GUIDED NOTES – Week 4

Simplifying Rational Expressions Name: _____ Period: ___

Multiplying and Dividing Rational Expressions

OBJECTIVE: I can simplify rational expressions using multiplication and division.

A rational expression is one where two polynomials are in the form of a fraction (dividing two polynomials – one in the numerator and one in the denominator of a fraction.

The key to simplifying rational expressions is to be able to _____. Let's review factoring basics.

GCF
$3x^2 + 15x$

Difference of Squares (DOS)
$x^2 - 4$

X Factor Method
$x^2 + 2x - 15$

X Methodw/SlipnSlide
$3x^2 - 7x - 6$

Combination
$2x^3 - 18x$

(Multi Method)

Combination
$4x^3 - 28x^2 + 48$

Grouping
$x^3 - 2x^2 + 5x - 10$

So if we have a rational expression that looks like these, we can simplify it by writing each part as factors. Then we can cancel out common factors (same factor on top and bottom).

Why does this work? Try writing the problem below as factors, to see how canceling out common factors simplifies the problem.

$$\frac{4}{9}\ \frac{15}{28}$$

Watch out for this:

$$\frac{5}{5x}$$

Example A:

Example B:

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

$$\frac{x^2-5x-6}{x^2-1}$$

Example C:

$$\frac{x-3}{x+2} \bullet \frac{x^2+5x+6}{x^2-9}$$

Example D:

$$\frac{4x-2x^2}{x^2-5x+6} \bullet \frac{x^2-4x+3}{2x}$$

To tackle division of rational expressions, change to _____, while you _____ the second expression.

Example E:

$$\frac{8x^2+10x-3}{4x^2} \div (4x^2-x)$$

Example F:

$$\frac{2x+6}{x^2+x-2} \div \frac{x+3}{x^2+3x+2}$$