

MATHEMATICS

Quarter 2 - Module 3: Basic Terms in Algebra



AIRs - LM

MATHEMATICS 7

Quarter 2 - Module 3: Basic Terms in Algebra
Second Edition, 2021

Copyright © 2021
La Union Schools Division
Region I

All rights reserved. No part of this module may be reproduced in any form without written permission from the copyright owners.

Development Team of the Module

Author: Romulo O. Sotiangco and Gema D. Jarata
Editor: SDO La Union, Learning Resource Quality Assurance Team
Content Reviewer: Richard O. Dizo and Marc Vincent Pacio
Language Reviewer: Maryjane A. Gacusan and Erliza D. Areola
Illustrator: Ernesto F. Ramos Jr.
Design and Layout: Christian R. Bumatay

Management Team:

Atty. Donato D. Balderas Jr.
Schools Division Superintendent
Vivian Luz S. Pagatpatan, Ph D
Assistant Schools Division Superintendent
German E. Flora, Ph D, *CID Chief*
Virgilio C. Boado, Ph D, *EPS in Charge of LRMS*
Erlinda M. Dela Peña, Ph.D, *EPS in Charge of Mathematics* Michael Jason D.
Morales, *PDO II*
Claire P. Toluyen, *Librarian II*

Printed in the Philippines by: _____

Department of Education – SDO La Union

Office Address: Flores St. Catbangan, San Fernando City, La Union
Telefax: 072 – 205 – 0046
Email Address: launion@deped.gov.ph

7

MATHEMATICS

Quarter 2 - Module 3: Basic Terms in Algebra



Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.



Target

This module is designed and written for you. It is here to help you master the basic terms in algebra. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. Lessons are arranged in the standard sequence of the course, but the order may be different from the textbook that you are using.

After going through this module, you are expected to

Learning Competency:

Illustrates and differentiates related terms in algebra:

- a^n where n is positive integer
- constants and variables
- literal coefficients and numerical coefficients
- algebraic expressions, terms and polynomials
- number of terms, degree of the term and degree of the polynomial

Learning Objectives:

1. Define related terms in algebra.
2. Classify algebraic expressions.
3. Identify number of terms, degree of the term and degree of the polynomial in a given expression

Before going on, check how much you know about this topic.

Pre – Assessment

Directions: Read each statement below carefully. Select the letter of the correct answer. Write your answer on a separate sheet of paper.

1. Which of the following are symbols or letters that may take one or more than one value?
A. Constants B. Exponents C. Terms D. Variables
2. Which of the following polynomials has two terms?
A. Binomial B. Monomial C. Trinomial D. Multinomial
3. How many term/s does a monomial have?
A. 1 B. 2 C. 3 D. 4
4. How many terms does the expression $3x^2 + 5x - 7$ have?
A. 1 B. 2 C. 3 D. 4
5. Which of the following numbers that have fixed values?
A. Constants B. Exponents C. Terms D. Variables
6. What is the degree in the expression $5x^2 + 9x - 7$?
A. 1 B. 2 C. 3 D. 4
7. What is the exponent of $25a^3$?
A. 1 B. 2 C. 3 D. 5
8. What is/are the variable/s of $5ab^2$?
A. a and b B. a and b^2 C. b^2 D. 5 and a
9. What is the numerical coefficient of $35a^8$?
A. 3 B. 5 C. 8 D. 35
10. What is the exponential form of $a \cdot a \cdot a \cdot a \cdot b \cdot b \cdot b \cdot b$?
A. $(4a)(4b)$ B. a^4b^4 C. $(ab)^4$ D. $(ab)_4$
11. Which of the following is similar to $-x^4y^3$?
A. x^2y^4 B. x^4y^2 C. x^3y^4 D. x^4y^3
12. What is the degree of polynomials in the expression $2x^3y - x^2y^3 + 5xy^4 - 1$?
A. 2 B. 3 C. 4 D. 5
13. Which of the following is usually referred to as the term without a variable?
A. Constant B. Exponent C. Terms D. Variable
14. How many terms does $3ab^2 - 6b + 10$ have?
A. 3 B. 4 C. 5 D. 6
15. Which of the following polynomials has three terms?
A. Binomial B. Monomial C. Polynomial D. Trinomial



Jumpstart

Activity 1: Individual Vocabulary List

1. In column 2, write down words that start with the corresponding letter in column 1 and are used or related to Algebra
2. In column 3, select one word from column 2 that you consider important to Algebra.

