tell if they are like radicals.

Lesson 21: Roots of Real Numbers & Radical Expressions

Like radicals:

$$2\sqrt{5} \quad \text{and} \quad 7\sqrt{5} \quad \text{and} \quad \sqrt{5}$$

$$3\sqrt{2x} \quad \text{and} \quad 8\sqrt{2x} \quad \text{and} \quad -\sqrt{2x}$$

Unlike radicals:

$$2\sqrt{5} \quad \text{and} \quad 5\sqrt{2}$$

$$2\sqrt{3} \quad \text{and} \quad 2\sqrt{13}$$

$$5\sqrt{x} \quad \text{and} \quad \sqrt{5x}$$

$$4\sqrt{5} \quad \text{and} \quad 4\sqrt[3]{5}$$

Example 1 ~ Simplify:

a.) $2\sqrt{5} + 7\sqrt{5} + \sqrt{5}$

b.) $9 + 9\sqrt{10} - 2\sqrt{10}$

Example 1 ~ Simplify:

c.) $9\sqrt{2} - 8\sqrt{3} - 2\sqrt{2} + \sqrt{3}$ d.) $19 - \sqrt{19} + 2 - \sqrt{2}$

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Example 1 ~ Simplify:

e.) $\sqrt{200} + \sqrt{98}$

f.) $\sqrt[3]{40} + \sqrt[3]{135} + \sqrt[3]{36}$

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Example 1 ~ Simplify:

$$g.) \quad 3\sqrt{27} - 7\sqrt{3} - \sqrt{12} \quad h.) \quad 5\sqrt{6} - 3\sqrt{24} + \sqrt{150}$$

Multiplying Radicals

Multiplying radicals is similar to multiplying monomials and polynomials. You do not need like radicals to multiply, but the index **MUST** be the same.

The coefficients are multiplied, and the radicands are multiplied.

Be sure to simplify at the end.

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Example 2 ~ Simplify:

a.) $3\sqrt{5} \cdot 10\sqrt{15}$

b.) $12\sqrt{3} \cdot \sqrt{7}$

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Example 2 ~ Simplify:

c.) $4\sqrt{10} \cdot 5\sqrt{10}$

d.) $\sqrt[4]{4t^3} \cdot \sqrt[4]{8t^2v^5}$

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Example 2 ~ Simplify:

e.) $\sqrt{10x^2y} \cdot \sqrt{40xy^3}$

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By the end of the lesson, we will be able to:

- ~Simplify Radical Expressions

- ~Add, Subtract, and Multiply Radical Expressions

Can you do these things?

Homework:

Assignment 21
&
Review Test 5 worksheet!!