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| *Solving Rational Equations*  **Handout-KEY** | **Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

**Objective: To study how to solve rational equations.**

**Segment 1**: Solving Rational Equations.

Rational equations are equations with fractions.

Here is an example



How to Solve Rational Equations

* To solve a rational equation, remember a few key things.

1. Our goal is find the value(s) of the variable that makes the equation true.
2. The key to solving equations with fractions is to find the least common denominator (LCD) and multiply both sides of the equation by the LCD in order to eliminate the fractions.
3. Since we cannot have zero in the denominator of fractions, we will need to check our possible answers very carefully and make sure they make sense (i.e. they don’t make the denominators zero.)

Example 1: Solve the following equation and check your answer.



The solution is below:

* Find the LCD of all fractions (10x) and multiply

both sides of the equation by that.

* Simplify the fractions and eliminate the denominators.
* Bring variable terms to one side, non-variable terms to the other.
* Isolate the variable.

Checking the solution to Example 1



* It is very important to check the answer.

Does -20 make the equation true?

* Plug in -20 for x.
* By getting a common denominator and

adding the fractions we see the two sides of the equation are equal.

* So -20 is the solution!!

Example 2: Solve the following equation and check your answer.



(a)

Answer: x= - 8/3



(b)

Answer: w= - 1 (Note 0 is an extraneous solution.)

**Segment 2**: Solving Proportions.

* A proportion is two fractions that are equal to each other. This is another type of rational equation.
* An easy way to eliminate the fractions in a proportion is to set the “cross products” equal (i.e. “cross-multiply”).



Example 3: Solve the following equation and check your answer.

(a)



Answer: x= - ½, 2



(b)

Answer: y=5