

# Polynomials

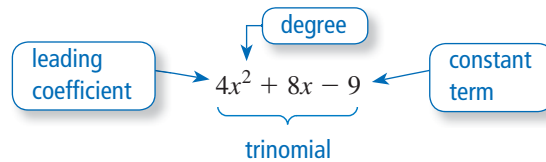
A **monomial** is a number, a variable, or the product of a number and one or more variables with whole number exponents. The **degree of a monomial** is the sum of the exponents of the variables in the monomial. The degree of a nonzero constant term is 0. The constant 0 does not have a degree.

**Example 1** Find the degree of (a)  $7x^2$  and (b)  $-\frac{2}{3}xy^4$ .

- a. The exponent of  $x$  is 2.  
 ▶ So, the degree of the monomial is 2.
- b. The exponent of  $x$  is 1, and the exponent of  $y$  is 4.  
 ▶ So, the degree of the monomial is  $1 + 4$ , or 5.

A **polynomial** is a monomial or a sum of monomials. Each monomial is called a *term* of the polynomial. A polynomial with two terms is a **binomial**. A polynomial with three terms is a **trinomial**.

The **degree of a polynomial** is the greatest degree of its terms. A polynomial in one variable is in **standard form** when the exponents of the terms decrease from left to right. When you write a polynomial in standard form, the coefficient of the first term is the **leading coefficient**.



**Example 2** Write (a)  $-24x^3$ , (b)  $8y - 1 + 10y^2$ , and (c)  $5z + 9z^4$  in standard form. Identify the degree and leading coefficient of each polynomial. Then classify each polynomial by the number of terms.

Standard Form	Degree	Leading Coefficient	Type of Polynomial
a. $-24x^3$	3	-24	monomial
b. $10y^2 + 8y - 1$	2	10	trinomial
c. $9z^4 + 5z$	4	9	binomial

## Practice

Check your answers at [BigIdeasMath.com](http://BigIdeasMath.com).

Find the degree of the monomial.

- |               |                       |                 |                     |
|---------------|-----------------------|-----------------|---------------------|
| 1. $-8x$ 1    | 2. $\frac{1}{2}y^5$ 5 | 3. $12.8$ 0     | 4. $6^2$ 0          |
| 5. $x^3z^2$ 5 | 6. $-3mn$ 2           | 7. $8q^2r^4s$ 7 | 8. $10g^5h^7j^2$ 14 |

Write the polynomial in standard form. Identify the degree and leading coefficient of the polynomial. Then classify the polynomial by the number of terms.

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|---|--|
| 9. $8y^5$ $8y^5$ ; 5; 8; monomial                             | 10. $2 + x^2 - 9x$ $x^2 - 9x + 2$ ; 2; 1; trinomial                    |
| 11. $2z^2 - 7z^3$ $-7z^3 + 2z^2$ ; 3; -7; binomial            | 12. $-\frac{2}{5}w^7$ $-\frac{2}{5}w^7$ ; 7; $-\frac{2}{5}$ ; monomial |
| 13. $5t^2 - t^3 + 6t^4$ $6t^4 - t^3 + 5t^2$ ; 4; 6; trinomial | 14. $-s - 10s^8$ $-10s^8 - s$ ; 8; -10; binomial                       |