Inspiring Greatness

INDEPENDENCE SCHOOL DISTRICT

## Math Virtual Learning

# Algebra 2/Honors Algebra 2

May 6, 2020

Lesson: May 6, 2020

**Objective/Learning Target:**
Students will be able to solve rational equations.

**Let's Get Started:**

On a sheet of paper, answer the question...

What's the difference?

$$\frac{x^2+7x+10}{x^2-4}+\frac{3}{x}$$

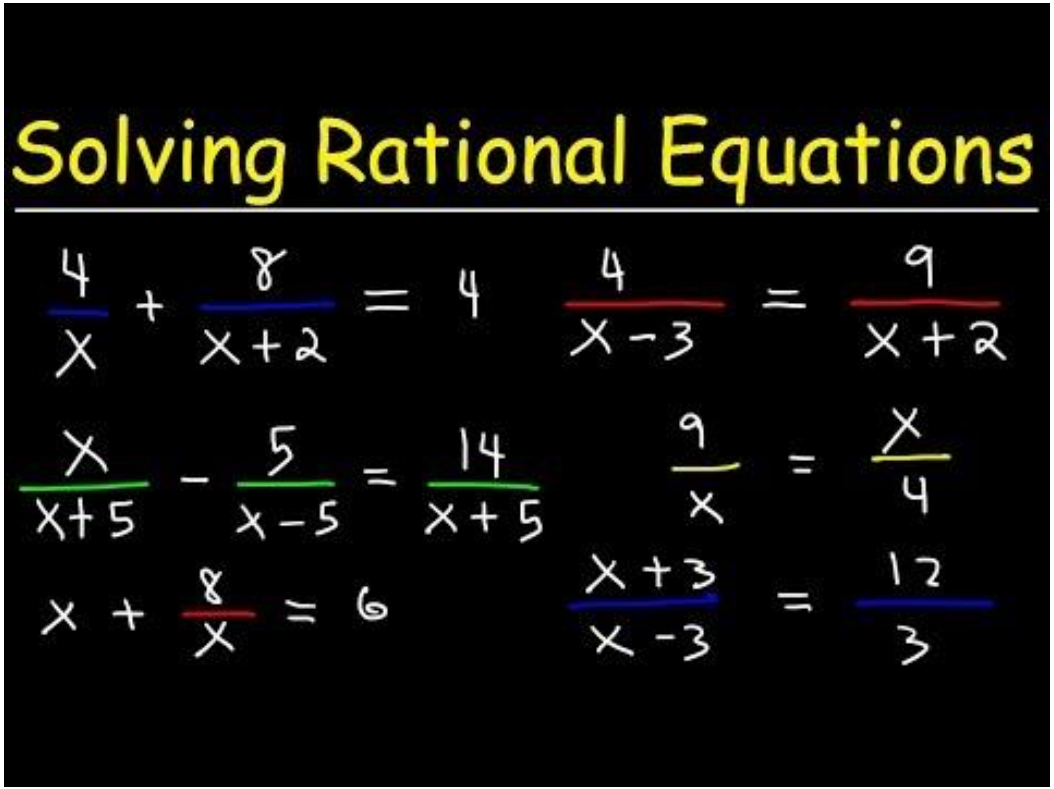
and

$$\frac{x^2+7x+10}{x^2-4}=\frac{3}{x}$$

(Hint, look at the symbols.)

**Watch the Video:**

Take notes as you watch the video below.



# Steps for solving a rational equation:

(write this down)

- factor the denominators
- find the LCD
- identify the domain
- multiply each term by <u>ALL</u> of the LCD
- cancel and solve
- check for extraneous solutions

# Example #1

**Given Problem:**

$$\frac{5}{x}+\frac{7}{4}=-\frac{9}{x}$$

LCD: $4x$

Domain: $x \neq 0$

$$4\cancel{x}\,\frac{5}{\cancel{x}}+\cancel{4x}\,\frac{7}{\cancel{4}}=-\frac{9}{\cancel{x}}\,4\cancel{x}$$

$$20+7x=-36$$
$$-20 \qquad -20$$

$$\frac{7x}{7}=\frac{-56}{7}$$

$$x=-8$$

# Example #2

**Given Problem:**

$$1 - \frac{8}{x-5} = \frac{3}{x}$$

LCD: $1x(x-5)$

Dom: $x \neq 5$

$x \neq 0$

$$\frac{1}{1}^{x(x-5)} - \frac{8}{(x-5)}^{x\cancel{(x-5)}} = \frac{3}{(x)}^{\cancel{x}(x-5)}$$

$$1x(x-5) - 8x = 3(x-5)$$

$$x^2 - 5x - 8x = 3x - 15$$

$$x^2 - 13x = 3x - 15$$

$$-3x \quad +15$$

$$x^2 - 16x + 15 = 0$$

$$(x-15)(x-1) = 0$$

$$x = 15 \qquad x = 1$$

# Solving Rational Equations Practice:

On the same sheet of paper, solve the following practice problems. Remember to check if your solutions work or are extraneous.

1) $\frac{4}{x} + x = 5$

2) $\frac{2}{3x} + \frac{1}{6} = \frac{4}{3x}$

3) $\frac{1}{2x} + \frac{3}{x+7} = -\frac{1}{x}$

4) $\frac{1}{x-2} + 2 = \frac{3x}{x+2}$

5) $\frac{x+1}{x+6} + \frac{1}{x} = \frac{2x+1}{x+6}$

6) $\frac{2}{x-3} + \frac{1}{x} = \frac{x-1}{x-3}$

7) $\frac{18}{x^2-3x} - \frac{6}{x-3} = \frac{5}{x}$

8) $\frac{x+3}{x-3} + \frac{x}{x-5} = \frac{x+5}{x-5}$

# Solving Rational Equations Answer Key:

Once you have completed the problems, check your answers here.

1) $x = 1 \ and \ x = 4$

2) $x = 4$

3) $x = -\frac{7}{3}$

4) $x = 1 \ and \ x = 6$

5) $x = -2 \ and \ x = 3$

6) $x = 1$

7) $no\ solution$

8) $x = 0 \ and \ x = 7$

# Additional Practice:

Click on the links below to get additional practice and to check your understanding!

Solving Rational Equations:
Notes, Practice, & Answer Key

Solving Rational Equations Website - Practice Problems