Unit 5 Quadratic Functions **Name**_____
Day 1 Operations with Polynomials **Date**_____**Hour**_____
(PH 9 – 1)

A ***monomial*** is an expression that is a number, a variable, or the product of a number and a variable. The following are examples of monomials: 7 x $-2ab^2$

The ***degree of a monomial*** is the sum of the exponents of its variables.

Example 1: State the degree of each monomial.

a. 18 b. 6c d. $7x^2y^3$

A ***polynomial*** is a monomial or the sum or difference of two or more monomials. The following are examples of polynomials: $2x^2 + 5x - 7$ $x - 9$ $-5x^3$

The ***degree of a polynomial*** is the same as the term with the greatest degree.

In order to describe a polynomial, we must classify them to find out what type of polynomial it is. It can be classified by the degree of the polynomial and by the number of terms. When the terms of a polynomial are listed in descending degree order then it is said to be in ***standard form***.
The following vocabulary is used.

Degree	Name Using Degree	Polynomial Example	Number of Terms	Name Using Number of Terms
0	Constant	6	1	Monomial
1	Linear	$x+3$	2	Binomial
2	Quadratic	$3x^2$	1	Monomial
3	Cubic	$2x^3-5x^2-2x$	3	Trinomial
4	Quartic	x^4+3x^2	2	Binomial
5	Quintic	$-2x^5+3x^2-x+4$	4	Polynomial of 4 terms
6	6th degree	$3x^6+x^4-5x^2$	3	Trinomial

Example 2: $5x^3+6$
The greatest power is a _____. That means it is a _____
Now count the number of terms. There are _____terms. That means it is a _____
So we classify this as a _____ _____.

Example 3: $-3x^2+x-12$
What is the greatest power? _____ That means it is a _____
How many terms are there? _____ That means it is a _____
So we classify this as a _____ _____.

Example 4: Write the polynomial in standard form. Then name it by its degree and number of terms.

a. $-2 + 7x$ b. $3x^2 - 3 - 2x^2 + 4x$

Example 5: Complete the chart below.

Problem Number	Equation	Degree	Number of Terms	Classification
1	x^4+2x^3-4x+2			
2	$x-12$			
3	$23x^2+5x-5$			
4	$6x^5$			
5	$5x^3-2$			

Polynomials can be added by combining like terms. They can be subtracted by adding the opposite.

Example 6: Simplify.

a. $(6x^2 + 3x + 7) + (2x^2 – 6x – 4)$

b. $(2d^3 + 4d^2 – 6) – (5d^3 + 2d – 2)$

c. $(2k^4 + 3k – 4) + (–3k + 4 + k^4)$

d. $(–3r + 4r^2 – 3) – (4r^2 + 6r – 2)$

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Find the degree of each monomial.

1. $4x$ **2.** $7c^3$ **3.** -16 **4.** $6y^2w^8$

5. $8ab^3$ **6.** 6 **7.** $-9x^4$ **8.** 11

Name each expression based on its degree and number of terms.

9. $5x^2 - 2x + 3$ **10.** $\frac{3}{4}z + 5$ **11.** $7a^3 + 4a - 12$

12. $\frac{3}{x} + 5$ **13.** -15 **14.** $w^2 + 2$

Write each polynomial in standard form. Then name each polynomial based on its degree and number of terms.

15. $4x - 3x^2$ **16.** $4x + 9$ **17.** $c^2 - 2 + 4c$

18. $9z^2 - 11z^2 + 5z - 5$ **19.** $y - 7y^3 + 15y^8$ **20.** $-10 + 4q^4 - 8q + 3q^2$

Simplify. Write each answer in standard form.

43. $(x^3 + 3x) + (12x - x^4)$ **44.** $(6g - 7g^8) - (4g + 2g^3 + 11g^2)$

45. $(2h^4 - 5h^9) - (-8h^5 + h^{10})$ **46.** $(-4t^4 - 9t + 6) + (13t + 5t^4)$

47. $(8b - 6b^7 + 3b^8) + (2b^7 - 5b^9)$ **48.** $(11 + k^3 - 6k^4) - (k^2 - k^4)$