Lesson Summary

In this lesson, we applied what we have learned in the past two lessons about addition, subtraction, multiplication, and division of rational expressions to solve rational equations. An extraneous solution is a solution to a transformed equation that is not a solution to the original equation. For rational functions, extraneous solutions come from the excluded values of the variable.

Rational equations can be solved one of two ways:

1. Write each side of the equation as an equivalent rational expression with the same denominator and equate the numerators. Solve the resulting polynomial equation, and check for extraneous solutions.
2. Multiply both sides of the equation by an expression that is the common denominator of all terms in the equation. Solve the resulting polynomial equation, and check for extraneous solutions.

Problem Set

1. Solve the following equations, and check for extraneous solutions.

   a. $\frac{x-8}{x-4}=2$

   b. $\frac{4x-8}{x-2}=4$

   c. $\frac{x-4}{x-3}=1$

   d. $\frac{4x-8}{x-2}=3$

   e. $\frac{1}{2a}-\frac{2}{2a-3}=0$

   f. $\frac{3}{2x+1}=\frac{5}{4x+3}$

   g. $\frac{4}{x-5}-\frac{2}{5+x}=\frac{2}{x}$

   h. $\frac{y+2}{3y-2}+\frac{y}{y-1}=\frac{2}{3}$

   i. $\frac{3}{x+1}-\frac{2}{1-x}=1$

   j. $\frac{4}{x-1}+\frac{3}{x}-3=0$

   k. $\frac{x+1}{x+3}-\frac{x-5}{x+2}=\frac{17}{6}$

   l. $\frac{x+7}{4}-\frac{x+1}{2}=\frac{5-x}{3x-14}$

   m. $\frac{b^2-b-6}{b^2}-\frac{2b+12}{b}=\frac{b-39}{2b}$

   n. $\frac{1}{p(p-4)}+1=\frac{p-6}{p}$

   o. $\frac{1}{h+3}=\frac{h+4}{h-2}+\frac{6}{h-2}$

   p. $\frac{m+5}{m^2+m}=\frac{1}{m^2+m}-\frac{m-6}{m+1}$

2. Create and solve a rational equation that has 0 as an extraneous solution.

3. Create and solve a rational equation that has 2 as an extraneous solution.