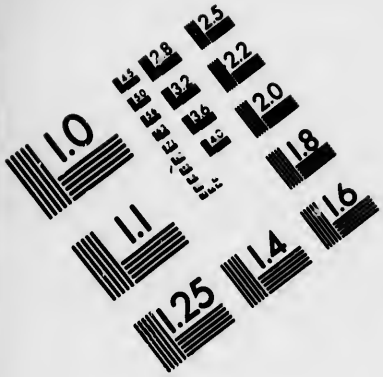

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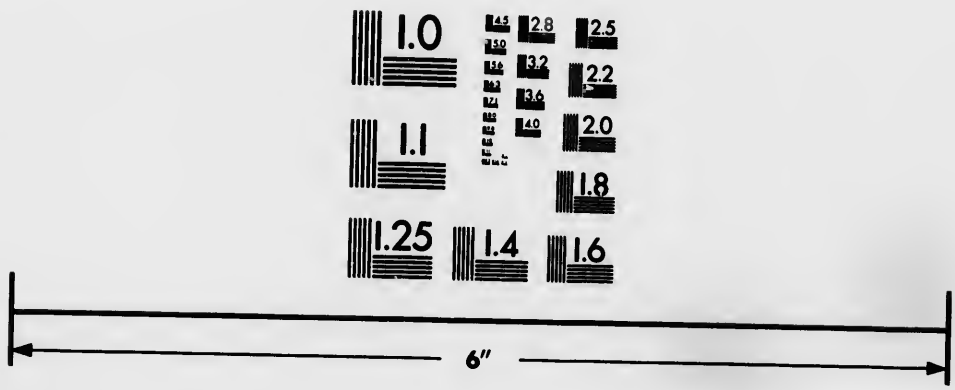

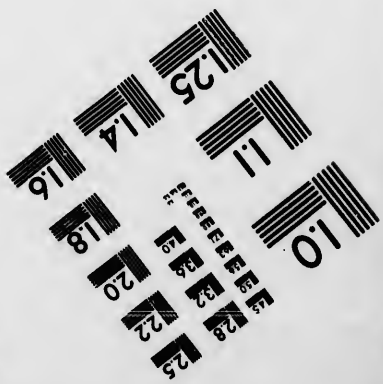

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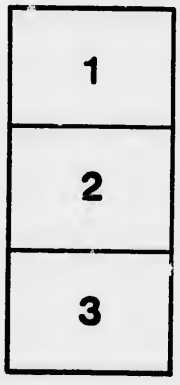

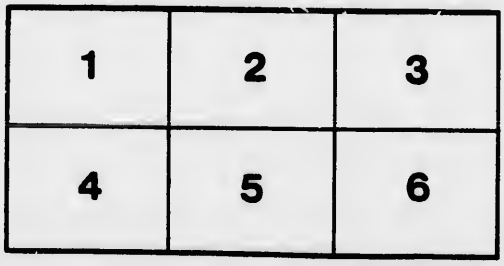

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ARITHMETIC.

ELEMENTARY COURSE.

Introduction.

1. **Arithmetic** is the science of numbers.

2. A **Number** is a unit or a collection of units.

3. A **Unit** is the quantity to which a quantity of the same kind is compared, when it is desired to measure it.

A unit may also be defined to be a single thing or one.

4. A **Quantity** is any thing that can me measured. Ex.: *the length of a street, the population of a city, the surface of a body*, etc.

5. The general classes of numbers are: 1 *Integers*, 2 *Fractions*, 3 *Denominate numbers*.

6. An **Integer** is a number of integral units; as, *four, six*, etc.

A **Fraction** is a number of the equal divisions of a unit; as, *one-half two-thirds, three-fourths*, etc.

A **Denominate** number is a number in which the unit is a measure of continuous quantity; as, three *yards*, two *pounds*, five *feet*, etc.

ARITHMETICAL LANGUAGE.

7. **Arithmetical Language** is the method of expressing numbers.

8. Arithmetical Language may be either *oral* or *written*. The former is called *Numeration*, the latter *Notation*.

9. **Numeration** is the method of naming numbers and of reading them when expressed by characters. It is the oral expression of numbers.

NUMERATION.

10. Each of the first nine numbers has received a separate name; thus, *one, two, three, four, five, six, seven, eight, nine*.

Each of these nine numbers express simple units or units of the first order. They are formed by adding one to the preceding number, thus: two is formed of one and one, three of two and one.....

The number after nine is called *ten*.

Ten is the unit of second order and is equal to ten units of the first order. Tens may be counted or read just as the simple numbers; thus, *one ten, two tens, three tens...., nine tens;* but usage has replaced these words by the following: *ten, twenty, thirty, forty, fifty, sixty, seventy, eighty, ninety.*

The numbers intervening between two tens are formed by joining the names of the first nine figures to each of the above tens. Thus *twenty-one, twenty-two, twenty-three,* till *twenty-nine.* However instead of saying *ten-one, ten-two,* etc., usage has adopted the expressions *eleven, twelve, thirteen, fourteen, fifteen, sixteen, seventeen, eighteen, nineteen.*

The number following ninety-nine or ten-tens is called *hundred.*

Hundred is the unit of the third order.

Hundreds are counted just as units are; thus, *one hundred, two hundred,....nine hundred.*

The group of the first three orders of units forms the first period or class of units.

The number following nine hundred and ninety-nine or ten hundreds is called *thousand.*

Thousand is the unit of the second period. The second period or class of units comprises units, tens and hundreds, just as the first period.

The number after nine hundred and ninety-nine thousand nine hundred and ninety-nine or a thousand thousands is called *million.*

Million is the unit of the third order. The fourth group of a thousand millions is called a **billion**; the fifth group a **trillion**, etc. Each of these periods comprises three orders: units, tens and hundreds.

11. **Remark.**—Ten units of any order forms a unit of the order immediately above it. A thousand units of any period forms a unit of the corresponding class in the period next above it.

Numeration table.

FIRST PERIOD	First order.....	Units.
	Second "	Tens.
	Third "	Hundreds.
SECOND PERIOD	Fourth "	Thousands.
	Fifth "	Ten-thousands.
	Sixth "	Hundred-thousands.

THIRD PERIOD	Seventh "	Millions
	Eighth "	Ten-millions.
	Ninth "	Hundred-milllons.
FOURTH PERIOD	Tenth "	Billions.
	Eleventh "	Ten-billions.
	Twelfth "	Hundred-billions.

NOTATION

12. **Notation** is the method of writing numbers. This may be done in three ways: 1 By *words*, 2 By *figures*, (Arabic Method), 3 By *letters* (Roman Method).

13. To represent numbers ten figures are used. These are:

1	2	3	4	5	6	7	8	9	0
one,	two,	three,	four,	five,	six,	seven,	eight,	nine,	zero or naught.

The first nine figures are said to be *significant*, because they represent a value; the tenth, *zero*, represents nothing by itself, it is an auxiliary figure; it may hold the place of a unit of any order when this unit is wanting.

14. **Principles.** All number may be represented by means of the two following principles:

1.—When several figures are written one after the other, the first to the right represents units; the second, tens; the third, hundreds; the fourth, thousands; the fifth, ten-thousands.

2.—The *zero* is put in the place of any order of units that may be wanting.

15. Every figure has two values; a *simple* and a *local* value. The **Simple Value** of a figure is the number it expresses when it stands alone, the **Local Value** of a figure is the number it expresses when in any other place than units place.

In the number 5,604, the simple value of the first figure to the left is 5, its local value is 5 units of thousands; so also the simple value of the second figure is 6, its local value is 6 hundreds, etc.

16. **How to write a number.**—To represent a number the figures representing the hundreds, tens and units of each period are written successively from left to right; the highest periods are written first, zeros are used to take the place of missing orders.

The number three hundred and eight is written 308; and the number representing forty million five hundred and twenty-seven thousand and thirty is written: 40,527,030.

17. **How to read a number.**--To read a number written in figures, it is divided, at least mentally, into periods of three figures, going from right to left; then the groups are successively read commencing to the left, and giving to each one the name of the period it represents. If an order of units or even an entire class were wanting, it should not be mentioned.

Thus 37,409,000,265 would read: thirty-seven billion four hundred and nine million two hundred and sixty-five.

Roman Figures.

18. To write numbers the Romans used the following characters:

	I,	V,	X,	L,	C,	D,	M.
whose values were:	1,	5,	10,	50,	100,	500,	1000.

19. **Principles.**—1. *The letters placed to the right of another, add their value to that of the other if less than it or equal to it.*

Thus the numbers:	III,	XV,	XXVII,	CLXI,	MDCCXVI
are read.	3,	15,	27,	161,	1716.

2. *Any letter placed to the left of another should be deducted for the value of this number if less than it.*

The numbers:	IV,	XXIX,	XL,	XCI,	CDXIX.
are read:	4,	29,	40,	91,	419.

3. *A dash over an expression increases its value a thousandfold.* Thus $\overline{\text{VIII}}$ denotes eight thousand.

EXERCISES IN NUMERATION.

Read the following numbers:

1.	10	15	17	24	26	29	31	
2.	35	40	48	49	53	08	59	
3.	62	72	80	86	98	99	09	
4.	100	101	040	160	169	406	768	
5.	004	050	505	528	006	796	801	
6.	1 027	1 060	1 090	1 126	2 002	3 019	5 404	
7.	11 011	11 101	4 046	111 010	10 409	12 002	15 040	
8.	116 096	273 459	430 590	246 689	386 211	406 804	679 432	

Express the following numbers in figures:

9. Ten, eleven, thirteen, eighteen, twenty-one, twenty-four.
10. Twenty-eight, thirty-four, thirty-seven, forty-three.
11. Forty-eight, fifty, sixty-four, sixty-nine.
12. Eighty-eight, ninety-five, one hundred.
13. One hundred and three, one hundred and eight, one hundred and ten, one hundred and twenty-three.

14. One hundred and fifty-seven, one hundred and sixty-eight, two hundred and eleven.
15. Three hundred and twelve, four hundred and thirteen, five hundred and fourteen.
16. Six hundred and fifteen, eight hundred and seventeen, one hundred and nineteen.
17. Seven hundred and twenty, one hundred and twenty-one, three hundred and three.
18. Two hundred and ninety-eight, five hundred and nineteen.
19. Nine hundred and sixty-eight, four hundred and seventy-four.
20. Seven hundred and ninety-seven, eight hundred and eighty.
21. Two thousand and five, four thousand and twenty-four, one thousand and seven.
22. Ten thousand and eight, twenty-four thousand and [illegible] teen.
23. Three hundred thousand and twenty-seven, seventy thousand and three.
24. Two million one thousand and nine, fifteen million five thousand.
25. Four hundred and six million nine thousand and fifty-six.
26. Six hundred and six million sixty thousand six hundred and six.
27. Twenty billion seventeen million one thousand and forty.
28. One hundred and fifty billion forty-five thousand three hundred and one.
29. Fifty-six million ten thousand and eight.
30. Three hundred and thirty-three million eighty-one thousand.
31. Nine million seventy-seven thousand and fifteen.
32. Five billion thirteen million two thousand and twelve.

Express in figures the following numbers:

33.	VII	43.	XC
34.	IX	44.	XCVII
35.	XIV	45.	XCIX
36.	XV	46.	CXCVIII
37.	XXI	47.	CDXXIX
38.	XXIX	48.	DLXXXVI
39.	XXXIV	49.	DCDLXXVII
40.	XLIII	50.	MCCXXXV
41.	LIX	51.	MDCLXXII
42.	LXXXVI	52.	MDCCLXLIII

Express the following numbers in Roman figures:

53.	8	13	16	19	25	31	44
54.	59	62	69	76	83	89	90
55.	95	98	101	212	319	347	418
56.	500	540	550	811	842	955	963
57.	1 000	1 019	1 146	1 237	1 328	1 556	1 666
58.	1 800	1 824	1 848	1 859	1 883	1 900	2 000

Oral exercises.

59. What is a unit? Name the different kinds of numbers.
60. What is an integer? Define a fraction.
61. In how many ways may numbers be expressed?
62. Name the orders of units in the first period.—In the second—In the third.
63. How many values has every figure?
64. What is the local value of 7 in 75?
65. What is the value of the Roman figures V, X, L, C, D?
66. What is the use of the figure zero?
67. How many figures are required to write a hundred units?
68. How many figures are required to write a thousand units?
69. How many tens are required to make a thousand?
70. How many figures are required to write ten-thousand units?—a hundred-thousand?—a million?
71. How many hundreds in ten-thousand?
72. How many ten-thousands in a million?
73. How many hundreds in a hundred-thousand?
74. In a million how many thousands are there? How many hundreds?
75. How many units in a hundred? How many tens?
76. How many tens in a thousand?
77. How many hundred-thousands in a million?
78. How many thousands in a billion?
79. How many figures are required to write a number whose highest unit is a thousand?
80. What is the highest unit in a number of five figures?
81. What is the highest unit in a number of eight figures?
82. How many periods are required to write a number of twelve figures?

FUNDAMENTAL OPERATIONS.

ADDITION.

21. **Addition** is the process of finding the *sum* of two or more numbers of the same nature.

The result of addition is called the **sum** or **total.**

22. Numbers of the same nature are those which are of the same **denomination** or **name.** Ex. 25 dollars, 6 dollars, 15 dollars, are numbers which have the same denomination; they are then of the same nature.

23. Addition is expressed by the sign +, called **plus.** The addition of the numbers 132, 118 and 65 is marked: 132+118+65.

24. To solve any addition with ease, it is necessary to be thoroughly familiar with the addition table. This table gives the sum of any two figures.

Addition Table.

1 and 0 are	1	4 and 0 are	4	7 and 0 are	7
1 and 1 are	2	4 and 1 are	5	7 and 1 are	8
1 and 2 are	3	4 and 2 are	6	7 and 2 are	9
1 and 3 are	4	4 and 3 are	7	7 and 3 are	10
1 and 4 are	5	4 and 4 are	8	7 and 4 are	11
1 and 5 are	6	4 and 5 are	9	7 and 5 are	12
1 and 6 are	7	4 and 6 are	10	7 and 6 are	13
1 and 7 are	8	4 and 7 are	11	7 and 7 are	14
1 and 8 are	9	4 and 8 are	12	7 and 8 are	15
1 and 9 are	10	4 and 9 are	13	7 and 9 are	16
2 and 0 are	2	5 and 0 are	5	8 and 0 are	8
2 and 1 are	3	5 and 1 are	6	8 and 1 are	9
2 and 2 are	4	5 and 2 are	7	8 and 2 are	10
2 and 3 are	5	5 and 3 are	8	8 and 3 are	11
2 and 4 are	6	5 and 4 are	9	8 and 4 are	12
2 and 5 are	7	5 and 5 are	10	8 and 5 are	13
2 and 6 are	8	5 and 6 are	11	8 and 6 are	14
2 and 7 are	9	5 and 7 are	12	8 and 7 are	15
2 and 8 are	10	5 and 8 are	13	8 and 8 are	16
2 and 9 are	11	5 and 9 are	14	8 and 9 are	17
3 and 0 are	3	6 and 0 are	6	9 and 0 are	9
3 and 1 are	4	6 and 1 are	7	9 and 1 are	10
3 and 2 are	5	6 and 2 are	8	9 and 2 are	11
3 and 3 are	6	6 and 3 are	9	9 and 3 are	12
3 and 4 are	7	6 and 4 are	10	9 and 4 are	13
3 and 5 are	8	5 and 5 are	11	9 and 5 are	14
3 and 6 are	9	6 and 6 are	12	9 and 6 are	15
3 and 7 are	10	6 and 7 are	13	9 and 7 are	16
3 and 8 are	11	6 and 8 are	14	9 and 8 are	17
3 and 9 are	12	6 and 9 are	15	9 and 9 are	18

PROBLEM.

25. *What is the sum of* 748, 695 *and* 874.

Solution.—The numbers are written so that the terms of the same order stand in the same column, units under units, tens under tens, etc; begin at the right to add: 4 and 5 are 9, 9 and 8 are 17, or 1 ten and 7 units; 7 is written under the column of units and the ten is added to the column of tens: 1 and 7 are 8, and 9 are 17, and 4 are 21; 1 ten and 2 hundreds; write the 1 under the column of tens and add the 2 to the column of hundreds. 2 and 8 are 10, and 6 are 16, and 7 are 23; 3 hundreds and 2 thousands, write the 3 under the column of the hundreds and place the 2 to the left in the place of thousands. Hence the sum of the numbers is 2,317.

Operation
748
695
874
Total 2317

26. **Remark.**—In practice the operation is performed thus:

4 and 5.... 9 and 8.... 17 write 7 and carry 1;
1 and 7.... 8 and 9.... 17 and 4 .... 21 write 1 and carry 2;
2 and 8.... 10 and 6.... 16 and 7 .... 23 which is written.

27. **Rule.**—*I. Write the numbers so that the units of the same order stand in the same column, and draw a line beneath.*

II. Begin at the units, add the number of each column separately, and write the number under it, if less than ten.

III. If the sum of any column is more than ten write the units only underneath the column and add the tens with the next column.

IV. Write the entire sum of the last column.

28. **Proof of addition.**—Find the sum of the figures in each column commencing at the top, the total found should be the sum as that found in the first operation.

1543	
678	
482	
1074	3783

29. **Second method.**—The proof of an addition comprising several lines may be made as follows: the numbers are added in groups of five or six, and the sum of these different totals is afterwards foumd, this sum should equal that already found.

2156	
1364	
769	
802	
1678	6804
10582	10582

EXERCISES IN NUMERATION AND ADDITION.

Add the following numbers:

83.
412
325
Ans. ...

84.
514
342
Ans. ...

85.
6976
827845
535694
Ans. .....

86.
405789
6854
75768
Ans. .....

87.
748
285
Ans. ...

88.
705
304
Ans. ...

89.
671079
9906
567765
Ans. .....

90.
875449
996898
3824
Ans. .....

91.
853454
907279
Ans. .....

92.
576507
447279
Ans. .....

93.
6823
989347
724839
Ans. .....

94.
4927
98896
679589
Ans. .....

95.
276721
464934
Ans. .....

96.
853799
764581
Ans. .....

97.
357047
79879
649754
Ans. .....

98.
452372
9694
877783
Ans. .....

