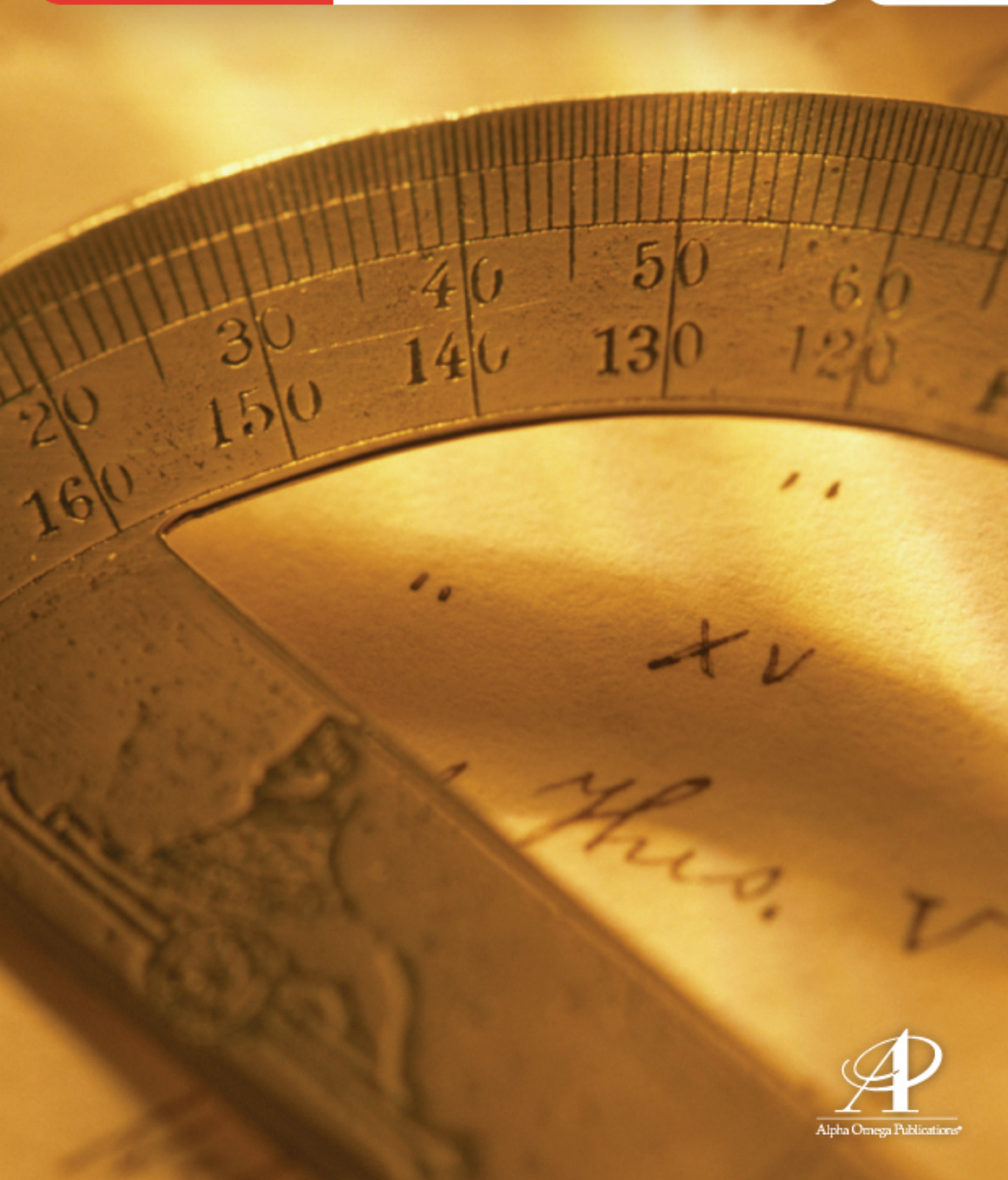
LIFEPAC® Math



Alpha Omega Publications®

MATHEMATICS 705
SETS AND NUMBERS

CONTENTS

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SETS AND NUMBERS

In this LIFEPAC® you will learn about sets and how to perform such basic operations as intersection and union of sets. Visualizing sets with Venn diagrams will be informative and fun.

