Math 9 Homework & Notebook

Name:______________________________ **Block:**_________
Teacher: Miss Zukowski **Date Submitted:** ____/_____/ 2018

Unit #____:____

Submission Checklist: *(make sure you have included all components for full marks)*

- ❏ Cover page & Assignment Log
- ❏ Class Notes
- ❏ Homework *(attached any extra pages to back)*
- ❏ Quizzes *(attached original quiz + corrections made on separate page)*
- ❏ Practice Test/ Review Assignment

Assignment Rubric: Marking Criteria			
Excellent (5) - Good (4) - Satisfactory (3) - Needs Improvement (2) - Incomplete (1) - NHI (0)		**Self Assessment**	**Teacher Assessment**
Notebook	● *All* teacher notes complete ● Daily homework assignments have been recorded & completed *(front page)* ● Booklet is neat, organized & well presented *(ie: name on, no rips/stains, all pages, no scribbles/doodles, etc)*	/5	/5
Homework	● *All* questions attempted/completed ● *All* questions **marked** *(use answer key, correct if needed)*	/5	/5
Quiz *(1mark/dot point)*	● Corrections have been made **accurately** ● Corrections made in a *different colour pen/pencil* *(+½ mark for each correction on the quiz)*	/2	/2
Practice Test *(1mark/dot point)*	● Student has completed all questions ● Mathematical working out leading to an answer is shown ● Questions are **marked** *(answer key online)*	/3	/3
Punctuality	● *All checklist items were submitted, and completed on the day of the unit test. (-1 each day late)*	/5	/5
Comments:		/20	/20

Homework Assignment Log

Textbook Pages:___________________________________

Date	Assignment/Worksheet	Due Date	Completed?

Quizzes & Tests:

What?	When?	Completed?
Quiz 1		
Quiz 2		
Unit/ Chapter test		

4.1 INTRODUCTION TO POLYNOMIALS

Name:_______________ Block_____

The Language of Algebra *(follow along with the powerpoint notes)*

A ______________is a letter that can represent any number

For example, the formula for the area of a rectangle is:

Area of a rectangle = length × width

If A represents the area of the rectangle, l represents the length of the rectangle and w represents the width of the rectangle, then we can write the formula for the area of the rectangle as follows:

A = l × w *In this formula, the letters ______________are called ______________.*

Example: *x could represent the number of goals a soccer player scored in a game*

The ____________is the answer when you ____________

the sum of a and b, is _____________

The____________is the answer when you ____________ the smaller number form the larger. *the difference of a and b, is _____________*

A______________is the answer when you_____________

_______________is written _______ *We say…"The **product** of a and b, is a × b "*

A ______________is the answer when you ____________ *(or share equally)*

________________ *is written* $\frac{a}{b}$ *We say* "The quotient of a and b, is a ÷ b"

Double: multiply _____________ ex. Double 16 is 16 × 2 = 32

Halve:________________by 2 ex. Half of 16 is 16 ÷ 2 =8

Triple: multiply _____________ ex. Triple 9 is 9 × 3 = 27

Square: multiply a number by _____________ ex. Square 7 is 7 × 7 = 7^2= 49

A _______________ may have one or more variables or may be just a number.

Ex. ____

A term is part of an _______________

A _______________is the number **in front** of a variable.

- If the term is being subtracted, the coefficient is a _______________number
- If there is no number in front, the coefficient is_________

Example: 9ay 4a w-16zy….

the coefficients are _______________and __________

An ______________________________is a combination of numbers and variables together with mathematical operations

ex. _______________

ex. _______________

Expressions are made by **adding, subtracting, multiplying or dividing** _______________

A _______________ is an algebraic expression with **1 or more terms.**

2 or more terms are *separated by addition or subtraction*

ex. _______________ ex. _______________

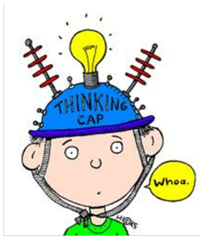
Polynomials are used in math to solve algebraic problems.

An _______________always has an equals sign =

ex. $r = 5a + 7y$ $2(v-6) = 12$

A _______________is a number whose value doesn't change, it always remains the same

ex. 2001 -3 737 15 -8



TRY THIS!

Language of Algebra

$4a + b - 12c + 5$

1. List the individual terms in the expression

2. In the expression, state the coefficients of a, b, c and d

3. What is the constant term?

4. State the coefficient of b in the expression

   $3a + 4ab + 5b^2 + 7b$

TRY THIS!

