**Rational Equations/Inequalities**

Definition – A **rational equation** is an equation that contains one or more *rational expressions*.

Recall that a *rational expression* was just a polynomial divided by a polynomial.

***Series of Steps:*** \*\* (REMEMBER THESE!!!) \*\*

1. **“Clear out” fractions**

* Multiply every term by the Least Common Denominator (LCD)

1. **Simplify**

* Distribute or FOIL
* Add/Subtract like parts
* Set = to zero (if quadratic) so it can be factored

1. **Solve**
2. **Check “extraneous” solutions**

**Example #1**



Step 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the LCD? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Multiply every term by the LCD.

 →

Step 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

We have a quadratic term so we’re going to want to set everything = to zero so we can factor it.

 → \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ → ( )( )

Step 3: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Set each factor = to zero and solve for x.

x = \_\_\_\_\_\_\_\_\_\_ and x = \_\_\_\_\_\_\_\_\_\_

Step 4: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Do our answers for x cause the denominators of the *original equation* to be zero?

If you are not sure, plug each value we got for x into the original equation and see if a denominator comes out to be zero.

In this case it does not, so we say there are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Practice Problem #1**



Step 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the LCD? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Step 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Step 3: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Step 4: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Do our answers for x cause the denominators of the *original equation* to be zero?

If you are not sure, plug each value we got for x into the original equation and see if a denominator comes out to be zero.

Yes or No? \_\_\_\_\_\_\_\_\_\_\_\_

So we would say that *“x = 8 is an extraneous solution”*.

Come show me your steps and final answers so I know you’re on the right track!!

**Assignment:** pg 605 #2-10, 19-27