ALGEBRA - notes

A **monomial** is a number, a variable, or a product of a number and variables.

The examples at the right are monomials. The **degree of a monomial** is the sum of the exponents of the variables.

x	degree 1 ($x = x^1$)
$3x^2$	degree 2
$4x^2y$	degree 3 (2+1)
$6x^3y^4z^2$	degree 9 (3+4+2)

In this unit, the variable n is considered a positive integer when used as an exponent.

x^n	degree n

The degree of a non-zero constant term is zero.

6	degree 0

A **polynomial** is a variable expression in which the terms are monomials.

A **monomial** is a polynomial of one term. $3x$

A **binomial** is a polynomial of two terms. $5x^2y + 6x$

A **trinomial** is a polynomial of three terms. $3x^2 + 9xy - 5y$

Polynomials with more than three terms do not have special names.

The **degree of a polynomial** is the greatest of the degrees of any of its terms.

$3x + 2$	degree 1
$3x^2 + 2x - 4$	degree 2
$4x^3y^2 + 6x^4 - y$	degree 5

The terms of a polynomial in one variable are usually arranged so that the exponents of the variable decrease from left to right. This is called **descending order.**

$2x^2 - x + 8$

$3y^5 - 3y^3 + y^2 - 12$

For a polynomial in more than one variable, descending order may refer to any one of the variables.

The polynomial at the right is shown first in descending order of the x variable and then in descending order of the y variable.

$2x^2 + 3xy + 5y^2$

$5y^2 + 3xy + 2x^2$

Why Did the Donkey Get a Passport ?

Simplify each expression below. Find your answer in the answer column and notice the letter next to it. Write this letter in each box at the bottom of the page that contains the number of that exercise.

(1) $8x^2 + 2x - 5x + 7$

(2) $4 - 3x^2 - 9x - 7 + x^2$

(3) $-5x + 8 - 4x^2 - 4x + 2x^2$

(4) $x^2 - (-3x) + 4 + 7x^2 - 8x - 6$

(5) $-x - 5x + (-3x^2) - 9 - 2x + 7$

(6) $-7 + x^3 - 5x^2 + 4x - 5x + 3$

(7) $4x^3 + 6x^2 + 6x - 1 + 5x^3 - x^2 - (-9)$

(8) $-7x + 5x^2 - 5x^3 + 8x + 3x^2 - 7x^3 + x^3$

(9) $6x^3 + (-2) - (-2x) - 5x^3 - 4x^2 + x + 4x^2 + 15$

(10) $6x^5 - 2x^4 + 6x^3 - 12x^5 - 6x^4 + 9x^3$

(11) $8ab - 3b^2 + 2a^2 - 4ab + 4b^2$

(12) $5a^2b + 9ab^2 - 2a^2b - 13ab^2$

(13) $3a^3 + b^3 - 6a^2b - a^3 + 6ab^2 + a^2b$

(14) $a^2b^2 + a^2b - a^3 - ab^2 + a^2b - b^3 - a^2b^2 - b^3$

(C) $-11x^3 + 8x^2 + x$

(N) $-6x^5 - 7x^4 + 9x^3$

(E) $8x^2 - 5x - 2$

(V) $3a^2b - 4ab^2$

(L) $8x^2 - 3x + 7$

(K) $2a^3 - 5a^2b - ab^2 - 2b^3$

(H) $x^3 + 3x + 13$

(U) $x^3 - 5x^2 - x - 4$

(B) $2a^2 + 4ab + b^2$

(A) $-2x^2 - 9x - 3$

(O) $2a^3 - 5a^2b + 6ab^2 + b^3$

(M) $9x^3 + 5x^2 + 6x + 8$

(S) $-2x^2 - 9x + 8$

(T) $-6x^5 - 8x^4 + 15x^3$

(R) $-a^3 + 2a^2b - ab^2 - 2b^3$

(D) $-3x^2 - 8x - 2$

3	13	9	4	8	13	6	1	5	11	4	8	13	7	4	2	10	14	2	12	4	1	11	6	14	14	13

OBJECTIVE 1-b: To simplify polynomials by combining like terms.

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