

Chapter 7  
Rational Functions

Section 7-5  
Solving Rational Equations

## Solving by Cross Multiplying

You can use **cross multiplying** to solve a rational equation when each side of the equation is a single rational expression.

**EXAMPLE 1** Solving a Rational Equation by Cross Multiplying

Solve  $\frac{3}{x+1} = \frac{9}{4x+5}$ .

## Solving by Using the Least Common Denominator

When a rational equation is not expressed as a proportion, you can solve it by multiplying each side of the equation by the least common denominator of the rational expressions.

### EXAMPLE 3

### Solving Rational Equations by Using the LCD

Solve each equation.

a.  $\frac{5}{x} + \frac{7}{4} = -\frac{9}{x}$

b.  $1 - \frac{8}{x-5} = \frac{3}{x}$

When solving a rational equation, you may obtain solutions that are extraneous. Be sure to check for extraneous solutions by checking your solutions in the *original* equation.

**EXAMPLE 4** Solving an Equation with an Extraneous Solution

Solve  $\frac{6}{x-3} = \frac{8x^2}{x^2-9} - \frac{4x}{x+3}$ .

## Using Inverses of Functions

### EXAMPLE 5 Finding the Inverse of a Rational Function

Consider the function  $f(x) = \frac{2}{x+3}$ . Determine whether the inverse of  $f$  is a function. Then find the inverse.