99. 745+223
100. 148+750
101. 632+243
102. 475+204
103. 557+227
104. 789+209
105. 575+405
106. 545+429
107. 574+219
108. 486+297
109. 596+279
110. 489+257
111. 345+456
112. 457+754
113. 896+944
114. 897+409
115. 609+769
116. 707+797
117. 779+776
118. 744+659
119. 575579+426145
120. 973476+595649
121. 898423+769579
122. 574615+697470
123. 574907+575799
124. 477424+648695

125. 475670+694957
126. 727519+844619
127. 995676+576544
128. 789476+517094
129. 547764+350097
130. 597091+447089
131. 895467+301959
132. 709987+505304
133. 794691+657784
134. 829651+728577
135. 789107+695999
136. 894575+876934
137. 759544+877409
138. 657897+794976
139. 707809+976437
140. 856437+934579
141. 576279+495176
142. 882354+576937
143. 650769+775678
144. 765097+975985
145. 578467+854359
146. 307450+850967
147. 745674+302956
148. 980079+395891
149. 807405+350705
150. 805464+890315

151. 217904+54825+679964
152. 897452+920672+746794
153. 904525+876577+928395
154. 987854+64247+809456
155. 741854+7465+3978
156. 327410+7689+456351
157. 59827+747365+984576
158. 677491+5887+976642
159. 854947+967876+789767
160. 654576+976787+898694
161. 654789+773212+564342
162. 495837+72224+795477
163. 676976+799884+685544
164. 834905+976827+895795
165. 954653+497974+689399

166. 5276+576423+760554
167. 654957+78786+547679
168. 7809+356377+254594
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181. 476795675+764579889+507687964
182. 457576324+6847987+689698798
183. 74234654+986876497+747987854
184. 354796452+477689376+766875889
185. 4347651+865755561+447675384
186. 645606997+2754884+567875776
187. 745676452+356789584+789898976
188. 7652927+535746795+676898888
189. 798652450+7987987+956896789
190. 650475875+6984989+889796854
191. 74678432+7465374+847953459
192. 7650342+974376457+83085768
193. 794217476+6954307+954307
194. 56276454+357796709+6719187+577485855
195. 576450079+94196376+65438+560898275
196. 57874089+4786774+875697897+965665
197. 789894607+6546754+73836454287948
198. 6798954+452679587+7665+777423749
199. 56884569+677958888+3735894+469952
200. 7847976+46964624+74548935+3856907
201. 7692752+79754276+736577423+4798234

202. 7854254+985676376+54476+776649867
203. 7808+886766554+834251+977407307
204. 796487825+4754954+92236+475235642
205. 452376824+1364795+898987885+856676
206. 746834232+988978345+75576+89452372
207. 5487634+607976469+89547978+97997807
208. 96577+476784896+7929654+856934701
209. 76542+653476+764589985+579698794
210. 97334+989296857+97576854+32677496
211. 45675467+6789854+307576376+489236579
212. 78475854+5995876+889689+979375487
213. 4809675+307685494+96972+807574676
214. 475879+674275827+7454+3976798
215. 564216354+457689+957684754+976789698+76556
216. 676401888+765465854+654754976+489894+7845.7).7
217. 507427+834236454+765687935+94879+476372384
218. 75685378+837456+24359876+507876934+8974325
219. 84369+47647898+69976+876247689+797685764
220. 654676450+56437+874954653+678869762+4976569
221. 476850+79643279 + 898767984 + 87678797+7709 474 + 968456 789
222. 76259+584089876+9276184+357208345+187674+815356257
223. 23654+987321456+748597319+847954817+596187+793873659
224. 495673987+549637709+34907+987103654+987967+123789769
225. 19673+297918376+198256370+891652073+562307+819586749
226. 43375+497582672+807912+943879773+545874+347221179
227. 954800+674985774+642275859+73849+273249245+433835643
228. 73279+673549875+643945873+495783+673985879+304050
229. 493058970+505408+735287743+219887374+47050+947297188
230. 45007+600780910 + 748875473 + 975654383+ 5945879+543873 335

Express the following numbers and find their sum:

231. Fifty-four *units*, ninety-five *units*, seventy-eight *units*.

232. Sixty-three *units*, eighty-nine *units*, seventy-seven *units*.

233. Five hundred and sixty-five *units*, four hundred and thirty-six *units*, nine hundred and eighty-five *units*.

234. Seven hundred and seventy-seven *units*, ninety-six *units*, nineteen *units*.

235. Four thousand and nine, sixteen thousand and fifty-four, three thousand and one, ten thousand and thirty-three.

236. Eight hundred and thirty-nine, three hundred and twenty-eight, two hundred and eighty-three.

237. Four hundred and seventy-nine, eight hundred and fifty-six, seven hundred and nineteen.

238. Thirteen thousand four hundred and eleven, sixty-one thousand six hundred and sixteen, three hundred and seventy-eight.

239. Thirty thousand and ninety-six, seventy-eight thousand and seven, eighteen thousand six hundred and nine, twenty-two thousand nine hundred and seventy.

240. Five hundred and ten, eighteen hundred and forty-four, three thousand eight hundred and ninety-five, six hundred and three, one thousand and thirty-three, nine hundred and ninety-one.

241. Fifteen thousand three hundred and nineteen, eleven hundred and seventy-six, seven hundred and two, three hundred and thirty-five, thirteen hundred and fourteen.

242. Eight hundred and sixty-three thousand four hundred and fifty-five, three hundred and eighty thousand four hundred and sixty-seven, nine hundred and three thousand six hundred and eighty-two, one hundred and forty six thousand three hundred and seventy.

Oral Exercises in Numeration and Addition.

243. How many tens in 1783 units?

244. How many hundreds in 18860?

245. How many ten thousands in 52465346?

246. What order of units represents: 1° tens, 2° simple units, 3° hundred-thousands?

247. What order of units represents: 1° ten-thousands, 2° hundreds, 3° ten-millions?

248. How many zeros to the right of a figure representing: 1° tens, 2° thousands, 3° hundreds, 4° millions?

249. In what order and period are: 1° tens, 2° hundred-millions, 3° thousands, 4° ten-thousands, 5° millions, 6° ten-millions, 7° hundreds?

250. What is the sum of: 1.—4+6+5; 2.—3+7+9; 3.—10+6+4; 4.—8+13+6; 5.—12+10+9; 6.—15+7+14; 7.—16+12+9?

251. What is the sum of: 1.—11+6+7; 2.—10+8+6+7; 3.—34+25; 4.—35+52; 5.—40+30+6; 6.—46+31; 7.—34+25+8?

252. What is the sum of: 1.—19+12+8; 2.—72+60+4; 3.—48+10+30; 4.—13+25+7; 5.—29+24+30; 6.—33+28+7+35?

253. What is the sum of: 1.—64+40+9; 2.—29+17+12; 3.—7+37+26; 4.—14+39+4; 5.—48+31+9; 6.—56+41+10; 7.—75+60+22?

254. What change is made in the sum of several numbers: 1. When one of the numbers is increased; 2. When one of the numbers is diminished?

255. What change is made in the sum of several numbers: 1. When one of the numbers is omitted; 2. When one of the numbers is doubled?

PRACTICAL PROBLEMS.

NOTE. The sign $, written before a number signifies *dollars*. Thus, the expression $120 is read *one hundred and twenty dollars*. *Dollars* and *cents* may be written together, the cents being separated from the dollars by a point, thus, the expression $25.36 is read *twenty-five dollars and thirty-six cents*.

In writing sums containing dollars and cents to be added together, care must be taken that the cents be written under the column of cents and the dollars under dollars; should there be no cents in any amount, they are replaced by two zeros.

256. Henry is twelve years old; how old will he be in 27 years?

257. A person was born in 1792; in what year will he be 50 years of age?

258. What number is formed by adding 15 to 57?

259. Champlain was born in 1570, his career covered the space of 65 years; in what year did he die?

260. Julius was born in 1808; in what year was he 27 years old?

261. Moses was born 2373 years after the creation, he died at the age of 120 years, in what year did he die?

262. A bookbinder delivered 75 volumes at one time and 149 at another; how many volumes did he deliver in all?

263. The smaller of two numbers is 60, and the greater 362; what is their sum?

264. One workman earns $45 and the other $69; how much do they both receive?

265. A baker receives 20 barrels or flour on Monday and 18 barrels on Tuesday; how many did he receive on both days?

266. A baker left 45 loaves of bread during one trip and 19 loaves during a second trip, how many loaves did he deliver?

267. In a battle 8945 cartridges were fired, there are 12450 remaining; how many were there before the battle?

268. How many pupils in a class if 49 are absent and there are 29 still in class?

269. What is the capacity of a tun which is to receive 45 gallons through one pipe and 35 through another?

270. Henry placed $12.50 in a bank at one time, then $17.50 more; how much has he in bank?

271. What is the amount of a bill of $5.25 for sugar and 80 cents for preserves?

272. How long did it take a man to clear a piece of land knowing that a first time he worked 75 days and a second time 49 days.

273. James received $42 from his father and $19 from his mother; how much has he?

274. What is the length of a piece of cloth, if after selling 45 yards there remain 27 yards?

275. A merchant bought goods for $164, for how much must he sell them to gain $24?

276. A person bought a house for $15160, he spent $1575 in reparations; fo. how much should he sell it to gain $2600?

277. Peter spent $123 and has remaining $20 more than he spent; how much has he now? How much had he at first?

278. A merchant made three sales during the day: the first was of $45, the second $65 and the third $97; what did he receive?

279. $24 were taken from a drawer containing money, then $45, and there remain $79; how much money was in the drawer?

280. In an orchard there are 395 apple-trees, 247 plum-trees and 197 pear-trees; how many trees in all?

281. A servant spent $18 for provisions and $23 for wood; what was the amount spent?

282. After paying a debt of $845; I have $179 remaining; how much had I?

283. On a certain number of oranges I ate 27 and have remaining 15 more than I ate; how many had I at first?

284. A man cut down in a forest, 445 maple-trees, 514 ash-trees, 423 cherry-trees and 536 pine-trees; how many trees were hewed down?

285. A family's expenses for a day were: for milk 8 cents, bread 32 cents, meat 28 cents, vegetables 15 cents, coffee 10 cents, tea 6 cents and sugar 12 cents. What were the total expenses?

286. What is the weight of four oxen, the first of which weighs 860 pounds, the second 1082, the third 1238 and the fourth 1148?

287. A person bought furniture for $225, linen for $137.50, cloth for $168.00 and provisions for $288. How much did he spend?

288. How many men in a regiment of four batallions: the first of which comprises 1209 men, the second 1075, the third 976 and the fourth 987?

289. A grocer received 4 boxes of soap: the first weighed 250 pounds, the second 150, the third 294 and the fourth 214. What was the weight of the soap received?

290. Owen bought a Grammar for 35 cents, a Geography for 65 cents, a Manual of Composition for 70 cents, an Algebra for 40 cents, a Geometry for $1.15, an Arithmetic for 75 cents, a History of Canada for 30 cents. How much did he spend?

291. A contractor has four men that he pays as follow: to the first $1.75 a day, to the second $1.50; to the third, $1.20; to the fourth, 90 cents and to an apprentice 45 cents. How much does he pay them all for a day?

292. What is the capacity of four casks of wine, if the first contains 155 gallons, the second 135, the third 120 and the fourth 90?

293. What sum must be paid for four notes: the first of which is for $405.50, the second $379.80, the third $576 and the fourth $179.25?

294. A man paid $3.80 for a hat, $18 for an overcoat, $4.25 for a pair of pants, $1.75 for a cane and $5.50 for a pair of boots. How much did he spend?

295. On a market there were sold 1415 sheep, 148 calves, 247 oxen, 85 horses, 105 pigs. How many animals were sold?

296. In what year before Christ was Alexander the Great born, if he died at the age of 32 years, in the year 324 before Christ?

297. At the birth of Our Lord the world had been created 4004 years, we are now in the year 1893. How long has the world been created?

298. To pay for a certain quantity of merchandise, I have given a bank note of $10, one of $5, one of $2, one of 50 cents, 25 cents and 10 cents. How much did the goods cost?

299. Having bought a carriage for $90, I exchange it for a horse, how much did I pay for the latter, if I give $65 cash besides?

300. What sum does it require to pay 5 clerks who have earned the following sums: the first $175, the second $209, the third $148, the fourth $97.50, and the fifth $241.75?

301. A person bought a house for $8750; he made reparations to the amount of $1572.70. For how much did he sell it, knowing that he gained $540.30?

302. A merchant, wishing to purchase some cheap goods, borrows $385.75 from one of his friends, $75.95 from another one; what was the amount of his purchase, knowing that he had $47.35 in his pocket before?

303. A man left by testament $4670 for the education of youth, $960.75 for the poor, $960.80 to the church, $7,506 for other charitable purposes; what is the amount of these legacies?

304. A contractor has received for the construction of a school:

1° $3643, 2° $3529, 3° $2675; he has still to receive $10825. What was the price of the contract?

305. An army composed of 6875 men received 3 re-enforcements: the first of 1680 men; the second, 1500 men, and the third, 2050. What is the total number of the army at present?

306. A person will be 40 years old in 1894. What age shall his father have who is 30 years older than he is?

307. What is the total length of 4 streets which are: the first 342 yards long, the second 1425 yards, the third 718 yards, and the fourth 856 yards?

308. A shoe factory turns out the following work during a week: On Monday 178 pairs, Tuesday 205 pairs, Wednesday 217 pairs, Thursday 245 pairs, Friday 256 pairs, Saturday 262 pairs. How many pairs were made during the week?

309. The number of pupils attending the schools of the Brothers of the Christian Schools, on the 31st of December 1892, was: in Europe, 253280; in Asia, 6879; in Africa, 4586; in America, 40735. Find how many pupils in all?

310. The population of Bonaventure county is 18908; that of Gaspe county, 25001; that of Rimouski county, 33791; that of Temiscouata county, 25484 and that of Kamouraska county, 22181. What is the population of these five counties?

311. A woman carrying eggs to the market, breaks 36 of them, she sells 120 on her way, gives 8 to the poor, and when she arrived had 665 remaining. How many eggs had she when she left home?

312. What is the revenue of a man who spends $150 for food, $120 for rent, $125 for clothing, $34 for sundry items; he gives $12.38 to the poor, and has $150.62 remaining?

313. I bought 647 yards of cloth for $2375.40; 755 yards of linen for $1036.25; 86 yards of ribbon for $126.30, and 30 yards of calico for $12. How many yards of goods did I buy and what did all cost?

314. A workman received $50, another received $20 more than the first and a third as much as the two others. What did each one receive?

315. If I could get $41.10, I would want only $2.10 more to double my money. How much have I?

SUBTRACTION.

30. **Subtraction** is a process by which one number is taken from another number of the same nature.

The result of the subtraction is called the **difference**.

31. Subtraction is expressed by the sign —, read **minus**. If 37 were to be taken from 78, the operation would be expressed by writing: 78 — 37.

Subtraction Table.

0 from 0 leaves 0	4 from 4 leave 0	8 from 8 leave 0
0 from 1 leaves 1	4 from 5 leave 1	8 from 9 leave 1
0 from 2 leaves 2	4 from 6 leave 2	8 from 10 leave 2
0 from 3 leaves 3	4 from 7 leave 3	8 from 11 leave 3
0 from 4 leaves 4	4 from 8 leave 4	8 from 12 leave 4
0 from 5 leaves 5	4 from 9 leave 5	8 from 13 leave 5
0 from 6 leaves 6	4 from 10 leave 6	8 from 14 leave 6
0 from 7 leaves 7	4 from 11 leave 7	8 from 15 leave 7
0 from 8 leaves 8	4 from 12 leave 8	8 from 16 leave 8
0 from 9 leaves 9	4 from 13 leave 9	8 from 17 leave 9
1 from 1 leaves 0	5 from 5 leave 0	9 from 9 leave 0
1 from 2 leaves 1	5 from 6 leave 1	9 from 10 leave 1
1 from 3 leaves 2	5 from 7 leave 2	9 from 11 leave 2
1 from 4 leaves 3	5 from 8 leave 3	9 from 12 leave 3
1 from 5 leaves 4	5 from 9 leave 4	9 from 13 leave 4
1 from 6 leaves 5	5 from 10 leave 5	9 from 14 leave 5
1 from 7 leaves 6	5 from 11 leave 6	9 from 15 leave 6
1 from 8 leaves 7	5 from 12 leave 7	9 from 16 leave 7
1 from 9 leaves 8	5 from 13 leave 8	9 from 17 leave 8
1 from 10 leaves 9	5 from 14 leave 9	9 from 18 leave 9
2 from 2 leave 0	6 from 6 leave 0	10 from 10 leave 0
2 from 3 leave 1	6 from 7 leave 1	10 from 11 leave 1
2 from 4 leave 2	6 from 8 leave 2	10 from 12 leave 2
2 from 5 leave 3	6 from 9 leave 3	10 from 13 leave 3
2 from 6 leave 4	6 from 10 leave 4	10 from 14 leave 4
2 from 7 leave 5	6 from 11 leave 5	10 from 15 leave 5
2 from 8 leave 6	6 from 12 leave 6	10 from 16 leave 6
2 from 9 leave 7	6 from 13 leave 7	10 from 17 leave 7
2 from 10 leave 8	6 from 14 leave 8	10 from 18 leave 8
2 from 11 leave 9	6 from 15 leave 9	10 from 19 leave 9

3 from 3 leave 0	7 from 7 leave 0
3 from 4 leave 1	7 from 8 leave 1
3 from 5 leave 2	7 from 9 leave 2
3 from 6 leave 3	7 from 10 leave 3
3 from 7 leave 4	7 from 11 leave 4
3 from 8 leave 5	7 from 12 leave 5
3 from 9 leave 6	7 from 13 leave 6
3 from 10 leave 7	7 from 14 leave 7
3 from 11 leave 8	7 from 15 leave 8
3 from 12 leave 9	7 from 16 leave 9

The preceding table should be mastered thoroughly before taking up the exercises in subtraction.

PROBLEMS.

32. **Case I.**—*To subtract when no term of the smaller number is greater than the corresponding term of the larger number.*

Ex.: Subtract 3582 from 4795.

