Your Name

Mrs. T

2/11/21

Lesson 7.1

Notes

Polynomials

Objective: To be able to write polynomials in ascending and descending order. To be able to state whether an expression is a binomial, monomial, trinomial, or not a polynomial.

Life lesson/Skill: Once we know how to identify polynomials then we can start multiplying, adding, subtracting, dividing them, as well as graphing them and factoring them.

Monomials- a number, a variable, or a product of numbers and/or variables.

multiply

examples: 80 x 80x xy $\frac{80x}{3}$

non examples: $8+x$ $\frac{80x}{y}$ $3\sqrt{x}$

*remember that any term to the power of 0 = 1

$5^0 = 1$ $x^0 = 1$

rules: no terms with variables in the denominator and no terms with variables under a radical sign (square root sign).

Polynomials many

-Many monomials and is described by the number of terms (separated by + or -)

Monomial	Binomial	Trinomial
	two terms	three terms
4	$x+1$	$a+b+c$
x	$a-5b$	x^2+2x+1
$2y^3$	c^2+d	$3m^3-mn+5$

Yes, they are polynomials

$2x^2+5x+7$ trinomial

$\frac{d}{2}$ Monomial

$x-3$ binomial

No, they are NOT polynomials

$t - \frac{3}{d} + 7$ no variables in denominator

$x^2 + y^{-2} - 3$ no negative exponents

The degree of a polynomial is same as the term with the greatest degree. , the biggest exponent

Examples:

5a has the degree of 1

$-4x^2 + x$ has the degree of 2

$a^2 + ab^2 + b^4$ has the degree of 4

The degree of a monomial If a polynomial has more than one variable, then the degree of that monomial is the sum of the exponents of those variables.

Knowing the degree of a polynomial will help you name an equation down the road.

*** in ch 9 we will cover quadratic and cubic functions**

Constant — degree of 0 — 7 or $7x^0$ no variable

Linear — degree of 1 — $x + 3 = x^1 + 3x^0$

Quadratic — degree of 2 — $x^2 - x + 2 = x^2 - x^1 + 2x^0$

Cubic — degree of 3 — $x^3 - x^2 + 5 = x^3 - x^2 + 0x^1 + 5x^0$

Quartic — degree of 4 — x^4

5 term polynomial with degree of 6

$2a^6 + 3a^2 + 4a^6 - 3a^4 + 2a^3$

Standard Form

Descending Order - when the polynomial is arranged so that the powers of one variable are in decreasing order

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

Degree 4, Degree 2, Degree 3

$8x^3y - y^2 + 6x^2y + xy^2$

$8x^3y + 6x^2y + xy^2 - y^2$

descending by x's exponents because x had the biggest degree in first term

Ascending Order - when the polynomial is arranged so that the powers of one variable are in increasing order

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

degree 4, degree 2, degree 3

$8x^3y - y^2 + 6x^2y + xy^2$ $\quad -y^2 + xy^2 + 6x^2y + 8x^3y$

degree 4, degree 2, degree 3, degree 3

if same degree ascending by x's exponents because y had the biggest exponent in the first term

Leading Coefficient — The number multiplied to the term with the biggest degree

*If in standard form, it is the first number

Constant — The number without a variable,

*Term with degree 0, x^0

ex. $15n^2 - n - 28$

Leading Coefficient: 15

Constant: -28

Put in standard form

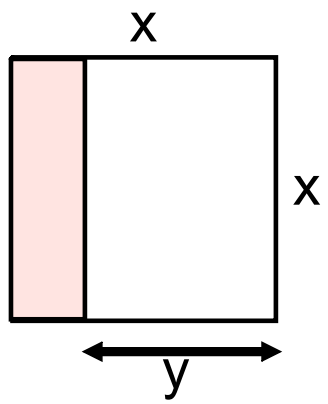
ex. $16x^2 - 8a^5 + 12$

$-8a^5 + 16x^2 + 12$

Leading Coefficient: -8

Constant: 12

Find the following for each polynomial	Leading Coefficient / Constant	Degree	Type of polynomial by degree	Type of polynomial by terms	Write in Standard Form
$5x - 2x^2 + 20$	The Leading Coefficient is -2 The Constant is 20	Degree 2	Quadratic	Trinomial	$-2x^2 + 5x + 20$
8					
$r^3 + 4 - r + s^2$					
$3y^2$					
$5x^2 y^4 - 4$					
$5x^3y^2 z$					
$r^3 - 3 - r - r^5$					
$25x^2 - 16x^4$					
$8x^2 - 13x + 5$					
$-7x + -9 + 4x^3$					
$-7 + \frac{3}{4}x$					



Write a polynomial expression for the area of the pink section.

