

Classification

A **monomial** is a real number, a variable or a product of a real number and one or more variables. Here are some examples of monomials.

$$16 \qquad y \qquad -3x^4 \qquad 2.5x^2z^5$$

The **degree of a monomial** is the sum of all exponents of its variables. The degree of a nonzero constant (a real number) is zero.

Problem 1: What is the degree of each monomial?

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| A) $5x$ | Degree: 1 | $5x = 5x^1$. The exponent is 1. |
| B) $7x^5y^3$ | Degree: 8 | The exponents are 5 and 3. Their sum is 8. |
| C) 2 | Degree: 0 | $2 = 2x^0$. The degree of a nonzero constant is 0. |

You can add or subtract monomials by *combining like terms*.

Problem 2: What is the sum or difference?

A) $2x^2 + 4x^2 = 6x^2$	B) $5x^3y - x^3y = 4x^3y$
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Now, we can use monomials to form larger expressions called **polynomials**. A polynomial is a monomial or sum of monomials. The following polynomial is the sum of the monomials x^4 , $-3x^2$, $-4x$, and 1 .

$$x^4 - 3x^2 - 4x + 1$$

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Degree of each monomial	4	2	1	0
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The polynomial above is in standard form. **Standard form of a polynomial** means that the degrees of its monomial terms are ordered from greatest to least. The **degree of a polynomial** in one variable is the same as the highest degree of a monomial.

The degree of $x^4 - 3x^2 - 4x + 1$ is **4**.

The table below shows how to name a polynomial based on its degree or the number of monomials it contains.

Polynomial	Degree	Name Using Degree	Number of Terms	Name Using Number of Terms
6	0	Constant	1	Monomial
$5x + 9$	1	Linear	2	Binomial
$4x^2 + 7x + 3$	2	Quadratic	3	Trinomial
$2x^3$	3	Cubic	1	Monomial
$8x^4 - 2x^3 + 3x$	4	Fourth degree	3	Trinomial