



Math Virtual Learning

Algebra 2/Honors Algebra 2

April 20, 2020



Lesson: April 20, 2020

Objective/Learning Target:

Students will be able to simplify rational expressions.

Let's Get Started:

Get out a sheet of paper and factor the following expression

$$x^2 + 5x - 36$$

Click here for a [hint](#).

Click here to check your [answer](#).

Today you will be learning to simplify rational expressions that look like $\frac{x^2 + 5x - 36}{x^2 - 6x + 8}$. You will use your factoring skills from above.

Watch Video: [Simplifying Rational Expressions](#)

As you watch the video for simplifying rational expressions, take notes over the example.

Take Some Notes:

Simplifying Rational Expressions

A rational expression is in **simplified form** if its numerator and denominator have no common factors (other than ± 1). To simplify a rational expression, apply the following property.

KEY CONCEPT

For Your Notebook

Simplifying Rational Expressions

Let a , b , and c be expressions with $b \neq 0$ and $c \neq 0$. Then the following property applies.

Property $\frac{ac}{bc} = \frac{a}{b}$

Divide out the common factor c .

Examples $\frac{15}{65} = \frac{3 \cdot \cancel{5}}{13 \cdot \cancel{5}} = \frac{3}{13}$

Divide out the common factor 5.

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

Divide out the common factor $x + 3$.

Simplifying a rational expression usually requires two steps. First, factor the numerator and denominator. Then, divide out any factors that are common to both the numerator and denominator. Here is an example:

$$\frac{x^2 + 7x}{x^2} = \frac{x(x + 7)}{x \cdot x} = \frac{x + 7}{x}$$

Notice that you can divide out common factors in the second expression above. However, you cannot divide out like terms in the third expression.

EXAMPLE 1 Simplify a rational expression

Simplify: $\frac{x^2 - 2x - 15}{x^2 - 9}$

$$\frac{x^2 - 2x - 15}{x^2 - 9} = \frac{(x + 3)(x - 5)}{(x + 3)(x - 3)}$$

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

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

Factor numerator and denominator.

Divide out common factor.

Simplified form

Guided Practice

Go to this website:

[Simplify Rational Expressions](#)

★ Review and solve the problem on [Simplifying Rational Expressions](#).

★ Always start by factoring the numerator and denominator. Next cancel out in common factors. Write your answer in simplified form.

★ Try to get at least 5 correct before moving on.

Simplify Rational Expressions Practice:

On the same sheet of paper, simplify the following practice problems.

$$1. \quad \frac{x^2 + 5x + 4}{x + 4}$$

$$2. \quad \frac{x^2 + 12x + 32}{x + 8}$$

$$3. \quad \frac{x - 3}{x^2 - 8x + 15}$$

$$4. \quad \frac{x - 4}{x^2 + x - 20}$$

$$5. \quad \frac{x^2 - 8x - 9}{x^2 - 13x + 36}$$

$$6. \quad \frac{x^2 + 7x + 12}{x^2 - 16}$$

Answer Key:

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

$$1. \frac{(x+4)(x+1)}{x+4} = x + 1$$

$$2. \frac{(x+8)(x+4)}{x+8} = x + 4$$

$$3. \frac{x-3}{(x-3)(x-5)} = \frac{1}{x-5}$$

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

$$5. \frac{(x-9)(x+1)}{(x-9)(x-4)} = \frac{x+1}{x-4}$$

$$6. \frac{(x+3)(x+4)}{(x-4)(x+4)} = \frac{x+3}{x-4}$$

Additional Practice:

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

[Simplify Rational Expressions \(part 1\)](#) - video

[Simplify Rational Expressions \(part 2\)](#) - video

[Simplify Rational Expressions \(part 3\)](#) - video

Simplifying Rational Expressions Practice - [worksheet](#) and
[answers](#)