Write an expression for this sentence:

Start with a number, multiply it by three then add five

Let the starting number be "y"

TRY THIS!

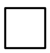
Write an **expression** for each of the following

1. The sum of 3 and k
2. The product of m and 7
3. 5 is added to one half of k
4. The sum of a and b is doubled

What is a polynomial?

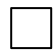
Algebra Tiles & Visual Representation

Red tiles represent positive 1



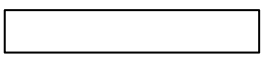
Positive 1 -tile

White tiles represent negative 1



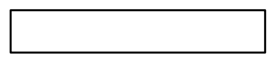
Negative 1 - tile

Green tiles this shape represent positive x



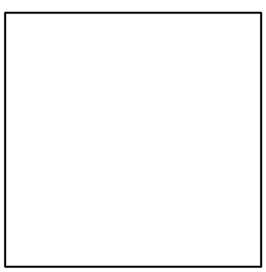
x tile

White tiles this shape represent negative x

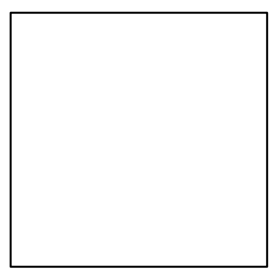


$-x$ tile

Green tiles this shape represent positive x^2



White tiles this shape represent negative x^2



______ $-x^2$ ______ x^2

USING THE 2 PAGES YOUR TEACHER HAS PROVIDED, MAKE YOURSELF 1 SET OF POSITIVE ALGEBRA TILES AND 1 SET OF NEGATIVE ALGEBRA TILES

PRACTICE

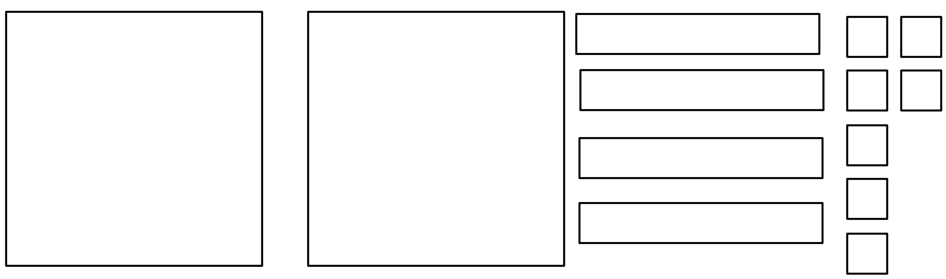
Example #1: Use algebra tiles to model each expression below.

a) $2x^2 + 3x - 5$

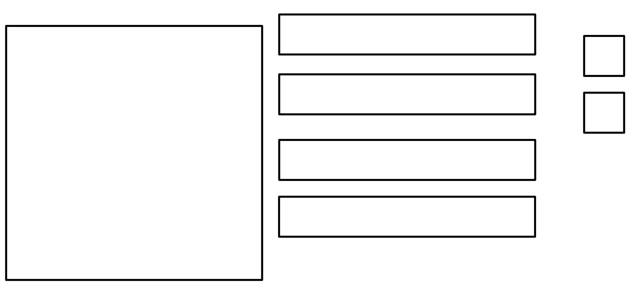
b) $-4x + 9$

Example #2: Write the expression represented by the algebra tiles below.

a)



b)



A polynomial is one term or the sum/difference of terms whose variables have whole number exponents.

Terms are numbers, variables, or the product of a number and a variable (ex. 6, x, or $3x^2y$)

The expression is **NOT A POLYNOMIAL** when:

- There is a ***negative exponent*** ex.
- The ***variable cannot be in the denominator*** of a fraction ex.
- The ***variable cannot be inside a radical*** ex.

<u>Example #3:</u> Which of the following are polynomials? Explain your reasoning.

a) $-2x + 6$

b) $-10x^2 + \sqrt{x}$

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

Vocabulary

Coefficients are the numbers in front of the variables.

The term with the greatest sum of exponents (from the variables only) determines the **degree** of the polynomial.

The **constant** term is the one without the variable (its value does not change/vary when the value of x change, it remains constant)

<u>Example #4:</u> For each polynomial below, determine the coefficients, the degree and the constant.

Polynomial	Coefficients	Degree	Variable	Constant
$5x^2 - 8x + 2$				
$- 6x - 7$				
$- 10x^2 + 3x$				

We classify polynomials by the number of terms.

