

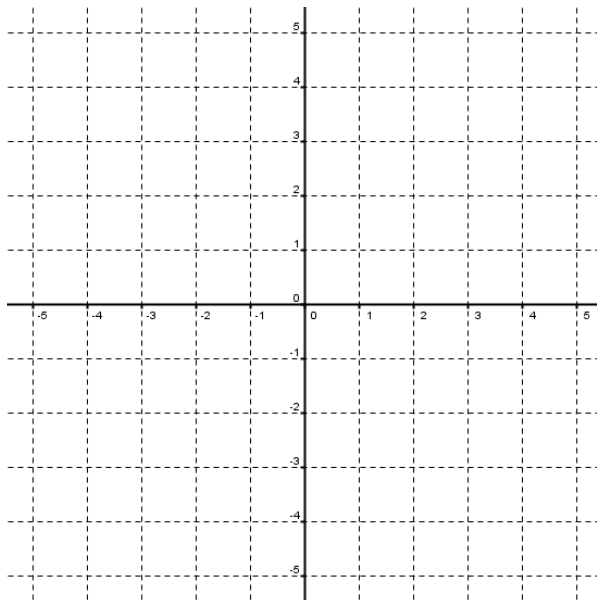
A rational expression is the quotient of two polynomial expressions.

A rational function is undefined when its denominator equals zero (there are restrictions on the x-values).

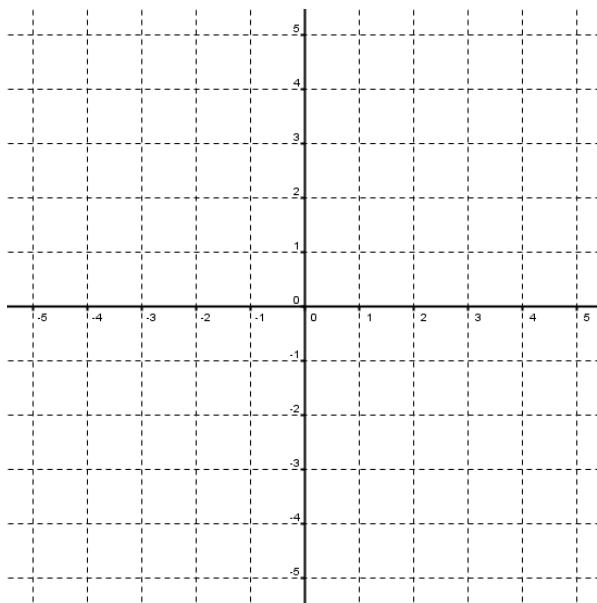
We can write an equivalent expression by simplifying a rational expression and stating the restrictions.

Ex. Simplify each of the following rational functions. State all restrictions and graph each function.

a) $g(x) = \frac{2x^2 - 7x + 6}{x - 2}$



b) $h(x) = \frac{3x + 6}{x^2 + 3x + 2}$



When multiplying or dividing rational expressions, it is important to factor in order to simplify.

Ex. Simplify the following rational expressions and state all restrictions on the variables.

a) $\frac{12a^3}{25b} \div \frac{9a^2}{10b^4}$

b) $\frac{4x^2 + 8x - 60}{x + 5} \times \frac{x + 1}{2x^2 - 6x}$

When adding or subtracting rational expressions, it is important to find common denominators to simplify.

Ex. Simplify and state the restrictions.

a) $\frac{3x}{6x^2 + 15x} - \frac{4}{2x + 5}$

b) $\frac{2}{x - 4} - 3$

c) $\frac{5}{8x} - \frac{1}{6x}$

d) $\frac{2}{x^2 + 2x - 15} + \frac{x + 4}{x + 5}$

Specific expectation:

3.1 simplify polynomial expressions by adding, subtracting, and multiplying

3.3 simplify rational expressions by adding, subtracting, multiplying, and dividing, and state the restrictions on the variable

3.4 determine if two given algebraic expressions are equivalent (i.e., by simplifying; by substituting values)