Name: KEY Hour: _____ Date: _____

NOTES: Section 11.5 Adding and Subtracting with Like Denominators.

Goals: #1 - I can add and subtract rational expressions with like denominators.

Homework: Section 11.5 Worksheet

Warm Up:

1. Find the product of the rational expression and simplify.

a. $\frac{4x}{3x^2} \cdot \frac{6x^3}{2x}$

$\frac{2 \cdot 2 \cdot x}{3 \cdot x \cdot x} \cdot \frac{3 \cdot 2 \cdot x \cdot x \cdot x}{2 \cdot x}$

$\frac{3 \cdot 8 \cdot 2 \cdot 2 \cdot x \cdot x \cdot x \cdot x}{3 \cdot 8 \cdot x \cdot x \cdot x}$

$\boxed{4x}$

b. $\frac{x-1}{2x+2} \cdot \frac{4}{3x-3}$

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

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

$\boxed{\frac{2}{3(x+1)}}$

2. Find the quotient of the rational expression and simplify.

a. $\frac{3(2x+1)}{2x-8} \div \frac{8x+4}{3(x-4)}$

$\frac{3(2x+1)}{2(x-4)} \cdot \frac{3(x-4)}{4(2x+1)}$

$\frac{3 \cdot 3 \cdot (2x+1) \cdot (x-4)}{2 \cdot 4 \cdot (x-4) \cdot (2x+1)}$

$\boxed{\frac{9}{8}}$

b. $\frac{5x^2+14x-3}{5x^2-x} \div (4x+12)$

$5 \cdot -3 = -15$

$-14 = 15 + -1$

$5x^2+15x-1x-3$

$5x(x+3)-1(x+3)$

$(x+3)(5x-1)$

$\frac{(x+3)(5x-1)}{x(5x-1)} \cdot \frac{1}{4(x+3)}$

$\frac{(x+3)(5x-1)}{4 \cdot x \cdot (5x-1)(x+3)}$

$\boxed{\frac{1}{4x}}$

Exploration #1: Work with a partner and add the following fractions.

1. $\frac{3}{5} + \frac{1}{5}$

$\boxed{\frac{4}{5}}$

2. $\frac{2}{3} + \frac{2}{3}$

$\boxed{\frac{4}{3}}$

3. $\frac{1}{4} + \frac{3}{4}$

$\frac{4}{4}$

$\boxed{1}$

Name:_____ Hour:_____ Date:_____

Notes:

As with fractions, to add or subtract rational expressions with like denominators, combine their numerators and keep the common denominator.

Example #1: Add the rational expression and simplify.

1. $\frac{5}{2x} + \frac{x-5}{2x}$

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

$\frac{x}{2x}$

$\boxed{\frac{1}{2}}$

$1 \cdot 1 = 1$

$1 + 1 = 2$

$x^2 + 1x + 1x + 1$

$x(x+1) + 1(x+1)$

$(x+1)(x+1)$

2. $\frac{2x}{x^2+2x+1} + \frac{2}{x^2+2x+1}$

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

$\frac{2(x+1)}{(x+1)(x+1)}$

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

You practice: Add the rational expression and simplify.

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

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

$\frac{4x}{x}$

$\boxed{4}$

$1 \cdot -5 = -5$

$4 = 5 + -1$

$a^2 + 5a - 1a - 5$

$a(a+5) - 1(a+5)$

$(a+5)(a-1)$

2. $\frac{a^2-2}{a^2-25} + \frac{4a-3}{a^2-25}$

$\frac{a^2-2+4a-3}{a^2-25}$

$\frac{a^2+4a-5}{a^2-25}$

$\frac{(a+5)(a-1)}{(a+5)(a-5)}$

$\boxed{\frac{a-1}{a-5}}$

Name:_____ Hour: _____ Date: _____

Example #2: Subtract the rational expression and simplify.

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

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

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

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

$3 \cdot -2 = -6$

$-3+2=-1$

$3x^2-3x+2x-2$

$3x(x-1)+2(x-1)$

$(3x+2)(x-1)$

2. $\frac{4x}{3x^2-x-2} - \frac{x-2}{3x^2-x-2}$

$\frac{4x-(x-2)}{3x^2-x-2}$

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

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

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

$\boxed{\frac{1}{x-1}}$

You practice: Subtract the rational expression and simplify.

1. $\frac{3x-4}{x-4} - \frac{2x}{x-4}$

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

$\frac{x-4}{x-4}$

$\boxed{1}$

$2 \cdot 5 = 10$

$-5 \quad -2$

$2x^2-5x-2x+5$

$x(2x-5)-1(2x-5)$

$(x-1)(2x-5)$

2. $\frac{1-x}{2x^2-7x+5} - \frac{3-3x}{2x^2-7x+5}$

$\frac{1-x-(3-3x)}{2x^2-7x+5}$

$\frac{1-x-3+3x}{2x^2-7x+5}$

$\frac{2x-2}{2x^2-7x+5}$

$\frac{2(x-1)}{(x-1)(2x-5)}$

$\boxed{\frac{2}{2x-5}}$