Polynomial Analysis

1. Anatomy of a Polynomial

Leading Coefficient   Degree

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

Variable   Term   Constant
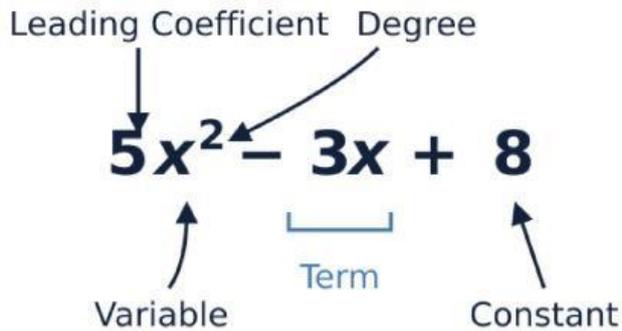
Key Vocabulary:

- **Term:** Parts separated by + or - signs.
- **Coefficient:** The **number** in front of a letter.
- **Constant:** A number **all by itself** (no letter).
- **Degree:** The **biggest** exponent (power).
- **Like Terms:** Same letter, same exponent.

2. Deconstruct the Polynomials

Look at the polynomials below. We have filled in the first row for you as an example.

Remember: If you don't see a number in front of a variable, the coefficient is **1**.

Polynomial	# of Terms	Coefficients	Constant	Degree
$4x^2 + 3x - 7$	3 terms	4, 3	-7	2
$y^3 - 9y + 2$				3
$15 - m$			15	
$\frac{1}{2}a^4 + a^2 - 6a$			None	

3. Like vs. Unlike Terms

Like Terms must have:

1. The same **variable** (letter)
2. The same **exponent** (power)

Example: $2x^2$ and $5x^2$ are like terms. $2x^2$ and $2x$ are NOT.
Look at the box below. Match the terms that belong together.

grouping like items

$3x^2$	$-5y$	12	x
$4y$	$-x^2$	$8x^2$	-7
y^2	$2x$	$9y$	10

Fill in the blanks to group the terms:

x^2 Group: $3x^2$, _____, _____

y Group: $-5y$, _____, _____

Numbers (Constants): 12, _____, _____

x Group: x, _____

4. Polynomial Architect

Create your own polynomials. Use the sentence frames to help you.

1. Write a polynomial with **3 terms** (trinomial) that uses exponent **2** and has the constant **-5**.

_____ x^2 + _____ x - 5

2. Write a polynomial with **2 terms** (binomial). Use **m** as the variable. The first number is **4**.

$4m$ + _____

3. Why are $3x^2$ and $3x$ DIFFERENT? Why can't we add them together?

They are not like terms because they have different _____.

5. Polynomial Power Check ⚡

Circle the correct answer for each question.

1. In the expression **7x³ - 4x + 9**, what is the **leading coefficient**?

   a) 3   b) 7   c) 4   d) 9

2. Which of the following is a **constant**?

   a) 5x   b) x²   c) -12   d) 2y

3. What is the **degree** of the polynomial **x⁵ + 2x² - 1**?

   a) 1   b) 2   c) 5   d) 0

6. Real or No? 🤔

Read each statement carefully. Write **True** or **False** in the box.

Statement	True / False
In the term **-8x**, the coefficient is **8** .	
4x and **4x²** are like terms because they both have x.	
A **trinomial** is a polynomial with exactly **3 terms**.	
The **degree** is the highest exponent in the polynomial.	