A **monomial** has

A **binomial** has

A **trinomial** has

A polynomial is generally written in descending order. This means we order the terms with the highest degree term first, all the way down to the constant term of degree zero.

Evaluating Algebraic Expressions

We can use algebraic expressions to solve problems and solve for things like cost.
The following algebraic expression is used to determine the cost of a school field trip.

C = \$300 + \$10t + \$7.50s

where C is the cost, t is the number of teacher supervisors on the trip and s is the number of students on the trip.

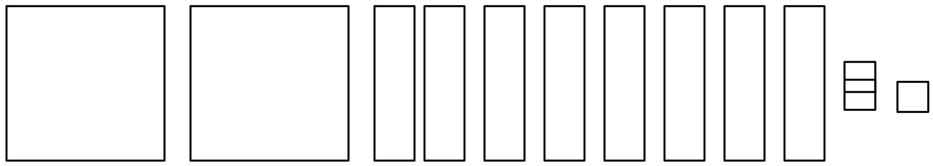
If a school field trip had 4 teacher supervisors and 100 students in attendance what would the total cost of the field trip be?

ASSIGNMENT #1 Section 4.1 pg 112-115	Required questions	Extra practice	Extension
	2, 3abcd, 4, 5abcd, 6, 7, 11, 13, 14, 15, 16	3ef, 5ef, 9, 10, 12, 17, 18,	21, 22

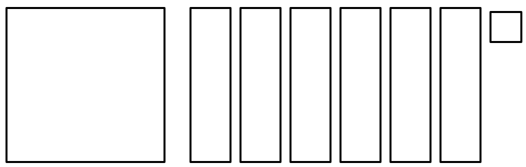
4.2 Adding and Subtracting Polynomials

Investigation: Model each polynomial using algebra tiles.
USE YOUR OWN ALGEBRA TILES TO MODEL ON YOUR DESK!

a) $2x^2 - 8x + 3$



b) $- x^2 + 6x - 1$



Consider the model for the polynomial $2x^2 - 8x + 3 - x^2 + 6x -1$.

We organize the tiles by grouping the same sizes together and simplify by removing the opposite pairs.

These opposite pairs are sometimes referred to as **zero pairs** as they are equivalent to zero.
*For example:*____ *are* ***zero pairs***

The opposite pairs cancel out and we are left with:

Simplified expression: ____________________

A polynomial is in **simplified form** when:

→ Its algebra tile model uses the fewest tiles possible

→ Its symbolic form contains only one term of each degree and no terms with a zero coefficient.

LIKE TERMS are:

→ Terms that can be represented by algebra tiles with the same shape AND size.

→ Terms with the same variable AND same exponent

→ Constants may be different. *For example: $3x^2$ and $5x^2$ are still "like terms" because they are both "x^2"*

Example #1:

a) List three terms that are like terms with $5x^2$

b) List three terms that are unlike terms with $5x^2$

Group the like terms in the following expression:

$$2x + 5 + x^2 + 7 + 36x + 3x^2$$

Group the like terms in the following expressions:

1) $-6k + 7k$

2) $12r - 8 - 12$

3) $n - 10 + 9n - 3$

4) $-4x - 10x$

5) $-r - 10r$

6) $-2x + 11 + 6x$

Adding Polynomials

Example #2: What is the sum of 2x + 2 and 3x + 3?

Simplify the polynomial visually using algebra tiles and symbolically with algebra.

Visually	**Symbolically**
Group like tiles:	Group Like Terms:
Remove Any Zero Pairs:	Combine Like Terms:

Example #3: What is the sum of $2x^2 + 2x - 3$ and $-x^2 - 3x + 3$?

Simplify the polynomial visually using algebra tiles and symbolically with algebra.

Visually	**Symbolically**
Group like tiles:	Group Like Terms:
Remove Any Zero Pairs:	Combine Like Terms:

Example #4: $(2x + 3) + (4x - 3)$

Remove the brackets

Rearrange so like terms are together

Combine like terms

Example #5: $(2x^2 - 4x - 1) + (3x^2 + 2x + 5)$

Remove the brackets

Rearrange so like terms are together

Combine like terms

PRACTICE

DO THE ADDITION QUESTIONS ONLY *(COME BACK TO SUBTRACTION NEXT LESSON)*

Simplify each expression.

