



**Math Virtual Learning**

# **Algebra 2/Honors Algebra 2**

**April 29, 2020**



Lesson: April 29, 2020

**Objective/Learning Target:**

Students will add and subtract rational expressions with common denominators.

## Let's Get Started:

What do you remember about adding and subtracting fractions?

a)  $\frac{7}{4} - \frac{8}{5}$

b)  $\frac{3}{2} - \frac{9}{7}$

c)  $\frac{7}{10} + \frac{2}{5}$

Watch Video:

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$$\frac{5}{7} + \frac{1}{7}$$

[Mathmeeting.com](https://mathmeeting.com)

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Today you will learn how to add and subtract rational expressions that look like

$$\frac{y^2}{y+3} - \frac{2y+15}{y+3}$$

Watch the this video  and take notes over the two examples.

$$\frac{x^2}{x+5} + \frac{7x+10}{x+5}$$

$$\frac{x^2 + 7x + 10}{x+5}$$

$$\frac{(x+2)(\cancel{x+5})}{\cancel{x+5}}$$

$$\boxed{x+2}$$

# Steps for Adding and Subtracting Rational Expressions with a Common Denominator :

(write this down)

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

# Let's look at example #1:

(write this down)

Problem:  $\frac{(x+2)}{(x+3)} + \frac{(x-1)}{(x+3)}$

Step 1: Identify the Least Common Denominator (shown in blue) → LCD:  $(x+3)$

Step 2: Find the domain by setting the factors in the denominator equal to zero. (shown in blue) → Domain:  $x \neq -3$

Step 3: Combine like terms in the numerator →  $= \frac{x+2+x-1}{(x+3)}$

Step 4: Factor and simplify if possible →  $= \frac{2x+1}{(x+3)}$

## Let's look at example #2:

(write this down)

Problem: 
$$\frac{2x+7}{(x+5)(x-3)} - \frac{x+10}{(x+5)(x-3)}$$

Step 1: Identify the Least Common Denominator (shown in blue)

LCD:  $(x+5)(x-3)$

Step 2: Find the domain by setting the factors in the denominator equal to zero. (shown in blue)

Domain:  $x \neq -5, 3$

Step 3: Combine like terms in the numerator

$$= \frac{2x+7-x-10}{(x+5)(x-3)}$$

Step 4: Factor and simplify if possible

$$= \frac{\overset{1}{\cancel{x-3}}}{(x+5)\cancel{(x-3)}} = \frac{1}{x+5}$$

# Add and Subtract Rational Expressions Practice:

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

$$1) \frac{u-v}{8v} + \frac{6u-3v}{8v}$$

$$2) \frac{m-3n}{6m^3n} - \frac{m+3n}{6m^3n}$$

$$3) \frac{5}{a^2+3a+2} + \frac{5a+1}{a^2+3a+2}$$

$$4) \frac{5}{10n^2+16n+6} + \frac{n-6}{10n^2+16n+6}$$

$$5) \frac{r+6}{3r-6} + \frac{r+1}{3r-6}$$

$$6) \frac{x+2}{2x^2+13x+20} - \frac{x+3}{2x^2+13x+20}$$

$$7) \frac{6}{x-1} - \frac{5x}{4}$$

$$8) 6 - \frac{x+5}{(7x-5)(x+4)}$$



# Answer Key:

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

$$1) \frac{u-v}{8v} + \frac{6u-3v}{8v}$$

$$\frac{7u-4v}{8v} \quad \text{Domain : } x \neq 0$$

$$2) \frac{m-3n}{6m^3n} - \frac{m+3n}{6m^3n}$$

$$-\frac{1}{m^3} \quad \text{Domain : } m \neq 0, n \neq 0$$

$$3) \frac{5}{a^2+3a+2} + \frac{5a+1}{a^2+3a+2}$$

$$\frac{6+5a}{a^2+3a+2} \quad \text{Domain : } a \neq -2, -1$$

$$4) \frac{5}{10n^2+16n+6} + \frac{n-6}{10n^2+16n+6}$$

$$\frac{-1+n}{10n^2+16n+6} \quad \text{Domain : } n \neq -\frac{3}{5}, -1$$

$$5) \frac{r+6}{3r-6} + \frac{r+1}{3r-6}$$

$$\frac{2r+7}{3r-6} \quad \text{Domain : } r \neq 2$$

$$6) \frac{x+2}{2x^2+13x+20} - \frac{x+3}{2x^2+13x+20}$$

$$-\frac{1}{2x^2+13x+20} \quad \text{Domain : } x \neq -4, -\frac{5}{2}$$

$$7) \frac{6}{x-1} - \frac{5x}{4}$$

$$\frac{24-5x^2+5x}{4(x-1)} \quad \text{Domain : } x \neq 1$$

$$8) 6 - \frac{x+5}{(7x-5)(x+4)}$$

$$\frac{42x^2+137x-125}{(7x-5)(x+4)} \quad \text{Domain : } x \neq -\frac{5}{7}, -4$$

## Additional Practice:

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

$$\frac{6x-12}{3x-6} + \frac{-15x+6}{3x-6}$$

Adding and Subtracting  
Rational Expressions with  
Common Denominators  
Practice - [worksheet](#) and  
[answers](#)