

Chapter 8 Polynomials and Factoring

Key Domains:
-adding and subtracting polynomials
-multiplying and factoring

Section 8-1 Adding and Subtracting Polynomials

Students will be able to:
-classify polynomials
-add and subtract polynomials

Solve the Solve It, Getting Ready
on pg. 486

A monomial is a number, variable or any combinations of these.

- Ex: 4, y, 7rs, 5a³

*no (+) or (-)
Signs*

The degree of a monomial is the sum of the exponents of the variables.

Find the degree of each of the examples. *4 → 0, y → 1, 7rs → 2*

Polynomial:
a monomial or sum of monomials

Ex: $7x + 12$
 $-3y^4 + 2y^2 + 1$

Degree of Polynomial (in one variable)
-greatest degree among its monomial terms.

Ex: $-3y^4 + 2y^2 + 1 \rightarrow 4^{\text{th}}$ degree
 $3 + 21x + x^3 \rightarrow 3^{\text{rd}}$ degree

Polynomials can be classified by number of terms and by degree.

Degree	Name Using Degree	Polynomial Example	Number of Terms	Name Using Number of Terms
0	constant	7	1	monomial
1	linear	$2x - 8$	2	binomial
2	quadratic	$-3x^2$	1	monomial
3	cubic	$x^3 + 2x - 4$	3	trinomial
4	quartic	$x^4 - x$	2	binomial

5, 6... to the degree 4, 5... polynomial

A polynomial with the variable x defines a polynomial function of x .

Standard Form of a Polynomial Function:
arranges terms by degree in descending order

$$f(x) = -4x^3 + 6x^2 - x + 2$$

highest exponent to smallest

Put the polynomial into standard form.

$$-3x^2 + 2x^5 - 10 - 11x + x^3$$

$$2x^5 + x^3 - 3x^2 - 11x - 10$$

Write the polynomial in standard form.
Classify it based on degree and number of terms.

1. $-2 + x^4 - 3x^2 + 5x^3$
 $x^4 + 5x^3 - 3x^2 - 2$, 4th degree polynomial

2. $3 + x^5$ $x^5 + 3$
5th degree binomial

Adding and Subtracting Monomials: add and subtract like terms

What is the sum and difference of the following.

$$-4x^4y^4 \text{ and } -12x^4y^4$$

exponents don't change

$$-4x^4y^4 + (-12x^4y^4) = -16x^4y^4$$

$$-4x^4y^4 + (+12x^4y^4) = 8x^4y^4$$

When you are adding polynomials, you combine like terms.

You can add vertically or horizontally.

$$15x^3 - 12x + 4 + (10x^3 + 5x^2 + 3x^3 - 5) =$$

and $18x^3 - 5x^2 - 22x - 1$

$$-10x - 5x^2 + 3x^3 - 5$$

vertically

$$\begin{array}{r} 15x^3 + 10x^2 - 12x + 4 \\ + \quad 3x^3 - 5x^2 - 10x - 5 \\ \hline 18x^3 - 5x^2 - 22x - 1 \end{array}$$

place holder for a missing part

A nutritionist studied the U.S. consumption of carrots and celery and of broccoli over 6 years. The nutritionist modeled the results, in millions of pounds, with the following polynomials:

Carrots and celery: $-12x^3 + 106x^2 - 241x + 4477$
Broccoli: $14x^2 - 14x + 1545$

What was the total amount, in millions of pounds, consumed during the 6-yr period?

$$-12x^3 + 120x^2 - 255x + 6022$$

Subtraction means to add the opposite, so when subtracting polynomials, change each of the term's sign to the opposite and add.

Simplify:

$$(x^3 - 3x^2 + 5x) - (-10 + 5x^3 - 2x^2 + 3x)$$

$$\begin{array}{r} x^3 - 3x^2 + 5x + 10 - 5x^3 + 2x^2 - 3x \\ \hline -4x^3 - x^2 + 2x + 10 \end{array}$$

Hwk: pg. 489 - 491
#10 - 22 (4th),
24 - 46 evens, 50, 51

Attachments

8-1cont.notebook