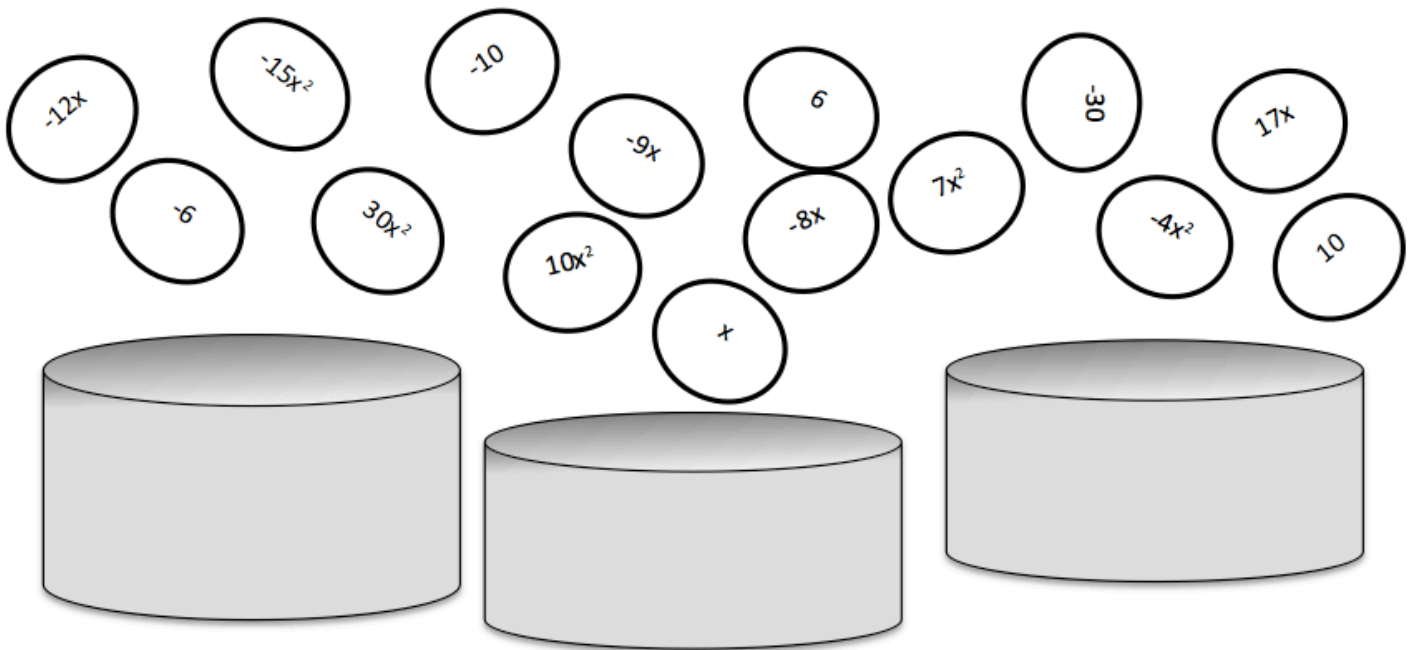


**Part I Objective:** to appropriately classify polynomials and write them in standard form.

**Warm-up:** While loading the gumball machine, one of the Oompa Loompas slipped on an Everlasting Gumball and spilled three bags of candy he was carrying! Please help them to sort the gumballs back into the proper bags by placing like terms in the same bag.



Willy Wonka is excited to announce his new Polynomial Bubble Gum! Each massive, long-lasting gumball will be a unique combination of flavors, represented by a polynomial. Combine like terms to write a number sentence representing the set of gumballs that you organized, above.

**Review:** What do the following prefixes mean?

a. **bi:** \_\_\_\_\_

b. **tri:** \_\_\_\_\_

c. **poly:** \_\_\_\_\_

d. **mono:** \_\_\_\_\_

## Vocabulary:

**Polynomial:**

**Parts of a polynomial:**

**Example 1:** Are these expressions polynomials? If not, explain why.

a.  $-4x^{\frac{1}{3}} + 5x^{\sqrt{2}} + \frac{3}{x} - 17x^{-9}$

b.  $-8x^3 + x^7\sqrt{10} + \frac{1}{5}x^2 + \sqrt{5}$

c.  $z^{44} + z^3 + ab^4 + c^{19} - 2y^{14}$

d. 3

**Example 2:** Classify each as **M** (monomial), **B** (binomial), **T** (trinomial), **P** (polynomial), or **C** (constant).

a. \_\_\_\_  $2x + 1$

b. \_\_\_\_  $17x^2 + 11$

c. \_\_\_\_  $8x^3 + 2x^2 + 3x - 7$

d. \_\_\_\_  $-130$

e. \_\_\_\_  $4a^2 + 7a - 10$

f. \_\_\_\_  $10x^3 - 2x + 1$

**Example 3:** Identify the leading term, leading coefficient and degree for the following.

a.  $12v + 20 - 2v^2$

b.  $-23y + 18y^2 + 2 - 15y^4$

# Classifying Polynomials

A polynomial can be classified with **two** names.

- Name #1 is determined by: \_\_\_\_\_
  - Usually this will be a prefix to the suffix “-nomial”
- Name #2 is determined by: \_\_\_\_\_
  - Degree is determined by the largest exponent you see

	<b>Degree</b>	<b>Number of Terms</b>
<b>0</b>	Constant	-
<b>1</b>	Linear	Monomial
<b>2</b>	Quadratic	Binomial
<b>3</b>	Cubic	Trinomial
<b>4</b>	Quartic	Polynomial
<b>5</b>	Quintic	Polynomial
<b>6</b>	6 <sup>th</sup> degree	Polynomial

## *Things to note:*

- Anything with four or more terms will be classified as a polynomial
- Anything to the 6<sup>th</sup> degree or higher will be named by the indicated number's degree

**Example 4:** Classify the following by **degree**:

A.)  $7x^3 + 5x + 1$

B.)  $6y^5 + 9y^2 - 3y + 8$

C.)  $8x - 4$

D.)  $9x^2 + 3$

E.)  $-4j^1f^3$

**Example 5:** Classify the following by both degree and number of terms!

A.)  $x^3 + 1$

B.)  $x^3 + x^2 + x + 1$

C.)  $x^5 - x^4$

**Part II Objective:** to simplify polynomials by performing the indicated operations.

**Example 6:** Simplify each of the following.

a.  $(x + 5)(x + 4) =$

b.  $(x^3 - 4x^2 + 3) + (x^3 - 3x^2 + 1) =$

c.  $-3x^2(x^2 + 3x) =$

d.  $(5n^2 - 7) - (2n^2 + n - 3) =$

**Example 7:** A square poster of length  $3x$  is going to have a square painting centered on it. The length of the painting is  $2x$ . The area of the poster not covered by the painting will be painted black. What is the area of the poster that will be painted black?

**Example 8:** The Cutting Edge frame shop makes a mat by cutting out the inside of a rectangular board. Use the diagram to find the length and width of the original board if the area of the mat is  $184 \text{ in}^2$ .

