Inspiring Greatness

INDEPENDENCE SCHOOL DISTRICT

Math Virtual Learning

Algebra 2/Honors Algebra 2

May 5, 2020

Lesson: May 5, 2020

Objective/Learning Target:
Students will practice multiplying, dividing, adding and subtracting rational expressions.

Let's Get Started:

$$\frac{2x+1}{x^2+7x+12} \diamond \frac{x+5}{x^2+2x-3}$$

Some things to remember:

- Always look at the symbol in the middle of the rational expressions to know which OPERATION (multiply, divide, add or subtract) you will be performing.
- Then follow the appropriate steps to completely simplify the expression.
- DO NOT FORGET TO CHECK YOUR DOMAIN!

Steps for Multiplying and Dividing Rational Expressions:

Multiplying Rational Expressions:

1. Factor everything
2. Identify the domain (this is the restricted values for x)
3. Cancel (only if the factor is the same on the top and bottom)
4. Write out the simplified answer (what is left after canceling)

Pay attention to the difference between multiplying and dividing.

Ask yourself, why do I need to recheck the domain when dividing rational expressions?

Dividing Rational Expressions:

1. Factor everything
2. Identify the domain (this is the restricted values for x)
3. Flip the 2nd fraction and change the symbol to multiplication
4. Re check the domain (you may now have new restricted values for x)
5. Cancel (only if the factor is the same on the top and bottom)
6. Write out the simplified answer (what is left after canceling)

Steps for Adding and Subtracting Rational Expressions:

Like Denominators:

- Identify the Least Common Denominator (LCD)
- Identify the domain (this is the restricted values for x)
- Combine like terms in the numerator
- Factor and simplify if possible

Write this down if you need to!

Ask yourself, why are there extra steps when the denominators are not the same?

Unlike Denominators:

- Factor the denominators
- Identify the Least Common Denominator (LCD)
- Identify the domain (this is the restricted values for x)
- Multiply each term by what it is missing from the LCD
- Combine like terms in the numerator
- Factor and simplify if possible

Operations on Rational Expressions Practice:

On the same sheet of paper, multiply/divide/add/subtract the following practice problems.

1. $\frac{5}{x+7} - \frac{2}{x+2}$

2. $\frac{2x}{x+4} - \frac{x^2+4}{x^2-16}$

3. $\frac{3x-12}{x+5} * \frac{x+6}{2x-8}$

4. $\frac{x^2-6x-27}{2x^2+2x} \div \frac{x^2-14x+45}{x^2}$

5. $\frac{x^2+12x+32}{6x+42} \div \frac{x^2+4x}{x^2-49}$

6. $\frac{4}{x+6} + \frac{7}{x-3}$

7. $\frac{8}{x-4} + \frac{12}{x^2-16}$

8. $\frac{6x}{x^2-36} + \frac{2}{x-6}$

9. $\frac{x+5}{4x-16} * \frac{2x^2-32}{x^2-25}$

10. $\frac{x^2-8x+15}{x^2+4x} \div (x^2 - x - 20)$

11. $(x + 5) + \frac{16x}{x+5}$

12. $\frac{x+2}{2x-2} - \frac{-2x-1}{x^2-4x+3}$

13. $\frac{3x+4}{x+2} - 1$

14. $\frac{4}{x+5} + \frac{2x}{x^2-25}$

15. $\frac{x+2}{x^2+4x+3} - \frac{5}{x^2-9}$

Answer Key:

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

1. $\frac{3x-4}{(x+7)(x+2)}$
2. $\frac{x^2-8x-4}{(x+4)(x-4)}$
3. $\frac{3(x+6)}{2(x+5)}$
4. $\frac{x(x+3)}{2(x+1)(x-5)}$
5. $\frac{(x+8)(x-7)}{6x}$
6. $\frac{11x+30}{(x+6)(x-3)}$
7. $\frac{4(2x+11)}{(x+4)(x-4)}$
8. $\frac{4(2x+3)}{(x+6)(x-6)}$
9. $\frac{x+4}{2(x-5)}$
10. $\frac{x-3}{x(x+4)(x+4)}$
11. $\frac{(x+25)(x+1)}{x+5}$
12. $\frac{x+4}{2(x-3)}$
13. $\frac{2(x+1)}{x+2}$
14. $\frac{2(3x-10)}{(x+5)(x-5)}$
15. $\frac{x^2-6x-11}{(x+3)(x+1)(x-3)}$

Additional Practice:

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

Multiplying & Dividing Rational Expressions:
Examples, Worksheet & Answer Key

Adding & Subtracting Rational Expressions:
Examples, Worksheet & Answer Key

Mixed - Operations on Rational Expressions:
Worksheet & Answer Key