Solution: Write the smaller number or *subtrahend* under the larger one or *minuend*, placing the terms of the same order in the same column, and begin at the right to subtract. 2 units from 5 units leave 3 units, which is written under the units; 8 tens from 9 tens leave 1 ten, which is written under the tens; 5 hundreds from 7 hundreds leave 2 hundreds, which is written under the hundreds; 3 thousands from 4 thousands leave 1 thousand. Therefore the difference is 1213.

Operation.
4795
3582
1213

33. **Case II.**—*To subtract when one or more terms of the smaller number is greater than the corresponding terms of the larger number.*

Ex.: Subtract 3867 from 45073.

Solution: Write the subtrahend under the minuend, and begin at the right to subtract.

7 units cannot be taken from 3 units, therefore add 10 units to the 3 units, making 13 units, 7 units from 13 units leave 6 units, now since 10 units or 1 ten were added to the minuend the remainder will be 10 units or 1 ten too large; hence to obtain the correct remainder add 1 ten to the subtrahend, 6 tens plus 1 ten are 7 tens; 7 tens from 7 tens leave 0 tens. 8 hundreds cannot be taken from 0; therefore add 10 hundreds to the minuend; 8 hundreds from 10 hundreds leave 2; now since 10 hundreds or 1 thousand were added to the minuend the remainder will be 1 thousand too large; hence 1 thousand must be added to the subtrahend. 3 thousands and 1 thousand

Operation.
45073
3867
41206

are 4 thousands; 4 thousands from 5 thousands leave 1 thousand. As there are no ten-thousands to take from 4 ten-thousands, write 4 ten-thousands Therefore the difference is 41206.

34. **Note**:—In practice the process is as follows:

7 from 13..... leave 6 and carry 1
1 and 6..... 7..... 7 from 7 leave 0
8 from 10..... leave 2 and carry 1
1 and 3..... 4..... 4 from 5 leave 1
0 from 4..... leaves 4.

35. **Rule**:—*I. Write the smaller number under the larger number placing the terms of the same order in the same column and draw a line beneath.*

II. Begin at the right and subtract each term of the smaller number from the corresponding term of the larger number, writing the remainder beneath.

III. If any term of the smaller number is greater than the corresponding term of the larger number, add 10 *to the latter and then subtract.*

IV. Add 1 *to the next term of the smaller number and proceed as before.*

Examples for Practice.

340. 729 − 417 = *Ans.* ....

341. 925 − 519 = *Ans.* ....

342. 454565 − 7347 = *Ans.* .....

343. 454565 − 7347 = *Ans.* .....

344. 487654 − 298047 = *Ans.* .....

345. 780705 − 90877 = *Ans* .....

346. 454500156 − 8893287 = *Ans.* .....

347. 542600741 − 66725745 = *An.* .....

348. 274000300 − 92129405 = *Ans.* .....

349.	748 − 534	356.	749 − 573	363.	476 − 297
350.	969 − 733	357.	683 − 494	364.	754 − 264
351.	767 − 548	358.	698 − 299	365.	745 − 359
352.	451 − 323	359.	784 − 395	366.	976 − 495
353.	855 − 548	360.	400 − 245	367.	874 − 199
354.	745 − 254	361.	800 − 501	368.	741 − 174
355.	617 − 429	362.	545 − 484	369.	842 − 376

370.	476 —	287	399.	759 400 007 —	71 900 747
371.	426 542 —	179 127	400.	879 765 833 —	19 837 692
372.	457 421 —	178 175	401.	705 454 377 —	7 792 193
373.	847 457 —	457 424	402.	879 457 651 —	97 780 079
374.	375 147 —	196 078	403.	457 893 453 —	9 594 327
375.	455 310 —	8 474	404.	104 007 852 —	72 876 194
376.	459 435 —	88 578	405.	678 476 501 —	89 497 354
377.	547 422 —	268 657	406.	405 234 542 —	53 912 479
378.	256 456 —	74 179	407.	587 847 007 —	94 958 098
379.	789 852 —	49 776	408.	657 462 024 —	79 834 015
380.	458 075 —	75 497	409.	867 491 234 —	91 374 927
381.	357 117 —	87 779	410.	645 479 846 —	493 791 797
382.	134 207 —	70 709	411.	875 674 745 —	94 789 823
383.	740 070 —	471 097	412.	745 874 320 —	97 905 483
384.	870 050 —	757 147	413.	874 807 790 —	65 910 047
385.	357 074 —	196 407	414.	997 007 001 —	45 124 375
386.	645 444 —	452 079	415.	847 653 454 —	74 375 570
387.	704 555 —	375 697	416.	546 807 575 —	277 451 794
388.	455 606 —	375 697	417.	956 753 764 —	678 404 954
389.	359 854 —	204 905	418.	950 076 074 —	475 207 454
390.	897 954 —	541 378	419.	477 275 759 —	298 345 847
391.	654 087 —	87 659	420.	876 007 054 —	798 435 495
392.	854 087 —	98 498	421.	564 079 758 —	285 187 976
393.	256 895 454 —	4 947 872	422.	400 075 546 —	93 457 897
394.	754 674 790 —	64 834 799	423.	450 007 546 —	40 079 452
395.	764 675 790 —	275 987 899	424.	650 079 059 —	479 084 764
396.	451 900 797 —	7 191 989	425.	837 040 054 —	4 134 567
397.	810 847 065 —	614 896 874	426.	974 500 700 —	93 235 945
398.	418 030 450 —	27 740 761	427.	845 977 605 —	7 884 996

Express in figures and subtract the following numbers:

428. Find the difference between four hundred and sixty-six and three hundred and fifty.

429. Diminish eight hundred and ninety-six by fifty-five.

430. How much greater is seventy-five thousand eight hundred and forty-three than sixty-seven thousand and nine?

431. Find the remainder when two hundred and sixty-nine thousand seven hundred and fifty-seven is diminished by one hundred and thirteen thousand and twenty.

432. Subtract one million seventy-eight thousand nine hundred and three from nine million three hundred and twenty-seven thousand six hundred and eighty-one.

433. What remains if three hundred and two be diminished by seven hundred and fifty-eight?

434. From two million five hundred and ninety-two thousand eight

hundred and fifty-nine take four hundred and two thousand three hundred and twelve.

435. Take one thousand six hundred and seventeen from fourteen thousand and two.

436. How much smaller is ninety-one thousand three hundred and six than nine hnndred and one thousand six hundred and two?

437. What is the difference between nine hundred thousand and two and one million nine hundred and fifty thousand and twenty-eight?

438. How much do ninety-six thousand and two exceed seventy-seven thousand two hundred and two?

439. Find the difference between one hundred and one million ten thousand one hundred and one, and nine million seven hundred and thirty-seven thousand three hundred and fifty-one?

Exercises in Addition and Subtraction.

440. (1207+352) — 1548.
441. (2713+1055) — 2466.
442. (21572+67023)—80471.
443. (87641—72320)+4537.
444. (112796—10683)+97042.
445. (71889+13562)—75262.
446. (87003—27509)+23709.
447. (4503+705+3518)—6034.
448. (7323+587+9346) — (812+5006).
449. (4503 — 706) — (8003 — 7125).

PRACTICAL PROBLEMS.

450. A laborer earned $76; he has received $55. How much more is owed him?

451. What number must be added to 67 to make it 201?

452. A gardener had 345 melons in his waggon; how many did he sell knowing he has 79 remaining?

453. Find the number that must be added to 138 to make it 450?

454. On a bill of $4217 a man pays $427. Find the balance due.

455. The sum of two numbers is 1052; the smaller is 358. Find the greater.

456. A bill has for total $4729; by how much has it been diminished if there still remain due $4278?

457. A person owing a sum of $16384, paid $7375; how much does he still owe?

458. A person after travelling 9 days, ends his journey on the 24th of the month. On what date did he start ?

459. A woman goes to market with $14.30 and returns with $6.75 ; How much did she spend ?

460. Two men working together perform 427 yards of work ; if one has done 174 yards, how many did the second do ?

461. I had $628.75. I bought a farm for $410.90 ; how much money have I left ?

462. A scholar has 345 lines to recite; he knows 257. How many more must he learn ?

463. Having $2128.25, I intend to buy a house worth $3000 ; how much more do I require to pay for it ?

464. A voyage is to last 87 days ; how many days is it begun if there are 49 days more to travel ?

465. The age of a father and his son together is 127 years. The father is 83 years old, how old is the son ?

466. A prisoner is in for 270 days ; he has served 187 days. How many more days must he pass in prison ?

467. The first Crusade was in 1096, and the seventh and last ended in 1270. How many years did these expeditions last ?

468. A merchant bought cloth for $6364. He sold part of it for $3977.40. Find the value of the remainder ?

469. Columbus was 51 years old when he discovered America in 1492 ; in what year was he born ?

470. A grocer sold sugar for $870.45 and by so doing gained $75.60. What did the sugar cost him ?

471. Potatoes were introduced into Europe in 1586, and coffee in 1644. For how many years were potatoes in use when coffee was introduced ?

472. I want $420.45 to be able to pay a debt of $746.20. How much have I ?

473. An army numbering 40300 men lost 7850 in a campaign. How many men are left ?

PROBLEMS IN ADDITION AND SUBTRACTION.

474. Find the total weight of 6 waggons, weighing respectively : 4524 pounds, 9425, 7217, 3425, 2027, and 1875 ?

475. Charlemagne ascended the throne in 768 and died in 814. His son Louis, ascended the throne on his father's death and died in 840. Which of the two sovereigns reigned the longer ?

476. A banker received on Monday $2426, Tuesday $4728.15, Wednesday $12475.60, Thursday $2749, Friday $5749.18, and Saturday $17429,07 ; how much did he receive during the week ?

477. A farmer had 345 sheep. Having sold 249, how many remain ?

478. Cannons were invented in 1346, and guns in 1430. For how many years are each of these pieces of ordinance in use ?

479. In 1871 the population of Quebec was 59699 ; in 1881 it was 62446. Find the increase of population for that decade of years.

480. What sum is owed a cabinet-maker for a desk worth $75.50, a bureau worth $48.25 and a table worth $7 ?

481. A man owes $4567 and pays $3789.65 ; how much does he still owe ?

482. Paul has $1892.05, Andrew $1998.55 ; how much more has Andrew than Paul ?

483. Two industries give a profit of $2945 ; if one brings $1295. Find the share of the other ?

484. Montreal has a population of 220650, Toronto 181220, Quebec 63090 and Ottawa 44154. Find the population of these four cities ?

485. The population of Ontario is 2114321 ; how many more inhabitants has it than the Province of Quebec, whose population is 1488535 ?

486. Having sold goods for $8795, I gained $374.84 ; what did the goods cost me ?

487. A debtor who owes $7887.75 pays $995.95 ; how much does he still owe ?

488. A house that cost me $7200 was repaired at a cost of $750. How much must I sell it so as to gain $1200 ?

489. A man having a fortune of $15860, gave $6700 to his family, $5400 to religious communities, and bequeaths the remainder to the poor. Find the share of the poor ?

490. I bought a villa for $18640 and sold it for $19455. What is my gain ?

491. Find the number which augmented by 45 will give 650.

492. A merchant received 3 pieces of cloth measuring respectively ; 118 yards, 85 yds, and 78 yds. How many yards did he receive ?

493. The ages of a father and his son make together 160 years ; the father is 92 years old. Find the son's age.

494. There are 450396 inhabitants in the province of Nova Scotia and 109078 in Prince Edward Island ; what is the difference in population ?

495. A work comprises 4 volumes having respectively 526, 478, 484, and 508 pages ; how many pages does the work contain ?

496. A father dying bequeaths his fortune to his three sons as follows: to the eldest he gives $15750; to the second, $13800 and to the youngest $11760. What was his fortune?

497. In a 1st class there are 38 pupils; in the 2nd, 65; in the 3rd, 78; in the 4th, 85; and in the 5th, 95. How many pupils attend the school?

498. I had $14.20; I bought a hat for $3.35, and a pair of boots for $5 40. The remainder I gave for a prayer book. Required the cost of the book?

499. Louis has $18930; how much has John knowing his sum to be greater than Louis' by $5980?

500. I owe my butcher $29.44; my baker $18.75; my shoemaker, $33.10; my tailor, $67.18; my milkman, $12.30 and my grocer $47.36. How much do I want to cover my expenses knowing that I have only $180.65?

501. A merchant has 18547 yds of calico; he sold at different times 750 yds., 200 yds., 567 yds., and 125 yds. How many yards remain?

502. A farmer has three pieces of land which yielded 4500 bushels of oats. The first yielded 1333 bushels and the second 1428. How many bushels did the third yield?

503. A workman should receive $45.75 for 5 weeks' steady work, but $8.95 were deducted for time lost. How much did he receive?

504. A servant spent $1.25 for linen, 90 cents for butter, 60 cents for cheese, $1.05 for vegetables and $2.35 for sugar. How much must she return to her master on $6.65?

MULTIPLICATION.

36. **Multiplication** is the process of taking one number, called **multiplicand**, as many times as there are units in another, called **multiplier.**

The **Product** is the result obtained by the multiplication.

The **Multiplicand** is the number to be multiplied; the **Multiplier,** the number by which we multiply.

37. The Multiplicand and Multiplier are called **Factors** of the product.

38. The sign of multiplication is $\times$ which is read: **multiplied by, times,** or **into.**

To indicate the multiplication of 7 by 6, the numbers are written: 7×6.

Multiplication Table.

1 time 0 is 0	4 times 0 are 0	7 times 0 are 0
1 time 1 is 1	4 times 1 are 4	7 times 1 are 7
1 time 2 is 2	4 times 2 are 8	7 times 2 are 14
1 time 3 is 3	4 times 3 are 12	7 times 3 are 21
1 time 4 is 4	4 times 4 are 16	7 times 4 are 28
1 time 5 is 5	4 times 5 are 20	7 times 5 are 35
1 time 6 is 6	4 times 6 are 24	7 times 6 are 42
1 time 7 is 7	4 times 7 are 28	7 times 7 are 49
1 time 8 is 8	4 times 8 are 32	7 times 8 are 56
1 time 9 is 9	4 times 9 are 36	7 times 9 are 63
2 times 0 are 0	5 times 0 are 0	8 times 0 are 0
2 times 1 are 2	5 times 1 are 5	8 times 1 are 8
2 times 2 are 4	5 times 2 are 10	8 times 2 are 16
2 times 3 are 6	5 times 3 are 15	8 times 3 are 24
2 times 4 are 8	5 times 4 are 20	8 times 4 are 32
2 times 5 are 10	5 times 5 are 25	8 times 5 are 40
2 times 6 are 12	5 times 6 are 30	8 times 6 are 48
2 times 7 are 14	5 times 7 are 35	8 times 7 are 56
2 times 8 are 16	5 times 8 are 40	8 times 8 are 64
2 times 9 are 18	5 times 9 are 45	8 times 9 are 72

3 times 0 are 0	6 times 0 are 0	9 times 0 are 0
3 times 1 are 3	6 times 1 are 6	9 times 1 are 9
3 times 2 are 6	6 times 2 are 12	9 times 2 are 18
3 times 3 are 9	6 times 3 are 18	9 times 3 are 27
3 times 4 are 12	6 times 4 are 24	9 times 4 are 36
3 times 5 are 15	6 times 5 are 30	9 times 5 are 45
3 times 6 are 18	6 times 6 are 36	9 times 6 are 54
3 times 7 are 21	6 times 7 are 42	9 times 7 are 63
3 times 8 are 24	6 times 8 are 46	9 times 8 are 72
3 times 9 are 27	6 times 9 are 54	9 times 9 are 81

PROBLEMS.

39. **Case I.**—*To multiply when the multiplier is not greater than ten.*

EXAMPLE.—Multiply 654 by 9.

Solution.—In this example 654 must be taken 9 times. Begin at the right and multiply; 9 times 4 units are 36 units, 3 tens and 6 units. Write 6 in the units place and carry 3 tens; 9 times 5 tens are 45 tens plus the 3 tens carried equal 48 tens or 4 hundreds and 8 tens. Write 8 in the tens place and carry 4 hundreds; 9 times 6 hundreds are 54 hundreds plus the 4 hundreds carried equal 58 hundreds which is written down. Therefore the product is 5886.

OPERATION.

654
9
5886

Note.—In practice the process is as follows:

9 times 4..... 36 write 6 and carry 3
9 times 5..... 45 and 3..... 48 write 8 and carry 4
9 times 6..... 54 and 4..... 58 write 58.

40. **Rule.**—*Begin at the right and multiply each term of the multiplicand by the multiplier, carrying as in addition.*

Case II.—*When the multiplier is greater than* 10.

EXAMPLE.—Multiply 3527 by 382.

Multiply by the units as in case I, then by the tens placing the first product under the tens column. Multiply the hundreds in like manner placing the first product under the hundreds column. Take the sum of the partial products. The total product is 1347314.

OPERATION.

3527	
382	
7054	product by units
28216	" " tens
10581	" " hundreds
1347314	Total product.

42. Rule. —*I. Begin at the right and multiply the multiplicand by each term of the multiplier, writing the first term of each product under the term of the multiplier which produces it.*

II. Add these partial products and their sum will be the entire product.

Arrangement of work.

3527	65437
382	53040
7054	2617480
28216	196311
10581	327185
1347314	3470778480

EXAMPLE: Multiply 109080 by 36050.

Begin the operation by placing a 0 in the units place there being no units. Then multiply by 5 saying: 5 times 0 are 0; write this 0 to the left of the first that is in the tens place. Continue: 5 times 8 are 40; write the 0 and carry 4; 5 times 0 are 0, plus 4 equal 4, etc..

OPERATION.

109080
36050
5454000
654480
327240
3932334000

Omitting the 0 occupying the hundreds place take 6 saying: 6 times 0 are 0, which 0 is to be placed in the same column as the 6 it being of the same order, thousands, etc. The product of the multiplicand by 3 must occupy the place of ten-thousands as it expresses by itself ten-thousands. The product is therefore 3932334000.

Note:—I. The product of the tens is advanced one place to the left, that of the hundreds two places, etc, because the first figure of each partial product is of the same order as the figure of the multiplier.

II. When ciphers occur between the figures of the multiplier omit them and multiply by the next significant figure.

III. To multiply a number by 10, 100, 1000, add one, two, three ciphers to the multiplicand. Ex. $75 \times 100 = 7500$. Also if there are ciphers at the right of one or both factors, multiply by the significant figures and annex as many ciphers to the result as there are ciphers to the right of both factors.