$A = l \cdot w$

$x \cdot y - x \cdot x$

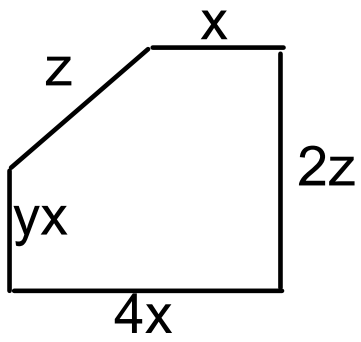
$xy - x^2$

- Now evaluate the expression knowing that x=5 units and y=3 units

$5(3) - (5)^2$

$15 - 25$

-10



Write a polynomial to find the perimeter of this garden.

$P = 5 + 5 + 5 + 5 + 5$

$P = 2z + x + z + yx + 4x$

$P = 3z + 5x + yx$

Now find the perimeter if x= 2, y= 3, and z= 5 feet.

$P = 3(5) + 5(2) + (3)(2)$

$P = 15 + 10 + 6$

$P = 31$ ft

Summary

Objective: To be able to write polynomials in ascending and descending order. To be able to state whether an expression is a binomial, monomial, trinomial, or not a polynomial.

Virtue/Skill: Once we know how to identify polynomials then we can start multiplying, adding, subtracting, dividing them, as well as graphing them and factoring them.

Assignment:

Worksheet Table
Workbook 7-3

Find the following for each polynomial	Leading Coefficient Constant	Degree	Type of polynomial by degree	Type of polynomial by terms	Write in Standard Form
$5x - 2x^2 + 20$	The Leading Coefficient is -2 The Constant is 20	Degree 2	Quadratic	Trinomial	$-2x^2 + 5x + 20$
8	L.C: 8 C: 8	D: 0	Constant	Monomial	8
$r^3 + 4 - r + s^2$	L.C.: 1 C: 4	D: 3	Cubic	4 term Polynomial	$r^3 + s^2 - r + 4$
$3y^2$	L.C.: 3 C: 0	D: 2	Quadratic	Monomial	$3y^2$
$5x^2 y^4 - 4$	L.C.: 5 C: -4	D: 6	6th degree Polynomial	Binomial	$5x^2y^4 - 4$
$5x^3y^2 z$	L.C: 5 C: 0	D: 6	6th degree Polynomial	Monomial	$5xy^2z$
$r^3 - 3 - r - r^5$	L.C.: -1 C: -3	D: 5	5th degree Polynomial	4 term Polynomial	$-r^5 + r^3 - r - 3$
$25x^2 - 16x^4$	LC: -16 C: 0	D: 4	Quartic	Binomial	$-16x^4 + 25x^2$
$8x^2 - 13x + 5$	L.C: 8 C: 5	D: 2	Quadratic	Trinomial	$8x^2 - 13x + 5$
$-7x + -9 + 4x^3$	L.C: 4 C: -9	D: 3	Cubic	Trinomial	$4x^3 - 7x - 9$
$-7 + \frac{3}{4}x$	L.C: $\frac{3}{4}$ C: -7	D: 1	Linear	Binomial	$\frac{3}{4}x - 7$

Homework Answers 7-3:

1. Yes; binomial 2. yes; binomial

3. yes; monomial 4. yes; monomial

5. no 6. yes; trinomial 7. ab - xy

8. $4r^2 - \pi r^2$ 9. 0 10. 4 11. 1

12. 3 13. 3 14. 9

15. $1 + 3x + 2x^2$ 16. -6 + 5x + 3x2

17. $2 + x + 9x2 + x^3$

18. $-3 + 4x - x^2 + 3x^3$

19. $21r^4 + 7r^5x - r^2x^2 - 15x^3$

20. $14a^2 + ax^2 - 10x^3 + 3a^2x^4$

21. $3x^3 + x^2 - x + 27$

22. $-x^3 + x + 25$

23. $5x^3 - 3x^2 + x + 4$

24. $7x^3 + x^2 - x + 64$

25. $6x^3 - c^3x^2 + 2cx + 32$

26. $-x^3y^3 + x^2y^2 + x + 13$