(1) Letter	(2) Words	(3) Important Word
A	algebra, algebraic expression	algebraic expression
B		
C		
D		
E		
F		
G		
H		
I		
J		
K		
L		
M		
N		
O		
P		
Q		
R		
S		
T		
U		
V		
W		
X		
Y		
Z		



Discover

Basic Terms in Algebra

Algebra is chock-full of words that are useful but often misunderstood. To do well on the Math test, you should be able to define these important terms: variable, constant, equation, expression, term, and coefficient.

Variable. A *variable* is any letter that stands for a number. The most commonly used letters are x and y , but you can use any letter.

Constant. A *constant* is a number without a variable. For example: The equation $6m + 7 = -m$ has one constant, the number 7.

Equation. An *equation* is any string of numbers and symbols that makes sense and includes an equal sign. For example, here are three equations:

$$2 + 2 = 4 \qquad 3x - 7 = 46 \qquad \left(\frac{1}{25}\right)^{n+1} = \sqrt{5}$$

Expression. An *expression* is any string of numbers and symbols that makes sense when placed on one side of an equation. For example, here are four expressions:

$$2 + 2 \qquad 3x - 7 \qquad -x^2 - 9x + 11 \qquad \left(\frac{1}{25}\right)^{n+1}$$

Term. A *term* is any part of an expression that's separated from the other parts by either a plus sign (+) or a minus sign (-).

Important: A term always includes the sign that immediately precedes it. For example,

The expression $3x - 7$ has two terms: $3x$ and -7 .

The expression $-x^2 - 9x + 11$ has three terms: $-x^2$, $-9x$, and 11 .

The expression $\left(\frac{1}{25}\right)^{n+1}$ has one term: $\left(\frac{1}{25}\right)^{n+1}$.

Coefficient. A *coefficient* is the numerical part of a term, including the sign that precedes it (+ or -). In the term $3x^2$, 3 is called the **numerical coefficient** and x^2 is called the **literal coefficient**.

Important: Every term has a coefficient. When a term appears to have no coefficient, its coefficient is either 1 or -1, depending on the sign. For example,

The term $3x$ has a coefficient of 3.

The term $-9x$ has a coefficient of -9.

The term $-x^2$ has a coefficient of -1.

Being clear about the meanings of these six words can help you with any other math you study.

Classifying Algebraic Expressions

There are special kinds of algebraic expression called *Polynomials*. A **Polynomial** is an algebraic expression where each term is a constant, a variable or a product of a constant and variable. The variable has a whole number (non-negative number) exponent. A polynomial also can be a *monomial*, *binomial*, *trinomial* or a *multinomial*.

Examples	Given	Reason
Polynomials	$8x^2$	It satisfies the conditions.
	$\frac{x}{5}$	It satisfies the conditions.
	$\sqrt{2}y$	It satisfies the conditions.
Not Polynomials	$3x^{-2}$	The exponent is negative.
	$\frac{5}{x}$	There is a variable in the denominator.
	$\sqrt{y^5}$	The variable is inside the radical sign.

Remember:

An algebraic expression is **NOT** a polynomial if

1. the exponent of the variable is NOT a whole number {0, 1, 2, 3..}.
2. the variable is inside the radical sign.
3. the variable is in the denominator.

We will classify an algebraic expression according to the number of its terms.

