Use the information on page 307 of your book to answer the following questions.

What is a **monomial**?

> **A monomial is an expression that is either a real number, a variable, or a product of real numbers and variables with whole-number exponents.**

What is a **polynomial**?

> **A polynomial is a monomial or the sum of monomials.**

Copy the definition of a Polynomial Function:

$$P(x) = a_n x^n + a_{n-1} x^{n-1} + \ldots + a_1 x + a_0 \quad \text{where } n \text{ is a nonnegative integer and the coefficients } a_n, \ldots, a_0 \text{ are real numbers.}$$

What does "nonnegative integer" mean? *(Hint: What does the prefix "non" mean?)*

> **Not negative. I.e., positive or zero.**

How do you find the **degree** of a <u>term</u> of a polynomial?

> **The exponent of the variable in a term determines the degree of the term.**
> *Note - for terms with multiple variables, the degree of the term is the sum of the exponents of the variable.*
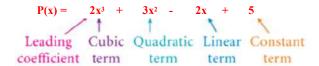> *I.e., $3xy^2$ has a degree of $1 + 2 = 3$*

What is the **"Standard Form"** of a polynomial?

> **A polynomial in standard form has the terms arranged in decreasing order by degree.**
> *Note that in a single-variable polynomial, no two terms can have the same degree (i.e., no like terms).*

<u>Example</u> – Rewrite the following polynomial function in standard form, then identify the leading coefficient, cubic term, quadratic term, linear term, and constant term:

$$P(x) = \quad -2x \quad + \quad 3x^2 \quad - \quad 2x^3 \quad + \quad 5$$

$$P(x) = \quad 2x^3 \quad + \quad 3x^2 \quad - \quad 2x \quad + \quad 5$$

Leading coefficient   Cubic term   Quadratic term   Linear term   Constant term

How do you find the **degree of a polynomial**?

The degree of a polynomial is the largest degree of any term in the polynomial.

Classifying Polynomials by Degree

What is the name for a **polynomial with degree 0?**

> **Constant**

What is the name for a **polynomial with degree 1**?

Linear

What is the name for a **polynomial with degree 2**?

Quadratic

What is the name for a **polynomial with degree 3**?

Cubic

What is the name for a **polynomial with degree 4**?

Quartic

What is the name for a **polynomial with degree 5**?

Quintic

Note: There are names for polynomials with degree higher than 5, but we do not use them. If you have a polynomial with degree higher than 5, simply call it "a polynomial of degree n," where n is the degree of the polynomial.

Classifying Polynomials by Number of Terms

What is the name for a **polynomial with one term**?

Monomial

What is the name for a **polynomial with two terms**?

Binomial

What is the name for a **polynomial with three terms**?

Trinomial

How do you write the name of a **polynomial with more than 3 terms**?

Polynomial with "N" terms

Examples – Do the three "Quick Check" Examples at the bottom of the page. Check your answers on page 981. Then do the homework.

HW: **p.309-310 #1-12 all, 33-41 odd, 47-51 odd**