







9PR2.5 Demonstrate an understanding of polynomials (limited to polynomials of degree less than or equal to 2).

Understanding Polynomials

Algebra tiles can be used to represent polynomials. This chart shows the tiles and what they represent.

	Positive Tile	Negative Tile
Unit Tile		
x-tile		
x^2 -tile		

Polynomials are algebraic expressions formed by combining numbers, variables, and exponents into algebraic terms. Terms in algebraic expressions are separated by addition and subtraction signs. A number that stands alone without any variables connected to it is called a constant. The degree of a polynomial is equal to the degree of the highest-degree monomial.

A polynomial with one term is called a monomial. A polynomial with two terms is called a binomial. A polynomial with three terms is called a trinomial. A polynomial with four or more terms is simply referred to as a polynomial.

Example

Identify the coefficient, variable, and constant in the expression $2x - 7$, and name the polynomial.

Solution

The coefficient is 2 because it is directly in front of x .

The variable is x because it is standing in place of an unknown value.

The constant is -7 because it is not connected to any variable.

The polynomial is a binomial because there are two terms: $2x$ and -7 .

Example

Identify and coefficients, variables, and constants in the expression $-2a - 6 + t$, and name the polynomial.

Solution

The coefficients are -2 and 1 because -2 is directly in front of a and 1 is directly in front of t (since $t = (1)(t)$).

The variables are a and t , since they are standing in place of unknown values.

The constant is -6 because it is not connected to any variable.

The polynomial is a trinomial because there are three terms in the expression: $-2a$, -6 , and t .

Example

For the polynomial $2x^2 - 3x - 4$, indicate the degree of each term and the degree of each term and the degree of the polynomial.

Solution

Step 1

Identify the degree of each term.

The first term, $2x^2$, has a degree of 2 because the exponent on the variable is 2.

The second term, $3x$, has a degree of 1 because the exponent of the variable is 1.

The third term, 4 , has a degree of 0 because there is no variable.

Step 2

Identify the degree of the polynomial.

The overall degree of the polynomial is equal to the highest-degree monomial. The first term has the highest degree of 2. The polynomial $2x^2 - 3x - 4$ has a degree of 2.

Example

Represent the polynomial expression $2x^2 - 3x + 3$ using algebra tiles.

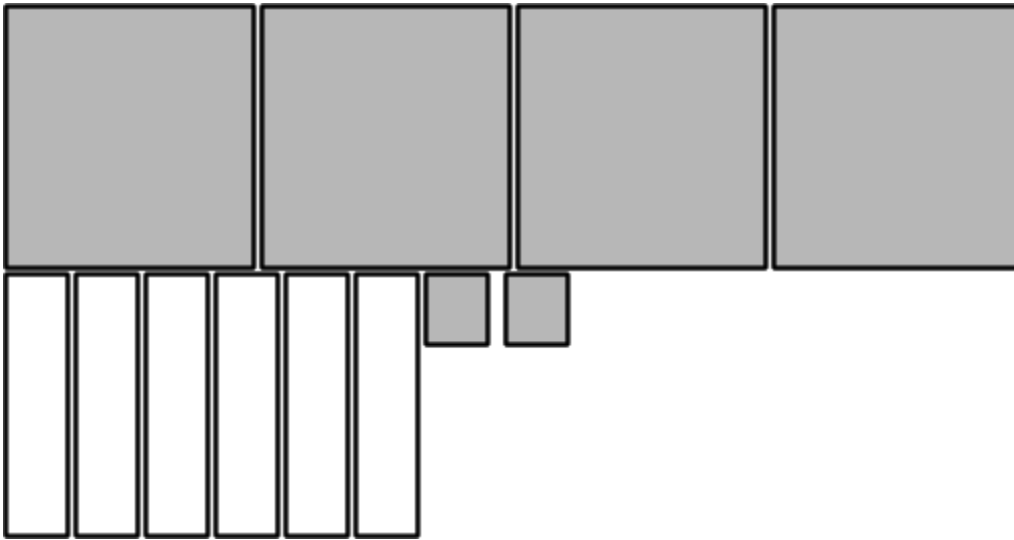
Solution

To represent the polynomial expression $2x^2 - 3x + 3$, 2 shaded x^2 -tiles, 3 unshaded x -tiles, and 3 shaded unit tiles are needed.

The polynomial expression can be represented by arranging the algebra tiles as shown.



Example



Identify the polynomial expression that represents the given arrangement of algebra tiles.

Solution

There are 4 shaded x^2 -tiles, 6 unshaded x -tiles, and 2 shaded unit tiles.

The polynomial expression that represents the given arrangement of algebra tiles is $4x^2 - 6x + 2$.