

Lesson 11-1 pg 586

Simplifying Radical Expressions

What You'll Learn:

- Simplify radical expressions using the **Product Property of Square Roots** and the **Quotient Property of Square Roots**

Vocabulary:

radical expression

radicand

rationalizing the denominator

conjugate

radical expression - contains a square root

radicand

6 radicand

$$\sqrt{6}$$

$$\sqrt{40x^4y^5}$$

$40x^4y^5$ radicand

Product Property of Square Roots

$$\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}$$

$$\sqrt{4 \cdot 25} = \sqrt{4} \cdot \sqrt{25}$$
$$2 \cdot 5$$
$$10$$

Simplify Square Roots

$$\sqrt{52}$$

$$\sqrt{4} \cdot \sqrt{13}$$

$$2\sqrt{13}$$

Prime factor **or**
find the factors that
contain a perfect
square

$$\sqrt{2 \cdot 2 \cdot 13}$$
$$\sqrt{4 \cdot 13} \quad 2\sqrt{13}$$

$$\sqrt{12}$$

$$\sqrt{4} \cdot \sqrt{3}$$

$$2\sqrt{3}$$

$$\sqrt{90}$$

$$3\sqrt{10}$$

$$\sqrt{9} \cdot \sqrt{10}$$

Multiply Square Roots

$$\sqrt{2}$$

$$\sqrt{2} \cdot \sqrt{4} \cdot \sqrt{6}$$

$$2\sqrt{2} \cdot \sqrt{2} \cdot \sqrt{3}$$

$$2\sqrt{4} \cdot \sqrt{3}$$

$$2 \cdot 2 \cdot \sqrt{3}$$

$$4\sqrt{3}$$

$$\sqrt{7}$$

$$\sqrt{7} \cdot \sqrt{2} \cdot \sqrt{7}$$

$$7\sqrt{2}$$

$$\sqrt{48}$$

$$\sqrt{12} \sqrt{4}$$

$$2\sqrt{12}$$

$$2 \cdot 2\sqrt{3}$$

$$4\sqrt{3}$$

$$\sqrt{98}$$

$$\sqrt{2} \sqrt{49}$$

$$7\sqrt{2}$$

Multiply Square Roots

$$3\sqrt{12} \cdot 5\sqrt{6}$$

$$(3 \cdot 5)\sqrt{12} \cdot \sqrt{6}$$
$$\sqrt{4}\sqrt{3} \cdot \sqrt{2} \cdot \sqrt{3}$$

$$15 \cdot 2 \cdot 3\sqrt{2}$$

$$90\sqrt{2}$$

$$\alpha$$
$$15\sqrt{72}$$

$$15 \cdot \sqrt{4} \cdot \sqrt{8}$$

$$15 \cdot 3\sqrt{4} \cdot \sqrt{2}$$

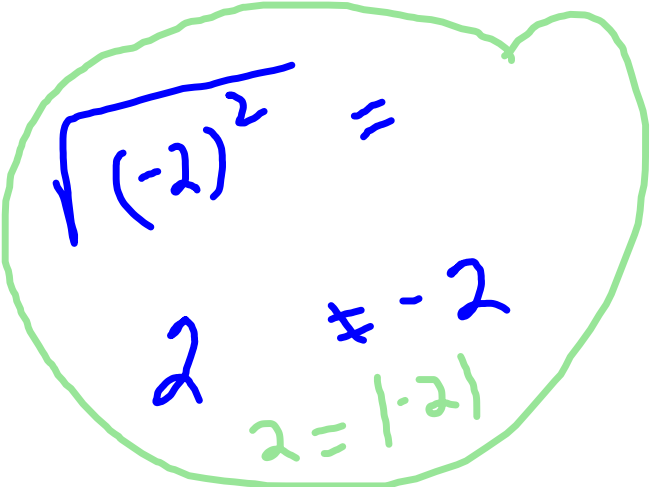
$$15 \cdot 3 \cdot 2\sqrt{2}$$

$$90\sqrt{2}$$

Simplify a Square Root with Variables

$$\sqrt{x} = |x|$$

?



A handwritten example is enclosed in a green oval. It shows the expression $\sqrt{(-2)^2}$ followed by an equals sign. Below this, the number 2 is written, with a blue asterisk and a minus sign next to it, indicating the result is 2, not -2. Below that, the equation $2 = |-2|$ is written in green.

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$$\sqrt{\mathbf{x}} = |x|$$

$$\sqrt{\mathbf{x}^3} = \sqrt{x^2} \cdot \sqrt{x}$$
$$|x| \cdot \sqrt{x}$$

$$\sqrt{\mathbf{x}^4} = \sqrt{x^2} \cdot \sqrt{x^2}$$
$$|x| \cdot |x|$$
$$x^2$$

$$\sqrt{\mathbf{x}^5}$$
$$\sqrt{x^4} \cdot \sqrt{x}$$
$$x^2 \cdot \sqrt{x}$$

$$*\sqrt{\mathbf{x}^6}$$
$$\sqrt{x^3} \cdot \sqrt{x^3}$$
$$|x^3|$$

$$\text{or } \sqrt{x^4} \cdot \sqrt{x^2}$$
$$x^2 \cdot |x|$$
$$|x^3|$$

EX:

$$\sqrt{45 a^4 b^5 c^6}$$

$$3\sqrt{5}$$
$$3a^2 \cdot b^2 \mid c^3 \mid \sqrt{5b}$$

$$\sqrt{a^4} = a^2$$
$$\sqrt{b^5} = \sqrt{b^4} \cdot \sqrt{b}$$
$$b^2 \cdot \sqrt{b}$$
$$\sqrt{c^6} = \sqrt{c^3} \cdot \sqrt{c^3}$$
$$\mid c^3 \mid$$

Ex 3 pg 587

40x y n

$$2\sqrt{2} \cdot \sqrt{5} \cdot x^2 \cdot y^2 \sqrt{y} \cdot \sqrt{n}/\sqrt{n}$$

$$\sqrt{x^4} = x^2$$

$$= x^2$$

$$\sqrt{y^4} \cdot \sqrt{y} = y^2 \cdot \sqrt{y}$$

$$2x^2 y^2 \sqrt{n} / \sqrt{10yn}$$

$$\sqrt{n^3}$$

$$\sqrt{n^2} \cdot \sqrt{n}$$

$$\sqrt{n} / \sqrt{n}$$

End of Day 1
Finish Study guide 11-1 &
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