

**Objectives**

- Add and subtract rational expressions
- Simplify complex fractions

**Vocabulary**

complex fractions

**Example 1**

**Add or subtract. Identify any x-values for which the expression is undefined.**

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

b) 
$$\frac{2x-1}{x^2+2} - \frac{4x+4}{x^2+2}$$

**Try it!**

a) 
$$\frac{6x+5}{x^2-3} + \frac{3x-1}{x^2-3}$$

b) 
$$\frac{3x^2-5}{3x-1} - \frac{2x^2-3x-2}{3x-1}$$

**Example 2****Find the least common multiple for each pair.**

**a)**  $2x^3y^4$ , and  $3x^5y^3$

**b)**  $x^2 + 3x - 4$ , and  $x^2 - 3x + 2$

**Try it!****Find the least common multiple for each pair.**

**a)**  $4x^3y^7$ , and  $3x^5y^4$

**b)**  $x^2 - 4$ , and  $x^2 + 5x + 6$

**Example 3**

Add or subtract. Identify any x-values for which the expression is undefined.

a)  $\frac{x}{x+3} + \frac{-18}{x^2-9}$

b)  $\frac{x-1}{x^2+3x+2} \cdot \frac{x}{x+1}$

*Try it!*

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

b)  $\frac{x}{x+3} + \frac{2x+6}{x^2+6x+9}$

**Example 4**

**Subtract. Identify any x-values for which the expression is undefined.**

a) 
$$\frac{2x^2 - 16}{x^2 - 4} - \frac{x + 4}{x + 2}$$

*Try it!*

**Subtract. Assume Identify any x-values for which the expression is undefined.**

a) 
$$\frac{3x - 2}{2x + 5} - \frac{2}{5x - 2}$$

b) 
$$\frac{2x^2 + 64}{x^2 - 64} - \frac{x - 4}{x + 8}$$

**Example 5**

**Simplify the complex fraction. Assume that all expressions are defined.**

a) 
$$\frac{\frac{2}{x} + \frac{x}{4}}{\frac{x+1}{x}}$$

b) **Method 2** Multiply by the numerator and denominator of the complex fraction by the LCD of the fractions in the numerator and denominator.

*Try it!*

**Simplify the complex fraction. Assume that all expressions are defined.**

a) 
$$\frac{\frac{x+1}{x^2-1}}{\frac{x}{x-1}}$$

b) 
$$\frac{\frac{20}{x-1}}{\frac{6}{3x-3}}$$

**Homework:8.3 pg 588 #1-19 odd**