

## 12.4-12.6: Operations with Rational Expressions Study Guide

### 12.4: Simplify Rational Expressions:

- Be able to identify excluded values of a rational expression

#### State the excluded values of each rational expression:

$$\text{Ex: } \frac{8}{x^2+4x-12}$$

$$\text{Ex: } \frac{7x}{x^2-25}$$

- Be able to simplify a rational expression

#### Simplify:

$$\text{Ex: } \frac{-36x^2}{18x}$$

$$\text{Ex: } \frac{4x-12}{3-x}$$

$$\text{Ex: } \frac{x+3}{x^2+10x+21}$$

### 12.5: Multiply and Divide Rational Expressions:

- Be able to multiply rational expressions

#### Multiply:

$$\text{Ex: } \frac{x^2+4x-12}{x^2+7x+10} \cdot \frac{x+5}{2x-4}$$

$$\text{Ex: } \frac{3x-6}{x^2-x-2} \cdot (x^2 + 6x + 5)$$

- Be able to divide rational expression

#### Divide:

$$\text{Ex: } \frac{2x+10}{x^2-25} \div \frac{4x^2}{2x^2-10x}$$

$$\text{Ex: } \frac{x^2+2x-35}{x^2-3x-10} \div \frac{3x^2+21x}{9x+18}$$

## 12.6 Add and Subtract Rational Expressions:

· Be able to add and subtract rational expressions with a common denominator

### Add or subtract:

$$\text{Ex: } \frac{x-5}{x+2} - \frac{x-6}{x+2}$$

$$\text{Ex: } \frac{x+3}{x-9} + \frac{5x}{x-9}$$

· Be able to find a common denominator

### Find the common denominator:

$$\text{Ex: } \frac{6}{5x^3}, \frac{7}{15x}$$

$$\text{Ex: } \frac{1}{x^2+5x+4}, \frac{1}{x^2-16}$$

· Be able to add or subtract rational expressions with unlike denominators

### Add or subtract:

$$\text{Ex: } \frac{8}{3x^3} - \frac{5}{12x}$$

$$\text{Ex: } \frac{x+3}{x-1} + \frac{x+2}{x-1}$$