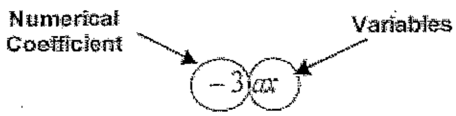
SIMPLYING POLYNOMIALS using ALGETILES

Name: ______________

What is a TERM (in Algebra)? The basic unit of an algebraic expression is a term.

In general, ***a term*** **is either a number or a product of a number and one or more variables.**

Below is the term $-3ax$. *It has two parts: Numerical Coefficient and Variable part.*



A constant is a term where its degree is zero, such as "-2" in 3x-2 since it when written with the variable part $-2x^0 = -2$ as $x^0 = 1$

The numerical coefficient includes the positive/negative sign of the operation in front of it.

The following polynomial $2x^2y^3 - 4x^2 - 3$ has _____ terms and is therefore called a ______________.

The degree of this polynomial is a __________-degree since the ________________________________.

The numerical coefficient of the Second term is _______. The constant of this polynomial is ______.

What are algebra tiles? Algebra tiles are manipulatives with which you can represent polynomials and perform polynomial operations. Each tile represents a specific monomial.

The **1-tile** is a unit square because the dimensions are 1 unit.

In class we use:

Large Square = x^2 **Rectangle = x** **Small Square = 1**

Large Red Square = $-x^2$ **Red Rectangle = - x** **Red Small Square = - 1**

A representation of the polynomial $2x^2 - x - 3$ would be:

This is a __________-degree _________________ if asked to classify this polynomial.

Adding & Subtracting Polynomials using Algetiles:

Addition and subtraction are performed by combining or removing tiles. When subtracting you may need to use this idea in reverse and add zero to a polynomial.

Tiles which are the same size but different colors (opposites) will combine to give zero.

Try the following problems. (Show Algetiles representations below each question)

When SIMPLYING any Polynomials, we always Remove all brackets FIRST before Collecting the Like-terms (tiles)

Like terms have the same variable(s) and the same degree for each variable.

Example:

Simplify $(-2x^2 + 4x) - (5x^2 - 3x)$

$= \mathbf{1}(-2x^2 + 4x) - \mathbf{1}(5x^2 - 3x)$
$= -2x^2 + 4x - 5x^2 + 3x$
$= -7x^2 + 7x$

Review the rules for **multiplying two integers.**
If the signs are the same the product is positive:

$(+)(+) = +$
$(-)(-) = +$

If the signs are opposite the product is negative:

$(+)(-) = -$
$(-)(+) = -$

1) $(x^2 + 2x + 1) - (x^2 - x - 4) =$ ________________

2) $(2x^2 + 2) - (x^2 + 2x - 1) =$ ________________

Exploring Adding and Subtracting Polynomials

Directions: Solve each polynomial when adding or subtracting and draw the representation of algebra tiles for each problem as well.

1. $(2x^2 + 3x + 3) + (x^2 + 2x - 2)$

4. $(5x^2 - 2x + 1) - (x^2 + 2x - 4)$

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

5. $(2x^2 + x + 3) - (x^2 + 2x - 2)$

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

6. $(-3x^2 + 4x + 3) + (3x^2 - 3x - 5)$

Adding and Subtracting Polynomials Using Algebra Tiles

Name ______________________________ **Date**______________________

Use algebra tiles to model each addition and subtraction problem and find the sum or difference. Draw your model of each problem below the problem. Cancel zero pairs by writing an X on the tiles that cancel. Write your simplified answer in the space provided.

1. $(2x^2 - 7x + 6) + (-3x^2 + 7x)$

   Answer:_______________

2. $(-2x^2 + 3x) + (-7x - 2)$

   Answer:_______________

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

   Answer:_______________

4. $(3x^2 - 5x - 2) - (x^2 - x + 1)$

   Answer:_______________

Is each statement below true or false? Justify your answer with a drawing. Write "True" or "False" in the space provided.

5. $(3x^2 + 2x - 4) + (-x^2 + 2x - 3) = 2x^2 + 4x - 7$ _______________

6. $(x^2 - 2x) - (-3x^2 + 4x - 3) = -2x^2 - 6x - 3$ _______________

Extend your learning and thinking by drawing, simplifying, and solving the following problem.

$(-x^2 - 3x - 1) - (x^2 - 3x - 1) + (2x^2 - x + 1) - (x^2 - x - 1) + (x^2 + x + 1)$

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Name____________________

Adding and Subtracting Polynomials

Date________________ Period____

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

17) $(7-13x^3-11x)-(2x^3+8-4x^5)$

18) $(13a^2-6a^5-2a)-(-10a^2-11a^5+9a)$

19) $(3v^5+8v^3-10v^2)-(-12v^5+4v^3+14v^2)$

20) $(8b^3-6+3b^4)-(b^4-7b^3-3)$

21) $(k^4-3-3k^3)+(-5k^4+6k^3-8k^5)$

22) $(-10k^2+7k+6k^4)+(-14-4k^4-14k)$

23) $(-7n^2+8n-4)-(-11n+2-14n^2)$

24) $(14p^4+11p^2-9p^5)-(-14+5p^5-11p^2)$

25) $(8k+k^2-6)-(-10k+7-2k^2)$

26) $(-9v^2-8u)+(-2uv-2u^2+v^2)+(-v^2+4uv)$

27) $(4x^2+7x^3y^2)-(-6x^2-7x^3y^2-4x)-(10x+9x^2)$

28) $(-5u^3v^4+9u)+(-5u^3v^4-8u+8u^2v^2)+(-8u^4v^2+8u^3v^4)$

29) $(-9xy^3-9x^4y^3)+(3xy^3+7y^4-8x^4y^4)+(3x^4y^3+2xy^3)$

30) $(y^3-7x^4y^4)+(-10x^4y^3+6y^3+4x^4y^4)-(x^4y^3+6x^4y^4)$