1) $(5p^2 - 3) + (2p^2 - 3p^3)$

2) $(a^3 - 2a^2) - (3a^2 - 4a^3)$

3) $(4 + 2n^3) + (5n^3 + 2)$

4) $(4n - 3n^3) - (3n^3 + 4n)$

5) $(3a^2 + 1) - (4 + 2a^2)$

6) $(4r^3 + 3r^4) - (r^4 - 5r^3)$

7) $(5a + 4) - (5a + 3)$

8) $(3x^4 - 3x) - (3x - 3x^4)$

9) $(-4k^4 + 14 + 3k^2) + (-3k^4 - 14k^2 - 8)$

10) $(3 - 6n^5 - 8n^4) - (-6n^4 - 3n - 8n^5)$

11) $(12a^5 - 6a - 10a^3) - (10a - 2a^5 - 14a^4)$

12) $(8n - 3n^4 + 10n^2) - (3n^2 + 11n^4 - 7)$

13) $(-x^4 + 13x^5 + 6x^3) + (6x^3 + 5x^5 + 7x^4)$

14) $(9r^3 + 5r^2 + 11r) + (-2r^3 + 9r - 8r^2)$

15) $(13n^2 + 11n - 2n^4) + (-13n^2 - 3n - 6n^4)$

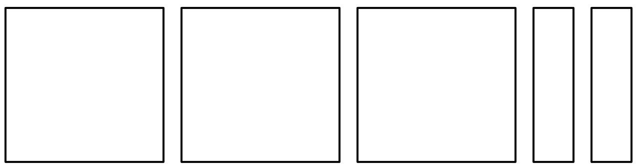
16) $(-7x^5 + 14 - 2x) + (10x^4 + 7x + 5x^5)$

Subtracting Polynomials

Method #1: Subtracting Polynomials Using Algebra Tiles

Example #1: Subtract $(3x^2 - 2x) - (x^2 + 4x)$

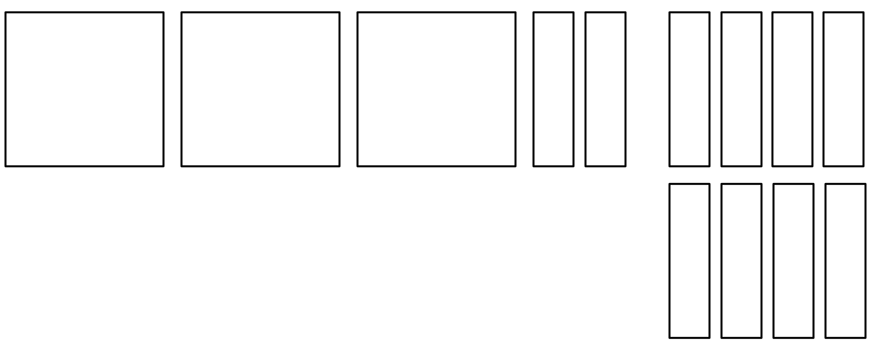
Start with the first polynomial:



We need to

- *take away one x^2 tile from three x^2 tiles*
- *take away four x tiles from two negative x tiles*

If you don't have enough positive tiles, you need to add more positive tiles and balance by also adding the same number of negative tiles.



Simplified expression: ___________________

Example #2: Use algebra tiles to subtract $(4x^2 - 2x + 1) - (3x^2 - 4x + 3)$

Method #2: Add the Opposite

Example #3: $(5x + 4) - (2x + 1)$

The opposite of $(2x + 1)$ is $(-2x - 1)$

Remove brackets and add the opposite

Collect like terms

Combine like terms

Example #4: $(3x^2 + 4x - 2) - (2x^2 + 6x + 2)$

The opposite of $(2x^2 + 6x + 2)$ is ___________

Remove brackets and add the opposite

Collect like terms

Combine like terms

Method #3: Subtracting Using Integer Properties *("paper an pencil method")*

Warm Up: Subtract.

a) $8 - 7$ b) $-3 – 5$ c) $6 – (-4)$ d) $-2 – (-5)$

Example Subtract using properties of integers.

a) $(3x^2 - 2x) - (x^2 + 4x)$

b) $(-8a^2 + 3a - 7) - (-2a^2 - a + 5)$

Homework	Required questions	Extra practice	Extension
ASSIGNMENT #2 Section 4.2 pg 123 - 126	1, 2a, 3, 4, 6, 7abcd, 9, 10, 11, 12, 13, 16, 19, 21, 22, 23a	2b, 7ef, 8, 14, 15, 17, 18, 20, 23bcd	25