

p. 10-11 Simplifying Radicals w/Distribution

6.3

Get new multiplication table from green bin and glue onto inside front cover of notebook.

6.3 Simplifying Radicals using Distributive Property

a. I can define like radicals.

b. I can use the Distributive Property to add and subtract radical expressions

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Warm-up: Fill in the blanks

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$$a(b + c) = \underline{ab} + \underline{ac}$$

Then simplify.

1. $2x(3x + 7)$

$6x^2 + 14x$

2. $4(8x - 2y)$

$32x - 8y$

We have discussed how to [multiply radicals](#)...

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

In order to simplify radical expressions by distributing, we must also know how to [add and subtract radicals](#)...

Adding/Subtracting Radicals

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You can only combine like terms

Like terms have exactly the same radicand and index, but may have different coefficient

Practice: Draw a line to match the like radicals

$-3\sqrt{7}$ $\sqrt[3]{7}$
 $2\sqrt{18}$ $2\sqrt[3]{20}$
 $4\sqrt[3]{7}$ $4\sqrt{7}$
 $\sqrt[3]{20}$ $3\sqrt{18}$

Adding/Subtracting Radicals

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Combine like radicals as you would other like terms:

- Combine the coefficients
- Keep the same radical

$$1) \quad 2\sqrt{5} + 7\sqrt{5} - 3\sqrt{6}$$

$$9\sqrt{5} - 3\sqrt{6}$$

$$2) \quad -10\sqrt[3]{2} - 10\sqrt[3]{7} + \sqrt[3]{2}$$

$$-9\sqrt[3]{2} - 10\sqrt[3]{7}$$

Let's put it all together...

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Simplify by Distributing

Step 1 - Write as the sum of two products

Step 2 - Simplify the products, if necessary

Step 3 - Combine Like Radicals, if necessary

$$3) \quad 3\sqrt{5}(\sqrt{2} + 2\sqrt{8})$$

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

$$3\sqrt{10} + 12\sqrt{10}$$

$$15\sqrt{10}$$

Simplify the following by Distributing

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$$4) \quad 3\sqrt{10}(\sqrt{2} + 5\sqrt{8})$$

$$3\sqrt{10 \cdot 2} + 15\sqrt{10 \cdot 8}$$

$$\begin{array}{c} \text{5} \uparrow \text{2} \text{2} \\ \hline \end{array} \quad \begin{array}{c} \text{5} \uparrow \text{2} \text{2} \text{4} \\ \hline \text{2} \text{2} \end{array}$$

$$6\sqrt{5} + 60\sqrt{5}$$

$$66\sqrt{5}$$

Simplify the following by Distributing

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$$5) \quad -10\sqrt{5}(\sqrt{15} + \sqrt{10})$$

$$-10\sqrt{5 \cdot 15} - 10\sqrt{5 \cdot 10}$$

$$\begin{array}{c} \text{5} \text{5} \text{3} \\ \hline \end{array} \quad \begin{array}{c} \text{5} \text{5} \text{2} \\ \hline \end{array}$$

$$-50\sqrt{3} - 50\sqrt{2}$$

Simplify the following by Distributing

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$$\begin{array}{l}
 6) \quad -3\sqrt{7}(5\sqrt{7} + \sqrt{6}) \\
 -15\sqrt{7 \cdot 7} - 3\sqrt{7 \cdot 6} \\
 \quad \quad \quad \begin{array}{c} \uparrow \quad \uparrow \\ 7 \quad 7 \end{array} \quad \quad \begin{array}{c} \uparrow \quad \uparrow \quad \wedge \\ 7 \quad 3 \quad 2 \end{array} \\
 -105 - 3\sqrt{42}
 \end{array}$$

Homework

Complete problems #1-4 by tomorrow

#5 - 16 will be completed during class tomorrow

Quiz on Thursday