

LESSON 17: POLYNOMIALS (SEC 5.2)

OBJECTIVES:

~ADD SUBTRACT, MULTIPLY POLYNOMIALS

SECTION 5-2: POLYNOMIALS

SOME IMPORTANT DEFINITIONS

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~ a POLYNOMIAL IS a MONOMIAL OR a SUM OF MONOMIALS.

$$\text{ex: } 2X + 3Y - 4XY$$

✎
~ THE MONOMIALS OF a POLYNOMIAL are called THE TERMS OF THE POLYNOMIAL.

$$\text{ex: } 2X + 3Y + 4XY \text{ HAS 3 TERMS: } 2X, 3Y, \text{ AND } 4XY$$

~ a POLYNOMIAL WITH 3 TERMS (UNLIKE TERMS-CANNOT BE COMBINED) IS KNOWN AS a TRINOMIAL.

$$\text{ex: } 6Z + 7W + 3ZWY \text{ IS a TRINOMIAL}$$

~ a POLYNOMIAL WITH 2 TERMS (UNLIKE) IS a BINOMIAL.

$$\text{ex: } X - 6TY \text{ IS a BINOMIAL}$$

SECTION 5-2: POLYNOMIALS

SOME IMPORTANT DEFINITIONS

DEGREE OF a MONOMIAL: THE SUM OF ALL THE EXPONENTS OF
ALL THE VARIABLES.

$$\text{ex: } 4xy^2z^3$$

$$\text{Degree} = 6$$

DEGREE OF a POLYNOMIAL: EQUALS THE DEGREE OF THE
TERM WITH THE GREATEST DEGREE.

$$\text{ex: } 4xy^2z^3 + 4z^{10} + 5x^2$$

6

10

2

$$\text{Degree} = 10$$

SECTION 5-2: POLYNOMIALS

POLYNOMIALS

D = degree

EXAMPLES:

STATE WHAT TYPE OF POLYNOMIAL AND THE DEGREE

$$a. \frac{2}{7}x^4y^3 - 21x^3$$

$$D = 7$$

Binomial

$$b. x - 3$$

$$D = 1$$

Binomial

$$c. x^2$$

$$D = 2$$

monomial

$$d. x^2 - 3x^3 + 2x$$

$$D = 3$$

trinomial

SECTION 5-2: POLYNOMIALS

SIMPLIFYING POLYNOMIALS

WHEN SIMPLIFYING POLYNOMIALS, COMBINE ALL LIKE TERMS.

EXAMPLES: SIMPLIFY.

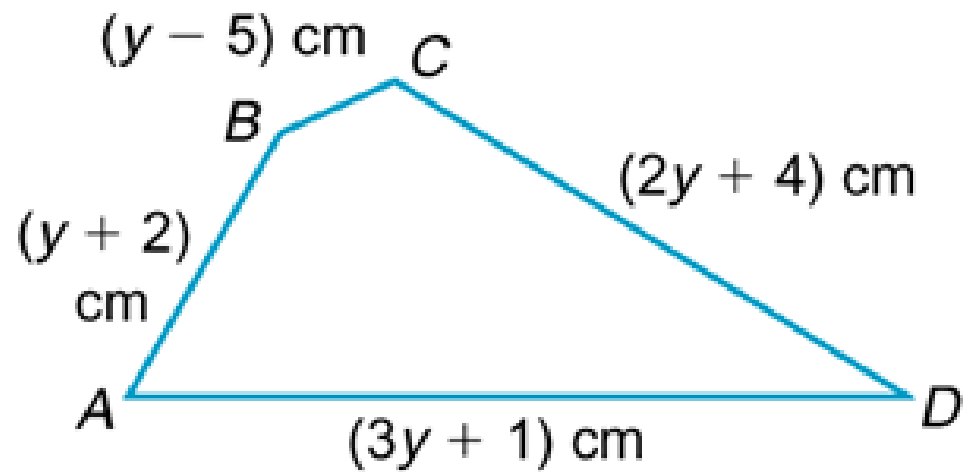
$$\begin{aligned} 1. & (4x^2 - 3x) - (x^2 + 2x - 1) \\ &= 4x^2 - 3x - x^2 - 2x + 1 \\ &= 3x^2 - 5x + 1 \end{aligned}$$

$$\begin{aligned} 2. & (2x^2 - 3xy + 5y^2) - (4x^2 - 3xy - 2y^2) \\ &= 2x^2 - 3xy + 5y^2 - 4x^2 + 3xy + 2y^2 \\ &= -2x^2 + 7y^2 \end{aligned}$$

