Homework 9

Rational Expressions and Rational Equations

Name: _____

Show all algebraic steps clearly. State all restrictions when simplifying rational expressions.

Part I: Simplify Rational Expressions

1.

$$\frac{x-y}{y-x}$$

2.

$$\frac{x^2+8x+12}{x+2}$$

3.

$$\frac{x^2+5x}{25-x^2}$$

4.

$$\frac{x^2-2x-15}{x^2+10x+21}$$

5.

$$\frac{x^2 - 36}{x^2 + 12x + 36}$$

6.

$$\frac{6x^2 - 5x - 1}{10x^2 + 9x - 19}$$

7.

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

8.

$$\frac{x^2 - 9}{10x - 25} \div \frac{2x + 3}{x - 5}$$

9.

$$\frac{x+4}{x^2-5x+6}$$

State all restrictions.

Part II: Solve Rational Equations

(a)

$$\frac{5}{7t+3} = \frac{9}{2}$$

(b)

$$\frac{3}{x+1} = \frac{12}{5}$$

(c)

$$\frac{7x+8}{x+1} = 9$$

(d)

$$\frac{2}{x-3} + \frac{1}{x+3} = \frac{5}{x^2-9}$$

Part III: Applications

(a) One pipe can fill a tank in 6 hours while another pipe can fill the same tank in 4 hours. If both pipes work together, how long will it take to fill the tank?

(b) A car travels 240 miles at a speed of x miles per hour. Write a rational expression representing the travel time.

Part IV: Additional Practice

(a) Simplify completely and state all restrictions.

$$\frac{x^2-16}{x^2+7x+12} \cdot \frac{x^2+5x+6}{x^2-4}$$

(b) Simplify the complex fraction completely and state all restrictions.

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