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43. **Proof:** Multiply the multiplier by the multiplicand and if the work is correct, the product will be the same as the first product.

Examples for practice.

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113 × 2
124 × 4
714 × 7
545 × 2
406 × 6
426 × 9
476 × 4
763 × 5
566 × 8
623 × 3
842 × 9
407 × 7
436 × 3
464 × 6
695 × 2
287 × 6
824 × 2
654 × 4
764 × 8
454 × 4
489 × 7
756 × 2
875 × 5
769 × 8
876 × 4
476 × 7
873 × 4
842 × 9
576 × 7
876 × 8
480507 × 2
924654 × 5
951847 × 8
670075 × 7
576824 × 5
677456 × 9
547854 × 3
854753 × 6
747827 × 9
954376 × 2
427907 × 4
857976 × 7
870089 × 9
576484 × 4

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390542 × 5
784260 × 7
945679 × 9
864207 × 3
824025 × 6
879789 × 8
875784 × 4
484374 × 6
876789 × 8
847989 × 7
456907 × 3
907075 × 7
974834 × 9
927454 × 5
845405 × 8
845607 × 9
215 × 10
321 × 12
529 × 14
540 × 17
754 × 19
359 × 21
669 × 25
984 × 30
697 × 34
184 × 36
371 × 41
505 × 45
625 × 48
747 × 53
957 × 58
876 × 62
964 × 67
854 × 70
674 × 74
357 × 80
487 × 81
657 × 84
457 × 87
657 × 91
937 × 93
978 × 96
378 × 36
469 × 48

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434 × 95
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875 × 85
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707045 × 16
753824 × 18
476937 × 22
674897 × 24
978007 × 25
769407 × 27
786795 × 29
853477 × 32
943754 × 35
609834 × 36
827454 × 38
687070 × 40
607741 × 43
746824 × 45
677007 × 47
796450 × 48
470079 × 50
976450 × 52
753827 × 54
407954 × 56
976753 × 58
489807 × 59
546854 × 63
456977 × 64
454275 × 67
896907 × 65
427907 × 69
678967 × 72
974854 × 74
695437 × 75
674854 × 76
134679 × 79
674874 × 81
456899 × 110
765407 × 257
834765 × 518
937456 × 705

637. 978457×346
638. 876574×457
639. 457974×640
640. 853473×703
641. 957456×854
642. 824956×387
643. 347653×457
644. 456824×654
645. 976489×877
646. 976546×200
647. 457834×456
648. 827569×623
649. 747898×907
650. 647959×183
651. 834706×370
652. 900897×405
653. 986007×726
654. 837454×947
655. 967827×125
656. 678984×345
657. 730064×500
658. 984765×756
659. 947876×842
660. 689834×943
661. 945634×235
662. 769487×426
663. 695844×575
664. 654265×429
665. 346854×537
666. 650079×935
667. 965789×327
668. 697896×938
669. 157679×937
670. 747876×945
671. 789379×849
672. 874119×927

673. 849654× 4507
674. 747876× 7487
675. 457854× 9768
676. 679456× 1304
677. 895775× 3726
678. 700789× 1425
679. 476895× 4070
680. 469889× 2004
681. 676489× 5360
682. 987824× 1076
683. 987684× 4567
684. 543956× 9475
685. 834753× 2475
686. 690790× 5709
687. 674825× 8907
688. 807405× 4937
689. 457670087× 4564
690. 546876× 94347
691. 475087654× 7498
692. 754276× 47839
693. 679009675× 6589
694. 759364× 27895
695. 347654857× 9874
696. 674307× 42765
697. 764897695× 8007
698. 470076× 742?4
699. 475795834× 2076
700. 786789× 69854
701. 953769475× 8421
702. 476843× 85654
703. 815456789× 3575
704. 764854× 37654
705. 454879456× 8419
706. 956433× 77807
707. 654476889× 4789
708. 897456× 87493
709. 365674987× 5321
710. 876452× 70809
711. 497364956× 8470
712. 867453× 96207
713. 487847207× 2450
714. 987407× 95307
715. 589047207× 2450
716. 654857× 80076
717. 877986755× 6790
718. 854307× 67084
719. 540090× 6900
720. 780000× 4000
721. 604000×702000
722. 990000× 3490
723. 940000× 7600
724. 670000× 47500
725. 875400× 96600
726. 987400× 7000
727. 857100× 1900
728. 914400× 7200
729. 977700× 4900
730. 742800× 47000
731. 890000× 98400
732. 548700000× 47000
733. 699400000×834000
734. 927540000×896500
735. 542570000× 69400
736. 754600000×529000
737. 600301000×400700
738. 975007000×457600
739. 845004000×700040
740. 795654000× 84700
741. 648745601×474257
742. 789407672×587648
743. 457465478×459876
744. 786745056×954378
745. 956543576×376894
746. 975432758×976432
747. 659754007×549876
748. 795030407×876007

by the multiplicand
l be the same as the

593.
594. 901× 57
595. 456× 69
596. 435× 83
597. 434× 95
598. 975× 79
599. 875× 85
600. 607405× 13
707045× 16
753824× 18
476937× 22
674897× 24
978007× 25
769407× 27
786795× 29
853477× 32
943754× 35
609834× 36
827454× 38
687070× 40
607741× 43
746824× 45
677007× 47
796450× 48
470079× 50
976450× 52
753827× 54
407954× 56
976753× 58
89807× 59
46854× 63
56977× 64
4275× 67
6907× 65
7907× 69
967× 72
854× 74
437× 75
54× 76
79× 79
74× 81
99×110
7×257
5×518
3×705

749.	938321576×458076	760.	695769452×976834
750.	476742974×378974	761.	876454876×615980
751.	957007428×689073	762.	87584906[illegible]×757976
752.	678098789×795409	763.	987453970×645843
753.	758507961×146279	764.	995296307×487923
754.	674907461×307824	765.	796753769×849584
755.	879421702×376548	766.	794037254×978476
756.	855807607×976856	767.	759097895×750054
757.	757489007×900076	768.	754827939×477234
758.	879407854×678765	769.	674396856×285679
759.	787375634×894757	770.	574007906×784569

Express the following numbers in figures and solve the multiplication.

771. What is the product of one thousand two hundred and three units by thirty-two?

772. Multiply three thousand one hundred and twenty-one by thirty-four?

773. What product is obtained by multiplying three hundred and twenty-four by two hundred and twelve?

774. Find the product of eleven thousand two hundred and twenty-three by forty-one.

775. Take four hundred and twenty-four times the number twelve thousand and twenty.

776. What is the product of two thousand and twenty-one by ninety-five?

777. Give the result of one hundred and three thousand two hundred and seven multiplied by five huudred and forty-three.

778. What number is obtained by multiplying thirty thousand and seventy-six by five thousand three hundred and forty-two?

779. Find the product of nine hundred eighty-four thousand and eighty-six by seventy-eight thousand three hundred and twenty-one.

780. Find the product of one thousand three hundred and two by forty-three units.

Oral Exercises in Addition, Subtraction and Multiplication.

781. What is obtained: 1st by adding the smaller number of a subtraction to the difference; 2nd by taking away the difference from the larger number?

782. What change takes place in the difference of two numbers: 1° if the larger number is increased; 2° if the larger number is diminished; 3° if the smaller number is increased; 4° if the smaller number is diminished?

783. Does the difference of two numbers change : 1.—if the same quantity be added to each of the two numbers ; 2.—if the same quantity be subtracted from each of the two numbers ?

784. To add 12 times the same number, in what other way may the answer be found besides by addition ?

785. How do you call the number that is to be multiplied ?

786. How do you call the number that indicates how many times another number is to be taken ?

787. What is the meaning of the expressions : twice smaller, three times larger ?

788. What number is : 1.—21 times larger than 9 ; 2.—12 times larger than 8 ; 3.—5 time smaller than 18 ; 4.—6 times smaller than 24 ?

789. How much are : 39—27 ; 43—32 ; 29—17 ; 53—23 ; 51—21 ; 67—45 ; 76—25 ; 77—23 ; 89—74 ; 39—19 ; 41—22 ; 55—25 ?

790. How much are : 25—10+5 ; 26—(10—4) ; 28—10+2 ; 27—(10+5) ; 29—10+6 ; 32—(10+8) ; 34—10+7 ; 36—(10+8) ; 44—10+9 ?

791. How much are : 8×10 ; 9×9 ; 9×11 ; 8×12 ; 4×5×3 ; 4×2×3 ; 5×2×7 ; 6×4×5 ; 7×2×6 ; 6×9×2×3 ?

792. How much are : 12×4+(9×2) ; 5×15+(14×6) ; 10×10—(11×9) ; 93—(6×8+5) ; 5×12—10+15 ?

793. How much are : 35—10+4 ; 37—(10+7) ; 38—10+8 ; 39—(10+9) ; 47—10+6 ; 40—(12+9 ; 42—20+7 ; 45—(20+5) ; 52—20+12 ?

794. How much are : (9×4)+(7×3)+(10×2) ; 12+15+20×5 ; 90—40×6 ; 7×20—(12×6) ?

795. How much are : 46—20+6 ; 47—20+8 ; 47—(37+4) ; 49—19+9 ; 52—22+10 ; 54—(34+11) ; 56—46+7 ; 57—27+14 ; 63—(31+9) ?

796. How much are : 6×2+(2×9+3)—(3×10) ; 14+11+8—(7×4) ; 12×11—(10×7) ; 8×16—(7×13+11) ?

PRACTICAL PROBLEMS.

Note.—When Dollars and Cents are multiplied by any integer the point to separate the Dollars and Cents must always be worked after the first two figures to the right.

797. How many balls are there in 6 bags if each bag contains 247 ?

798. How many boys can be seated on 18 benches if there are 8 places on each bench ?

799. How many shots have been fired off in six hours at the rate of 20 shots in one hour ?

800. A family spends $1,30 a day ; how much will it spend in 169 days ?

801. A train is composed of 27 cars each weighing 4800 pounds. What is the weight of the entire train ?

802. What is the price of 490 pounds of mercury at $2.80 a pound ?

803. How many hours are there in a month of 30 days ?

804. How many hours are there in a year of 365 days ?

805. A man gains $45 a month ; what is his annual income ?

806. What number is 37 times larger than 4015 ?

807. An acre of land costs $72.50 ; how much would you have to pay for 18 acres ?

808. Twenty-seven children received 15 cents each, how much did they all receive ?

809. It requires 38500 slabs to cover a street ; how much must be paid if each one cost 49 cents ?

Problems in Addition, Subtraction and Multiplication.

810. On a tree there are 942 apples ; how many remain if 579 are gathered ?

811. How many apples on a tree, knowing that if 345 are gathered, there remain 407 ?

812. Bought 72 pounds of coffee at 34 cents a pound, and 95 pounds of sugar at 7 cents ; how much must be paid for all ?

813. What is the number of oranges contained in two boxes if the first contains 345 and the second 367 ?

814. A box of oranges contains 345 oranges ; another contains 542 oranges ; if 47 be taken from the second and placed in the first, how many will each box then contain ?

815. A servant receives $12.85 a month, what are his yearly wages ?

816. A box contains 476 oranges, another contains 504 ; how many must be put in the first box so as to equal the number in the second box ?

817. A merchant receives four orders each for 450 bottles of beer; he sends on two occasions 370 bottles each time. How many bottles must he still send ?

818. A man bought 12 reams of paper at 15 cents a quire, how much must he pay if there are 20 quires in a ream ?

819. How many travellers can a train of three cars transport, if there are in the 2nd class car 36 places, in the 1st class 40, and in the parlor car 20 ?

820. How many pupils are absent in a class of 75 places, if those present are seated on 8 tables of 9 places each ?

821. What is the number of boards in two loads the first containing 240 and the second 275 ?

822. How much must be given to 34 men, working during 20 days at $1.20 a day?

823. A wagon carries 375 boards; how many remain after taking away 89?

824. In each of 4 baskets there are 364 apples, if they are sold for 3 cents each, what sum will be received?

825. Two brothers share 2424 volumes, if the older gets 1875 volumes, what will be the part of the second?

826. How many figs are there in 18 baskets each containing 125 dozen?

827. What is the sum of money that is composed of 120 fifty-cent pieces and 87 two-cent pieces?

828. What is the effective force of a fleet of 9 vessels carrying 450 men each?

829. How many men must be added to a detachment of 465 men so as to make it 1183?

830. What is the total number of years in the ages of 4 persons in a family, the first being 41, the second 40, the third 18 and the fourth 9 years old?

831. A cutler sold 15 dozen of knives at 35 cents each; how much did he receive for all?

832. A man breathes 25 times a minute, how many times does he breathe in a day, knowing that there are 24 hours in a day and 60 minutes in an hour?

833. A person buys 11 pounds of meat at 9 cents a pound and 8 pounds of butter at 23 cents a pound; how much must he pay?

834. A man breathes 19 time a minute; how many times will he breathe in an hour?

835. A boarder pays 45 cents daily for his board; what must he pay for two years and 6 days?

836. A person carries 2704 bottles; how many did he break on the way if he has only 2597 remaining?

837. I remained 6 weeks and 5 days in a boarding house at 42 cents a day; what sum must I pay?

839. A hatter sent once for 450 hats, and at another time for 250. He received only 575; how many must he yet receive?

839. A merchant having 500 eggs, sells 13 dozen; how many has he remaining?

840. A basket contains 146 eggs; 17 dozen were added to it, how many are there in it now?

841. What is gained by selling at 35 cents a pound, 60 pounds of goods that cost 28 cents a pound?

842. What is the number of men in an army composed of 14700 infantry, 3800 cavalry, 2160 artillery and 1140 lancers?

843. In thrashing wheat with a flail a man strikes 37 times a minute; how many times will he strike in a day of 10 hours?

844. If a pile of sheaves give an average of 32 gallons of wheat, how many gallons will 95 piles give?

845. A man earns 75 cents a day, what will he receive for the work of the five last months of the year allowing 25 days for Sundays and sickness?

846. A city pays annually $1345600 for butter and $5498060 for fish; by how much does the amount paid for fish exceed that paid for butter?

847. The area of Prince Edward Island is 2133 square miles; that of Nova Scotia, 20907 square miles; New Brunswick, 27174 square miles; Quebec, 188688 square miles; Ontario, 101733 square miles; British Columbia, 341305 square miles; Manitoba, 123200 square miles; the Territories, 2665252 square miles. What is the area of the Dominion?

848. A workman saves 40 cents a day; how much can he save in 3 years of 305 working-days each?

849. Bought 12 yards of cloth at $4.30 a yard and 31 yards at $5.50 a yard. I sold the whole at $6.80. Did I gain or lose and how much?

850. There are 15780 slates placed on a roof; and the slaters say that they want 29 times as much to complete it; how many slates will there be on the roof?

851. In a hospital containing 156 persons, they distribute yearly 5 shirts and 3 pair of stockings; how many shirts and pairs of stocking will there be distributed in 4 years?

852. How much does a man earn yearly, if he spends $212.50 and saves $140?

853. A man was born in 1796 and died in 1882, how many months did he live?

854. A work is composed of 5 volumes, each volume contains 220 pages, each page contains 32 lines and each line 11 words. How many words in the whole work?

855. If a man breathes 20 times a minute; how many times will he breathe from the first of March to the first of September a period of 184 days?

856. A merchant bought 486 dozen of oranges at 2 cents apiece; how much must he pay?

857. An overseer has 20 men under him, he pays them $1.25 a day. How much must he pay them for 50 days' work ?

858. How many hours are there in 11 years and 20 days ?

859. What sum is required to maintain 34 sick persons during a year of 365 days at an average of 3 cents each hour ?

860. A father of a family earns $2.50 a day and spends $1.60 ; how much money will he have remaining at the end of a year if he abstained from working during 52 Sundays and 9 Feast-days ?

861. How many days are there in 34 years, if 27 are of 365 and the remainder of 366 days ?

862. In a workshop there are 33 workmen, 11 of whom earn $1.30 a day ; 12 others $1.50, and the remainder $1.75 ; what sum is required to pay them for a year if they did not work on Sundays and on 9 festivals ?

863. Six baskets of apples contain 15 dozen each, what is the total contents of these baskets ?

864. 10 baskets containing 125 dozen of figs each were bought for 2 cents a fig ; what was the amount paid ?

865. An army of 49854 men received reenforcements after which the army numbered 65878 men. What was the number of the reenforcement ?

866. A man received 3690 boxes each containing 1350 pens at 2 cents a pen. Require the cost.

867. Six boxes, containing 24 dozen of knives each, were bought for 45 cents a knife ; what was the total cost ?

868. A merchant sold 645 plates : he delivered 340 the first time and 178 the second time. How many are still to be delivered ?

869. In a building there are 85 windows having 24 panes of glass each ; the glazier received 15 cents for each pane : how much did he receive for all ?

870. What must be paid for 2 boxes of soap the first box containing 242 pounds and the second 191 pounds, at 6 cents a pound ?

871. In selling 30 yards of cloth for $180 I gained 90 cents on a yard what did the cloth cost me ?

872. What would be the gain on 50 pounds of tobacco that were sold for 40 cents and bought for 33 cents ?

873. A man bought 36 yards of silk at $2.60 a yard, 64 pounds of salt at 3 cents a pound 15 gallons of oil at 42 cents a gallon, and 25 cords of wood at $3.70 a cord. How much must he pay for all ?

874. A contractor has three workmen, by the first he gains 45 cents per day, by the second 30 cents, by the third 25 cents ; what will be his entire gain at the end of 3 weeks, omitting Sundays ?

DIVISION.

44. **Division** is the process of finding how many times a number call **divisor** is contained in another number called **dividend.**

45. The result of the division is called **quotient.**

46. Division is indicated by the sign ÷ or : which reads **divided by,** or by a line placed between the dividend and the divisor.

Thus to indicate the division of 21 by 3, it is written 21÷3 or $\frac{21}{3}$.

Note.—The quotient of a division may be obtained by subtraction. Thus, to find the quotient of 16 by 5 ; subtract 5 from 16, this gives 11 for remainder ; then 5 from 11 give 6 for remainder ; 5 from 6 leave 1 for remainder. Another subtraction being impossible it is seen that 16 contains 5 three times with 1 for remainder.

