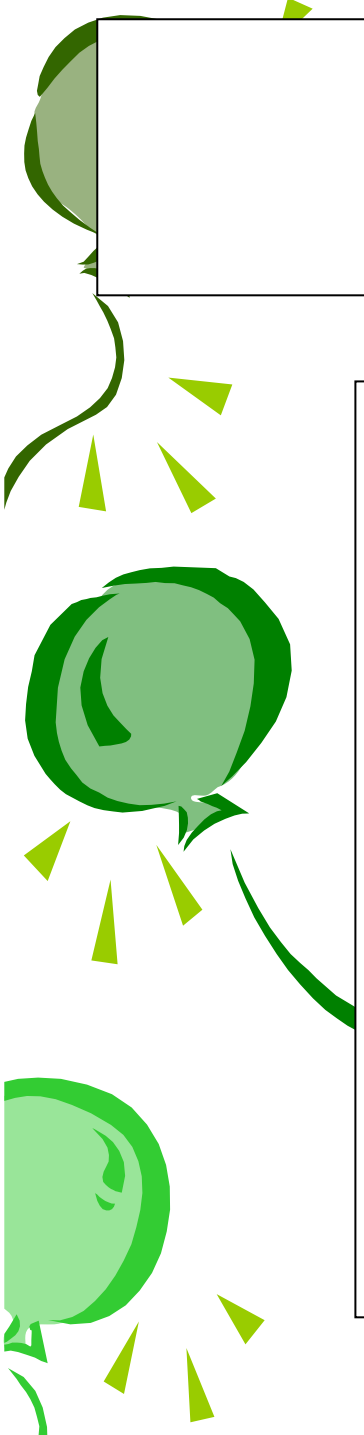
Algebra I

Operations with Radical Expressions

What You'll Learn Why It's Important

- To simplify radical expressions involving addition, subtraction, and multiplication You can use radical expressions to solve problems involving travel and construction



Like Terms

- Radical Expressions get combined just like monomials, for radicals to be like terms they must have the same radicand
- Examples
- $4x + 5x = (4+5)x = 9x$
- $18y - 7y = (18 - 7)y = 11y$

$$4\sqrt{5} + 5\sqrt{5} = (4+5)\sqrt{5} = 9\sqrt{5}$$

$$18\sqrt{2} - 7\sqrt{2} = (18-7)\sqrt{2} = 11\sqrt{2}$$

Example 1

- Simplify each expression
- A. $6\sqrt{7}+5\sqrt{7}-3\sqrt{7}$

- B. $5\sqrt{6}+3\sqrt{7}+4\sqrt{7}-2\sqrt{6}$

Example 1

- Simplify each expression
- A.

$$6\sqrt{7}+5\sqrt{7}-3\sqrt{7}$$

$$(6+5-3)\sqrt{7}$$

$$8\sqrt{7}$$

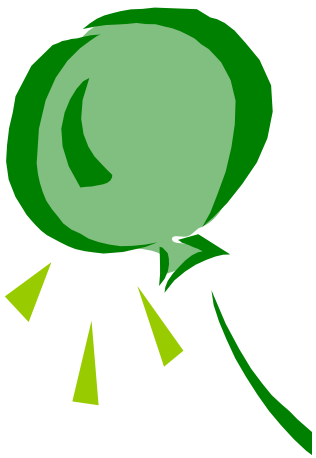
Example 1

- Simplify each expression
- B.

$$5\sqrt{6}+3\sqrt{7}+4\sqrt{7}-2\sqrt{6}$$

$$(5-2)\sqrt{6}+(3+4)\sqrt{7}$$

$$3\sqrt{6}+7\sqrt{7}$$



Example 2

- Simplify, Then use a calculator to verify your answer

$$4\sqrt{27}+5\sqrt{12}+8\sqrt{75}$$

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- Simplify, Then use a calculator to verify your answer

$$4\sqrt{27}+5\sqrt{12}+8\sqrt{75}$$

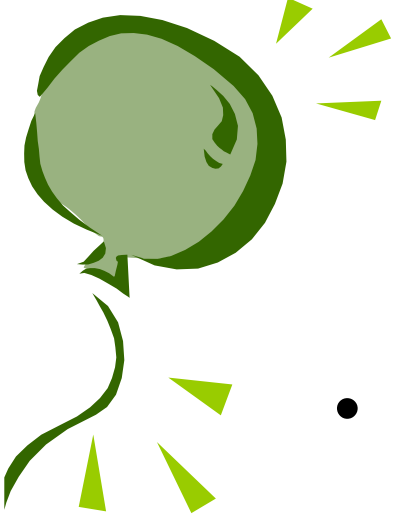
$$4\sqrt{9\bullet 3}+5\sqrt{4\bullet 3}+8\sqrt{25\bullet 3}$$

$$4\bullet 3\sqrt{3}+5\bullet 2\sqrt{3}+8\bullet 5\sqrt{3}$$

$$12\sqrt{3}+10\sqrt{3}+40\sqrt{3}$$

$$(12+10+40)\sqrt{3}$$

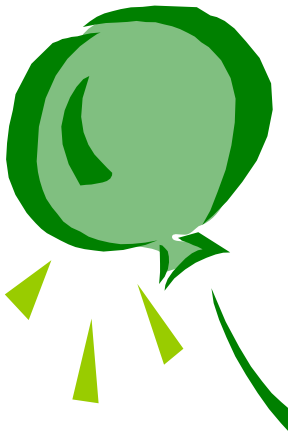
$$62\sqrt{3}$$



Example 3 (Foil Method)

- Simplify

$$(2\sqrt{3}-\sqrt{5})(\sqrt{10}+4\sqrt{6})$$



Example 3 (Foil Method)

$$(2\sqrt{3}-\sqrt{5})(\sqrt{10}+4\sqrt{6})$$

$$(2\sqrt{3})(\sqrt{10})+(2\sqrt{3})(4\sqrt{6})-(\sqrt{5})(\sqrt{10})-(\sqrt{5})(4\sqrt{6})$$

$$(2\sqrt{3\bullet 10})+2\bullet 4\sqrt{3\bullet 6})-(\sqrt{5\bullet 10})-4(\sqrt{5\bullet 6})$$

$$(2\sqrt{3\bullet 2\bullet 5})+8\sqrt{3\bullet 3\bullet 2}-(\sqrt{5\bullet 5\bullet 2})-4(\sqrt{5\bullet 2\bullet 3})$$

$$2\sqrt{30}+8\bullet 3\sqrt{2}-5\sqrt{2}-4\sqrt{30})$$

$$2\sqrt{30}+24\sqrt{2}-5\sqrt{2}-4\sqrt{30})$$

$$(2-4)\sqrt{30}+(24-5)\sqrt{2}=-2\sqrt{30}+19\sqrt{2}$$

THE END