



Math Virtual Learning

College Prep Algebra

May 1, 2020



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Lesson: May 1, 2020

Objective/Learning Target:
How to add and subtract rational expressions

Let's Get Started:
Here's an example of a Rational Expression.

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

← numerator
← denominator

A Rational Expression
*because it is a "ratio"
of two polynomials*

Yep! It is a fraction.
And it will have an algebraic numerator and denominator.

Today, we are going to focus on adding and subtracting two rational expressions.

Lesson:

When adding or subtracting any fractions, the fractions **MUST** have common denominators.

Usually that means multiplying the top and bottom of each fraction to create the common denominator.

Then you finish by adding or subtracting the numerators together.

$$\frac{1}{2} + \frac{1}{3} = ?$$

$$\frac{1}{2} \begin{matrix} \times 3 \\ \times 3 \end{matrix} = \frac{3}{6}$$

$$\frac{1}{3} \begin{matrix} \times 2 \\ \times 2 \end{matrix} = \frac{2}{6}$$

$$\frac{3}{6} + \frac{2}{6} = \frac{5}{6}$$

Lesson:

Here is an example done with algebraic fractions.

(If you need help with factoring, see the lesson from 4/28)

Subtract and simplify $\frac{x}{x+3} - \frac{5}{x-2}$

Multiply top and bottom to create common denominators

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

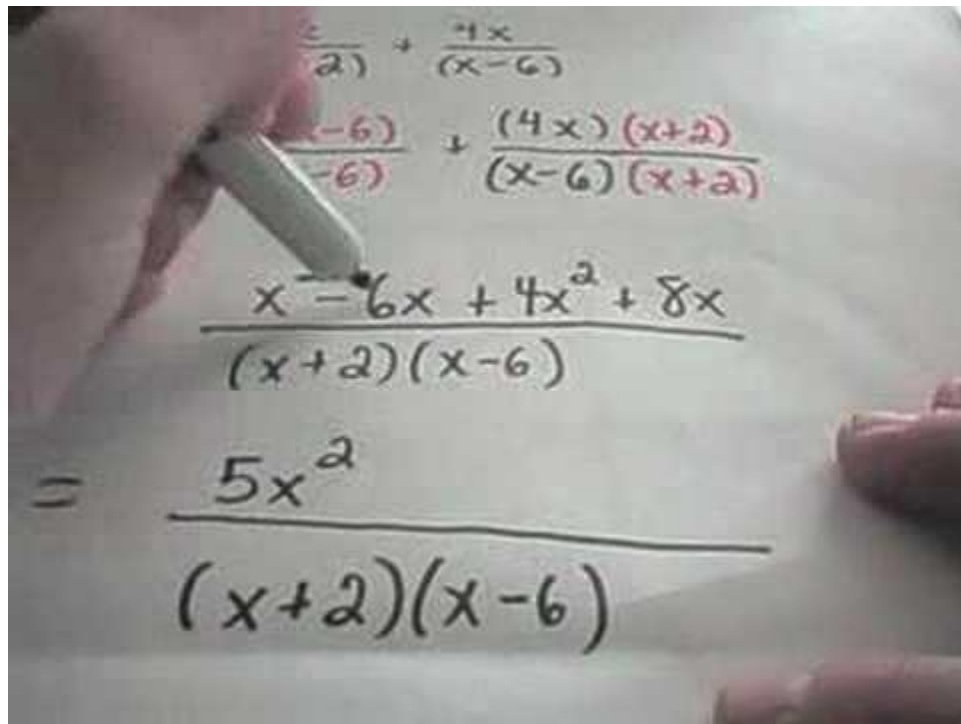
Distribute and multiply to remove the parentheses on top.

$$= \frac{x(x-2) - 5(x+3)}{(x+3)(x-2)}$$
$$= \frac{x^2 - 2x - 5x - 15}{(x+3)(x-2)}$$

Combine like terms in the numerator

$$= \frac{x^2 - 7x - 15}{(x+3)(x-2)}$$

Lesson: Here is a video to explain in more detail how to create common denominators and add/subtract rational expressions.




The image shows a hand holding a white marker, writing mathematical steps on a piece of paper. The steps are as follows:

$$\frac{x}{2} + \frac{4x}{x-6}$$
$$\frac{x(x-6)}{-6} + \frac{(4x)(x+2)}{(x-6)(x+2)}$$
$$\frac{x^2 - 6x + 4x^2 + 8x}{(x+2)(x-6)}$$
$$= \frac{5x^2}{(x+2)(x-6)}$$

Lesson: Here is one more video example

SIMPLIFY:

$$\frac{2}{x^2+5x+4} - \frac{3}{x^2-1}$$
$$= \frac{2}{(x+4)(x+1)} - \frac{3}{(x+1)(x-1)}$$
$$= \frac{2(x-1)}{(x+1)(x-1)(x+4)} - \frac{3(x+4)}{(x+1)(x-1)(x+4)}$$


Practice

[Add and Subtract Rational Expressions
with Answers](#)

Even more practice

[More practice with
adding and subtracting rational expressions
with answers](#)