2-1 Operations with Polynomials

Objectives:

- I can identify the parts of a polynomial

- I can perform operations with polynomials including addition, subtraction, and multiplication

Vocab

Monomial

ONE TERM ex x^2

Binomial

two terms x^2+3x

Trinomial

3 terms x^2+3x-5

Polynomial

any # of terms

Monomials pg. 315

Identify the monomials: $x^3, y + 3y^2 - 5y^3 + 10, a^2 bc^{12}, 76$

Monomials: x^3, 76, a^2bc^{12}

Not monomials: $y+3y^2-5y^3+10$

$76x^0$

Identify the degree of each monomial.

Monomial	x^3	$a^2 bc^{12}$	76
Degree	3	15	0

DEGREE MONOMIAL: all exponents added

DEGREE POLYNOMIAL: highest MONOMIAL degree

Polynomials pg. 315

Identify the terms of the polynomial $y + 3y^2 - 5y^3 + 10$. y, $3y^2$, $-5y^3$, 10

Identify the coefficient of each term.

Term	y	$3y^2$	$-5y^3$	10
Coefficient	1	3	-5	—

in front of variable!

Identify the degree of each term.

Term	y	$+3y^2$	$-5y^3$	$10x^0$
Degree	1	2	3	0

Write the polynomial in standard form. $-5y^3+3y^2+y+10$

Largest degree $\longrightarrow$ smallest

What is the leading coefficient of the polynomial? -5

Coeffient of highest degree monomial

Adding Polynomials pg. 316

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

$$\begin{array}{rrrrr} 5x^4 & -x^3 & +4x^2 & 0 & +2 \\ +3x^4 & 0 & +6x^2 & -x & 0 \\ \hline 8x^4 & -x^3 & +10x^2 & -x & +2 \end{array}$$

Ex 2 [illegible]

$$\begin{array}{rrrrr} 6x^4 & -18x^3 & & +10x & -2 \\ -7x^4 & 2x^3 & & x & 5 \\ \hline -1x^4 & -16x^3 & +11x & +3 & \end{array}$$

Add the following polynomials pg. 316

$(17x^4 + 8x^2 - 9x^7 + 4 - 2x^3) + (11x^3 - 8x^2 + 12)$

$17x^4 - 9x^7 + 16 + 9x^3$

$-9x^7 + 17x^4 + 9x^3 + 16$

$(-8x + 3x^{11} + x^6) + (4x^4 - x + 17)$

$3x^{11} + x^6 + 4x^4 - 9x + 17$

Subtracting Polynomials pg. 317

$(12x^3 + 5x - 8x^2 + 19) + (6x^2 + 9x - 3 + 18x^3)$

Write in standard form.

Align like terms and add the opposite.

Add.

$$\begin{array}{rrrr} 12x^3 & -8x^2 & +5x & +19 \\ +18x^3 & -6x^2 & +9x & -3 \\ \hline 30x^3 & -14x^2 & +14x & +16 \end{array}$$

$(-4x^2 + 8x^3 + 19 - 5x^5) + (9 + 2x^2 + 10x^5)$

Write in standard form and add the opposite.

$(-5x^5 + 8x^3 - 4x^2 + 19) + (-10x^5 - 2x^2 - 9)$

Group like terms

Add

Subtract the following polynomials pg. 317

$(23x^7 - 9x^4 + 1) + (+9x^4 - 6x^2 + 31)$

$(7x^3 + 13x - 8x^5 + 20x^2) + (+2x^5 - 9x^2)$

$6 + (+5)$

Multiplying Polynomials pg. 328

$5x^1 \cdot 6x^3 = 30x^{1+3}$ 4

$30x^4$

$-2x^2y^4z^1 \cdot 5y^2z^1 = -10x^2y^{4+2}z^{1+1}$

$-10x^2y^6z^2$

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

$2 + 2x + 3x^2 + 3x$

COMBINE

STANDARD $3x^2 + 5x + 2$

Pg. 328

Ex 1 $(x+2)(1-4x+2x^2)$

Find the product by multiplying horizontally.