This means of finding the quotient of two numbers requires too much time and would not be practical in many cases ; a shorter method of solving division is therefore necessary.

Division Table.

Ex. 20÷6=3, r. 2. Read 20 divided by 6 equal 3 remainder 2.

1÷1=1	17÷2=8, r. 1	15÷3=5	4÷4=1
2÷2=1	18÷2=9	16÷3=5, r. 1	5÷4=1, r. 1
3÷2=1, r. 1	19÷2=9, r. 1	17÷3=5, r. 2	6÷4=1, r. 2
4÷2=2		18÷3=6	7÷4=1, r. 3
5÷2=2, r. 1	3÷3=1	19÷3=6, r. 1	8÷4=2
6÷2=3	4÷3=1, r. 1	20÷3=6, r. 2	9÷4=2, r 1
7÷2=3, r. 1	5÷3=1, r. 2	21÷3=7	10÷4=2, r. 2
8÷2=4	6÷3=2	22÷3=7, r. 1	11÷4=2, r. 3
9 ÷2=4, r. 1	7÷3=2, r. 1	23÷3=7, r. 2	12÷4=3
10÷2=5	8÷3=2, r. 2	24÷3=8	13÷4=3, r. 1
11÷2=5, r. 1	9÷3=3	25÷3=8, r. 1	14÷4=3, r. 2
12÷2=6	10÷3=3, r. 1	26÷3=8, r. 2	15÷4=3, r. 3
13÷2=6, r. 1	11÷3=3, r. 2	27÷3=9	16÷4=4
14÷2=7	12÷3=4	28÷3=9, r. 1	17÷4=4, r. 1
15÷2=7, r. 1	13÷3=4, r. 1	29÷3=9, r. 2	18 ÷4=4, r. 2
16÷2=8	14÷3=4, r. 2		19÷4=4, r. 3

$20 \div 4 = 5$
$21 \div 4 = 5$, r. 1
$22 \div 4 = 5$, r. 2
$23 \div 4 = 5$, r. 3
$24 \div 4 = 6$
$25 \div 4 = 6$, r. 1
$26 \div 4 = 6$, r. 2
$27 \div 4 = 6$, r. 3
$28 \div 4 = 7$
$29 \div 4 = 7$, r. 1
$30 \div 4 = 7$, r. 2
$31 \div 4 = 7$, r. 3
$32 \div 4 = 8$
$33 \div 4 = 8$, r. 1
$34 \div 4 = 8$, r. 2
$35 \div 4 = 8$, r. 3
$36 \div 4 = 9$
$37 \div 4 = 9$, r. 1
$38 \div 4 = 9$, r. 2
$39 \div 4 = 9$, r. 3

$5 \div 5 = 1$
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$9 \div 5 = 1$, r. 4
$10 \div 5 = 2$
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$44 \div 5 = 8$, r. 4
$45 \div 5 = 9$
$46 \div 5 = 9$, r. 1
$47 \div 5 = 9$, r. 2
$48 \div 5 = 9$, r. 3
$49 \div 5 = 9$, r. 4

$6 \div 6 = 1$
$7 \div 6 = 1$, r. 1
$8 \div 6 = 1$, r. 2
$9 \div 6 = 1$, r. 3
$10 \div 6 = 1$, r. 4
$11 \div 6 = 1$, r. 5
$12 \div 6 = 2$
$13 \div 6 = 2$, r. 1
$14 \div 6 = 2$, r. 2
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$58 \div 6 = 9$, r. 4
$59 \div 6 = 9$, r. 5

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$67 \div 7 = 9$, r. 4
$68 \div 7 = 9$, r. 5
$69 \div 7 = 9$, r. 6

$8 \div 8 = 1$
$9 \div 8 = 1$, r. 1
$10 \div 8 = 1$, r. 2
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$13 \div 8 = 1$, r. 5
$14 \div 8 = 1$, r. 6
$15 \div 8 = 1$, r. 7
$16 \div 8 = 2$
$17 \div 8 = 2$, r. 1
$18 \div 8 = 2$, r. 2
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$23 \div 8 = 2$, r. 7
$24 \div 8 = 3$
$25 \div 8 = 3$, r. 1

26÷8=3, r. 2
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81÷9=9
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83÷9=9, r. 2
84÷9=9, r. 3
85÷9=9, r. 4
86÷9=9, r. 5
87÷9=9, r. 6
88÷9=9, r. 7
89÷9=9, r. 8

Different Cases of Division.

48. **Case I.**—*The divisor is less than* 10. In this case the quotient may be easily found by the multiplication table.

EXAMPLE.—Divide 51 by 6.

In the multiplication table it is seen that 51 is greater than 6×8, and smaller than 6×9; therefore 8 is the quotient with a remainder of 3.

OPERATION.

6) 51

8 R. 3

EXAMPLE 2.—Divide 8754 by 8.

Solution.—8 is contained in 8 thousands 1 thousand times, with no remainder; 8 into 7 hundred is contained 0 hundred times. Annex

OPERATION.

8)8754

1094—2

5 tens, 7 hundreds and 5 tens are 75 tens, which divided by 8 gives 9 for quotient and a remainder of 3 tens. 3 tens annexed to 4 units are 34 units which divided by 8 gives a quotient of 4 and a remainder of 2. The quotient then is 1094 and a remainder of 2 units.

49. **Case II.**—*When the divisor contains more than one figure.*

Find how many times 42 is contained in 12945.

Solution.—Write the dividend and the divisor on the same line with a vertical line between them and draw a horizontal line beneath the divisor.

Operation.	
12945	42
126	308
345	
336	
9—Rem.	

42 is not contained in 1 ten-thousand hence there are no ten-thousands in the quotient; 1 ten-thousand and 2 thousands are 12 thousands; 12 thousand does not contain 42, hence there are no thousands in the quotient; 12 thousands and 9 hundreds are 129 hundreds, 41 is contained 3 hundred times in 129, 3 hundred times 42 are 126 hundreds, which subtracted from 129 leave 3 hundreds which with 4 tens are 34 tens. 42 is not contained in 34 tens, a cipher is written in the quotient. 34 tens with 5 units are 345 units. 42 is contained 8 units times in 345. 8 units times 42 are 336 which subtracted from 345 leave a remainder of 9 units.

The quotient then is 308 with a remainder of 9.

50. **Note I.**—It is not necessary to write the number 126, the subtraction may be made mentally after the figure of the divisor is multiplied by the quotient:

Thus 3 times 2.... 6 from 9 leave 3
3 times 4.... 12 from 12 leave 0
Remainder 3 hundreds, add 4 tens.... 34. Proceed as above.

51. **Rule.**—*I. Write the dividend and the divisor on the same line, separating them by a vertical line and drawing a horizontal line under the divisor.*

II. Find how many times the number expressed by the first figures of the dividend contains the highest units of the divisor; place this figure in the quotient.

III. Multiply the divisor by this figure, and subtract the product from the partial dividend. To the remainder annex the following figure of the dividend.

IV. Proceed as before till all the terms of the dividend have been used.

V. If any partial dividend will not contain the divisor place a cipher in the quotient and annex the following figure of the dividend and proceed as above.

52. **Note.**—I. When the divisor has but one figure. The quotient is written under the dividend without writing down the remainder as shown in Case I.

II. When there are ciphers to the right of the divisor, they are cut off from the divisor and as many figures from the right of the dividend. Then divide the remaining figures as usual; prefix the remainder to the figures cut off.

EXAMPLE.

6|00) 97|80

16—180 R.

III. To divide by 10, 100, 1000..... it suffices to cut off one, two, three..... figures to the right of the dividend.

53. **Proof.**—Multiply the quotient by the divisor and add the remainder, if any, to the product; if the work is correct the result will equal the dividend.

54. **Proof of multiplication.**—Divide the product by the multiplier; the quotient will equal the multiplicand if the work is correct. There should be no remainder.

Examples for Practice.

Divide

875.	468÷2	890.	333006÷6
876.	963÷3	891.	870120÷9
877.	624÷4	892.	540764÷4
878.	970÷5	893.	751002÷7
879.	672÷6	894.	432536÷8
880.	434÷7	895.	478353÷3
881.	672÷8	896.	981006÷6
882.	405÷9	897.	453607÷7
883.	621÷9	898.	600702÷3
884.	207÷9	899.	604430÷5
885.	420472÷2	900.	650016÷8
886.	407630÷5	901.	450009÷9
887.	342009÷9	902.	674108÷4
888.	492630÷6	903.	894509÷7
889.	644013÷3	904.	874224÷4

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EXAMPLE.

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16—180 R.

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540764÷4
751002÷7
432536÷8
478353÷3
981006÷6
453607÷7
600702÷3
604430÷5
650016÷8
450009÷9
674108÷4
894509÷7
874224÷4

905. 459675÷ 9
906. 354÷11
907. 407÷12
908. 984÷14
909. 549÷20
910. 895÷23
911. 780÷25
912. 354÷26
913. 197÷28
914. 425÷33
915. 407÷34
916. 654÷35
917. 954÷39
918. 201÷43
919. 426÷46
920. 999÷46
921. 854÷50
922. 964÷53
923. 975÷54
924. 543288÷12
925. 905765÷17
926. 405680÷20
927. 652547÷23
928. 743240÷25
929. 793751÷26
930. 704900÷29
931. 805909÷33
932. 847216÷36
933. 487804÷38
934. 497999÷40
935. 659415÷43
936. 710756÷46
937. 925404÷49
938. 845001÷53
939. 858415÷57
940. 867010÷59
941. 984324÷61
942. 594115÷64
943. 699999÷65
944. 840025÷68
945. 500010÷72
946. 430074÷76
947. 605407÷78
948. 604905÷81
949. 306404÷85
950. 576477÷86
951. 934376÷89
952. 297049÷91
953. 977046÷93
954. 674246÷96
955. 305423÷99

956. 800715÷ 35
957. 540072÷ 69
958. 695425÷ 97
959. 789016÷ 84
960. 426432÷ 67
961. 694120÷ 68
962. 943274÷ 62
963. 796425÷ 75
964. 843255÷ 87
965. 169400÷ 78
966. 345895÷ 85
967. 474050÷ 470
968. 654207÷ 147
969. 574604÷ 341
970. 805940÷ 276
971. 506825÷ 375
972. 546079÷ 345
973. 654054÷ 897
974. 907850÷ 307
975. 512904÷ 761
976. 576452÷ 384
977. 764805÷ 359
978. 975450÷ 970
979. 389807÷ 778
980. 576402÷ 876
981. 572070÷ 452
982. 908405÷ 607
983. 454026÷ 247
984. 430020÷ 729
985. 874984÷ 789
986. 678751÷ 290
987. 904868÷ 207
988. 767765÷ 451
989. 896875÷ 675
990. 845790÷ 475
991. 654327÷ 147
992. 842364÷ 915
993. 346518÷ 954
994. 846518÷ 854
995. 809456÷ 942
996. 654827÷ 835
997. 576454÷ 807
998. 456872÷ 867
999. 650017÷ 456
1000. 976450÷ 749
1001. 845872÷ 948
1002. 470878÷ 548
1003. 765484÷ 654
1004. 452878÷ 874
1005. 829742÷ 764
1006. 840742÷ 842

1007.	459065÷ 774	1058.	345676407÷ 287
1008.	739874÷ 819	1059.	809596433÷ 876
1009.	605427÷ 742	1060.	576827452÷ 634
1010.	605207÷ 789	1061.	852025044÷ 297
1011.	437878÷ 879	1062.	654307854÷ 387
1012.	859049÷ 847	1063.	745653842÷ 977
1013.	754754301÷ 247	1064.	300457089÷ 897
1014.	178935421÷ 247	1065.	534875706÷ 876
1015.	351978432÷ 658	1066.	679854374÷ 447
1016.	794325069÷ 895	1067.	546594325÷ 470
1017.	459457853÷ 704	1068.	746876381÷ 279
1018.	373765007÷ 405	1069.	674237452÷8907
1019.	394756809÷ 749	1070.	743215908÷3427
1020.	947450207÷ 345	1071.	578332572÷4086
1021.	517486809÷ 621	1072.	574834207÷6954
1022.	929452907÷ 347	1073.	543207509÷4987
1023.	465027897÷ 534	1074.	743207008÷2075
1024.	167047096÷ 296	1075.	542396987÷6430
1025.	757807953÷ 196	1076.	453837954÷6534
1026.	847695876÷ 341	1077.	898754321÷9784
1027.	954761827÷ 684	1078.	47[illegible]940815÷4110
1028.	807436587÷ 659	1079.	907008752÷1941
1029.	504876554÷ 896	1080.	547927952÷8432
1030.	874256084÷ 647	1081.	764106347÷5943
1031.	749657822÷ 345	1082.	684124206÷5398
1032.	397458701÷ 499	1083.	541307650÷4765
1033.	907009471÷ 742	1084.	673454807÷7964
1034.	542324529÷ 674	1085.	470075334÷8107
1035.	453873201÷ 542	1086.	807077927÷9067
1036.	940079009÷ 579	1087.	456374204÷5760
1037.	675423804÷ 779	1088.	407854274÷1749
1038.	943217875÷ 476	1089.	742960854÷9765
1039.	987745878÷ 749	1090.	674075847÷2471
1040.	876495688÷ 677	1091.	746820049÷1985
1041.	347006921÷ 845	1092.	787455654÷9876
1042.	740080008÷ 540	1093.	537658470÷7407
1043.	942357460÷ 875	1094.	876432574÷1784
1044.	547084372÷ 976	1095.	345653027÷4854
1045.	827453571÷ 197	1096.	476845904÷1654
1046.	457009840÷ 742	1097.	875454807÷2759
1047.	254856763÷ 475	1098.	307452805÷8745
1048.	176870009÷ 497	1099.	746854954÷2975
1049.	784256852÷ 746	1100.	453347907÷2794
1050.	670076407÷ 857	1101.	787654927÷4789
1051.	496807904÷ 357	1102.	874642874÷1743
1052.	596807904÷ 678	1103.	546874957÷2987
1053.	104856009÷ 595	1104.	174854957÷4789
1054.	547607007÷ 457	1105.	678907854÷9875
1055.	564600070÷ 596	1106.	347942671÷7421
1056.	794827954÷ 547	1107.	742525834÷1456
1057.	607324087÷ 579	1108.	874089453÷2989

345676407÷ 287
809596433÷ 876
576827452÷ 634
852025044÷ 297
654307854÷ 387
745653842÷ 977
300457089÷ 897
534875706÷ 676
679854374÷ 447
546894325÷ 470
746876381÷ 279
674237452÷8907
743215908÷3427
578332572÷4086
574834207÷6954
543207509÷4987
743207008÷2075
542396987÷6430
453837954÷6534
898754321÷9784
47 940815÷4110
907008752÷1941
547927952÷8432
764106347÷5943
684124206÷5398
541307650÷4765
673454807÷7964
470075334÷8107
807077927÷9067
456374204÷5760
407854274÷1749
742960854÷9765
674075847÷2471
746820049÷1985
787455654÷9876
537658470÷7407
876432574÷1784
345653027÷4854
476845904÷1654
875454807÷2759
307452805÷8745
746854954÷2975
453347907÷2794
787654927÷4789
874642874÷1743
546874957÷2987
174854957÷4789
678907854÷9875
347942671÷7421
742525834÷1456
374089453÷2989

1109.	904087605÷2984	1132.	790078456÷2347
1110.	741233479÷4875	1133.	653070089÷6097
1111.	476807452÷1627	1134.	487094070÷6075
1112.	500109729÷6079	1135.	701874417÷1011
1113.	370230510÷2798	1136.	794854376÷4561
1114.	874337452÷2653	1137.	230456876÷8741
1115.	761045817÷2352	1138.	347605854÷8479
1116.	216115076÷8234	1139.	805423135÷4689
1117.	742676207÷2694	1140.	635426976÷8941
1118.	904007369÷2747	1141.	560079452÷8974
1119.	709478927÷9079	1142.	765876342÷9784
1120.	294076927÷7609	1143.	907880077÷2769
1121.	560076927÷2475	1144.	560079076÷4985
1122.	346074837÷1074	1145.	340058952÷4794
1123.	745674854÷8790	1146.	545068095÷9765
1124.	174800976÷1009	1147.	547610023÷4706
1125.	652475856÷7845	1148.	547607432÷8423
1126.	895405974÷8495	1149.	604653752÷8423
1127.	170079450÷4560	1150.	243072654÷7981
1128.	900075456÷3217	1151.	504224012÷7654
1129.	650074605÷6541	1152.	894007965÷1765
1130.	654800077÷7045	1153.	654006795÷9871
1131.	964757754÷8794	1154.	670074027÷3799

Express the following numbers in figures and solve the Problems.

1155. What is the quotient of one hundred and twenty-one thousand one hundred and forty-seven by seven?

1156. The product of a multiplication is two hundred and thirty-eight; and the multiplier is twelve. What is the multiplicand?

1157. How many times is thirty contained in twenty thousand and forty?

1158. How many times is three hundred and twelve contained in seven thousand four hundred and eighty-eight?

1159. If four thousand one hundred and sixty-six be multiplied by an unknown number, and if the product be fifty thousand and forty; what is the unknown number?

1160. Make the number seven thousand five hundred and forty, ten times smaller.

1161. What will be the result of twenty-five thousand made one thousand times smaller?

1162. How many times can the number one thousand eight hundred and five be taken from eleven million eight hundred and forty-five thousand and three?

1163. The product of a multiplication is three million six hundred and three thousand three hundred and thirteen and the multiplicand is twenty-nine thousand and forty-nine ; what is the multiplier ?

1164. How many hundreds are there in 8602 units ?

1165. How is a unit called : 1.—of the 4th order ; 2.—of the 6th order ; 3.—of the 7th order ?

1166. When each part of the sum is multiplied by the same number, what change does that sum undergo ?

1167. If 10 be added to one number and 6 to another, what change is made in the difference of these two numbers ?

1168. When does the product equal : 1.—the multiplicand ; 2.—the multiplier ?

1169. What must be done to find the dividend : 1.—having the divisor and quotient of a division without remainder ; 2.—having the divisor, quotient and remainder ?

1170. When is the quotient : 1.— smaller than the dividend ; 2.— greater than the dividend ; 3.— greater than one ; 4.—less than one ?