Numbers are shown in many forms: early number systems, our decimal number system, and various other number bases. Egyptian numerals, Greek numerals, Roman numerals, and Arabic numerals represent early number systems. The ideas of place value and powers of ten will be covered in decimal numerals.

Factoring, finding the greatest common factor and the least common multiple, and divisibility tests are the subjects of the final section.

You will discover many interesting topics as well as important ideas as you progress through this study. Be sure to learn the basic ideas presented, because they link the previous Mathematics LIFEPAC with the one that follows.

OBJECTIVES

Read these objectives. The objectives tell you what you will be able to do when you have successfully completed this LIFEPAC.

When you have finished this LIFEPAC, you should be able to:

1. Use the vocabulary of sets.
2. Define the types of sets.
3. List various uses of sets.
4. Perform the operations of intersection and union of sets.
5. Represent sets as Venn diagrams.
6. Identify early number systems.
7. Use place value and powers of ten in the decimal system.
8. Work with various number bases.
9. Factor numbers using prime factorization.
10. Use prime factors in finding the greatest common factor and the least common multiple.
11. Use divisibility tests.

Survey the LIFEPAC. Ask yourself some questions about this study. Write your questions here.

I. SETS

OBJECTIVES

When you have completed this section, you should be able to:

1. Use the vocabulary of sets.
2. Define the types of sets.
3. List various uses of sets.
4. Perform the operations of intersection and union of sets.
5. Represent sets as Venn diagrams.

When collections of objects or numbers are organized or have something in common, they are called sets. Concepts of sets and operations with sets will be studied in this section.

CONCEPTS

In the study of sets, basic terms, types of sets, and uses of sets will give you a better understanding of what sets are and how to work with them.

BASIC TERMS

A set is a collection or group of objects. Sets can involve almost anything.

DEFINITIONS

Set: A collection or group of objects.

Element or *member*: An object that belongs to the set.

Model 1: Name the elements in the set {red, white, blue}.

Notice that the set is enclosed by braces, {}.

The elements are red, white, and blue.

Model 2: Name the set of whole numbers 1 to 100.

The set is {1, 2, 3, 4, . . . , 100}.

Notice that four elements followed by three dots allows the whole set to be shown instead of writing all the elements.

We have two common ways of expressing sets. One method is called the rule method and the other the roster method. The rule method uses a sentence or phrase that describes the elements of the set. The roster method actually lists the elements, or at least enough elements to show the set.

Model 3: Write the set of vowels as a set using a roster.

The set is {a, e, i, o, u}.

Model 4: Write the set {1, 2, 3, 4} as a rule.

The rule is {whole numbers between zero and five}.

The symbol $\in$ means an element of. The expression $2 \in A$ means 2 is an element of set A. The expression $3 \notin A$ means 3 is not an element of A. The symbol for an empty set, a set with no elements at all, is ϕ.

Model 5: A = {J, K, L}
B = {1, 2, 3}

$J \in A$ $\quad$ $J \notin B$
$1 \in B$ $\quad$ $1 \notin A$

Write the elements of the following sets.

1.1 {1, 2, 3, 4} _____

1.2 {14, 18, 22} _____

1.3 $\{x, y, z\}$ _____

1.4 {blue, green, red} _____

1.5 {5, 10, 15, 20, . . . , 100} _____

1.6 {0} _____

Using the following elements, show the set.

1.7 The set containing 4, 6, and 10. _____

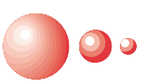
1.8 The set containing tires and oil. _____

1.9 The set with elements eyes, nose, and throat. _____

1.10 The set with elements 5, toy, can, and 10. _____

1.11 If the elements of a set are Matthew, Mark, Luke, and John, show the set. _____

1.12 If the elements of a set are Genesis, Exodus, Leviticus, Numbers, and Deuteronomy, show the set. _____



Describe the following sets using the rule method.

1.13 {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

_____

1.14 {red, white, blue}

_____

1.15 {2, 4, 6, 8, 10, 12, 14}

_____

1.16 {a, e, i, o, u}

_____

1.17 {a, b, c, d, e, f, . . . , z}

_____

1.18 {Saturday, Sunday}

_____

1.19 {5, 10, 15, 20, . . . , 100}

_____

1.20 {addition, subtraction, multiplication, division}

_____