

When you are done with your 7.7 homework you should be able to...

$\pi$  Solve Equations Containing Rational Expressions.

$\pi$  Solve for a Variable in a Rational Expression.

WARM-UP:

1. Solve.

a.  $2x^2 - x = 15$

b.  $(w-6)(w+5)(2w-3) = 0$

Definition

A **rational expression** is an equation that contains a rational expression.

Definition

An **extraneous solution** is a solution obtained through the solving process that does not satisfy the original equation.

### Steps to Solve a Rational Equation

Step 1: Determine the value(s) of the variable that result in an undefined rational expression in the rational equation.

Step 2: Determine the least common denominator (LCD) of all the denominators.

Step 3: Multiply both sides of the equation by the LCD, and simplify the expression on each side of the equation.

Step 4: Solve the resulting equation.

Step 5: Verify your solution using the original equation.

2. Solve each equation and state the solution set.

a.  $\frac{6}{x+3} + \frac{4}{x-3} = 1$

b.  $\frac{4}{x-4} = \frac{5}{x+4}$

$$c. \frac{1}{n-3} = \frac{3n-1}{9-n^2}$$

$$d. \frac{2t}{t^2+2t+1} + \frac{t-1}{t^2+t} = \frac{6t+8}{t^3+2t^2+t}$$

$$e. \frac{2x+1}{x^2+2x-3} = \frac{x-1}{x^2+5x+6} + \frac{x+1}{x^2+x-2}$$

3. Solve the equation for the indicated variable.

a.  $r = \frac{d}{t}$ , for  $t$

b.  $X = \frac{ab}{a-b}$ , for  $a$

When you are done with your 7.8 homework you should be able to...

- $\pi$  Model and Solve Ratio and Proportion Problems.
- $\pi$  Model and Solve Problems with Similar Figures.
- $\pi$  Model and Solve Work Problems.
- $\pi$  Model and Solve Uniform Motion Problems.

Definition

A **ratio** is the quotient of two numbers or two quantities. The ratio of two numbers  $a$  and  $b$  can be written as

$a$  to  $b$  or

$a : b$  or

$\frac{a}{b}$

## Definition

A **proportion** is an equation of the form  $\frac{a}{b} = \frac{c}{d}$ , where  $b \neq 0$  and  $d \neq 0$ . We call  $a$ ,  $b$ ,  $c$ , and  $d$  the **terms** of the proportion. The terms  $b$  and  $c$  the **means** of the proportion and the terms  $a$  and  $d$  are called the **extremes** of the proportion.

4. 50 Mexican pesos are worth approximately 2.5 British pounds. If Sean takes 80 pounds as spending money in Mexico City, how many pesos will he have?
5. If it takes  $2\frac{1}{4}$  cups of flour to make 2 dozen cookies, how much flour would you need to use to make 3 dozen cookies?

## Definition

Two figures are **similar** if their corresponding angle measures are equal and their corresponding sides are proportional.

6. A fifth-grade student is conducting an experiment to find the height of a tree in the schoolyard. The student measures the length of the tree's shadow and then immediately measures the length of the shadow that a yardstick forms. The tree's shadow measures 30 feet and the yardstick's shadow measures 6 feet. Find the height of the tree.
7. Shannon can clean the house in 4 hours. When she worked with Rory, it took 3 hours. How long would it take Rory to clean the house if he worked alone?
8. Sharon can run 1.5 times as fast as she can walk. If she runs for 5 miles and walks for 7 miles, the total time to complete the trip is 6 hours. How many hours did she walk?