1171. Having divided a number by 5, how many times does the dividend contain the quotient ?

1172. In dividing a number by 2, how many times does the quotient contain the dividend ?

1173. How many times are : 1.— 5+2 contained in 21, in 35 ; 2.— 6+4, in 50, in 70 ; 3.— 9+2, in 66, in 77 ; 4.— 8, in 55+9, in 63+9 ?

1174. How many are : 1.— 9×12+20+12—30 ; 2.— 15×12+(20×5) ; 3.— 40×4+(27×3) ; 4.— 8×9+(3×7—13) ?

1175. How many times are : 1.— 10 contained in 115—5, in 107—7 ; 2.— 3, in 69—3, in 78—6 ; 3.— 9—4 in 63—8 ; 4.— 18—12 in 90—30 ; 5.— 29—4 in 137—12 ; 6.— 26—8 in 140—32 ?

1176. How many times are : 1.— 15 contained in 5×12 ; 2.— 5, in 15×7 ; 3.— 21, in 12×7 ; 4.— 9, in 3×(21+9) ; 5.— 5, in 7×15+(10—5) ?

1177. What is the quotient : 1.— of 5+6—2×4÷6 ; 2.— of 4+8—1×3÷11 ; 3.— of 5+9—4×6÷12 ; 4.— of 7+8—3×5÷10 ?

1178. How many are : 1.— 4×5+(5×3)—7—5 ; 2.— 16×9—(13×6) ; 3.— 10+12×6—40 ; 4.— 14×8+18+12—7 ?

1179. What is the quotient : 1.— of 7+5—6×7÷6 ; 2.— of 9+7—8×10÷20 ; 3.— of 3+10—5×7+8 ; 4.— of 8×9—9×7+7 ?

1180. What is the quotient : 1.— of 3+14—9×12÷24 ; 2.— of 9+5—8×10+6 ; 3.— of 5+16—3×2÷6 ; 4.— of 6+15—11×12÷10 ?

1181. How many are: 1.— 36+9—12; 2.— 38+22—15; 3.— 43+37—20; 4.— 13+26—25; 5.— 44—20+10—12; 6.— 60—(40+13); 7.— 32+8+5—10; 8.— 40+10+8—20?

1182. What is the quotient: 1.— of 8+5—7×12+8; 2.— of 13+11—6×3+2; 3.— of 12—9×6+15; 4.— 5+17—2×8+16?

1183. How many are: 1.— 15+25—20+15; 2.— 20+40—(30+10); 3.—64—(25+30); 4.— 29—9—7; 5.— 84+26+15—(70+25); 6.—64+4+6+1—15; 7.— 59+9+7+5—30?

1184. What is the quotient: 1.— of 10+9—7×8+16; 2.— of 7+9—6×10+25; 3.— of 11+12—3×6+12; 4.— of 8+14—2×8+16?

1185. Add 5 to 22, divide the sum by 9, multiply the quotient by 12, subtract 6 from the product, add 10 to the remainder; what is the result?

1186. Divide 40 by 8, multiply the quotient by 9, add 11 to the product and subtract 6; what remains?

1187. From 36 subtract 6, divide the remainder by 5, multiply the quotient by 12, add 15 to the product, subtract 77 and divide the remainder by 10; what is the quotient?

1188. Add 5 and 7 to 8, multiply the sum by 3, subtract 5, divide the remainder by 11, multiply the quotient by 6, add 20 to the product; what is the sum?

1189. Multiply 15 by 5, add 5, divide the sum by 8, multiply by 6, subtract 10, divide by 5, add 2, and multiply by 11; what is the product?

Practical Problems in Division.

1190. How many books at 60 cents a volume can be bought for $72?

1191. What is the price of a bottle of olive oil, when 345 bottles cost $138?

1192. By what number must 5513 be divided to obtain 37 as quotient?

1193. A clerk has a monthly salary of $45, he received $360, for how many months was he paid?

1194. What number multiply by 87, gives the same product as 348×60?

1195. A city of 43872 inhabitants paid $636144 in taxes; what would be the value paid by each, if in equal parts?

1196. A sum of $7300 is made up of 365 pieces of equal value; what was the value of a piece?

1197. In a province the expenses for the public service during a year amounted to $146547.50; what are the daily expenses?

1198. How many 5 cent-pieces must I give in exchange for 45790 fifty cent-pieces ?

1199. How many days would be required for a writer to copy a book of 720 pages if he copies 3 pages an hour and works 12 hours a day ?

1200. A horse-dealer bought horses for $7990 and in selling them for $8466 he gains $28.00 on each horse. How many horses did he buy ?

REVIEW PROBLEMS.

1201. A debtor owes $4,050 ; he pays $380.00, how much does he still owe ?

1202. A person has in his safe $9260.00, if he deposits $750.00 more at one time and then $250.00 ; what sum has he in his safe ?

1203. In an arsenal there are 92 piles of shot, each pile contains 3400 bullets ; what is the number of bullets ?

1204. The Carlovingian dynasty commenced in 752 and occupied the throne 235 years. In what year did it end ?

1205. A decorator received $25.20 for his salary of six days' work of 12 hours each ; What did he gain each hour ?

1206. A printer bought paper at $2.50, $2.75 and $3.00 a ream ; he had the same number of reams of each quality and he spent $330.00. How many reams of each sort has he ?

1207. On the eve of a battle an army consisted of 80,000 men, on the next day it had but 60785 ; how many men did the army lose ?

1208. I bought 75 yards of velvet at $9.20 a yard. In payment I gave an equal number of pieces of $5, of 50 cents and 25 cents. How many did I give of each ?

1209. I bought 96 reams of paper for the sum of $124.80. What is the cost of each sheet knowing that a ream contains 20 quires and each quire 25 sheets ?

1210. How many vessels will be required to carry 6840 men, if one vessel carries 1368 men ?

1211. If 6 horses cost $1500, what will 16 cost ?

1212. I pay 75 cents for 25 steel pens, how many can I buy for $30 ?

1213. Patrick was 7 years old when he went to school, if he remains 2 years in the 3rd class, one year in the 2nd class, and 4 years in the 1st ; at what age will he leave school ?

1214. A man earns $25.20 in 9 days. What will he earn in 40 days ?

1215. From a certain sum 172 persons received $18 each and there are $15 remaining ; what was the sum ?

1216. If 90 dozen of eggs cost $4.50 ; how many eggs can be had for $12.50 ?

1217. A father was 35 years old at the birth of his son ; how old will the son be when the father is 77 ?

1218. Nicholas was 23 years old in 1860 ; how old was he in 1851 ?

1219. A man spent $260 in 5 months ; at that rate what would he spend in 3 years ?

1220. A person has an annual revenue of $2021, how much can he spend a day after placing $743.50 in bank ?

1221. Owen Kearney was born in 1870, how many years after 1892 will he be 47 years old ?

1222. A grocer received 308 pounds of sugar for $21.56 ; he wishes to gain $6.16. What price will he ask for a pound ?

1223. The deluge took place 3308 years before Christ ; how many years elapsed from that event to the death of Champlain 1635 after Christ ?

1224. The siege of a city lasted 45 days, and the besiegers fired 13365 bombs into the city, how many bombs did they fire on an average per day ?

1225. What number multiplied by 341 gives 443641 for product ?

1226. How many years in 10512000 minutes ? (365 days to the year).

1227. A bookbinder has 640 volumes to bind at the rate of 16 cents per book ; if he completes the work in 41 days, what will he earn a day ?

1228. A general distributes 116000 cartridges among 5 batallions each comprising 550 men ; how many cartridges will each soldier receive ?

1229. A vestibule is paved with marble tiles and is divided into 44 parts the whole number of squares is 148852, how many squares in each part ?

1230. Peter owes $168, he pays $62, then $53 ; how much remains due ?

1231. A butcher buys 28 oxen for $1200 ; he sells them and gains $10 on each ox. What is his entire gain ?

1232. A grocer receives 6 cases containing 1500 pounds of cheese ; what did each case contain, and what will be the cost of a pound knowing that he paid $189 for the 6 cases ?

1233. Ernest received 40 cents to buy 6 pounds of bread at 4 cents a pound and 2 candles at 3 cents apiece. How much money did he spend ?

1234. What is the weight of a case which contains 85 packages of candles each package containing 4 pounds, knowing that the case when empty weighs 24 pounds ?

1235. A hundred volumes cost $75.00, what will be the cost of one volume, and for what will I have to sell them to gain $5.00 on all ?

1236. A contractor engaged 10 workmen at $1.20 ; 15, at $1.00 ; 20 at 80 cts., and 25 at 60 cts. What sum of money will he require each week to pay the workmen ?

1237. A father when dying left $3500 to each of his 4 sons and $6500 to each of his 2 daughters. What was his fortune ?

1238. A hundred eggs cost $2.00, how many can you purchase for $15.00 ?

1239. 135 pages of 15 lines each were written by 46 pupils ; how many lines did each pupil write ?

1240. How many pages can be written by 55 pupils, if each pupil writes 4 pages of 18 lines each ?

1241. A remnant of cloth cost $126.00 and in selling it for $155.25 I gain $2.25 a yard ; how many yards were contained in the remnant ?

1242. A man said that in 15 years he would be 49 years old and his son would be 23 ; what are the ages of father and son ?

1243. A rosary contains 70 grains ; how many grains will be required for 3 dozen of rosaries ?

1244. A horse and harness cost $170.00, the horse without the harness cost $76.00 ; how much does the price of the harness exceed that of the horse ?

1245. George's overcoat cost 3 times as much as Andrew's shoes which cost $6.50 ; what is the cost of the overcoat ?

1246. A work lasted 18 days ; on what day was it begun if it was finished on the 23rd of May and there were two Sundays in that time ?

1247. A person says that with $72.46 more he would double his money and have $24.46 over ; how much has he ?

1248. A workman started his day at 4 o'clock A. M. and left work 10 hours after ; what o'clock was it ?

1249. A servant receives $182.50 a year ; if he loses 73 days how much less will he receive ?

1250. A man spends $1.35 a day ; how much does he save a day if he gets a salary of $7.30 ?

1251. I am to receive $7424 in three payments : the first will be $1704, the second $4025 ; what will be the amount of the third ?

1252. A miller wants $84 in order to pay for 125 barrels of flour at $4 a barrel. How much has he ?

1253. Along a road trees are planted every 12 yards ; how many trees will there be in a distance of 3660 yards ?

1254. A subscription was taken up in a church on different occasions : the first collection realized $37.00, the second $9 more than the first, the third $52.00, and the fourth as much as the 1st and the 2nd ; what was the amount of the subscription ?

1255. I pay $4.50 a yard for a certain work ; how many yards should a workman do to receive $90.00 ?

1256. A workman received $42.50 for 17 days work. How many days will he work for $1487.50 ?

1257. A house has 28 windows each containing 12 panes; how much will the glazier be paid at 15 cents a pane ?

1258. Peter has $570, Paul has $60.00 more than Peter, and John has as much as the other two together less $45.00. How much have Paul and John ?

1259. A tailor has a piece of cloth worth $189.00, he made 4 pairs of pants at $3.50 and 8 coats at $35.00 ; how much did he receive for it ?

1260. A man having $12300 gave $8900 to an hospital and divided the remainder among his 5 sons, what did each receive ?

1261. I bought 12 books at 52 cents each and I received 13 books free ; how much did each book actually cost me ?

1262. A scholar had to recite 250 lines ; but having recited only 125 lines, he has to write 2 lines for every line not recited ; how many pages has he to write, if each page contains 25 lines ?

1263. A squadron is composed of 6 corvettes and 2 frigates. The vessels carry each 400 men and the frigates 350 men ; what is the number of men in the squadron ?

1264. A man spends 65 cents on Monday, 90 cents on Tuesday, 55 cents on Wednesday, $1.04 on Thursday, 75 cents on Friday and $1.64 on Saturday ; how much has he left if he had $4.00 on Sunday ?

1265. Three gamblers made a common purse, John gained $75.00 but Peter and Charley lost each $27.00. What is their gain ?

1266. A gentleman having an annual revenue of $3560, pays $56.00 for taxes and other expenses ; what can he spend daily after paying these ?

1267. The city of Constantinople was 2540 years in existence in 1882; what is the date of its foundation, and how many years after the creation was it built ?

1268. Four gamblers have a common purse ; the 1st loses $40.00 ; the 2nd, $7.00 less than the first ; and the 3rd gains $15.00 and the 4th $25.00 ; what is their net loss ?

1269. A boatman made 4 voyages a day, he carried 80 persons each time at 30 cents each ; what does he gain every day, his daily expenses being $33.00 ?

1270. A man having no children ; left half of his goods to his four nephews and the other half to his six cousins ; how much does each receive, the fortune being $20640 ?

1271. I bought a certain amount of goods for $620 ; if I had sold them for $56 more I would have gained half the cost price ; how much should I have sold them for ?

1272. Fred had $1500 before borrowing $850, if he pays a debt of $1860, how much money has he left ?

1273. A workman gains $730 a year ; and spends $1.25 a day ; what sum does he possess at the end of the year ?

1274. A merchant has a revenue of $6935 ; what can he spend daily ?

1275. St Louis reigned from 1226 to 1270 and Louis XII from 1498 to 1515, how many years more did St Louis reign than Louis XII ?

1276. A sailor buys silk for 30 cents, thread for 25 cents, needles for 8 cents and cotton for 6 cents, after paying these amounts he had 55 cts. remaining. How much had he at first ?

1277. Of three individuals ; the first receivea twice as much as the second plus $55, and the third as much as the other two minus $120 ; how much has the third knowing that the first had 66 times $2.50 ?

1278. Thornley went out with $1.30 ; how much money should he bring back to his mother after paying . 40 cents for sugar, 25 cents for coffee, 18 cents for butter and 8 cents for milk ?

1279. On an avenue there are 36 trees 15 yards from each other ; if 5 trees more were added ; what would be the distance between the first and the last tree ?

1280. Frank walks from the city to the village twice a day during three years, knowing that the village is 5800 yards from the city, how many yards did he cover ?

1281. How many seconds in 15 hours and 6 minutes ?

1282. With $540 more than I have, I could pay $1800 and have $28 remaining ; how much money have I ?

1283. Twenty-five men worked 60 days at $1.25 a day ; what sum will they receive ?

1284. A postman has 60 unpaid letters to distribute, among the number there are 23 at 3 cents and the remainder at 6 cents ; how much will he collect in all ?

1285. A merchant has $12000 cash, he gains 3 times $580, and 5 times $805 ; how much money has he ?

1286. A man gains 1 cent on every pencil sold ; how many pencils did he sell knowing that he received $13.80 for what cost him $11.04 ?

1287. A dozen of oranges cost 60 cents ; what will 35 oranges cost ?

1288. Four persons divide a sum of money between them: the 1st gets $1200, the 2nd $150 more than the 1st, the third half of the first two, and the 4th $225 less than the 3rd; what was the sum divided?

1289. A dozen of copies cost 42 cents; how much would a person gain who would sell 108 of these copies, at the rate of 4 cents a copy?

1290. A hundred volumes cost $92; how much must a volume be sold to gain $10 on the whole?

1291. John saves 3 tickets of $2 each per month; what will he save in 2 years and 4 months?

1292. I have bought 48 dozen of pencils for the sum of $11.52, I wish to gain one cent on each pencil; for what must I sell them a dozen?

1293. A foreman employs 16 laborers at the rate of 80 cents a day for 9 of them, and 70 cents for the others; what sum will he require to pay for 25 days' work?

1294. How many hours in a journey which begins Monday at 7 o'clock A. M. and finishes on Wednesday at 8 o'clock P. M.?

1295. A man having an income of $1328.25, has saved $3225.00 in 15 years; how much did he spend a day?

1296. The quotient of a division is 102215, the divisor 342 and the remainder is 341; what is the dividend?

1297. Two laborers having worked for 18 days received $45; one of them earned $1 a day; what were the wages of the other, and what amount did each receive?

1298. Find the day and hour that a journey began knowing it took 86 hours and was finished on Saturday at 11 o'clock A. M.?

1299. A workman from whom $7.50 were retained, received $42 as his salary for 18 days' work; how much did he gain a day?

1300. In a family the father gains $56 a month, the mother $2.70 a week, and the children $437.50 a year; how much did they all gain a year?

1301. A farmer has a crop of 2500 bundles of hay from 4 acres, which he sells $30 a hundred. How much did he get from each acre?

1302. A child being sick the doctor came to see him 15 times. The first seven visits cost $5.25; find the price of each of the other visits knowing that the doctor received $9.25 in all?

1303. If I had 25 $5-bills, 45 $2-bills and sixty 50-cent pieces, I could pay my debts and have $7.50 remaining; what do I owe?

MENTAL ARITHMETIC.

55. **Mental Arithmetic** is the art of calculating without writing the numbers. A pupil acquainted with written work only, will not readily detect an error by the absurdity of the result obtained. He, who is in the habit of calculating mentally, will, on the contrary, immediately detect such errors, and will seek to correct his work.

Rules for Addition.

56. *To add a small number add the tens successively and then the units.*

Example.—To add 37 to 44, first add 3 tens to 44, thus : 54, 64, 74 ; then add 7 units and the result gives : 74+7=81.

57. *To add a number, it may be decomposed into parts and then added successively.*

Example.—To add 324 to 475 ; decompose it into parts as : 300+20+4, then 475+300=775 ; 775+20=795 ; 795+4=Ans. 799.

58. *It is sometimes more advantageous to add a larger number than that given, and then subtract the difference.*

Example.—To add 92 to 446, first add 100 and then subtract 8, since 92=100—8 ; thus 446+100=546 ; 546—8=Ans. 538.

59. *When the numbers to be added end in the same number of ciphers, add the significant figures, and annex the number of ciphers in either number.*

Example.—To add 1200, 600 and 900, first add 12, 6 and 9 : 12+6=18+9=27 ; then annex two ciphers, 2700.

Problems in Addition.

1304. I bought $7 worth of bread, $4 of butter and $6 of wheat ; how much did I spend ?

1305. A piece of cloth cost $70, another $80 ; find the total cost ?

1306. A school consists of two classes : in the 1st there are 30 pupils, in the 2nd 45 ; how many pupils in the school ?

1307. How many minutes in one hour and a half ?

1308. Paul was born in 1874 ; in what year was he 11 years old ?

1309. What is the perimeter of a room 9 yards long and 7 yards wide? (There are 2 lengths and 2 breadths in the perimeter.)

