Rational Expression

a fraction of polynomials

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

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

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

Adding and Subtracting Rational Expressions

Rational expressions with like denominators can be added or subtracted by adding or subtracting the numerators and putting the result over the like denominator.

$$\underbrace{\frac{2}{5} + \frac{1}{5} = \frac{2+1}{5} = \frac{3}{5}}_{\text{like denominator}} \qquad\qquad \underbrace{\frac{a}{b} + \frac{c}{b} = \frac{a+c}{b}}_{\text{like denominator}}$$

After adding or subtracting rational expressions always put in simplified form.

Add or subtract the following rational expression

$$\frac{3}{2x} + \frac{5}{2x}$$

Add or subtract the following rational expression

$$\frac{x+3}{x+2} + \frac{x+1}{x+2}$$

Adding and Subtracting Rational Expressions with Like Denominators

Add or subtract the following rational expression

$$\frac{2x + 3}{x + 2} - \frac{x + 1}{x + 2}$$

Add or subtract the following rational expression

$$\frac{x^2 - 3x}{x^2 - 4} + \frac{5x - 8}{x^2 - 4}$$

Add or subtract the following rational expression

$$\frac{4x + 7}{x + 3} - \frac{x - 2}{x + 3}$$

Adding and Subtracting Rational Expressions

Rational expressions with like denominators can be added or subtracted by adding or subtracting the numerators and putting the result over the like denominator.

$$\frac{2}{5} + \frac{1}{5} = \frac{2 + 1}{5} = \frac{3}{5} \qquad \frac{a}{b} + \frac{c}{b} = \frac{a + c}{b}$$

like denominator   like denominator

After adding or subtracting rational expressions always put in simplified form.