

# Sec 5-2: Polynomials

In English "poly" means Many.

A polynomial is a monomial or the sum of monomials.

$3x^2$  Monomial 1 term

$xy + b^2$  binomial 2 terms

$x^2 + 2xy + y^2$  trinomial 3 terms

$x + y + w + z$  General Polynomial 4+ terms.

"Like Terms" have the same exact variables. Can combine:

Ex.)  $3x^2y + 6x^2y = 9x^2y$

Ex.)  $2ab - 8ab + 5ab = -ab$

Ex.)  $\boxed{-10xy} + 2y \boxed{-20xy} = -30xy + 2y$

Degree of Polynomial is the degree of ~~monomial~~ monomial that's highest. Ex.)  $2x^2 + x^3y + z^1$

Degree of 4

Ex.)  $\frac{2}{7}x^4y^3 - 21x^3$  D = 7

Ex.)  $2a^5 + a^5b + b^9$  D = 9

Ex.) Simplify:  $(4x^2 - 3x) - 1(x^2 + 2x - 1)$   
 $4x^2 - 3x - 1x^2 - 2x + 1$   
 $3x^2 - 5x + 1$

Distribute:  $3x^4(5x^4 - x^3 + 4x)$   
 $15x^5 - 3x^4 + 12x^2$

FOIL method - way to remember  
how to distribute binomials.

Ex.)  $(4n+3)(3n+1)$

multiply:

F	O	I	L
$12n^2$	$+ 4n$	$+ 9n$	$+ 3$
$12n^2 + 13n + 3$			

Ex.)  $(3y^2 - 2)(-5y + 1)$

F	O	I	L
$-15y^3$	$+ 3y^2$	$+ 10y$	$- 2$

Distribute:

$K^2 + 3K + 9$	$(K + 3)$
$K^3 + 3K^2 + 3K^2 + 9K + 9K + 27$	
$K^3 + 6K^2 + 18K + 27$	



Sec S-2 Continued

Binomial \* Binomial

Use FOIL Method

$$(4n + 3)(3n + 1)$$

First F	outer O	Inner I	Last L
$12n^2$	$+ 4n$	$+ 9n$	$+ 3$

$$12n^2 + 13n + 3$$

a.)  $(x+8)(x+12)$

F	O	I	L
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$$x^2 + 12x + 8x + 96$$

$$x^2 + 20x + 96$$

44.

$$(x^3 - y)(x^3 + y)$$

$$\begin{array}{cccc}
 F & 0 & I & L \\
 x^6 & + x^3 & - x^3 & - y^2 \\
 x^6 & - y^2 & & 
 \end{array}$$

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$$x^3 y^2 (y x^4 + y^{-1} x^3 + y^{-2} x^2)$$

$$\begin{array}{l}
 x y^3 + y + x^{-1} \\
 x y^3 + y + \frac{1}{x}
 \end{array}$$

(4A)  $(1+4m)^2 = (1+4m)(1+4m)$

$1 + 4m + 4m + 16m^2$

$1 + 8m + 16m^2$

(5D)  $(w^2 - 5)(2w^2 + 3)$

$2w^4 + 3w^2 - 10w^2 - 15$

$2w^4 - 7w^2 - 15$