Name:_____ Class #:_____

LESSON 9: Rational Expressions and Functions

- ☐ Polynomial expressions
- ☐ Rational expressions
- ☐ Rational functions
- ☐ Simplified rational expressions
- ☐ Caution on canceling

ALGEBRAIC PROPERTIES OF FRACTIONS

Rational Number: a number that can be expressed as the quotient of two integers

$$\frac{550}{5} \quad \leftarrow \quad \leftarrow$$

Fraction Notation for 1: $\frac{A}{A} =$

Multiplication of Fractions: $\frac{A}{B} \cdot \frac{C}{D} =$

Division of Fractions: $\frac{A}{B} \div \frac{C}{D} =$

Addition of Fractions: $\frac{A}{D} + \frac{B}{D} =$

Addition of Fractions: $\frac{A}{D} - \frac{B}{D} =$

Name:_____ Class #:_____

LESSON 9: EQUIVALENT FRACTIONS

Start with the number on the left and use a series of operations to create the **equivalent** expression on the right. Remember, you can change the way a number looks without changing the VALUE by multiplying or dividing by 1 (in any form you want).

	Start with:	End with:
7.	5 =	$=\frac{30y}{6y}$
8.	2 =	$=\frac{4x^2}{2x^2}$
9.	1 =	$=\frac{x+5}{5+x}$
10.	-1 =	$=\frac{3-x}{x-3}$

Name:_____ Class #:_____

LESSON 9: EQUIVALENT FUNCTIONS

Fill in the tables below. You can use your graphing calculator or you can do the computations by hand.

1. $f(x) = -2x$

x	$f(x)$
-1	
1	
3	
5	
7	

2. $g(x) = \frac{6x-2x^2}{x-3}$

x	$g(x)$
-1	
1	
3	
5	
7	

3. Compare the output values of $f(x)$ to $g(x)$. What do you notice?

4. Use the algebraic properties of fractions to validate your observations from problem 3 above.

Name:_____ Class #:_____

LESSON 9: Multiplication and Division

- ☐ The product of two rational expressions
- ☐ The quotient of two rational expressions

Using the rules of fractions that we've studied together, multiply or divide the following rational expressions.

5. $\frac{16}{25} \cdot \frac{35}{12}$

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

Name:_____ Class #:_____

7. $\frac{10t+20}{2t^2-3t+1} \cdot \frac{t^2-1}{5t+10}$

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

Name:_____ Class #:_____

OPTIONAL CHALLENGE PROBLEMS

9. $\frac{(a^2+3a+2)}{a^2-4} \div \frac{5a^2+10a}{a-2}$

10. $\frac{10b+20}{b} \cdot \frac{b^2}{b+2}$