Geometry Lomac 2015-2016 **Date** 12/1 **due** 12/2 **Multiplying Polynomials 6.2L**

Name _____ **Per**_____

LO: I can multiply and simplify polynomial expressions and write them in standard form.

emath 7.2

☐ **DO NOW** On the back of this packet

☐ (1) **Multiplying monomials and binomials**

Polynomials, as we saw in the last lesson, behave a lot like integers (whole numbers including the negatives). We saw that just like integers, **adding one polynomial to another polynomial results in a third polynomial**. The same will occur with multiplying them. First, a review problem.

***Exercise* #1: Monomials** are the simplest of **polynomials**. They consists of one **term** (terms are separated by addition and subtraction). Find the following products of monomials.

(a) $5x^3 \cdot 2x^2$ (b) $-3x \cdot -8x$ (c) $\frac{1}{2}x^2y^5 \cdot \frac{3}{4}x^9y$

We have also used the **Distributive Property** in previous lessons to multiply polynomials that are more complicated.

***Exercise* #2:** Find each of the following products in simplest form by using the distributive property once or twice.

(a) $2x(3x-1)$ (b) $x^2(4x^2+3)$ (c) $-2x^2y^3(2xy-5x)$

(d) $(x+2)(x-6)$ (e) $(2x+7)(x+3)$ (f) $(3x-2)(5x-1)$

☐ (2) Polynomial Expressions

Never forget that as we do these manipulations we are using **properties of equality** to produce **equivalent expressions**.

***Exercise* #3:** Consider the product of the two **binomial polynomials** $(x-1)(x-3)$.

(a) Find this product and express it as a **trinomial polynomial** written in standard form. Fill in the result in the first row (third column) of table (b).

(b) Fill out the table below using **TABLES** on your calculator to show they are equivalent.

x	$(x-1)(x-3)$	
0		
1		
2		
3		
4		

☐ (3) Multiplying more complex polynomials

We can evaluate more complicated products, just as we have done in the past with normal numbers. The key will always be the careful use of the **distributive property**.

***Exercise* #4:** Find each of the following more challenging products.

(a) $(2x+5)^2$

(b) $(x+2)(x^2+4x+3)$

(c) $(x-4)(x+3)(x-5)$

(d) $(3x+2)^3$

☐ (4) **Polynomial Conjugates – What happens?**

4. An interesting thing happens when you multiply two **conjugate binomials**. Conjugates have the property of having the same **terms** but differ by the operation between the two terms (in one case addition and in one case subtraction). Multiply each of the following **conjugate pairs** and state your answers in **standard form**. The first is done as an example

(a) $(x+3)(x-3)$

$= x(x-3)+3(x-3)$

$= x^2-3x+3x-9$

$= x^2-9$

(b) $(x-5)(x+5)$

(c) $(10+x)(10-x)$

(d) $(2t+3)(2t-3)$

(e) $(5t+1)(5t-1)$

(f) $(8-3t)(8+3t)$

☐ (5) **Polynomial Reasoning**

REASONING

6. Notice again how similar polynomials are to integers, i.e. the set $\{...-3,-2,-1,0,1,2,3...\}$. Write a statement below for polynomials based on the statement about integers.

Statement About Integers: An integer times an integer produces an integer.

Statement About Polynomials: _____

_____

7. Consider the product $(3x+1)^2$.

(a) Write this product in standard trinomial form.

(b) Use your answer in part (a) to determine the value of 31^2 without your calculator.

☐ (6) **Exit Ticket**

ON THE LAST PAGE

☐ (7) **Homework**
cont.

FLUENCY

1. Write the following products as polynomials in either x or t. The first is done as an example for you.

(a) $5x(2x-4)$

$=(5x)(2x)-(5x)(4)$

$=(5\cdot 2)(x\cdot x)-(5\cdot 4)(x)$

$=10x^2-20x$

(b) $3t(t+7)$

(c) $-4x(5x+1)$

(d) $4(t^2-5t+2)$

(e) $x(x^2-2x-3)$

(f) $-5t(2t^2+3t-7)$

2. Perhaps the most important type of polynomial multiplication is that of two binomials. Make sure you are **fluent** with this skill. Write each of the following **products** as an **equivalent polynomial** written in **standard form**. The first problem is done as an example using **repeated distribution**.

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

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

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

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

$=x^2+2x-15$

(b) $(x-10)(x-4)$

(c) $(x+3)(x+12)$

(d) $(2x+3)(5x+8)$

(e) $(4x-1)(x+2)$

(f) $(6x-5)(4x-3)$

3. Never forget that squaring a binomial also a process of repeated distribution. Write each of the following perfect squares as **trinomials** in **standard form**.

(a) $(x+3)^2$

(b) $(x-10)^2$

(c) $(2t+3)^2$

Exit Ticket **Name**_____ **Date** _____ _____ **Per**_ _____ **6.2L**

The LO (Learning Outcomes) are written below your name on the front of this packet. Demonstrate your achievement of these outcomes by doing the following:

(1) Write each of the following products in standard polynomial form.

(a) $(x+3)(x-2)(x-8)$ (b) $(x+2)(x-2)(x+3)(x-3)$ (Hint: try to use #4)

DO NOW Name_____ Date _____ Per_____ 6.2L

(1) Translation to algebra progress. Write one or more algebraic statement(s) to represent this situation. Be sure to write at least one "Let" statement to define any variables.

Michelle scored 30 points by making 13 shots from the floor in a basketball game. How many 2 and 3 pointers did she make?