A BUSINESS ARITHMETIC DESIGNED FOR USE IN ALL SCHOOLS IN WHICH THE COMMERCIAL BRANCHES ARE TAUGHT AND AS A BOOK OF REFERENCE FOR BUSINESS MEN

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PREFACE.

A text book on Business Arithmetic should embrace all of the requirements of commercial calculations. It should not only contain the theories and principles which underlie arithmetical computations, but it should aim to render the pupil expert in applying them to practical work. The real test of the value of the pupil's knowledge of this subject is the facility with which he can perform his operations. Accuracy and rapidity are absolute essentials in business.

In preparing this book two things have been constantly kept in mind: the introduction of such subjects as will provide a thorough knowledge of the requirements of business in this direction, and to present the topics in a teachable way. Unimportant subjects have been omitted, and arithmetical puzzles have been carefully avoided.

CONTENTS.

BUSINESS ARITHMETIC.

DEFINITIONS.

1. Arithmetic is the science of numbers and the art of computation.

Science is a classification of facts, and as applied to Arithmetic it deals with the principles, properties, and relations of numbers. Art is the power of applying a system of knowledge, and as applied to Arithmetic, it is the power of applying the knowledge of numbers to practical purposes.

2. Number expresses an idea of how many, and refers to a single thing or to a collection of single things.

3. A Unit is a single thing. ` It is the least whole number.

A unit is the object, the thing itself, while a number conveys the idea of how many units are considered. Thus, an apple in a fruit dish is a unit, and seven apples is a collection of units. But to refer to apples by figures the number indicates how many; as, 7 apples.

4. The Unit of a Number is one of the single things forming the collection represented by the number. Thus, the unit of 5 is 1; of 13 dollars, 1 dollar; of 18 boys, 1 boy.

5. Units of Computation are the standards by which we compute. Thus, the unit of eggs sold by the dozen is 1 dozen; of lumber, sold by the hundred, 1 hundred; by the thousand, 1 thousand, etc.

6. A Concrete Number refers to some particular thing or quantity, as 7 apples, 18 boys, 13 dollars, 5 bushels of wheat.

7. An Abstract Number refers to no particular thing, but indicates unity or a certain number of times unity; as 1, 3, 5, 50, &c.

Usually, in computations, abstract numbers represent a repetition of some particular thing understood, which in itself properly expressed would be a concrete number; but 1 standing alone is understood as unity and an abstract number.

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NOTATION AND NUMERATION.

8. Notation is the art of writing or expressing numbers by means of words or characters. There are two methods of notation in use, the *Arabic* and the *Roman*.

9. Numeration is the art of reading numbers expressed by characters.

10. The **Arabic Notation** is the method of expressing numbers by figures. This method employs *ten* different figures to represent numbers, viz.:

$$0, \quad 1, \quad 2, \quad 3, \quad 4, \quad 5, \quad 6, \quad 7, \quad 8, \quad 9.$$

Naught, One, Two, Three, Four, Five, Six, Seven, Eight, Nine.

Figures are arbitrary characters used to express numbers. The first character is called *Naught, Cipher,* or *Zero,* because when standing alone it has no value. The other nine characters are called *significant figures,* because each, when standing alone, signifies something or has a value of its own. These nine figures are also called *digits.* By combining these ten figures according to certain principles, any number may be expressed.

11. By the Arabic Notation the value of numbers increases from right to left and decreases from left to right in a ten-fold ratio; the successive figures from right to left or from left to right are called *orders of units,* the value of one of any order being ten times the value of one of the order next on its right, and only one-tenth of the value of the order next on its left.

12. This method of numeration establishes a decimal system in which the successive orders are grouped for convenience into periods of three figures each as shown in the following

NUMERATION TABLE.

Periods.	6th	5th	4th	3d	2d	1st
Name.	Quadrillions.	Trillions.	Billions.	Millions.	Thousands.	Units.
Orders of units in the Periods.	Hundreds Tens Ones	Hundreds Tens Ones	Hundreds Tens Ones	Hundreds Tens Ones	Hundreds Tens Ones	Hundreds Tens Ones
Number.	3 7,	4 0 6,	5 2 3,	0 7 1,	3 0 0,	3 8 4

13. The Arabic method of notation is based upon the following

General Principles.— *1. The removal of any figure one place toward the left multiplies its value by ten; two places, by one hundred; three places by one thousand, etc.*

2. The removal of any figure one place toward the right divides its value by ten; two places, by one hundred, etc.

3. A cipher placed after a significant figure multiplies it by ten; two ciphers so placed multiplies it by one hundred, etc.

14. To read numbers expressed by figures.

Rule.— *Separate the numbers into periods of three figures each, read each period as though it stood alone, then add the name of the period.*

15. The following table will serve to illustrate the application of the above principles and rule.

COMBINED NOTATION AND NUMERATION TABLE.

Illustrative Examples.	Periods. Orders.	Millions			Thousands			Units		
		Hundreds	Tens	Ones	Hundreds	Tens	Ones	Hundreds	Tens	Ones
1. Write One hundred twenty-five *millions*, one hundred twenty-five *thousands*, one hundred twenty-five *units*.		1	2	5	1	2	5	1	2	5
2. Write One hundred *millions*, one hundred *thousands*, one hundred *units*.		1	0	0	1	0	0	1	0	0
3. Write Ten *millions*, ten *thousands*, ten *units*.			1	0	0	1	0	0	1	0
4. Write One *million*, one *thousand*, one *unit*.				1	0	0	1	0	0	1
5. Write Five *millions*, three hundred six *units*.				5	0	0	0	3	0	6

16. Enumerate and read each one of the above numbers.

In example 2 observe that 1 *hundred* of millions = 100 *ones* of millions; that 1 *hundred* of thousands = 100 *ones* of thousands; and that 1 *hundred* of units = 100 *ones* of units.