

Polynomials

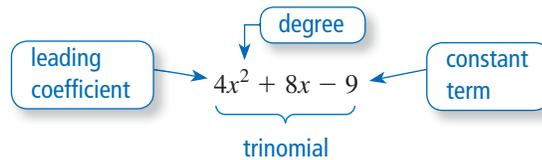
A **monomial** is a number, a variable, or the product of a number and one or more variables with whole number exponents. The **degree of a monomial** is the sum of the exponents of the variables in the monomial. The degree of a nonzero constant term is 0. The constant 0 does not have a degree.

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.

Find the degree of the monomial.

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

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