Algebra 1: 12.1 Notes   **Name** _____ **Period** _____
Vocabulary & Classifying Polynomials

Let's Review - Vocabulary   (Take out your homework.)

What is a <u>polynomial</u>?

c. a mathematical expression involving the sum of powers in 1 or more variables multiplied by coefficients.

Examples: $m^3 + 4m^2 - 9$ $\frac{1}{2}x^2 + 4$ 7.5

   *Always write polynomials in **standard form**, meaning alphabetical order from highest to lowest exponent!*

Brainteaser: Are the following polynomials?

   $3xy^{-2}$ No, exponents must be whole numbers like 0, 1, 2, 3…!

   $\frac{1}{x}$ No, you can't divide by a variable!

   $\sqrt{x}$ No, exponents can't be fractions, $\sqrt{x} = x^{\frac{1}{2}}$!

What is a <u>term</u>?

f. each product in a polynomial expression

What is a <u>coefficient</u>?

e. any number being multiplied by a power within a polynomial expression

Working with a partner, complete the table for the given polynomial: $m^3 + 8m^2 - 10m + 5$.

How many terms does this polynomial have? 4

	1st	2nd	3rd	4th
Term	$+m^3$	$+8m^2$	$-10m$	$+5$
Coefficient	$+1$	$+8$	-10	$+5$
Power	m^3	m^2	m^1	m^0
Exponent	3	2	1	0

What do you call a term, like 5, that has NO variable?

A constant

The *exponent* of a term in a polynomial is also called the <u>degree of the term.</u>

The degree of $8m^2$ is <u>2.</u>

Classifying Polynomials

Polynomials are classified based on the number of terms.

     1 term is a <u>monomial</u>   because "*mono*" means 1

     2 terms is a <u>binomial</u>   because "*bi*" means 2

     3 terms is a <u>trinomial</u>   because "*tri*" means 3

Examples: $\underbrace{-6x^2 + 4x}_{binomial}$ $\underbrace{\dfrac{2}{3}x^4}_{monomial}$ $\underbrace{0.5x^3 + 7.4x^2 + 3.2}_{trinomial}$ $\underset{monomial}{8}$

Remember, terms are separated by a "+" or "–".

Polynomials are also classified based on the term with the greatest exponent or degree.

Examples: $-6x^2 + 4x$ $5x^3 + \dfrac{2}{3}x^4$ $3.2 + 7.4x^2 + 0.5x^3$ 8

            Degree: <u>2</u>   Degree: <u>4</u>   Degree: <u>3</u>   Degree: <u>0</u>

Let's Practice "We Do, You Do"

Write each polynomial in standard form. Determine if it is a monomial, binomial, or trinomial. State the degree of the polynomial.

1. $12.5t^3$

    Standard Form: <u>$12.5t^3$</u>

    # of Terms: <u>monomial</u>

    Degree: <u>3</u>

2. $h - 10 + h^2$

    Standard Form: <u>$h^2 + h - 10$</u>

    # of Terms: <u>trinomial</u>

    Degree: <u>2</u>

3. $-12 + 32j^3$

    Standard Form: <u>$32j^3 - 12$</u>

    # of Terms: <u>binomial</u>

    Degree: <u>3</u>

4. $7 - 3n^2 + n^4$

    Standard Form: <u>$n^4 - 3n^2 + 7$</u>

    # of Terms: <u>trinomial</u>

    Degree: <u>4</u>

How do you know when an expression is a polynomial?