Solving equations is a skill that algebra students practice a great deal. In Algebra 2, the equations become increasingly more complex. Whenever possible, it is beneficial for students to rewrite equations in a simpler form, or as equations they already know how to solve. This is done by recognizing equivalent expressions and developing algebraic strategies for demonstrating equivalence.

Addition and Subtraction of Rational Expressions uses the same process as simple numerical fractions. First, find a common denominator. Second, convert the original fractions to equivalent ones with the common denominator. Third, add or subtract the new numerators over the common denominator. Finally, factor the numerator and denominator and simplify if possible.

Multiplication or division of rational expressions follows the same procedure used with numerical fractions. However, it is often necessary to factor the polynomials in order to simplify them.

The following topics will be studied:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Skills</th>
<th>Length</th>
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| Topic 1B: Radical Expressions and Functions | • Simplifying radical expressions  
• Using exponent rules  
• Adding, subtracting, multiplying, and dividing radical expressions  
• Solving radical equations in one variable  
• Identifying extraneous solutions  
• Identifying and comparing key features of graphs of radical functions | 7 (90-minute) periods |
| Topic 1C: Rational Expressions and Functions | • Rewriting rational expressions by factoring  
• Simplifying rational expressions  
• Graphing rational functions and identifying key features  
• Solving rational equations by cross multiplying | 7 (90-minute) periods |

**Exploring Mathematics**

*Real World Connections*

Radical equations are used for a variety of applications. Check out these formulas that incorporate radical expressions as part of the equations:

Doctors can approximate the Body Surface Area of an adult (in square meters) using an index called $BSA$ where $H$ height in centimeters and $W$ is weight in kilograms using the formula

$$BSA = \sqrt{\frac{H \cdot W}{3600}}.$$

The Pacific Tsunami Warning Center is responsible for monitoring earthquakes that could potentially cause tsunamis in the Pacific Ocean. Through measuring the water level and calculating the speed of a tsunami, scientists can predict arrival times of tsunamis. The speed (in meters per second) at which a tsunami moves is determined by the depth $d$ (in meters) of the ocean and $g$ (acceleration due to gravity in meters per second) with the formula

$$s = \sqrt{g \cdot s}.$$

To measure voltage, $V$, measured in volts, can be found by using the equation $V = \sqrt{P \cdot R}$, where $P$ is power (measured in watts) and $R$ is resistance (measured in ohms).
Resource Toolkit

CPM Algebra 2 Textbook and eBook Resources

Topic 1B
   Not contained in CPM Materials

Topic 1C
   Chapter 3 Equivalent Forms, Lessons 3.1.1 – 3.2.2

Homework Help

Topic 1B
   Khan Academy:
   Simplifying Square-Root Expressions
   Simplifying Radical Expressions (Addition)
   Simplifying Radical Expressions (Subtraction)
   Simplifying Hairy Expression with Fractional Exponents
   Solving Square Root Equations: Two Solutions

Topic 1C
   Go to CPM Homework Help, Chapter 3 and select the appropriate lesson for specific support on homework items
   Khan Academy:
   Equations with Rational Expressions

“All of our dreams can come true, if we have the courage to pursue them.”

– Walt Disney