

Rosary School \ Marj Elhamam

Name : _____
Subject: study sheet 3 chapter (3)

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Grade : 6 ()

- An **algebraic term** is made up of numbers (called coefficients), letters (called variables) and multiplication operation sign.

Examples : $3x$, $2y^2z$, $-4ab$, 10

Note: 10 is a **constant** algebraic expression.

- An **algebraic expression** is made up of one term or more and an addition operation signs.

Examples: $(3x + 2)$, $(4a - 7)$, $(2x + 3x + 5)$

Note: every algebraic term is an algebraic expression but not every algebraic expression is an algebraic term.

• Like Terms

Like terms are terms that have the same variable raised to the same power.

Examples of like terms: $3x$ and $5x$

$7a$ and $-2a$

$-2y^3$ and $5y^3$

Examples of unlike terms: $4x$ and $4y$ (different variables)

x^2 and x (different powers).

• Simplifying Like Terms When Adding and Subtracting

To simplify an algebraic expression, combine the numbers of the like terms.

Examples:

$$2x + 5x = 7x$$

$$8y - 3y = 5y$$

$$4a + 7b - 2a + 3b =$$

$$(4a - 2a) + (7b + 3b) =$$

$$2a + 10b$$



Be careful with positive and negative signs when simplifying.

Examples:

$$6x - 9x = -3x$$

$$-5a + 3a = -2a$$

• Tips to Remember

- ✓ Group like terms together before simplifying.
- ✓ Add or subtract the coefficient of each variable.
- ✓ Keep the sign (+ or -) between the terms.

Examples:

<u>Expression Form</u>	<u>Steps</u>	<u>Simplified Form</u>
1. $2x + 5x$	$2x + 5x = (2 + 5)x$	$7x$
2. $8y - 3y$	$8y - 3y = (8 - 3)y$	$5y$
3. $3x + 5 + 2x - 7$	$(3x + 2x) + (5 - 7)$	$5x - 2$
4. $4a + 7b - 2a + 3b$	$(4a - 2a) + (7b + 3b)$	$2a + 10b$

• Simplifying When Multiplying Variables

When we multiply variables, we multiply their coefficients and add the powers of the variables.

Example 1:

$$2x \times 3x = (2 \times 3) \times (x \times x) = 6x^2$$



Example 2:

$$4a \times 5a \times 2a = (4 \times 5 \times 2) \times (a \times a \times a) = 40a^3$$

Example 3:

$$3x \times 2y = 6xy$$

(different variables — just write them together)

Example 4:

$$-2a \times 3a^2 = (-2 \times 3) \times (a \times a^2) = -6a^3$$

Writing Algebraic Expressions

Words / Phrases	Operation	Example	Expression
Sum, total, more than, increased by	Addition (+)	5 more than x	$x + 5$
Difference, less than, decreased by	Subtraction (-)	7 less than x	$x - 7$
Times, product of, multiplied by	Multiplication (\times)	4 times x	$4x$
Divided by, quotient of	Division (\div)	x divided by 3	$x \div 3$ or $x/3$
Double	Multiplying by 2	double x	$2x$

Example 1:

“A number increased by 9” $\rightarrow x + 9$

“Twice a number” $\rightarrow 2x$

“A number decreased by 4” $\rightarrow x - 4$

“The product of 3 and a number” $\rightarrow 3x$

“Half of a number” $\rightarrow x \div 2$ or $\frac{1}{2}x$

Example 2:

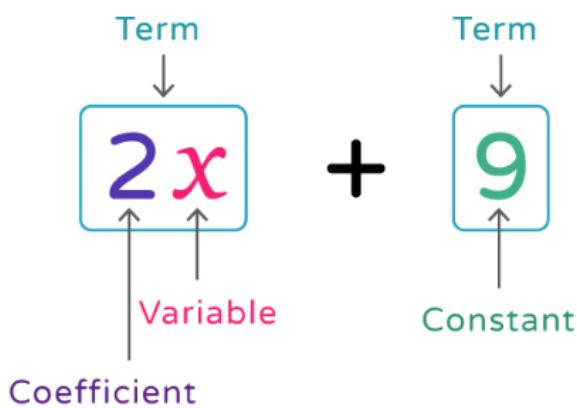
“A number doubled, then increased by 6” $\rightarrow 2x + 6$

“Three less than five times a number” $\rightarrow 5x - 3$

“A number divided by 2, then decreased by 7” $\rightarrow (x \div 2) - 7$

“Four more than twice a number” $\rightarrow 2x + 4$

Algebraic Expression



Teachers: Eman Nabas, Qusie Hijazeen