SECTION 5-2: POLYNOMIALS

SIMPLIFYING POLYNOMIALS

FIND THE PERIMETER OF THE QUADRILATERAL



$$P = y + 2 + y - 5 + 2y + 4 + 3y + 1$$

$$P = 7y + 2 \text{ cm}$$

$-3 + 4 + 1$
 $1 + 1$

SECTION 5-2: POLYNOMIALS

MULTIPLYING POLYNOMIALS

USE THE DISTRIBUTIVE PROPERTY TO MULTIPLY POLYNOMIALS.

EXAMPLE: SIMPLIFY

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

$$= 3x(5x^4) - (3x)(x^3) + (3x)(4x)$$

$$= \boxed{15x^5 - 3x^4 + 12x^2}$$

SECTION 5-2: POLYNOMIALS

MULTIPLYING POLYNOMIALS

USE THE DISTRIBUTIVE PROPERTY TO MULTIPLY POLYNOMIALS.

EXAMPLE: SIMPLIFY

$$9a^2(3a - 7b^3)$$

$$= 9a^2(3a) - (9a^2)(7b^3)$$

$$= \boxed{27a^3 - 63a^2b^3}$$

SECTION 5-2: POLYNOMIALS

MULTIPLYING POLYNOMIALS

WHEN MULTIPLYING 2 BINOMIALS, THE FOIL METHOD CAN BE USED.

THE FOIL METHOD IS AN APPLICATION OF THE DISTRIBUTION PROPERTY THAT MAKES MULTIPLICATION EASIER.



The product of two binomials is the sum of the products of

- F** **the *first* terms,**
- O** **the *outer* terms,**
- I** **the *inner* terms, and**
- L** **the *last* terms.**

SECTION 5-2: POLYNOMIALS

MULTIPLYING POLYNOMIALS

The product of two binomials is the sum of the products of

- F the *first* terms,
- O the *outer* terms,
- I the *inner* terms, and
- L the *last* terms.

EXAMPLE: USE THE FOIL METHOD (FOR DISTRIBUTION) TO FIND THE PRODUCT.

$$(x + 8)(x + 12)$$

$$= x^2 + 12x + 8x + 96$$

$$= \boxed{x^2 + 20x + 96}$$

SECTION 5-2: POLYNOMIALS

MULTIPLYING POLYNOMIALS

EXAMPLE: USE THE FOIL METHOD TO FIND THE PRODUCT.

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

$$= 12n^2 + 4n + 9n + 3$$

$$= \boxed{12n^2 + 13n + 3}$$

SECTION 5-2: POLYNOMIALS

MULTIPLYING POLYNOMIALS

EXAMPLE: USE THE FOIL METHOD TO FIND THE PRODUCT.

$$(x + 3)^2$$

$$= (x + 3)(x + 3)$$

$$= x^2 + 3x + 3x + 9$$

$$= x^2 + 6x + 9$$

SECTION 5-2: POLYNOMIALS

MULTIPLYING POLYNOMIALS

EXAMPLE: USE THE FOIL METHOD TO FIND THE PRODUCT.

$$\begin{aligned} & (3y + 1)(3y - 1)(y + 2) \\ &= (9y^2 - 3y + 3y - 1)(y + 2) \\ &= (9y^2 - 1)(y + 2) \\ &= \boxed{9y^3 + 18y^2 - y - 2} \end{aligned}$$

SECTION 5-2: POLYNOMIALS

MULTIPLYING POLYNOMIALS

EXAMPLE: USE THE FOIL METHOD TO FIND THE PRODUCT.

$$(3y^2 - 2)(-2y + 1)$$

SECTION 5-2: POLYNOMIALS

MULTIPLYING POLYNOMIALS

EXAMPLE: USE THE FOIL METHOD TO FIND THE PRODUCT.

$$(3 - q)(3 + q)$$

JOURNAL 17

DUE AT END OF MATH LAB IN TWO TIMES

ASSIGNMENT 17

REVIEW FOR TEST!!!

DUE AT BEGINNING OF BI CLASS