

Friday 1/17/20

1. Get Notes & Calc.
2. Take out HW
3. Add/Subt. unlike Denom.
Rational Expression Notes
4. HW

Reminders:

- No School
Monday
- Unit 4 Test 1
- Tues. 1/28

Topic: Adding and Subtracting Rationals w/Unlike Denominators

Name: _____

What am I learning today?

Warm-Up

Add or Subtract.

$$1) \frac{2x-3}{x+4} - \frac{x-7}{x+4} = \frac{(2x-3) - (x-7)}{x+4} = \frac{2x-3-x+7}{x+4} = \frac{x+4}{x+4} = 1$$

$$2) \frac{4x+7}{x+5} + \frac{x-6}{x+5} = \frac{(4x+7) + (x-6)}{x+5} = \frac{5x+1}{x+5}$$

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

Notes
The least common denominator

Recall: In order to add/subtract a rational expression, you must have a **common denominator**.

Finding the Least Common Denominator

If you do not have a common denominator, you must find one before you can add/subtract. We call this the least common denominator (LCD).

Steps:

- Factor First!** Factor **both** denominators.
- Find a combination of the same factors of both denominators. Do not repeat any factors this is why its called the least common.

Factors of polynomial ⇒ same factors under each fraction

Examples

$x \cdot x \cdot x$
 $x \cdot x \cdot x$

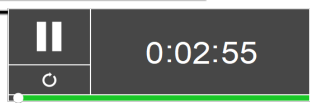
Find the least common denominator (LCD):

$$1) \frac{num}{2x^2y}; \frac{num}{5x^3} \quad \text{LCD: } 10x^3y$$

$$2) \frac{num}{x-3}; \frac{num}{x+5} \quad \text{LCD: } (x-3)(x+5)$$

$$3) \frac{num}{2x-4}; \frac{num}{x^2-4} \quad \text{LCD: } 2(x+2)(x-2)$$

$$4) \frac{num}{x+3}; \frac{num}{x^2-5x-24} \quad \text{LCD: } (x-8)(x+3)$$



Topic: Adding and Subtracting Rationals w/Unlike Denominators

Date: _____

Notes

Steps for adding and subtracting rationals w/unlike denominators

- Step 1:** If subtraction, distribute the negative.
- Step 2:** Find the least common denominator (LCD).
- Step 3:** Multiply both the numerator and denominator by the missing term in the LCD.
- Step 4:** Combine like terms in the numerators.
- Step 5:** Factor and simplify, if possible.

Examples

Add or Subtract
 $\frac{3}{x-3} + \frac{2}{3x}$ (Handwritten: $\frac{(3x)}{(3x)} \cdot \frac{3}{x-3} + \frac{2}{3x} \cdot \frac{(x-3)}{(x-3)}$)

$$\frac{9x}{3x(x-3)} + \frac{2x-6}{3x(x-3)}$$

$$\frac{9x + 2x - 6}{3x(x-3)}$$

$$\boxed{\frac{11x - 6}{3x(x-3)}}$$

$$\frac{5}{x+2} - \frac{3}{x-2}$$
 (Handwritten: $\frac{(x-2)}{(x-2)} \cdot \frac{5}{x+2} - \frac{3}{x-2} \cdot \frac{(x+2)}{(x+2)}$)

$$\frac{5x+10}{(x+2)(x-2)} - \frac{3x-6}{(x+2)(x-2)}$$

$$\frac{5x+10 - (3x-6)}{(x+2)(x-2)} = \frac{5x+10-3x+6}{(x+2)(x-2)}$$

$$= \frac{2x+16}{(x+2)(x-2)} = \boxed{\frac{2(x+8)}{(x+2)(x-2)}}$$

$$\frac{5x}{2x-5} - \frac{25}{4x-1}$$
 (Handwritten: $\frac{(4x-1)}{(4x-1)} \cdot \frac{5x}{2x-5} - \frac{25}{4x-1} \cdot \frac{(2x-5)}{(2x-5)}$)

$$= \frac{20x^2 - 5x}{(4x-1)(2x-5)} - \frac{50x - 125}{(4x-1)(2x-5)}$$

$$= \frac{20x^2 - 5x - 50x + 125}{(4x-1)(2x-5)}$$

$$= \frac{20x^2 - 55x + 125}{(4x-1)(2x-5)}$$

$$= \frac{5(4x^2 - 11x + 25)}{(4x-1)(2x-5)}$$

$$\frac{x-3}{2x+2} + \frac{4}{x^2+8x+7}$$
 (Handwritten: $\frac{(x-3)}{(x-3)} \cdot \frac{(x+7)}{(x+7)} + \frac{2 \cdot 4}{(x+7)(x+1)}$)

$$\frac{x^2+7x-3x-21}{2(x+1)(x+7)} + \frac{8}{2(x+1)(x+7)}$$

$$= \boxed{\frac{x^2+4x-13}{2(x+1)(x+7)}}$$

M	A
100	-11
10,10	
25,4	
20,5	
50,2	
100,1	

Summary

Summarize the lesson in your own words