Classifications	Example	1 st term	2 nd term	3 rd term	Reason
Monomial	$6xyz^3$	$6xyz^3$			These are called <i>monomials</i> because there is only one term in each of the algebraic expressions.
	$9a$	$9a$			
	$-8b^2c$	$-8b^2c$			
Binomial	$3xy + 7xy^2$	$3xy$	$7xy^2$		These are called <i>binomials</i> because the algebraic expressions are made up of two terms.
	$a + 8b$	a	$8b$		
	$-n^2 + 9$	$-n^2$	9		
Trinomial	$-5x^2 - 3xy + 2x$	$-5x^2$	$-3xy$	$2x$	These are called <i>trinomials</i> because the algebraic expressions contain three terms.
	$x^5 + 5x - 8$	x^5	$5x$	-8	
	$xy + 2x - 3y$	xy	$2x$	$-3y$	

Algebraic expressions composed of two or more terms are called **multinomials**.

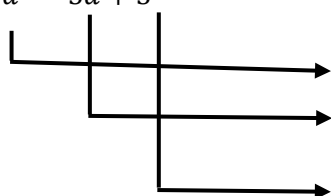
Degree of Polynomials

If the polynomial is in standard form (terms are arranged in descending order of exponents), the first term is called the **Leading Term**. The numerical coefficient of the leading term is called the **Leading Coefficient**.

The **degree of a polynomial** in a single variable is the highest exponent of the variable among the terms. For polynomials with more than one variable, the degree of the polynomials is the highest sum of the exponents of the variables among the terms.

Examples

1. $a^2 - 5a + 3$



The degree of the term is 2.

The degree of term is 1.

The degree of the term is 0.

Since the highest exponent of the polynomial $a^2 - 5a + 3$ is 2, the degree of the polynomial is 2. You can also say that it is a second degree trinomial.

2. $15x$

The variable x has exponent 1. Thus, degree of the polynomial $15x$ is 1. You can also say that it is a first-degree monomial.

3. xyz

Each variable has an exponent of 1, that is, $(x^1y^1z^1)$ and the sum of their exponents is 3. Therefore, the degree of the polynomial is 3. You can also say that it is a third-degree monomial.

4. $4x^4 - 10x^3y + 9ax^2y - 2xy^3 + y^4$

The sum of the exponents of each term is 4. Therefore, the degree of the polynomial is 4. You can also say that it is a fourth-degree polynomial.

5. $ab + 7 - a^5b^4 + a^4b^5$

In the polynomial, ab has degree 2, 7 has a degree 0, $-a^5b^4$ and a^4b^5 have degree 9. The highest sum of the exponents among the terms is 9. Therefore, the degree of the polynomial is 9. You can also say that it is a ninth-degree polynomial.

Kinds of Polynomial According to its Degree		
Constant	a polynomial of degree zero	2
Linear	a polynomial of degree one	$x + 6$
Quadratic	a polynomial of degree two	$2x^2 - x + 6$
Cubic	a polynomial of degree three	$12x^3 - 10x^2 + 1$
Quartic	a polynomial of degree four	$5x^4 - 8x + 2$
Quintic	a polynomial of degree five	$3x^5 - 2x^4 - x^3 + 1$

Consider the trinomial $8x - y + 32$. The three terms of the trinomial are $8x$, $-y$ and 32. In $8x$, 8 is the **numerical coefficient** of x , and x is the **literal coefficient** of 8. In the term $-y$ the numerical coefficient is -1. A numerical coefficient of 1 can be omitted in a term since the term **$-y$ means $-1y$** .

Terms with the same literal coefficients of the same degree are called ***similar*** terms, while the terms that have different literal coefficients and degree are called ***dissimilar terms***.

In writing polynomial, the easiest way is to write the terms in decreasing order of degrees. When a polynomial is written with descending order of exponents, the coefficient of the first term is called the ***leading coefficient***.



Explore

Here are exercises to work on to master and strengthen the basic concepts you have learned from this lesson.

Activity 3: Count me in!

Directions: Count the number of terms if each figure represents a variable.

