Solving Equations with Rational Expressions

MATH 101 *College Algebra*

J Robert Buchanan

Department of Mathematics

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Objectives

Definition

A **ratio** is a comparison of two numbers by division and denoted

$$a : b \quad \text{or} \quad \frac{a}{b} \quad \text{or} \quad a \text{ to } b.$$

A **proportion** is an equation stating that two ratios are equal.

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In this lesson we will learn to

- solve proportions, and
- solve other equations with rational expressions.

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Example

$$\frac{5x}{3} = \frac{9x+4}{5} \quad \text{(LCM: 15)}$$

$$15\left(\frac{5x}{3}\right) = 15\left(\frac{9x+4}{5}\right)$$

$$25x = 27x + 12$$

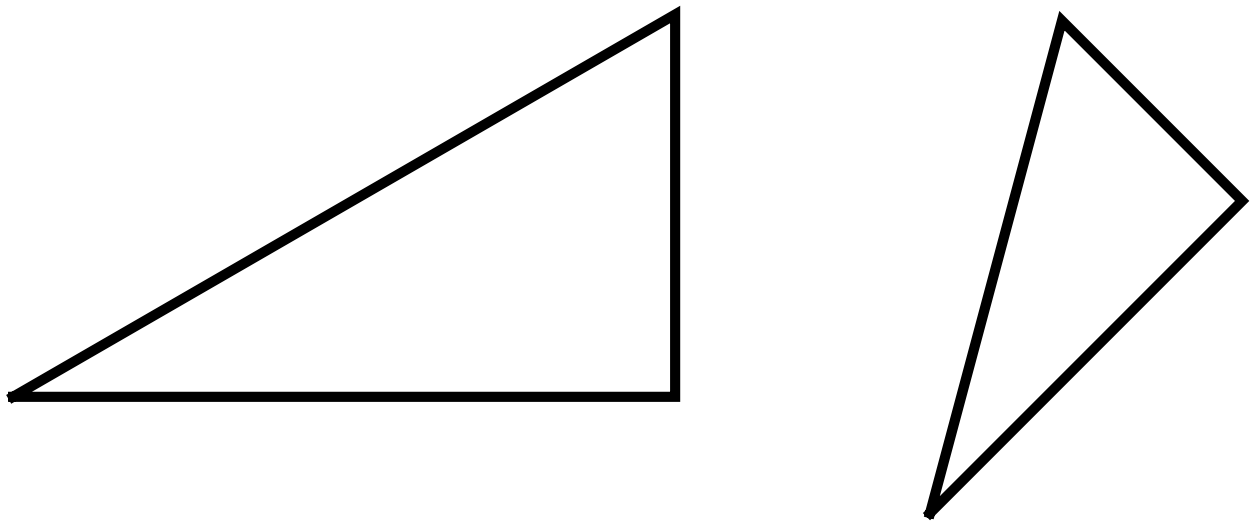
$$-2x = 12$$

$$x = -6$$

Similar Triangles

Similar triangles are triangles whose

1. corresponding angles are equal, and
2. whose corresponding sides are proportional.



To denote that two triangles are similar we will use the notation

$$\Delta ABC \sim \Delta DEF.$$

Solving Equations with Rational Expressions

Steps:

1. Find the LCM of the denominators.
2. Multiply both sides of the equation by the LCM and simplify.
3. Solve the resulting equation.
4. Check each solution in the original equation (sometimes extraneous solutions will be found).