Lesson 9: Radicals and Conjugates

Classwork

Opening Exercise

Which of these statements are true for all , ? Explain your conjecture.

**Example 1**

Express in simplest radical form and combine like terms.

Exercises 1–5

1.

**Example 2**

Multiply and combine like terms. Then explain what you notice about the two different results.

Exercise 6

1. Find the product of the conjugate radicals.

**Example 3**

Write in simplest radical form.

Problem Set

Lesson Summary

* For real numbers and , where when is a denominator,

 and .

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 and .

* Two binomials of the form and are called conjugate radicals:

 is the conjugate of , and

 is the conjugate of

For example, the conjugate of is .

* To express a numeric expression with a denominator of the form in simplest radical form, multiply the numerator and denominator by the conjugate and combine like terms.
1. Express each of the following as a rational number or in simplest radical form. Assume that the symbols , , and represent positive numbers.
	1.
	2.
	3.
	4.
	5.
	6.
	7.

Lesson Summary

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* Two binomials of the form and are called conjugate radicals:
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For example, the conjugate of is .

* To express a numeric expression with a denominator of the form in simplest radical form, multiply the numerator and denominator by the conjugate and combine like terms.
	1.
1. Express each of the following in simplest radical form, combining terms where possible.
	1.
	2.
	3.
	4.
2. Evaluate when and.
3. Evaluate when and .
4. Express each of the following as a rational expression or in simplest radical form. Assume that the symbols and represent positive numbers.
	1.
	2.
	3.
	4.
	5.
	6.
	7.
	8.
5. Simplify each of the following quotients as far as possible.
	1.
	2.
	3.
	4.
6. If , show that has a rational value.
7. Evaluate when the value of is .
8. Write the factors of Use the result to obtain the factored form of .
9. The converse of the Pythagorean Theorem is also a theorem: If the square of one side of a triangle is equal to the sum of the squares of the other two sides, then the triangle is a right triangle.

Use the converse of the Pythagorean Theorem to show that for ,,, if , then , so that .