Warm Up

Evaluate each expression for the given value of x.

1. $2x + 3$; $x = 2$ **2.** $x^2 + 4$; $x = -3$

3. $-4x - 2$; $x = -1$ **4.** $7x^2 + 2x = 3$

Identify the coefficient in each term.

5. $4x^3$ **6.** y^3

7. $2n^7$ **8.** -5^4

Objectives

Classify polynomials and write polynomials in standard form.

Evaluate polynomial expressions.

Add and subtract polynomials.

→ one term

The **degree of a monomial** is the sum of the exponents of the variables. A constant has degree 0.

Example 1: Finding the Degree of a Monomial

Find the degree of each monomial.

A. $4p^4q^3$ 4 + 3 = 7

B. $7ed$ 2

C. 3 0

a. $1.5k^2m$ 3

b. $4x$ 1

b. $2c^3$ 3

Binomial - 2 terms

tri - 3 terms

A **polynomial** is a monomial or a sum or difference of monomials.

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

Example 2: Finding the Degree of a Polynomial

Find the degree of each polynomial.

A. $11x^7 + 3x^3$ 7

B. $\frac{1}{3}w^2z + \frac{1}{2}z^4 - 5$ 4

a. $5x - 6$ 1

b. $x^3y^2 + x^2y^3 - x^4 + 2$ 5

The **standard form of a polynomial** that contains one variable is written with the terms in order from greatest degree to least degree. When written in standard form, the coefficient of the first term is called the **leading coefficient**.

Example 3A: Writing Polynomials in Standard Form

Write the polynomial in standard form. Then give the leading coefficient.

$6x - 7x^5 + 4x^2 + 9$

$y^2 + y^6 - 3y$

$16 - 4x^2 + x^5 + 9x^3$

$18y^5 - 3y^8 + 14y$

Example 5: *Application*

A tourist accidentally drops her lip balm off the Golden Gate Bridge. The bridge is 220 feet from the water of the bay. The height of the lip balm is given by the polynomial $-16t^2 + 220$, where t is time in seconds. How far above the water will the lip balm be after 3 seconds?

Adding Polynomials

$15m^3 + 6m^2 + 2m^3$

$2x^2 + 3x^2 + x$

$4y^4 + 6y^3 + 2y^4$

Adding Polynomials

$(5x^2 + 4x + 1) + (2x^2 + 5x + 2)$

$(4b^5 + 8b) + (3b^5 + 6b + 7b^5 + b)$

$(5a^3 + 3a^2 - 6a + 12a^2) + (7a^3 - 10a)$

Adding Polynomials

$(4m^2 + 5) + (m^2 - m + 6)$

$(10xy + x) + (-3xy + y)$

$(6x^2 - 4y) + (3x^2 + 3y - 8x^2 - 2y)$