

**Monomial:**

Is a number, a variable, or the product of a number and one or more variables with whole number exponents

**Degree of a Monomial:**

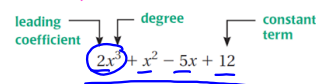
Is the sum of the exponents of the variables in the monomial

| Monomial          | Degree      |
|-------------------|-------------|
| 10                | 0           |
| $3x^1$            | 1           |
| $\frac{1}{2}ab^2$ | $1 + 2 = 3$ |
| $-1.8m^5$         | 5           |

| Not a monomial | Reason  |
|----------------|---|
| $5 + x$        | A sum is not a monomial.                              |
| $\frac{2}{n}$  | A monomial cannot have a variable in the denominator. |
| $4^a$          | A monomial cannot have a variable exponent.           |
| $x^{-1}$       | The variable must have a whole number exponent.       |

**Polynomial:**

Is a monomial or a sum of monomials, each called a term of the polynomial



**Degree of a Polynomial:**

Is the GREATEST degree of its terms 3

**Example #1 - Complete the Table**

| Expression        | Is it a polynomial?   | Classify by degree and number of terms |
|-------------------|-----------------------|--|
| 9                 | Yes                   | 0 degree monomial                      |
| $2x^2 + x - 5$    | Yes                   | 2nd degree trinomial                   |
| $6n^4 - 8^n$      | No; variable exponent |  |
| $n^{-2} - 3$      | No; negative exponent |  |
| $7bc^3 + 4b^2c^4$ | Yes                   | 5th degree binomial                    |

**Standard Form (Rewriting Polynomials)**

the terms (exponents) of the polynomial are ordered from left to right in descending order

(the exponents are in order from greatest to least)

**Example #2**

Write the polynomials in standard form and identify the degree and leading coefficient of the polynomial.

a)  $9 + x^4 - 4x^2$

- ①  $-4x^2 + x + 9$
- ② 2nd degree
- ③ -4

b)  $2x^4y^2 - 8xy$

- ①  $2x^4y^2 - 8xy$
- ② 4th degree
- ③ 2

**Adding Polynomials:**

**Example #3**

Find the sum of  $(2x^2 - 3x + 5) + (4x^2 + 7x - 2)$

“Vertical Form”  
(line up like terms)

$$\begin{array}{r} 2x^2 - 3x + 5 \\ + 4x^2 + 7x - 2 \\ \hline 6x^2 + 4x + 3 \end{array}$$

“Horizontal Form”  
(box/circle & combine)

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

$$6x^2 + 4x + 3$$

**Subtracting Polynomials:**

**Example #4**

Find the difference of  $(3x^2 - 2x + 8) - (x^2 - 4)$

“Vertical Form”  
(line up like terms)

$$\begin{array}{r} 3x^2 - 2x + 8 \\ - \quad x^2 \quad - 4 \\ \hline 2x^2 - 2x + 12 \end{array}$$

“Horizontal Form”  
(box/circle & combine)

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

$$2x^2 - 2x + 12$$

5)  $(x^2 + 11xy - 3y^2) + (-2x^2 - xy + 4y^2)$

$$-x^2 + 10xy + y^2$$

6)  $(8a^2b - 6a) - (2a^2b - 4b + 19)$

$$8a^2b - 6a - 2a^2b + 4b - 19$$

$$6a^2b - 6a + 4b - 19$$