$(x+2)(2x^2-4x+1)$

$1x^1(2x^2-4x+1)+2(2x^2-4x+1)$

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

$2x^3-7x+2$

$2x^2(x+2)-4x(x+2)+1(x+2)$

$(3x-5)(2x+3)$

$6x^2+9x-10x-15$

$6x^2-x-15$

$3x(2x+3)-5(2x+3)$

Pg. 329

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

$$\begin{array}{r} -7x^2+x+2 \\ \times \quad\quad 3x-4 \\ \hline 28x^2-4x-8 \\ -21x^3+3x^2+6x\ \ 0 \\ \hline -21x^3+31x^2+2x-8 \end{array} \quad +$$

Multiply the following polynomials pg. 329

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

$12-21x+15x^2+8x-14x^2+15x^3$

$10x^3+x^2-13x+12$

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

$3x-8x^2-4x^3-18+48x+24x^2$

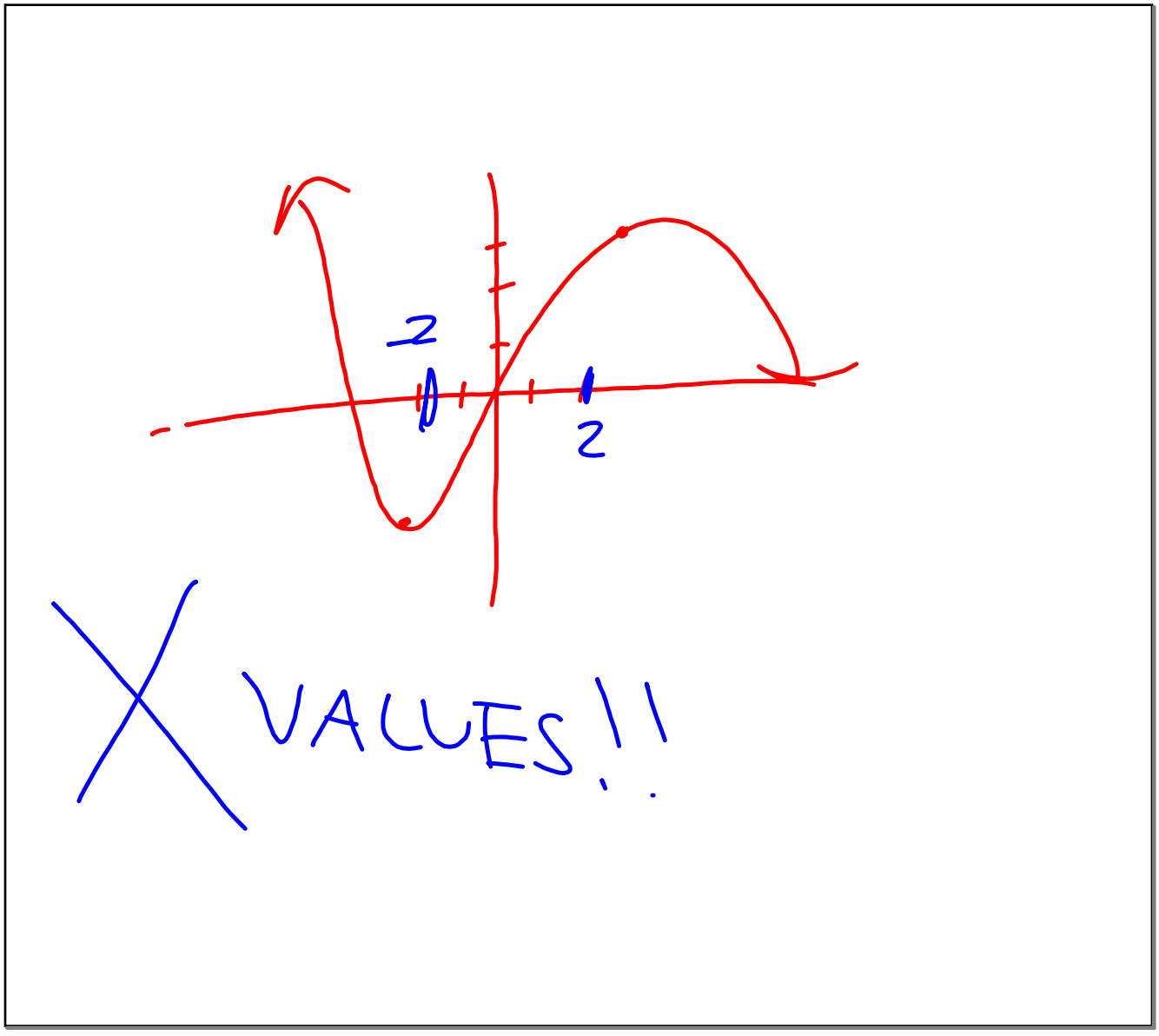
$-4x^3+16x^2+51x-18$

Multiplying with a table

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

	x^2	$-x$	1
x^2	x^4	$-x^3$	x^2
$+3x^1$	$3x^3$	$-3x^2$	$3x$
-5	$-5x^2$	$5x$	-5

$x^4+2x^3-7x^2+8x-5$


-2
2
X VALUES!!