Algebra 2

Ch. 6 Handout 6.1

Polynomial Functions

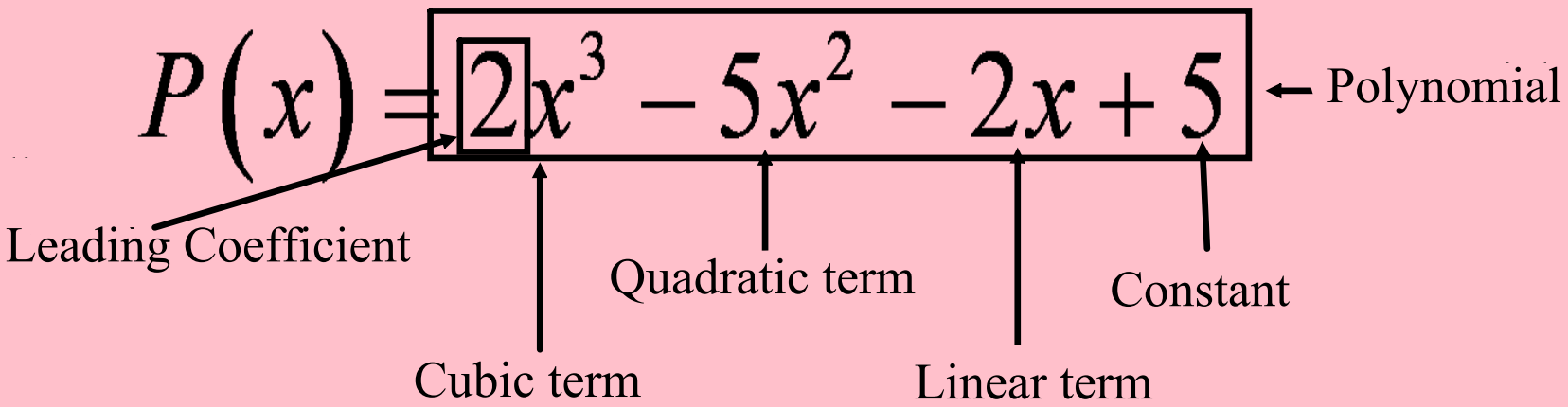
Polynomial Function

$P(x) = a_n x^n + a_{n-1} x^{n-1} + \ldots + a_1 x^1 + a_0$ where n is a nonnegative and the coefficients $a_n, \ldots, a_0$ are real numbers.

Naming a Polynomial by degree		Naming a polynomial by number of terms	
Zero degree -- Constant	5	One term -- Monomial	$4xy$
One degree -- Linear	$2x + 3$	Two terms -- Binomial	$x^2 - 4$
Second degree -- Quadratic	$x^2 - 4x + 1$	Three terms -- Trinomial	$4x^3 + 2x + 1$
Third degree -- Cubic	$x^3 - 3x^2 - 4x$	Four terms -- polynomial of 4 terms	
Fourth degree -- Quartic	$x^4 - 2x + 1$		
Fifth degree -- Quintic	$3x^5$		

Match with polynomial example .

Polynomial Example	Degree	Name using degree	Number of Terms	Name Using Number of Terms
8	0	Constant	1	Monomial
$x-12$	1	Linear	2	Binomial
$-4x^2$	2	Quadratic	1	Monomial
x^3-3x^2-6x	3	Cubic	3	Trinomial
$3x^4+x^2$	4	Quartic	2	Binomial
$-x^5+2x^2-x+7$	5	Quintic	4	Polynomial of 4 terms


$P(x) = 2x^3 - 5x^2 - 2x + 5$
Polynomial
Leading Coefficient
Cubic term
Quadratic term
Linear term
Constant

1. **Classifying Polynomials:** Write each polynomial in standard form. Then classify it by degree and by number of terms.

a) $9 + x^3$

$x^3 + 9$

Cubic; Binomial

b) $x^3 - 2x^2 - 3x^4$

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

Quartic; trinomial

1. **Classifying Polynomials:** Write each polynomial in standard form. Then classify it by degree and by number of terms.

c) $4x - 6x + 5$

$-2x+5$

Linear; Binomial

d) $3x^3 + x^2 - 4x + 2x^3$

$5x^3 + x^2 - 4x$

Cubic; trinomial

1. **Classifying Polynomials:** Write each polynomial in standard form. Then classify it by degree and by number of terms.

e) $6 - 2x^5 + 3x^3$

$-2x^5 + 3x^3 + 6$

Quintic ; trinomial

f) 6

Constant ; monomial

1. **Classifying Polynomials:** Write each polynomial in standard form. Then classify it by degree and by number of terms.

g) $4x(5x)$

$20x^2$

Quadratic; monomial

h) $x^3(3-x)$

$3x^3 - x^4$

$-x^4 + 3x^3$

Quartic; Binomial

2. Simplify. Classify each result by number of terms

a) $-x^2 + 2x + x^2$

$2x$

Linear; monomial

b) $3x(4x) + x^2(2x^2)$

$12x^2 + 2x^4$

$2x^4 + 12x^2$

Quartic, Binomial

2. Simplify. Classify each result by number of terms.

c) $(20x^3 - 39x^2 + 5x) + (40x^3 - 75 - 6x^2)$

$60x^3 - 45x^2 + 5x - 75$

cubic; polynomial of 4 terms

2. Simplify. Classify each result by number of terms.

d) $(2x+1)^2+3$

$(2x+1)(2x+1)+3$

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

$4x^2+4x+4$

Quadratic; trinomial

2. Simplify. Classify each result by number of terms.

e) $(-2x^3+7x^2-6)-(-4x^3+9x^2-7x+15)$

$-2x^3+7x^2-6+4x^3-9x^2+7x-15$

$2x^3-2x^2+7x-21$

cubic; polynomial of 4 terms

2. Simplify. Classify each result by number of terms.

f) $(x+2)^3 = (x+2)[(x+2)(x+2)]$

$(x+2)(x^2+2x+2x+4)$

$(x+2)(x^2+4x+4)$

$x^3+4x^2+4x+2x^2+8x+8$

$x^3+6x^2+12x+8$

cubic; polynomial of 4 terms

Assignment:

Pgs 309-311 1-12 all, 25-30 all, 34-58 all