

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:

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

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 term 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  $1 + 2 = 3$*

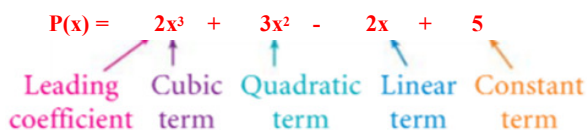
What is the “**Standard Form**” of a polynomial?

**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).*

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

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



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

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