Rules for Subtraction.

60. Two processes are used to solve questions in subtraction :

The first process is to subtract successively the units of the smaller number from the larger.

Thus to subtract 3 from 15, say : 15—1=14 ; 14—1=13 ; 13—1=12 Ans. Or, 15—1=14 ; 15—2=13 ; 15—3=12.

The second method is to add to the smaller number the units required to equal the larger number.

Example.—To subtract 4 from 9.

4 and 1 make 5 and 1 make 6 and 1 make 7 and 1 make 8 and 1 make 9. Thus 5 units are required to have 4 equal 9. The practice of addition enables the pupil to resume these operations in a single one. Thus 4 and 5 make 9. The answer is 5 units.

Problems in Subtraction.

1310. A person buys meat for $4, vegetable for $2. To pay he offers a $10 bill ; what change will he receive ?

1311. I sold goods for $75 and gained $12 ; how much did I pay for it ?

1312. Peter is 15 years old and Paul 29. How many years older is Paul ?

1313. A man was 30 years at the birth of his son. How old is the son now the father being 77 ?

1314. One traveller walked 47 miles and a second 22 miles. How many miles did the first one walk more than the second ?

Rules for Multiplication.

61. *When the multiplier is* 11 *or* 12, *the multiplication can be solved as by one number.*

EXAMPLE.— 97085
12
1165020

Thus : 12 times 5=60, write 0 and carry 6 ; 12 times 8=96 and 6 make 102, write 2 and carry 10 ; 12 times 0=0 and 10 make 10, write 0 and carry one ; 12 times 7 are 84 and 1 are 85, write 5 and carry 8 ; 12 times 9 are 108 and 8 make 116. Write 116 ; the product is 1165020.

62. *The product does not change if one factor is multiplied and the other factor divided by the same number.*

Example.—Multiply 24 by 5.

Multiply 5 by 2 to have the factor 10 and divide 24 by 2 this gives 12 which multiplied by 10 will give 120.

63. *To multiply a number by* 20 *it can be doubled and then multiplied by* 10.

Example.—Multiply 42×20

42×2=84 ; 84×10=840.

64. *To multiply a number by* 50 *it can be multiplied by* 100 *and then half of the product taken.*

Example.—Multiply 36×50

36×100=36 hundreds ; 36 hundreds ÷ 2=1800.

65. *To multiply a number by* 25 *we can multiply it by* 100 *and divide the product by* 4.

Example.—Multiply 56×25

56×100=56 hundreds ; 56÷4=14 hundreds=1400.

Problems in Multiplication.

1315. I bought 40 yards of cloth at $4 a yard. How much did I pay ?

1316. What will be the cost of 100 yards of cloth at $5.50 a yard ?

1317. What will 40 registers cost at 50 cents apiece ?

1318. What is the price of 50 chairs at 60 cents each ?

Rules for Division.

66. *To divide a number by* 10, *by* 100, *etc., make the number* 10 *times,* 100 *times smaller by cutting off one, two or more figures.*

1st **Example.**—275÷100=2.75 or 2 with a remainder of 75.

2nd " 12451÷000=1.245 or 1 and a remainder of 245.

Problems in Division.

1319. Six persons share $54 ; what part does each receive ?

1320. If you divide $130 among 5 persons what will be the share of each ?

1321. I bought 5 dozen of eggs for 60 cents. What is the price of a dozen ?

1322. Divide $5 among 20 children. What is each one's share ?

1323. Twenty men earn $46. What is one man's wages ?

Problems in Mental Arithmetic.

1324. Paul had 8 lines of writing to do; he has 5 more to finish. How many has he done?

1325. Andrew had 14 marbles; he won 5 more. How many has he now?

1326. Owen had 25 pens in a box; he lost 7 of them. How many had he remaining?

1327. James had 60 cents, his father gave him 40 cents and his aunt 50 cents. How much has he now?

1328. Louis had $80 in bank, his uncle gave him $15. How much has he now?

1329. Add 250 to 150.

1330. What is the sum of 360 and 140?

1331. My uncle had 15 hens; he bought 2 others and gave me 4. How many has he remaining?

1332. Alfred had 15 cents; he buys a pen for 1 cent and 2 copy-books at 3 cents each. How much has he remaining?

1333. How many hats must I sell at $3.00 each to receive $30?

1334. Walter received 18 pieces of candy; he gives 3 to each of his companions and keeps 3 for himself. What was the number of his companions?

1335. Louis gains 50 cents a day; how many days will it take him to gain $5?

1336. Philip has arranged his pens in several piles; the 1st contains 25, the 2nd 35, the 3rd 40, and the 4th 70. How many pens has he?

1337. John buys oil for 12 cents, ink for 15 cents and coffee for 6 cents. What sum did he spend?

1338. A merchant sold 150 newspapers in the morning and 130 at night. How many has he sold in his day?

1339. What is the product of 4 by 7?

1340. Henry has 35 apples, his brother 25 and his sister 40. How many have they together?

1341. A man owes $15 to the grocer, $25 to the baker and $20 to the butcher. How much does he owe them all?

1342. Leo had 37 apples; he gave 4 of them to each of his four companions. How many has he remaining?

1343. A husband earns 80 cents a day, his wife 40 cents, his son 60 cents and his daughter 20 cents. How much do they save if they spend $1.40?

1344. Joseph received 60 cents from his father, 40 cents from his uncle and $2 from his god-mother. How much did he receive in all ?

1345. James bought a horse for $450 and sold it for $200. How much did he lose ?

1346. If I had $4 more I would have $29. What is my fortune ?

1347. Charles bought a cupboard for $50 and sold it for $68. How much has he gained ?

1348. If Peter had 7 cents less, he would have 27 cents. How much has he ?

1349. A barrel contains 220 quarts of wine ; 4 quarts are drawn every day during 20 days. How many quarts remain in the barrel ?

1350. Paul obtained 7 good notes a day during 4 days. How many has he now knowing that he had 14 already ?

1351. How many pair of boots at $1.50 a pair can be bought for $6 ?

1352. If a boy draws 4 quarts of oil out of a barrel that contains 32 quarts, how many will be remaining at the end of 3 days ?

1353. I had $75 ; I have given $5 to the poor and placed $50 in the Savings Bank. How much have I remaining ?

1354. Alphonsis had 45 marbles ; he lost 15 and gained 20 ; how many has he now ?

1355. A flock is composed of 730 sheep ; 100 are sold every day during 7 days. How many sheep remain ?

1356. Felix's father spends 4 cents a day for tobacco. How much does he spend weekly ?

1357. A family eats 8 pounds of bread a day. How long will it take to eat 72 pounds ?

1358. Leo gained 8 good notes a day during 5 days ; how many has he now knowing that he had 14 to start with ?

1359. Thomas had 24 apples ; he ate 8 a day. How long did his provisions last ?

1360. A fruit-seller offers me 9 plums for a cent. I bought some and he gave me only 50 for 6 cents. How many are missing ?

1361. How many 10 cent-pieces will it take to pay $1.20 ?

1362. A gardener plants 144 cabbages in a piece of land in which only 12 can be planted on the width. How many rows will he be obliged to make ?

1363. How many months in 15 years ?

1364. Eugene is 12 years old, his younger sister is 7, his father 35 and his mother 29. What will be their ages in 12 years ?

1365. A man bought 100 eggs on the market. He broke 4 in coming home. How many dozen has he remaining to sell?

1366. An apple-tree produces 132 apples. The proprietor gives 3 dozen away and keeps the rest for himself. How many dozen did he keep?

1367. At 18 cents a dozen for eggs, how many eggs could I buy for 9 cents?

1368. A bookseller receives 13 volumes which he sells at a gain of 15 cents each. How much did he gain?

1369. A farmer brought 65 eggs to market and sells them for 20 cents per dozen giving away every thirteenth egg. What must he receive?

1370. Thomas goes around a square garden whose side is 13 yards long. What distance did he go?

1371. In a package containing 25 needles, 3 are broken, 5 are rusty, 3 are crooked and 2 cannot be used. How many needles can be sold?

1372. How much do I owe for 8 umbrellas bought for $1.40 each?

1373. How many buttons are there in 15 dozen?

1374. What will be the cost of 6 pair of boots at the rate of $3 a pair?

1375. If I had $8 more I could buy a coat worth $25. How much money have I?

1376. Ferdinand had 78 cherries. He gives 15 to each of his comrades. He keeps 18 for himself. How many did he give to his comrades?

1377. How many dozen of buttons at 16 cents a dozen, can be had for 80 cents?

1378. What sum of money would be necessary to pay 10 workmen at the rate of $1.20 per day?

1379. Maurice was 16 years old when his sister was born. What will be each of their ages when I am 40, knowing that I am 3 years younger than Maurice?

1380. What must you pay for 17 Primers at 9 cents each?

1381. I paid $56 for 14 yards of cloth, what is it worth per yard?

1382. What is the length of a tree which measures 33 times 4 feet?

1383. 17 of Willie's steps make 12 yards, what length has he walked when he has made 68 steps.

1384. A pendulum loses 3 minutes in 17 days. How many minutes will it lose in 51 days.

1385. Andrew disposed 360 fragments of stone in 18 piles. How many stone were there in each pile?

1386. I bought 18 eggs at 18 cents per dozen. What must I give for them?

1387. Eugene will be 18 years old in 11 years. How old is he now?

1388. John's father receives $9 for 4 days work. What will he get for 20 days work?

1389. Wilfrid changed forty-five 5 cent-pieces for twenty-five cent-pieces. How many did he receive?

1390. A ream of paper contains 20 quires and each quire 24 sheets. How many sheets in a half quire?

1391. Charles gains $15 per month. What is his annual gain?

1392. Adolphus was born in 1864. How old was he in 1885?

1393. In adding $3 to what I have actually, and in doubling the sum obtained, I find I have $14. What is my money?

1394. Joseph's mother paid $21 for three pair of sheets. What was the price of one pair?

1395. Stanislas was 8 years old the first of March 1893 in what year was he half this age?

1396. If the sum of money I have were tripled I would have $45, what is this sum?

1397. I had 50 plums. I gave 32 to my brother; and after eating a part I fined that I have 18 remaining. How many plums did I eat?

1398. I met three poor persons and to the first I gave two cents. How much did I give in all knowing that to the others I tripled the amount given the first?

1399. Edgar bought 45 yards of cloth for $27. He sold 15 yards at cost price. How many yards remain and what is he to receive for the part sold?

1400. I give $14.50 to my baker and this sum is only half of what I owe. What credit did he give me?

1401. If the sum I had were four times greater I would have $32. What is the sum?

1402. Four brothers have each 25 marbles: The 3 older give what they have to their youngest brother. How many marbles has the youngest brother?

1403. Ferdinand divides his pictures he has into 4 parts and gives one of these parts to each of his companions. Counting those that remain he has 35. How many had he at first?

1404. If James's pictures were multiplied by five he would have 75; how many has he?

1405. Andrew's father received $35 for ten days' work. How much would he have received had he worked only 7 days?

1406. Seven times my money would be sufficient to purchase 6 yards of silk at $7 a yard. How much have I?

1407. Each shelf of a library contains 25 volumes. How many volumes : 1.— in three shelves ; 2.— in eight shelves ?

1408. 15 yards of ribbon cost $4.50. How many yards will I receive for $8 ?

1409. Louis gave one-half his money to the poor and his father multiplied the remainder by three. How much had he at first if he has 24 cents now ?

1410. Half a certain sum equals 24. What is four times this sum ?

1411. I received three times a certain amount when I bought I would receive four times the amount. How much did I receive less than I anticipated, if the double of what I received equals $18 ?

1412. Alfred's money was doubled three times and he now has $40. How much had he at first ?

1413. William arrived home on the 28 of February after an absence of 15 days. When did he leave home ?

1414. My mother is 5 years younger than my father. What is the age of my mother if I am 25 years younger than my father who is now 39 years old ?

1415. My father was 29 years old when I was born. How old am I if my father is 40 years old ?

1416. What number is that which augmented by 12 equals 37 ?

1417. During how many days has a man worked who receives $327 at the rate of $3 a day ?

1418. A grocer sold a tub of butter for $10, and a box of cheese for $5. He receives in payment a barrel of flour worth $6. How much is still to be paid ?

1419. If a pound of coffee costs 31 cents. How much will : 1.— 5 pounds cost ; 2.— 7 pounds ; 3.— 8 pounds ?

1420. How much will be paid for 6 pounds of butter at 15 cents a pound, and 4 pounds of sugar at 8 cents a pound ?

1421. I bought 35 sheep at $3 a head, and sold them for $90. How much did I lose ?

1422. When pork costs 9 cents a pound. How many pounds can be had for : 1.— 63 cents ; 2.— 72 cents ; 3.— 90 cents ?

1423. A butcher buys lambs for $40 at one time ; a second time for $130. Having sold them for $2, how much did he gain ?

1424. A man having been married 49 years dies at the age of 77. What age was he when he was married ?

1425. At 18 cents a yard what cost : 1.— 6 yards of calico ; 2.— 7 yards ; 3.— 9 yards ?

1426. A farmer sells 14 sheep at $4 each and 10 lambs at $2 each. How much did he receive for all ?

1427. What is the sum of : 1.— 9+12+6—7 ; 2.— 36+10—12 ; 3.— 14+10+12—24 ?

1428. A man walks 25 miles per day : how many miles will he walk : 1.— in 10 days ; 2.— in 12 days ; 3.— in 15 days ?

1429. John has 16 marbles, and Leo has 4 times as many as John. How many have both together ?

1430. What is the result of the following combinations : 1.— 43+37—20 ; 2.— 9+12+15—25 ; 3.— 26+15+7—18 ; 4.— 27+23—20—2 ; 5.— 33+28+9—30+15 ; 6.— 16+12+9+5—34+7 ; 7.— 44—20+11—12 ; 8.— 15+25—30+15 ?

1431. By how many does the number 58 exceed 31+19 ?

1432. What cost 12 pounds of butter : 1.— at 15 cents per pound ; 2.— at 18 cents ; 3.— at 20 cents ?

1433. I have $30. I buy a coat for $15 a vest for $5 and a hat for $4. How much will I have remaining ?

1434. Joseph bought 12 oranges for 3 cents each ; 8 melons for 4 cents each and five pen holders at 2 cents. How much did he spend ?

1435. A child bought 16 apples from one stand, 13 from another ; he ate 6 and lost 5. How many has he remaining ?

1436. At 56 cents a pound for tea what will be paid for : 1.—9 pounds ; 2.—7 pounds ; 3.--10 pounds ; 4.—8 pounds ; 5.--12 pounds ?

1437. Henry has 48 cents in 3 boxes : the first contains 15 cents, the second 19 ; how many are in the third ?

1438. A merchant employs a man and his son, he pays the father $1.80 a day and the son 80 cents. How much will he owe them : 1.—in 7 days ; 2.--in 10 days ; 3 in 12 days ?

1439. Jack had 12 marbles, one of his comrades gave him 8, another 10 ; a third comrade gave him enough marbles to make 36 ; how many did the third give him ?

1440. If a railroad train runs at the rate of 24 miles an hour, how far will it run : 1.—in 7 hours ; 2.—in 9 hours ; 3.—in [illegible] hours ; 4.—in 12 hours ; 5.—in 15 hours ?

1441. Francis who is 17 years old is 8 years older than Louis, who is 12 years younger than Leander. What are the ages of Louis and Leander ?

1442. At the rate of 30 cents a bushel, what cost : 1.— 5 bushels of potatoes ; 2.— 7 bushels ; 3.— 9 bushels ?

1443. Edward sells one dozen and a half of eggs for 20 cents; one bushel of apples for 35 cents; he receives in payment a pair of skates worth 70 cents. What will be the change?

1444. Thomas is 15 years old and Philip is twice his age. What is the sum of their ages?

1445. A young man buys a hat for $7, a pair of boots for $8, a pair of gloves for $2, and an umbrella for $4. He gives the merchant 6 bank notes of $4 each. How much money will he receive back?

1446. How much will be paid for 10 spindles of cotton: 1.— at 12 cents; 2.— at 14 cents; 3.— at 15 cents?

1447. A boy gains 14 cents a day, another gain 15 cents and a third 20 cents, if the three work together, how much will they gain 1.—in 4 days; 2.—in 5 days; 3.—in 7 days?

1448. A laborer gains 90 cents on Monday and he spends 20; Tuesday he gains 70 and spends 50. How much has he remaining after his two days' work?

1449. Jerome worked 8 days at 15 cents per day, and Michael during 5 days at 20 cents per day. How much more has Jerome gained than Michael?

1450. In a class-room there are 4 benches each seating 15 pupils each; 3 seating 7 each; and 16 other places. How many places in the class?

1451. How much money should a farmer receive in exchanging 5 cows at $16 each, for 8 calves at $9 each?

1452. James picks 7 quarts of berries, Frank picks 3 times as many less 6 quarts. How many did Frank pick?

1453. Three boys speaks of their money; the first says: "I have 32 cents"; the second adds: "I have twice as much"; and the third states: "I have as much as both of you together less 12 cents." How much has the third boy?

1454. A plumber earns $1.80 a day, and a carpenter $1.20; what is the difference of their wages for 12 days?

1455. When beef is 5 cents a pound and pork 9 cents; what will be the difference in cost of 9 pounds of each?

1456. What is the difference between 7 times 18, and 8 times 12 less 13?

1457. John has 4 times 5 plums, and Henry 3 times 6. How many will both have remaining when John has eaten 7, and Henry 6?

