

Label in your binder:

Unit 1: Polynomials

EXPRESSIONS VS EQUATIONS

What is the difference?

Equations contain equal signs!

Expressions are mathematical phrases

Equations are mathematical sentences.

What are Terms?

- the different parts of the equation- can be a single number or variable

$$3x + 2y = 8$$

↓
term

↓
term

↓
term

What are Constants?

- Fixed quantity that doesn't change

- $y = 2x + 5$

What are Coefficients?

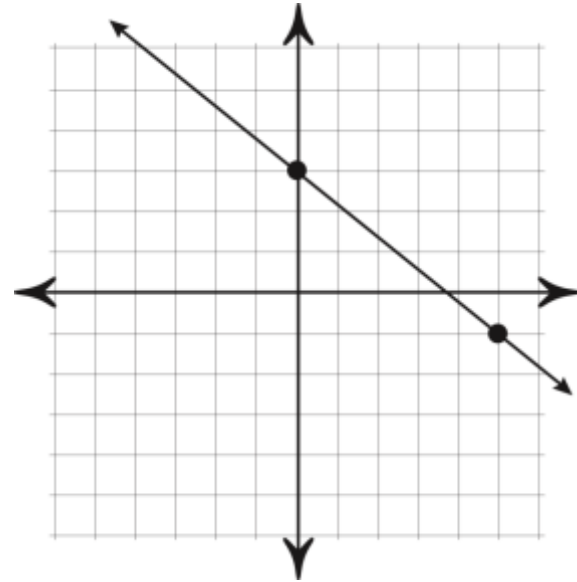
- a number that is multiplied by a variable
- Ex: $5x$ $-9y$ $10z$

Polynomial Basics

Objectives:

- What IS a polynomial?
- Find the degree of a polynomial
- Classify polynomials
- Write polynomials in standard form

- Linear graphs are pretty boring:



- Graphs of polynomials are much more fun:



- **Monomial** – Number, Variable, or product of numbers and variables with whole-number exponents
- **Degree of a Monomial** – Sum of the exponents of the variables
- **Polynomial** – a monomial or a sum or difference of monomials
- **Degree of a Polynomial** - Degree of the term with the highest degree

POLYNOMIAL NO-NOs:

NO:

- Variables in the exponent
- Variables in the denominator of a fraction
- Negative Exponents
- Non-whole number exponents

Find the Degree

- $1.5x^2y$

- $5x^3$

- $10x^2yzabc$

Find the degree:

• $\frac{4x^3}{3} + \frac{9x^2}{2} - \frac{5x}{1}$

Cubic trinomial

• $18y + y^2z - 5z^2 + 40$

Cubic polynomial

Some polynomials have special names based on their degree and the number of terms they have.

Degree	Name
0	Constant
1	Linear
2	Quadratic
3	Cubic
4	Quartic
5	Quintic
6 or more	6 th , 7 th , degree and so on

Terms	Name
1	Monomial
2	Binomial
3	Trinomial
4 or more	Polynomial

these are all polynomials



- **Standard Form** – Terms written from highest to lowest degree
- **Leading Coefficient** – Coefficient of Term with Highest Degree
- $18y + y^2z - 5z^2 + 40$

$$1y^2z - 5z^2 + 18y + 40$$

- 1. Is it a polynomial? Why or Why not?
- 2. If yes...
 - A. Write the Polynomial in Standard Form
 - B. State the Leading Coefficient $\rightarrow 20$
 - C. Classify it based on the number of terms \rightarrow binomial
 - D. State the Degree $\rightarrow 8$

\rightarrow 8th degree binomial

$$9y^6 + 20x^2y^6$$

$$20x^2y^6 + 9y^6$$

- 1. Is it a polynomial? Why or Why not?
- 2. If yes...
 - A. Write the Polynomial in Standard Form
 - B. State the Leading Coefficient
 - C. Classify it based on the number of terms
 - D. State the Degree

quadratic trinomial

$$20x + 2 - x^2$$

$$-x^2 + 20x + 2$$

- 1. Is it a polynomial? Why or Why not?
- 2. If yes...
 - A. Write the Polynomial in Standard Form
 - B. State the Leading Coefficient 1
 - C. Classify it based on the number of terms
 - D. State the Degree

quintic
polynomial

$$16 - 4x^2 + x^5 + 9x^3$$

$$x^5 + 9x^3 - 4x^2 + 16$$