**Lesson Title 7.3 Multiplying & Dividing Rational Expressions DAY ONE NOTES** **Alg 2** **Date** _____

TASK 1: Answer the following questions.

a) What is the difference between an expression and an equation? Simplify: no = Solve: =

b) When is a fraction undefined? dividing by 0. $\frac{0}{K}$ $\frac{N}{0}$

***The KEY to RATIONAL EXPRESSIONS is FACTORING. FACTORING should ALWAYS be your FIRST STEP!***

## OBJECTIVE 1: Simplifying Rational Expressions

STEPS:

1. Factor the numerator & denominator completely
2. Cancel any common factors
3. Remember ALL OR NOTHING: a + or – groups the two terms it is touching

TASK 2: Simplify the rational expressions below.

a) $\frac{4x^3y^4}{12x^7y^2} = \frac{4}{12}\cdot\frac{x^3}{x^7}\cdot\frac{y^4}{y^2} = \frac{1}{3}\cdot\frac{1}{x^4}\cdot\frac{y^2}{1} = \boxed{\frac{y^2}{3x^4}}$

b) $\frac{8x^3-2x^2}{4x^2-x} = \frac{2x^2(4x-1)}{x(4x-1)} = \frac{2x^2}{x} = \boxed{2x}$

## OBJECTIVE 2: Multiplying Rational Expressions

STEPS:

1. Factor the numerator & denominator completely
2. Cancel any common factors
3. Remember ALL OR NOTHING: a + or – groups the two terms it is touching

TASK 3: Multiply the rational expressions below. Simplify your final answer completely.

a) $\frac{8x^3}{26xy}\cdot\frac{14y^4}{12x^2} = \frac{112x^3y^4}{312x^3y} = \boxed{\frac{14y^3}{39}}$

b) $\frac{2x^2-x-3}{x^2+x}\cdot\frac{4x^2+4x}{2x-3} = \frac{(2x-3)(x+1)}{x(x+1)}\cdot\frac{4x(x+1)}{(2x-3)} = \boxed{4(x+1)}$

c) $\frac{4x^2-4x}{x^2+2x-3}\cdot\frac{x^2+x-6}{4x} = \frac{4x(x-1)}{(x+3)(x-1)}\cdot\frac{(x+3)(x-2)}{4x} = \boxed{x-2}$

**OBJECTIVE 3:** Dividing Rational Expressions

STEPS:

1. Rewrite the problem as a multiplication problem using Keep Change Flip (KCF)
2. Factor the numerator & denominator completely
3. Cancel any common factors
4. Remember ALL OR NOTHING: a + or – groups the two terms it is touching

TASK 4: Divide the rational expressions below. Simplify your answer completely.

a) $(x^2-1) \div \frac{x-1}{x+5}$

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

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

$(x+1)(x+5)$

b) $\frac{x^2+4x+4}{x+3} \div \frac{(x+2)}{1}$

$\frac{x^2+4x+4}{x+3} \cdot \frac{1}{x+2}$

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

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

c) $\frac{3x-1}{2x^3-2x} \div \frac{x}{2x^3-2x^2}$

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

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

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

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

Common mistakes:

**Still need help with:**