Solving Rational Equations

When we multiply or divide an equation by an expression containing variables, the resulting equation may have solutions that are *not* solutions of the original equation. These are **extraneous solutions**. For this reason we must check each solution of the resulting equation in the original equation.

EXAMPLE 1 Solving by Clearing Fractions

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

EXAMPLE 2 Solving a Rational Equation

Solve $x + \dfrac{1}{x-4} = 0$.

EXAMPLE 3 Eliminating Extraneous Solutions

Solve the equation $\dfrac{2x}{x-1} + \dfrac{1}{x-3} = \dfrac{2}{x^2-4x+3}$.

EXAMPLE 4 Eliminating Extraneous Solutions

Solve

$$\frac{x-3}{x}+\frac{3}{x+2}+\frac{6}{x^2+2x}=0.$$