

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.

