

- constants [like 3, -20, or 1/2]
- Variables [like x , y etc]
- exponents [like the 2 in  $y^2$ ] but only whole number exponents

exponent  
 $2x^2 + y + 4$   
 constant  
 [never changes]  
**Variables** [a letter that represents a number]

Polynomials are combined using:

- addition [+], subtraction [-]

Term-a constant [number], variable **or** the product of a number and variable.

Examples 2, y,  $2xy$ ,  $2x^2$ , -3x, -2  
of a Term

constant 2, -2

Variable y, x

product of a number and a variable  $2xy$ ,  $-3y$   
 $2x^2$

Polynomial	How many terms	List the terms (commas)	Identify constant if there is one
A. $-3$	1	$-3$	$-3$
B. $4a^2$	1	$4a^2$	none.
C. $-3a + 4a^3$	2	$-3a, 4a^3$	none
D. $-3xy + 2$	2	$-3xy, 2$	2
E. $-4x + 3a + 2$	3	$-4x, 3a, 2$	2
F. $2x^2 + 4x - 3y + 2$	4	$2x^2, 4x, -3y, 2$	2

The degree of a term is the sum of the exponents of the **variables** in a single term. For example, the degree of  $4x^2y$  is 3.

\*The term with the greatest exponent \*  
\*determines the **DEGREE**  
of the polynomial.

$$3x^2 - 2x^1 + 5$$

The term  $-2x$  has a  
degree of 1

The term 5 is **constant**  
term. Its value does  
not change when the  
value of  $x$  changes. A  
**constant term has a**  
**degree of 0.**

What is the degree of the polynomial?

## Polynomial

	<small>[Highest exponent]</small> Degree	# Terms
a) $-3x^4$	4	1
b) $-2x^2 + 3x^1 - 4$	2	3
c) $2x^4 + 4x^6 - 6$	6	3
d) $-3x^2 + 4x^3 - 2x + 4$	3	4
e) 4	none	1

# What is not a polynomial?

If an expression has a square root of a variable  $\sqrt{x}$ , or has a variable in the denominator  $(\frac{1}{x}, \frac{2}{x^2})$  it IS NOT A **POLYNOMIAL!**

Complete the Chart below:

Polynomial	#terms	list terms	[highest exponent]	[just a number]
			degree	constant
a. $3x + 4y^2$	2	$3x, 4y^2$	2	none
b. $3x^1$	1	$3x$	1	none
c. -3	1	-3	none	-3
d. $3x - 4x^3 - 4$	3	$3x, -4x^3, -4$	3	-4

## Classifying polynomials [look at the number of terms]...

Polynomials with 1, 2, or 3 terms have special names.

A **monomial** has 1 term, for example:  $4a$ ,  $6$ ,  $-2p^2$

A **binomial** has 2 terms, for example:  $2c - 5$ ,  $2m^2 + 3m$

A **trinomial** has 3 terms, for example:  $2h^2 - 6h + 4$

*Numerical Coefficient-* found in front of a variable

Term	Coefficient[s]	degree	variable[s]	constant	Classify
a. $2x + 4y^2$	2, 4	2	x, y	none	binomial
b. $-3a^2$	-3	2	a	none	monomial
c. $-2xy + 4a^3 + 2$	-2, 4	3	x, y, a	2	trinomial
d. 6	none	none	none	6	monomial

Annotations for the first row:

- Coefficient:  $2, 4$  (with arrows pointing to each coefficient)
- variable:  $x, y$  (with arrows pointing to each variable)
- degree: 2 (with an arrow pointing to the exponent of the highest term)
- (\* in front of variable): A bracketed note indicating the numerical coefficient is in front of the variable.
- (highest exponent): A bracketed note indicating the degree is the highest exponent of the variables in the term.

Annotations for the right side:

- [Monomial Binomial Trinomial]: A bracketed note classifying the terms.
- Classify: A handwritten note indicating the classification of the terms.

<b>Polynomial</b>	<b>Classify/type</b>	<b>Coefficient[s]</b>	<b>Degree</b>	<b>Constant</b>
	Monomial, Binomial or Trinomial?			
A. $-3x^3$				
B. $9r - 7$				
C. $-3y^2 - 4y + 6$				

\* The sign in front of the term  
goes with the coefficient or constant \*