Name _____
Date _____ Period _____

# Rational Expression

a fraction of polynomials

$$\frac{\text{polynomial}}{\text{polynomial}}$$

$$\frac{3}{2x} \qquad \frac{4x+1}{x^2-9} \qquad \frac{2x^2+3x-2}{x^2-4x+6}$$

Anything you do with fraction you can do with rational expression, but with rational expressions there are more rules to consider.

## Multiplying Rational Expressions

A rational expression can be multiplied by multiplying the numerators and denominators together. Before multiplying, sometimes is beneficial to cancel common factors.

$$\frac{x \cdot \cancel{y}}{a \cdot b} \cdot \frac{z}{\cancel{y}} = \frac{x \cdot z}{a \cdot b}$$

Because we're canceling common factors, factoring is the key to multiplying and simplifying rational expressions.

Multiply the following rational expression

$$\frac{6x^2}{xy} \cdot \frac{y^2}{2x^2}$$

$$\frac{5z^3}{x^2y} \cdot \frac{x^3}{10yz}$$

Multiply the following rational expression

$$\frac{2x-6}{x^2-2x} \cdot \frac{3x-6}{2x+10}$$

Multiply the following rational expression

$$\frac{2x^2 - 6x}{x^2 - 2x - 3} \cdot \frac{x^2 + 3x + 2}{x^2 - 3x - 10}$$

Multiply the following rational expression

$$\frac{x^2 - 4}{x^2 - 6x - 16} \cdot \frac{x^2 - 9x + 8}{x^2 + x - 6}$$

Multiply the following rational expression

$$\frac{x^2 - 4}{6x + 12} \cdot \frac{3x - 15}{x^2 - 7x + 10}$$