**Unit 3 Day 5: Solving Rational Equations** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The Multiplicative Identity: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ equals \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Ex) 5 ∙ 1 = \_\_\_\_\_\_\_\_\_ = \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_

Any value divided by itself equals = \_\_\_\_\_\_\_\_\_\_\_\_.

Ex) =\_\_\_\_\_\_\_\_\_ =\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_

Therefore, multiplying a term by the same value on the top and the bottom is the same as multiplying by \_\_\_\_\_\_\_\_\_, which means that the value actually stays the same!

This means that we can follow the same rules as we did for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rational expressions when we solve equations because we are not actually changing the value of the equation!

Solve: 

**How to Solve a Rational Equation (more than one fraction)**

1. Re-write whole numbers as a fraction (put over \_\_\_\_\_)

2. Get \_\_\_\_\_\_\_\_\_\_\_\_ denominators

3. Combined & Simplify \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the denominators

5. Solve & Check

Solve: 

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**How to Solve a Rational Equation (one fraction each side)**

1. Re-write whole numbers as a fraction (put over \_\_\_\_\_)

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Set products \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to each other

4. Solve & Check

Why do we have to check our solutions?

**Extraneous solution:** sometimes our answer will occur at a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. In this situation we say the solution is extraneous. Use your calculator check for locations of holes & asymptotes.

**Ex)** Solve the equation below and check for the extraneous solution:

**Practice:** Solve each equation below; check for extraneous solutions.

1.  2.

3. 4.