

1.7 Addition and Subtraction of Algebraic Expressions

Definition: (**algebraic operations**)

The addition, subtraction, multiplication, division, and taking of roots of literal numbers

$$+, -, \cdot, \div, \sqrt{\quad}$$

Definition: (**algebraic expression**)

The combination of numbers and literal symbols that results from algebraic operations.

$$2x + 3y^2 - \frac{4x}{y} ; \text{ 2 variable : } x, y$$

$$2x^2 + 8x - 1 ; \text{ 1 variable : } x$$

Definition: (**Term**)

One of the quantities connected by addition or subtraction signs in an equation;
member. (including the sign)

Terms

$$2y^2 - 5xy + 10x^2$$

Terms: $\left\{ \begin{array}{l} 2y^2 \\ -5xy \\ 10x^2 \end{array} \right.$

Factors

$$4x^2 - 6xy + 2y - 7$$

4 terms

Definition: (**Factor**)

Any of the numbers (or symbols) that form a product when multiplied together

$$2 \cdot y$$

2 factors

$$2 + x$$

terms

$$2x$$

factors

List the factors and the terms

$$7x + 3y - 2$$

$$7x(y^2 + x) - \frac{x+y}{6x}$$

Chapter1 section7 notes

Definition: (Monomial)

An algebraic expression containing only one term

monomials	not monomials
$3x$ $3xy$ $-3a^2b^3c$	$3x+y$

Pick up
Per //

Definition: (Binomial)

An algebraic expression containing two terms

$$4x+1 ; -3x^2-4xy$$

$$3x+x$$
$$3x$$

Definition: (Trinomial)

An algebraic expression containing three terms

$$4x+3+2y ; 2x^2-9x+7$$

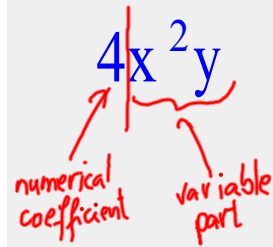
Definition: (Multinomials (or) Polynomials)

An algebraic expression containing two or more terms

Chapter1 section7 notes

Definition: (Numerical Coefficient)

A number multiplied with a variable or an unknown quantity in an algebraic term.



Term	Coefficient	Variable Part
$2xy^2$	2	xy^2
$-3xyz$	-3	xyz
$1 \cdot a^2b$	1	a^2b
$-a^2b$	-1	a^2b
7	7	none

constant term

Definition: (Similar (or) like terms)

Terms that differ at most in their numerical coefficients.

They have the same variable part

$2x; -3x \rightarrow$ similar

$2x; -3x^2 \rightarrow$ not similar

$2x; 2y \rightarrow$ not similar

$7; \frac{2}{3} \rightarrow$ similar

$2x^2y; 2yx^2 \rightarrow$ similar

$2\$ + 3\$ = 5\$$ $\sqrt{2x+3x} = 5x$

$2\$ + 3\text{€}$ $2x + 3y$

Chapter1 section7 notes

working with nested grouping symbols:

parentheses $()$ ✓

brackets $[\]$ ✓

braces $\{ \}$ ✓

bar $\underline{\quad}$

$$8c - \{5 - [2 - (3 + 4c)]\}$$

what to do with the negative outside the grouping symbols.

$$\begin{aligned} -(3 + 4c) &= -3 + -4c \\ &= -3 - 4c \end{aligned}$$

$$\begin{aligned} 8c - [2 - (5 - 6c)] &= \\ &= 8c - [2 - 5 + 6c] = \\ &= 8c - [-3 + 6c] \\ &= 8c + 3 - 6c = 2c + 3 \end{aligned}$$

$$\begin{aligned} a \cdot (b+c) &= ab+ac \\ +1 \cdot (b+c) &= b+c \\ -1 \cdot (b+c) &= -b-c \\ -1 \cdot (b-c) &= -b+c \\ -(-b+c) &= b-c \\ -(-b-c) &= b+c \end{aligned}$$

Chapter1 section7 notes

example problems

$$6) 6t - 3t - 4t = \quad 3t - 4t = -1t$$

$$8) 4c + L - 6c = \quad -2c + L$$

$$10) \underline{x} - \underline{2y} + \underline{3x} - \underline{y} + \underline{z} = \quad 4x - 3y + z$$

$$12) \underline{3x^2} - \underline{3x^2y^2} + \underline{2xy^2} + \underline{5x^2y^2}$$
$$3xy^2 + 2x^2y^2$$

$$16) 2a - (b - a)$$

$$2a + -b + a$$

$$3a + -b$$

$$20) (4x - y) - (-2x - 4y)$$

$$4x - y + 2x + 4y$$

$$6x + 3y$$

