Solving Rational Equations

Rational equation:

Proportion:

Extraneous solution:

Restricted domain:

Example 1 Solve a proportion

To solve a proportion, cross multiply. Remember to distribute when appropriate. Then solve for x. Always check for extraneous solutions.

A] $\frac{20}{3x-5}=\frac{5}{x-2}$ B] $\frac{x}{x^2-2}=\frac{-1}{x}$ C] $\frac{x-3}{x+5}=\frac{x}{x+2}$

Example 2 Solve a rational equation

To solve a rational equation, multiply each term by the LCD to eliminate the fractions. Then solve for x. Remember to check for extraneous solutions.

A] $\frac{2}{3x}+\frac{1}{6}=\frac{4}{3x}$ B] $\frac{1}{x-2}+2=\frac{3x}{x+2}$

Example 3 Rational equations with extraneous solutions

Extraneous solutions are answers that are algebraically correct but do not check in the original problem. Remember that you can never divide by zero, so any value of x that makes a denominator in the original problem equal zero is restricted from the domain.

A] $\frac{2}{x-3}=\frac{1}{x^2-2x-3}$ B] $\frac{2}{x-3}+\frac{1}{x}=\frac{x-1}{x-3}$