9.1 Add & Subtract Polynomials

Monomial: a number or variable or product of number & variable ex) 5, x, y, 5x, xy, 5xy

Degree of monomial: sum of exponent of the variables
ex x^2 → 2nd degree, $5x^1$ → 1st degree, x^3y^3 → 5th degree

Parts of Polynomials

$$2x^3 + x^2 - 5x + 12$$

Polynomial: sum or difference of monomials

Degree of polynomial: greatest degree of its terms 3rd degree

Leading coefficient: coefficient of the highest degree term L.C. = 2

Standard Form of a Polynomial

$15x - x^3 + 3$

Exponents listed greatest to least

$-x^3 + 15x + 3$ ↳ standard form

Degree: 3

L.C. = −1

Write the polynomial so that the exponents decrease from left to right. Identify the degree and leading coefficient of the polynomial.

7. $-8 + 10a^4 - 3a^7$

$-3a^7 + 10a^4 - 8$

Degree: 7

L.C. = −3

8. $4z + z^3 - 5z^2 + 6z^4$

$6z^4 + z^3 - 5z^2 + 4z$

Degree: 4

L.C. = 6

9. $8h^3 - 6h^4 + h^7$

$h^7 - 6h^4 + 8h^3$

Degree: 7

L.C. = 1

Add Polynomials

a. $(2x^3 - 5x^2 + x) + (2x^2 + x^3 - 1)$

Horizontal format:

$(2x^3-5x^2+x)+(2x^2+x^3-1)$

$3x^3-3x^2+x-1$

Vertical formal:

$$\begin{array}{r} 2x^3-5x^2+x \\ +\quad x^3+2x^2\quad\quad -1 \\ \hline 3x^3-3x^2+x-1 \end{array}$$

b. $(3x^2 + x - 6) + (x^2 + 4x + 10)$

Horizontal format:

$4x^2+5x+4$

Vertical formal:

$$\begin{array}{r} 3x^2+x-6 \\ +\quad x^2+4x+10 \\ \hline 4x^2+5x+4 \end{array}$$

Subtract Polynomials

Find the difference.

a. $(4n^2 + 5) - (-2n^2 + 2n - 4)$

Horizontal format:

$6n^2-2n+9$

Vertical formal:

$$\begin{array}{r} 4x^2-3x+5 \\ -\quad 3x^2-x-8 \\ \hline x^2-2x+13 \end{array}$$

b. $(4x^2 - 3x + 5) - (3x^2 - x - 8)$

Horizontal format:

$x^2-2x+13$

Vertical formal:

Practice

Find the sum or difference.

17. $(5a^2 - 3) + (8a^2 - 1)$

$13a^2 - 4$

18. $(h^2 + 4h - 4) + (5h^2 - 8h + 2)$

$6h^2 - 4h - 2$

23. $(-n^2 + 2n) - (2n^3 - n^2 + n + 12)$

$-2n^3 + n - 12$

24. $(9b^3 - 13b^2 + b) - (-13b^2 - 5b + 14)$

$9b^3 + 6b - 14$

BASEBALL ATTENDANCE Major League Baseball teams are divided into two leagues. During the period 1995–2001, the attendance N and A (in thousands) at National and American League baseball games, respectively, can be modeled by

$N = -488t^2 + 5430t + 24{,}700$ and

$A = -318t^2 + 3040t + 25{,}600$ +

where t is the number of years since 1995. About how many people attended Major League Baseball games in 2001?

$-806t^2 + 8470t + 50{,}300$

$-806(6)^2 + 8470(6) + 50300$

$72{,}104{,}000$