

INTERMEDIATE ARITHMETIC

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649119301

Intermediate arithmetic by Bruce M. Watson & Charles E. White

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Cover @ 2017

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D. C. HEATH & CO., PUBLISHERS

BOSTON NEW YORK CHICAGO

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INTRODUCTION

THE Intermediate Arithmetic is divided into two parts, each containing a full year's work. Throughout the book the pupil is led to see, in each new topic, an extension and application of principles previously learned. Fractions are treated as expressions of division. The work in decimals is presented as an extension of the decimal scale of notation to numbers smaller than one. Percentage is treated as an application of decimals—a familiar topic under a new name. There is no formal division of percentage into "cases," but the pupil is led to apply his knowledge of the relation of product and factors in determining the process to be employed in the solution of each individual problem. All technical commercial terms are reserved for later consideration.

The work in denominate numbers is confined to such problems as people of the present generation are likely to meet in their daily vocations. Extended reductions and intricate measurements are not required. Attention has been given to the development of ideas of proportion, the real purpose of the so-called "ratio exercises" found in some courses of study.

An effort has been made to shorten the course and simplify the work, to a reasonable degree, by reducing each topic to as few cases as possible, and by employing the simplest and most generally applicable processes.

The study of arithmetic should furnish the child a means of interpreting mathematically the world about him. It should

enable him to measure and relate the facts of geography, history, and science. It should bear directly upon the vital interests of the home and family. Care has been taken in the selection of problems to meet these requirements, so far as possible, with due regard to the mathematical content of the exercises, which must always be the first consideration.

INTERMEDIATE ARITHMETIC

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PART ONE

NOTATION AND NUMERATION

1. *That which tells how many is number*; e.g. 11, 14 (books), 25 (cents).

2. *One is a unit*; e.g. 1 dollar, 1 house, one.

Every number is made up of units. Three contains 3 units. Twenty contains 20 units.

3. *Expressing numbers in figures or letters is notation*; e.g. 7, 29, VII, XXIX.

4. *Expressing numbers by means of figures is Arabic notation*; e.g. 13, 4728, 23806.

1, 2, 3, 4, 5, 6, 7, 8, and 9 are called significant figures, because each figure has a value.

The figure 0, called *zero*, or *naught*, has no value, but is used to give the significant figures their proper places in a number.

5. *Expressing numbers by means of letters is Roman notation*; e.g. VIII, CD, XCIV.

ARABIC NOTATION

6.

ARABIC NOTATION

| | | | | | | | | | | | | |
|------------------|-------------------|--------------|----------|------------------|--------------|----------|-------------------|---------------|-----------|----------|------|-------|
| | NAMES OF PERIODS. | | | | | | | | | | | |
| | Billions | | | Millions | | | Thousands | | | Units | | |
| NAMES OF PLACES. | | | | | | | | | | | | |
| | Hundred-billions | Ten-billions | Billions | Hundred-millions | Ten-millions | Millions | Hundred-thousands | Ten-thousands | Thousands | Hundreds | Tens | Units |
| | 4 | 6 | 5 | 2 | 0 | 9 | 3 | 1 | 5 | 0 | 8 | 7 |

This number is read, *four hundred sixty-five billion, two hundred nine million, three hundred fifteen thousand, eighty-seven.*

A comma (,), sometimes called a **separatrix**, is used between periods to aid in reading numbers.

7. *Oral*

1. Name the periods in this number. Name the places.
2. How many periods are there? How many places?
3. How many places are there in each period?
4. How does the name of each period compare with the name of its right-hand place?

8. *Written*

Express in figures:

1. Two hundred thousand, sixteen.
2. Eleven thousand, two.