

Introduction to Rational Expressions

A rational expression is a division of two polynomials. You have seen this before, but this unit will deal with them in much more detail. In a sense, this unit completes your education in algebra, because from here on in Math 10, 11, and 12, everything will build on the algebra you have learned in math 9 and 10.

The following are examples of rational expressions:

$$\frac{3}{x}$$

$$\frac{x+2}{x-3}$$

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

The two main problems with rational expressions are:

1. There are restrictions on the values the variables are allowed to take, and
2. To add or subtract them, you need to find common denominators.

Simplifying

Each of the following rational expressions can be simplified by factoring the top and bottom. Use this as an opportunity to review your factoring skills. If either the numerator or denominator contains a common factor, you can "cancel" it out to get the final answer. YOU CANNOT CANCEL INDIVIDUAL TERMS, only binomial factors.

$$\frac{2x^2 + 9x + 9}{x^2 + 7x + 12}$$

$$\frac{2x^2 - 7x - 3}{2x^2 - 2x - 12}$$

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$$\frac{6x^2 - 5x - 1}{9x^2 - 6x - 1}$$

$$\frac{2x^2 - x - 10}{6x^2 - 27x + 30}$$