A. Count the number of terms.

1. $5x^2 + 3x + 6$

2. $7y + 3$

3. 4

4. $-3a^2 + 2a - 9$

5. $55b + 27$

B. Classify the following algebraic expressions as monomial, binomial, trinomial or multinomial.

1. $2r^2 + 3r + 1$

2. $4t + 7$

3. $8s - 5st + 2s - stu$

4. $\frac{1}{4}x$

5. $12m^2n - 10n^3l^2 + 19m - 20nl + mnl$



Deepen

Activity 4: Check It Out!

Directions: Copy and complete the table below.

1. Mark check (✓) whether each expression is a polynomial or not.
2. If it is a polynomial, mark check whether it is a monomial, binomial, or trinomial.
3. Write the leading coefficient and the degree of the polynomial.

Expressions	Polynomial	Not a Polynomial	Monomial	Binomial	Trinomial	Leading Coefficient	Degree of a Polynomial
1. $a^2 + ab + b^3$	✓				✓	1	3
2. $\frac{6}{x^2}$							
3. $2w^2x^3y^3z^4$							
4. $\frac{b^2}{2}$							
5. $y^2 + xy + x^3$							

Metacognition for knowing why:

Why are your answers in the second column polynomial?

1. I know...
2. One reason...
3. A second reason...
4. Last....
5. For these three reasons, I know....



Gauge

Assessment

Directions: Read each statement below carefully. Write the letter of the correct answer on a separate sheet of paper.

1. What is the exponential form of $a \cdot b \cdot b \cdot c \cdot a \cdot b \cdot a \cdot a \cdot a \cdot a \cdot a$?
A. $c(7a)(3b)$ B. a^7b^3c C. $(abc)^{10}$ D. $(abc)_{10}$
2. Which of the following is similar to $5m^4n^3$?
A. $-m^3n^4$ B. n^4 C. $-2m^4$ D. m^4n^3
3. What is the degree of polynomials in the expression $4x^5y - 2x^4y^3 + 5xy^2 - 8$?
A. 4 B. 5 C. 6 D. 7
4. Which of the following is a polynomial that has three terms?
A. Binomial B. Monomial C. Polynomial D. Trinomial
5. Which of the following is usually referred to as the term without a variable?
A. Constant B. Exponent C. Terms D. Variable
6. Which of the following that have fixed values?
A. Constants B. Exponents C. Terms D. Variables
7. How many terms does $3x^2 + 8x - 2$ have?
A. 3 B. 4 C. 5 D. 6
8. How many terms does a monomial have?
A. 1 B. 2 C. 3 D. 4
9. Which of the following are symbols or letters that may take one or more than one value?
A. Constants B. Exponents C. Terms D. Variables
10. Given the expression $8x^2 + 4x - 2$, how many terms does it have?
A. 1 B. 2 C. 3 D. 4
11. Which of the following polynomials has two terms?
A. Binomial B. Monomial C. Multinomial D. Trinomial
12. In the expression $4x^3 + 4x - 2$ what is its degree?
A. 1 B. 2 C. 3 D. 4
13. Which is the exponent in the term $23a^4$?
A. 1 B. 2 C. 3 D. 4
14. What is the variable in the term $78a^b$?
A. a B. b C. 7 D. 8
15. What is the numerical coefficient in the term ab^2 ?
A. a B. b C. 1 D. 2

References

A. Books

- Mathematics Grade 7 Learner's Material, First Edition, 2013
- Mathematics Grade 7 Teacher's Guide, First Edition, 2013
- Herreria, L. D., & Tesorio, M. L. V. Math @ Work, 2013
- Bernabe, J. G. Elementary Algebra, 2009

B. Online Resources

- <https://www.dummies.com/test-prep/act/six-important-algebra-terms-you-must-know-for-the-act/> Six Important Algebra Terms You Must Know for the ACT By Mark Zegarelli

For inquiries or feedback, please write or call:

Department of Education – SDO La Union
Curriculum Implementation Division
Learning Resource Management Section
Flores St. Catbangan, San Fernando City La Union 2500
Telephone: (072) 607 - 8127
Telefax: (072) 205 - 0046
Email Address:
launion@deped.gov.ph
lrm.launion@deped.gov.ph