

**WENTWORTH & HILL'S  
EXAMINATION  
MANUALS. NO. I.  
ARITHMETIC**

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Wentworth & Hill's Examination Manuals. No. I. Arithmetic by G. A. Wentworth & G. A. Hill

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**G. A. WENTWORTH & G. A. HILL**

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## MATHEMATICAL TEXT-BOOKS

By G. A. WENTWORTH, A.M.

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Analytic Geometry.

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## PREFACE.

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**T**HIS Manual consists of two parts: The first part contains one hundred and fifty examination papers, the questions for which have been selected mainly from the English, French, and German collections of problems. These papers may be divided into three groups. The first fifty papers are confined to the Simple Rules, Fractions, and Weights and Measures; the next fifty papers cover all the subjects treated in ordinary text-books except the Metric System; the last fifty also include the Metric System.

In each group the earlier papers will be found somewhat easier than the later ones. The papers are intended to be *hour* papers, but if any of them are thought to be too long for one hour, the time may be increased, or the length of the paper reduced by omitting one or more questions.

The second part of the Manual is a collection of recent examination papers actually set in various American and English institutions of learning.

The Manual may be used in two ways.

First: To test the learner's knowledge in the usual way by means of an examination. For this purpose the class will come to the recitation-room provided with the Manual and blank books, and the teacher will simply designate by number the paper to be worked.

Secondly: To review the subject-matter of Arithmetic. This may be done by assigning problems to be worked in the class-room,



or by assigning to each pupil a paper with directions to hand in the solutions, neatly worked out, at a subsequent recitation.

The Manual will be found especially useful in preparing for written examinations.

Answers to the problems in the first one hundred and fifty papers, bound separately in paper covers, can be had by teachers only, on application to the publishers.

G. A. WENTWORTH.

G. A. HILL.

## SPECIMEN PAPER WORKED OUT.

1. In 674,381 inches how many miles, furlongs, rods, etc.?

$$\begin{array}{r}
 12) 674381 \text{ in.} \\
 3) 56198 \text{ ft. 5 in.} \\
 \quad 18732 \text{ yds. 2 ft.} \\
 \quad \quad 2 \\
 11) 37464 \text{ half-yds.} \\
 40) 3405 \text{ rds. } 4\frac{1}{2} \text{ yds.} \\
 \quad 8) 85 \text{ fur. 5 rds.} \\
 \quad \quad 10 \text{ mi. 5 fur.} \\
 \quad \quad \quad 10 \text{ mi. 5 fur. 5 rds. } 4\frac{1}{2} \text{ yds. 2 ft. 5 in.} \\
 \text{Ans. } 10 \text{ mi. 5 fur. 5 rds. 5 yds. 0 ft. 11 in.}
 \end{array}$$

2. Find the G.C.M. of 269,178 and 352,002.

$$\begin{array}{r}
 6) 269178 \quad 352002 \\
 \quad 44863 \quad 58667 (1 \\
 \quad \quad 44863 \\
 \quad \quad \quad 4) 13804 \\
 \quad \quad \quad \quad 3451) 44863 (13 \\
 \quad \quad \quad \quad \quad 3451 \\
 \quad \quad \quad \quad \quad \quad 10353 \\
 \quad \quad \quad \quad \quad \quad \quad 10353 \\
 \text{Ans. } 6 \times 3451 = 20,706.
 \end{array}$$

The common factor 6 is first taken out from both numbers. From the remainder 13,804, the factor 4, which is prime to 44,863, is ejected. The resulting number 3451 is contained 13 times in 44,863, and therefore the greatest common measure is  $6 \times 3451 = 20,706$ .

3. Simplify  $\frac{\frac{1}{3} + \frac{2}{11} + \frac{7}{24} - \frac{1}{12} \text{ of } \frac{7}{11} \text{ of } \frac{7}{24}}{1 - \frac{1}{3} \text{ of } \frac{7}{11} - \frac{7}{12} \text{ of } \frac{7}{24} - \frac{7}{24} \text{ of } \frac{1}{3}}$ .

$$\frac{1}{3} \text{ of } \frac{7}{11} \text{ of } \frac{7}{24} = \frac{7}{396};$$

$$\frac{1}{3} + \frac{2}{11} + \frac{7}{24} - \frac{7}{396} = \frac{264 + 144 + 231 - 14}{792} = \frac{625}{792};$$

$$\frac{1}{3} \text{ of } \frac{7}{11} = \frac{7}{33}; \quad \frac{7}{12} \text{ of } \frac{7}{24} = \frac{7}{132}; \quad \frac{7}{24} \text{ of } \frac{1}{3} = \frac{7}{72};$$

$$1 - \frac{7}{33} - \frac{7}{132} - \frac{7}{72} = \frac{792 - 48 - 42 - 77}{792} = \frac{625}{792};$$

$$\frac{625}{792} \div \frac{625}{792} = 1.$$

Ans. 1.

4. Divide 0.025 by 500, and 0.08625 by 0.29.

$$\begin{array}{r} 500 \overline{)0.02500} \\ \underline{0.00005} \end{array}$$

$$\begin{array}{r} 0.125 \\ 29 \overline{)3.625} \\ \underline{29} \\ 72 \\ \underline{58} \\ 145 \\ \underline{145} \end{array}$$

$$\left. \begin{array}{l} 0.00005 \\ 0.125 \end{array} \right\} \text{ Ans}$$

5. Make out the following bill:

3½ pounds of tea at 64 cents per pound;

1½ pounds of coffee at 40 cents per pound;

6½ pounds of loaf sugar at 10 cents per pound;

1½ pounds of butter at 34 cents per pound.

How much change out of \$5 should Mr. Smith receive?

Mr. JOHN SMITH,

Dr. to JAMES HORN.

1883.			
Aug. 17.	3½ lbs. of tea	@ 64 cts.	. . . \$2.08
	1½ lbs. of coffee	@ 40 cts.	. . . .60
	6½ lbs. of sugar	@ 10 cts.	. . . .65
	1½ lbs. of butter	@ 34 cts.	. . . .51
			<u>\$3.84</u>

Received payment,

Ans. \$5.00 - \$3.84 = \$1.16.

JAMES HORN.