Name: Key Date: 10/17/17

CC ALGEBRA 2 TROICI

LESSON #1: EQUIVALENT RATIONAL EXPRESSIONS

Do Now:

Simplify the following:

$\frac{12}{15} = \frac{4}{5}$ $\quad \frac{7}{28} = \frac{1}{4}$ $\quad \frac{x^5}{x^2} = x^3$

$\frac{x}{x^3} = \frac{1}{x^2}$ or x^{-2} $\quad \frac{0}{5} = 0$ $\quad \frac{5}{0}$ = undefined!

RULE:

If a, b, and n are integers with $n \neq 0$ and $b \neq 0$, then

$$\frac{na}{nb} = \frac{a}{b}.$$

Write a rational expression with denominator $6b$ that is equivalent to

a. $\frac{a}{b} \cdot \frac{6}{6} = \frac{6a}{6b}$ b. $\frac{a}{2b} \cdot \frac{3}{3} = \frac{3a}{6b}$ c. $\frac{1}{3} \cdot \frac{2b}{2b} = \frac{2b}{6b}$

RULE #1: A Fraction is undefined when the denominator equals zero.

Find all numbers for which each rational expression is undefined.

a.) $\frac{2}{x-4}$ $x-4=0$, $+4\ +4$, $x \neq 4$

b.) $\frac{3x+9}{x+5}$ $x+5=0$, $-5\ -5$, $x \neq -5$

c.) $\frac{14x^3 - x^2 + 9x - 2}{x^2 - 16}$ $x^2-16=0$, $\sqrt{x^2}=\sqrt{16}$, $x \neq \pm 4$

d.) $\frac{3x}{6x^2 - x - 2}$ -12, $6x^2+3x-4x-2$, $3x(x+1)-2(x+1)$, $(3x-2)(x+1)=0$, $\frac{2}{3}$ | -1

e.) $\frac{5}{x^2+4}$ $x^2+4=0$, $-4\ -4$, $\sqrt{x^2}=\sqrt{-4}$, impossible, $\{\emptyset\}$

For the following:

1. Reduce the following rational expressions to lowest terms
2. Identify the values of the variable(s) that must be excluded to prevent division by zero.

RULE #2: To simplify rational expressions with monomials, reduce by finding the GCF

a. $\frac{16n}{20n} = \frac{4}{5}$

$n \neq 0$

b. $\frac{x^3y}{y^4x} = \frac{x^3y}{xy^4} = \frac{x^2}{y^3}$

RULE #3: To simplify rational expressions with polynomials, factor first and then reduce.

c. $\frac{x^2-x-6}{5x^2+10x}$ (a m, GCF)

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

$\frac{x-3}{5x}$

d. $\frac{3-x}{x^2-9}$ (DOTS ★)

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

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

e. $\frac{y-x}{x+y}$ -1

f. $\frac{a^2-b^2}{b+a}$ (DOTS ★)

★ $\frac{(a-b)(a+b)}{(b+a)}$ becomes !!

$a-b$

g. $\frac{3x-3y}{y^2-2xy+x^2}$ ★ (a m)

$x^2-2xy+y^2$

$\frac{3(x-y)}{(x-y)(x-y)} = \frac{3}{x-y}$

$(x-y)(x-y)$

$x^2-xy-xy+y^2$

$x^2-2xy+y^2$

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

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

$= \frac{2+2}{2x+2} = \frac{4}{2x+2}$

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