Registration for the PSAT ends on September 11th. Students can register online by going to the Guidance website and following the PSAT registration link. 11th graders planning on attending a 4 year college are encouraged to sit for the exam. 10th graders enrolled in Algebra 2 are also eligible to sit for the exam. The exam will be Wednesday, October 10th. The cost is $16.

You will study

- Operations & multiplying with polynomials
- Long division
- Factoring polynomial expressions
- The zeros of polynomial functions
- The roots of polynomial equations
- The intercepts of polynomial graphs
- Solving polynomial equations by factoring
- Simplifying Radicals and the Discriminant
- Solving quadratic equations with the Quadratic Formula
- Solving quadratic equations by Completing the Square

Unit 1
Polynomials

1-1: Operations/Multiplying with Polynomials

Term - *a number or product of numbers and variables: 3xy*
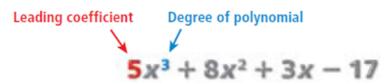
Monomial - *a single term: 3, 3xy^2*

Polynomial - *one or more terms combined as a sum or difference of terms: 3 + 3xy^2*

Classifying Polynomials

- A polynomial can be named by its ___# of terms___ and ___degree___

highest exponent ↓ (degree)

Classifying Polynomials by Degree			
Name	Degree	Example	# Terms
Constant	0	-9	1 monomial
Linear	1	$x - 4$	2 binomial
Quadratic	2	$x^2 + 3x - 1$	3 trinomial
Cubic	3	$x^3 + 2x^2 + x + 1$	4 polynomial

Standard Form

Leading coefficient   Degree of polynomial

$$5x^3 + 8x^2 + 3x - 17$$

Adding and Subtracting Polynomials

Add or subtract. Write your answer in standard form.   *"Combine like terms"*

1. $(3x^2 + x + 7) + (14x^3 + x^2 - x + 2)$

$3x^2 + x + 7 + 14x^3 + x^2 - x + 2$

$14x^3 + 4x^2 + 9$

2. $(2x^3 + 9 - x) + (5x^2 + 4 + 7x + x^3)$

$3x^3 + 5x^2 + 6x + 13$

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

$1 - x^2 - 3x^2 - 2x + 5$

$-4x^2 - 2x + 6$

4. $(5x^3 + 6x^2 + 12) - (15x^2 + 3x - 2)$

$5x^3 + 6x^2 + 12 - 15x^2 - 3x + 2$

$5x^3 - 9x^2 - 3x + 14$

5. Subtract $(x^2 - x + 6)$ from $(3 - 2x^2)$.   *"From goes First"*

$(3 - 2x^2) - (x^2 - x + 6)$

$3 - 2x^2 - x^2 + x - 6 = -3x^2 + x - 3$

6. From $(x^2 - x + 6)$ subtract $(3 - 2x^2)$.

$(x^2 - x + 6) - (3 - 2x^2)$

$x^2 - x + 6 - 3 + 2x^2$

$3x^2 - x + 3$

Multiplying Polynomials

- Remember $(x^a)(x^b) = x^{a+b}$

1. $\dot{x}(x^3) = x^4$

2. $3x^2(x^5) = 3x^7$

3. $xy(7x^2) = 7x^3y$

4. $3y^2(-3y) = -9y^3$

Multiplying a monomial and a polynomial:

To multiply a polynomial by a monomial, use the _distributive_ property and the properties of exponents.

1. $3x^2(x^3 + 4) = 3x^5 + 12x^2$

2. $ab(a^3 + 3ab^2 - b^3) = a^4b + 3a^2b^3 - ab^4$

You try these:

3. $3cd^2(4c^2d - 6cd + 14cd^2)$

$12c^3d^3 - 18c^2d^3 + 42c^2d^4$

4. $-x^2y(6y^3 + y^2 - 28y + 30)$

$-6x^2y^4 - x^2y^3 + 28x^2y^2 - 30x^2y$

Multiplying a binomial and a binomial:

To multiply a binomial by a binomial, use the distributive property and multiply each term in the second polynomial by each term in the first. This is double distribution.

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

$2x^2 + 10x - 3x - 15$

$2x^2 + 7x - 15$

You try:

2. $(4a - 3b)(a + 3b)$

$4a^2 + 12ab - 3ba - 9b^2$

$4a^2 + 9ab - 9b^2$

Multiplying polynomials:

To multiply two polynomials, use double distribution. Remember this uses the distributive property to multiply each term in the second polynomial by each term in the first.

Examples:

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

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

$-6 + 15a - 3a^2$

$a^3 - 8a^2 + 17a - 6$

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

You try these:

     3. $(y^2 + 2y - 12)(x + 2)$

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

Multiply $(x - 1)(x^4 + x^3 + x^2 + x + 1)$ and combine like terms. Explain how you reached your answer.

Your assignment is Homework Worksheet 1-1 in your homework packet