1458. If 3 apples cost 9 cents what will be the cost: 1.— of 4 apples 2.— 7 apples; 3.— 16 apples?

1459. What will 5 lemons cost at 3 for 12 cents?

1460. If 4 peaches are worth 8 cents, what will be the cost of 8 peaches ; of 18 peaches ; of 27 peaches ?

1461. If 7 pounds of meat cost 42 cents what will be the cost of 9 pounds ; of 13 pounds ; 17 pounds ?

1462. What will 11 barrels of flour cost at the rate of 5 barrels for $30 ?

1463. A man walks a distance of 36 miles in 4 days. What distance will he walk in 12 ; in 15 days ; in 20 days ?

1464. What will be paid for 5 turkeys at the rate of 120 cents for 3 turkeys ?

1465. William gave 10 cents for apples at the rate of 3 apples for 9 cents ; how many did he get ?

1466. If 6 men can mow 12 acres of land in one day. How much will 15 men do ?

1467. Six cooks use a chest of tea in 12 days ; what time will 4 chests last ?

1468. If 5 workmen can do a certain amount of work in 16 days. In what time would 20 men do the same work ?

1469. How many men would be required to build a yacht in 6 days, if 3 men can build it in 12 days ?

1470. Maurice paid 8 cents for a ball. How many balls of the same kind can he buy for 32 cents ; 56 cents ; 80 cents ; 96 cents ; 104 cents ?

1471. If 4 pounds of butter cost 60 cents, what will 5 pounds cost ?

1472. If 9 dozen of eggs cost 81 cents ; what will 1 dozen cost ?

1473. If 6 pen holders cost 12 cents ; what will be the cost of 7 pen holders ; 10 pen holders ?

1474. When beefsteak cost 10 cents a pound, how many pounds can be had for 70 cents ; 90 cents ; $1.20 ; $3.00 ; $5.50 ?

1475. If a child reads 7 pages per day, how many days will he require to read 49 pages ; 77 pages ; 98 pages ?

1476. If a horse goes 42 miles in 7 hours ; what distance will he go in 11 hours ?

1477. What will 9 pounds of coffee cost if 3 pounds cost 27 cents ?

1478. If 6 barrels of flour cost $54 ; how much will 8 barrels cost ?

1479. If 15 yards of cloth cost $75. What will be the cost of 12 yards ; 16 yards ?

1480. When melons are sold at the rate of 3 for 60 cents, how many can I buy : 1.—for $1.20 ; 2.—for $1.60 ; 3.—for $2.40 ?

1481. If 9 yards of muslin cost $1.08, what will be the cost : 1.—of 5 yards ; 2.—8 yards ; 3.—10 yards ; 4.—13 yards ?

1482. A fruit-dealer gives 3 apples for 4 cents, how many will he give for : 1.—24 cents ; 2.—40 cents : 3.—56 cents ?

1483. If 6 lead pencils cost 24 cents, what must be paid for : 1.—9 pencils ; 2.—15 pencils ; 3.—12 pencils ?

1484. A man paid 72 cents for a certain number of oranges at the rate of 5 oranges for 12 cents. How many oranges did he buy ?

1485. At the rate of 4 oranges for 9 cents, how many can you buy for : 1.—63 cents ; 2.—45 cents ; 3.—$1.08 ?

1486. If you pay $4 to transport plaster 20 miles, what distance can it be transported for : 1.—$12 ; 2.—$15 ; 3.—$18 ; 4.— $24 ?

1487. How long would it take 7 men to reap a field, if 14 men could reap it in two days ?

1488. The wages of a servant amount to $42 for 3 months. How much does he gain in a year ?

1489. When butter is worth 14 cents a pound, how many pounds could I buy for 28 apples at 3 cents each ?

1490. If 4 chestnuts equal 8 marbles, how many marbles could you have for : 1.— 24 chestnuts ; 2.— 36 chestnuts ; 3.— 48 chestnuts ?

1491. I bought 40 geese at 5 for $3 ; and I sold them at 8 for $7. How much did I gain ?

1492. A trader gives 15 pounds of sugar for 5 pounds of butter ; how much is the butter worth a pound, knowing that 8 pounds of sugar are worth 56 cents ?

1493. A merchant sold 13 barrels of flour at $4 a barrel, and received in payment 26 yards of cloth. What is the price of 1 yard of the cloth ?

1494. When wheat is worth $10 for 5 bushels. How many bushels would be required to buy 3 cords of wood at $4 a cord ?

1495. If 4 bushels of wheat are worth 12 bushels of corn ; how many bushels of corn equal 10 bushels of wheat ?

1496. A farmer sells 8 dozen of eggs for 96 cents ; how many dozen would he have to sell, to buy 6 yards of cotton at 18 cents a yard ?

1497. A man bought 14 barrels of cider for $56 ; he gives 5 barrels for a certain number of yards of cloth at $2 a yard. How many yards of cloth did he get for his 5 barrels of cider ?

1498. Five men buy a mowing machine for $120. They lend it during 3 weeks for $15 per week and afterwards sell it for $100. What does each man gain ?

1499. If two apples equal one orange ; and 2 oranges equal one lemon ; How many lemons can a boy have : 1st for 48 apples ; 2nd for 60 apples ; 3rd for 76 apples ?

1500. I bought 5 tubs of butter for $35. For how much must I sell them so as to gain $10 dollars on all, and what is my gain per tub ?

1501. If one bushel of corn equals 2 bushels of oats, and one bushel of wheat equals 2 of corn, how many bushels of wheat will equal 20 bushels of oats?

1502. If it require 8 days for 10 men to build a wall. How many men would it take to build it in 5 days?

1503. Justin gave 7 apples for 21 chestnuts; at this rate how many chestnuts can he have for 8 apples?

1504. I gave 8 yards of merino for 6 pints of syrup: what will a pint of syrup cost, if 4 yards of merino cost 48 cents?

1505. Felix bought 7 yards of cloth for $21, and he gave 4 yards of this cloth in exchange for apples worth $2 a barrel. How many barrels of apples did he receive?

COMMON FRACTIONS.

67. A **fraction** is one or more of the equal parts of a unit; as, *one-half*, *two-thirds*,.....

If we divide a unit into 5 equal parts, we can take one of these parts and have *one-fifth*. If three parts were taken then the part would be *three-fifths*; one-fifth and three-fifths are fractions.

68. A fraction is represented by means of two numbers placed one over the other and separated by a dash. For example the fraction three-fifths is written $\frac{3}{5}$.

The number above the line is called **numerator.** It denotes the number of equal parts which is taken.

The number below the line is called **denominator.** It denotes the number of parts into which the unit is divided.

69. To read a fraction the numerator is called first, then the denominator. Example: $\frac{3}{4}$ is read *three-fourths.*

The fractions $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$, $\frac{5}{6}$, are read, *one-half*, *two-thirds*, *three-fourths*, *four-fifths*, *five-sixths.*

70. The numerator can be greater or less than the denominator, or it can be equal to it.

When the numerator is smaller than the denominator we have a **proper fraction,** that is to say, a value less than a unit. Ex.: $\frac{2}{7}$.

When the numerator is greater than the denominator it is an **improper fraction**, that is to say a value greater than unity. Ex: $\frac{9}{4}$.

When the numerator is equal to the denominator the fraction equals **unity**. Ex: $\frac{5}{5}$, $\frac{6}{6}$, $\frac{10}{10}$.

To teachers: Give a clear idea of fractions to the pupils by dividing some objet before them; as, a line on the black-board, an apple, etc.

EXERCISES.

I. Read the following fractions

$\frac{1}{2}$	$\frac{7}{8}$	$\frac{7}{11}$	$\frac{9}{15}$	$\frac{5}{31}$	$\frac{21}{68}$
$\frac{2}{3}$	$\frac{2}{7}$	$\frac{5}{12}$	$\frac{12}{16}$	$\frac{7}{34}$	$\frac{40}{47}$
$\frac{4}{5}$	$\frac{8}{9}$	$\frac{9}{14}$	$\frac{3}{17}$	$\frac{5}{21}$	$\frac{54}{62}$
$\frac{3}{4}$	$\frac{5}{8}$	$\frac{2}{13}$	$\frac{6}{23}$	$\frac{23}{57}$	$\frac{60}{72}$
$\frac{5}{6}$	$\frac{3}{6}$	$\frac{7}{20}$	$\frac{4}{23}$	$\frac{41}{49}$	$\frac{75}{80}$

II. Write in figures the following fractions

Three-fourths	Eight-ninths	One-fourteenth	Thirteen-fourteenths
Five-sixths	Five-tenths	Three-fifteenths	Seven-eighteenths
One-half	Five-sixteenths	Four-sevenths	Nineteen-twentieths
Two-thirds	Eight-ninths	Four-twentieths	Seven-twenty-fifths
Seven-eights	Four-elevenths	Six-ninteenths	Twenty-seven-thirtieths

III. What fraction is obtained by dividing a unit

1.—Into 2	equal parts	Ans. $\frac{1}{2}$	1.—Into 5	equal parts	Ans. $\frac{1}{5}$
4	"	....	7	"	....
8	"	....	11	"	....
12	"	....	15	"	....
16	"	....	19	"	....
20	"	....	23	"	....
24	"	....	27	"	....
28	"	....	31	"	....

IV. Into how many equal parts must a unit be divided to obtain:

1.—halves	Ans. into 2	fifteenths	.....
fourths	.....	eighteenths	.....
sixths	.....	twentieths	.....
tenths	.....	twenty-fifths	.....

2.—thirds	Ans. into 3	seventeenths	.....
fifths	.....	thirteenths	.....
sevenths	.....	eighteenths	.....
elevenths	.....	thirtieths	.....

V. Express in the form of a fraction

1. Five numbers smaller than unity.
2. Five numbers greater than unity.
3. Five numbers equal to unity.

VI. What are the following expressions in relation to a unit

$\frac{2}{3}$	$\frac{6}{7}$	$\frac{5}{12}$	$\frac{22}{17}$	$\frac{3}{8}$
$\frac{4}{5}$	$\frac{5}{6}$	$\frac{9}{2}$	$\frac{11}{22}$	$\frac{24}{25}$
$\frac{1}{2}$	$\frac{3}{3}$	$\frac{9}{7}$	$\frac{15}{18}$	$\frac{33}{31}$
$\frac{3}{4}$	$\frac{7}{6}$	$\frac{6}{6}$	$\frac{20}{10}$	$\frac{43}{39}$
$\frac{3}{2}$	$\frac{4}{12}$	$\frac{5}{11}$	$\frac{14}{16}$	$\frac{51}{49}$
$\frac{7}{6}$	$\frac{12}{11}$	$\frac{7}{13}$	$\frac{16}{19}$	$\frac{60}{60}$

REDUCTION OF FRACTIONS.

71. **Reduction of fractions** is the several operations to which the terms of a fraction may be submitted without changing or altering the value of the fraction.

There are four principal reductions of fractions.

72. To reduce a whole or mixed number to an improper fraction.

1.— Let it be required to reduce 4 to fifths.

A unit equals 5 fifths $= \frac{5}{5}$, 4 units will equal 4 times $\frac{5}{5}$ or $\frac{20}{5}$.

2.— Let it be required to reduce 6 units $\frac{2}{3}$ to an improper fraction.

A unit equals 3 thirds$= \frac{3}{3}$, 6 units will equal $\frac{18}{3}$: adding $\frac{2}{3}$ we have $\frac{18}{3}+\frac{2}{3}=\frac{20}{3}$. Therefore $6+\frac{2}{3}$=or $6\frac{2}{3}=\frac{20}{3}$.

73. **Rule.**—To reduce a whole or mixed number to an improper fraction, *multiply the given denominator by the whole number and add the numerator of the fraction if any.*

EXERCISES.

I. Reduce to an improper fraction

1506. 3	units	to halves	Ans. $\frac{6}{2}$	1512. 6	units	to fifths	Ans. $\frac{30}{5}$
1507. 4	"	thirds	....	1513. 8	"	sixths	....
1508. 5	"	halves	....	1514. 9	"	sevenths	....
1509. 6	"	fourths	....	1515. 10	"	eights	....
1510 8	"	thirds	....	1516. 11	"	sixths	....
1511. 9	"	fourths	....	1517. 12	"	ninths	....

II. Reduce the following numbers to improper fractions

1518. $4\frac{1}{2}$	Ans. $\frac{9}{2}$	1524. $2\frac{4}{7}$	Ans. $\frac{18}{7}$	1530. $7\frac{3}{7}$	Ans. $\frac{52}{7}$
1519. $5\frac{1}{3}$	....	1525. $7\frac{1}{2}$	....	1531. $4\frac{2}{3}$	....
1520. $8\frac{3}{4}$	....	1526. $6\frac{1}{3}$	....	1532. $10\frac{4}{5}$	....
1521. $9\frac{2}{5}$	....	1527. $7\frac{1}{8}$	....	1533. $14\frac{7}{8}$	....
1522. $6\frac{5}{7}$	....	1528. $9\frac{7}{8}$	....	1534. $17\frac{3}{4}$	....
1523. $9\frac{3}{8}$	....	1529. $8\frac{5}{9}$	....	1535. $21\frac{3}{8}$	....

74. To reduce an improper fraction to a whole or mixed number.

1.—Let it be required to find the units contained in the expression $\frac{12}{4}$.

One unit equals 4 fourths or $\frac{4}{4}$. As often as 4 is contained in 12, the fraction then contains one unit. The quotient of 12 by 4 is 3; therefore $\frac{12}{4}=3$ units.

2.—Let it be required to find the units contained in the expression $\frac{147}{8}$.

One units contains 8 eights $=\frac{8}{8}$. The quotient of 147 by 8 in 18 and the remainder is 3, thefore $\frac{147}{8}=18+\frac{3}{8}$ or $18\frac{3}{8}$.

75. Rule.—To find the number of units contained in an improper fraction *divide the numerator by the denominator; the quotient is the number of units.*

EXERCISES.

Find the units contained in the following numbers

1536.	$\frac{6}{2}$	Ans. 3	1542.	$\frac{10}{3}$	Ans. $3\frac{1}{3}$	1548.	$\frac{19}{6}$	Ans. $3\frac{1}{6}$
1537.	$\frac{12}{4}$	....	1543.	$\frac{18}{7}$	....	1549.	$\frac{34}{6}$	....
1538.	$\frac{15}{3}$	....	1544.	$\frac{15}{6}$	....	1550.	$\frac{42}{5}$	....
1539.	$\frac{20}{5}$	....	1545.	$\frac{14}{8}$	....	1551.	$\frac{12}{7}$	....
1540.	$\frac{28}{4}$	....	1546.	$\frac{22}{5}$	....	1552.	$\frac{23}{8}$	....
1541.	$\frac{54}{6}$	....	1547.	$\frac{71}{4}$	....	1553.	$\frac{24}{5}$	....

To reduce a fraction to its lowest terms.

76. **To simplify** a fraction is to represent it by its lowest terms. The fraction $\frac{12}{18}$ simplified could be written $\frac{6}{9}$ or $\frac{2}{3}$. These are obtained by dividing by 2 and then by 3.

To reduce a fraction to its **lowest terms** is to represent it by the smallest numbers possible.

1.—Let it be required to reduce to its lowest terms the fraction $\frac{12}{24}$.

Divide both terms by 2 and we have $\frac{6}{12}$; divide again both terms of the new fraction by 2 and we have $\frac{3}{6}$, of which both terms may be divided by 3 and the quotient $=\frac{1}{2}$. $\frac{1}{2}$ is the lowest term of $\frac{12}{24}$.

2.—Let it be required to reduce to its lowest terms the fraction $\frac{120}{180}$.

Divide successively both terms by 10 and by 6 and we have $\frac{2}{3}$ as the lowest terms of $\frac{120}{180}$.

76. **Rule.**—To reduce a fraction to its lowest terms, *divide both terms of the fraction by the same number, and repeat this operation with each new fraction until a fraction is obtained whose terms will contain no common factor.*

EXERCISES.

Reduce the following fractions to their lowest terms

1554.	$\frac{4}{6}$	Ans. $\frac{2}{3}$	1560.	$\frac{12}{15}$	Ans. $\frac{4}{5}$	1566.	$\frac{56}{60}$	Ans. $\frac{14}{15}$
1555.	$\frac{2}{4}$	....	1561.	$\frac{18}{20}$	....	1567.	$\frac{32}{44}$	....
1556.	$\frac{18}{21}$	....	1562.	$\frac{15}{18}$	....	1568.	$\frac{630}{1800}$	....
1557.	$\frac{21}{35}$	....	1563.	$\frac{16}{36}$	....	1569.	$\frac{180}{450}$	....
1558.	$\frac{8}{14}$	....	1564.	$\frac{42}{54}$	....	1570.	$\frac{1240}{4000}$	....
1559.	$\frac{15}{18}$	....	1565.	$\frac{64}{96}$	....	1571.	$\frac{800}{1500}$	....

To reduce fractions to a common denominator.

Fractions have a **common denominator** when both have the same number for denominator.

1.—To reduce two fractions $\frac{3}{5}$ and $\frac{7}{8}$ to a common denominator.

OPERATION.

$$\frac{3}{5} = \frac{3 \times 8}{5 \times 8} = \frac{24}{40}$$

$$\frac{7}{8} = \frac{7 \times 5}{8 \times 5} = \frac{35}{40}$$

Multiply both terms of the first by 8, and both terms of the second by 5, and we obtain $\frac{24}{40}$, $\frac{35}{40}$.

77. **Rule.**—To reduce two fractions to a common denominator *multiply both terms of each by the denominator of the other.*

2.—To reduce more than two fractions to a common denominator. **Ex.**—$\frac{2}{3}$, $\frac{4}{5}$ and $\frac{6}{7}$.

OPERATION.

$$\frac{2}{3} = \frac{2 \times 5 \times 7}{3 \times 5 \times 7} = \frac{70}{105}$$

$$\frac{4}{5} = \frac{4 \times 3 \times 7}{5 \times 3 \times 7} = \frac{84}{105}$$

$$\frac{6}{7} = \frac{6 \times 3 \times 5}{7 \times 3 \times 5} = \frac{90}{105}$$

Multiply both terms of the first by 5 and 7, then both terms of the second by 3 and 7, and both terms of the third by 3 and 5. We thus obtain $\frac{70}{105}$, $\frac{84}{105}$, $\frac{90}{105}$.

78. **Rule.**—To reduce more than two fractions to a common denominator, *multiply both terms of each fraction by the product of the denominators of the other fractions.*

EXERCISES.

Reduce the following fractions to a common denominator

1572.	$\frac{1}{2}$, $\frac{3}{5}$.	Ans. $\frac{5}{10}$, $\frac{6}{10}$.	1581.	$\frac{2}{3}$, $\frac{1}{5}$, $\frac{3}{7}$.	Ans. $\frac{140}{105}$, $\frac{21}{105}$, $\frac{45}{105}$.
1573.	$\frac{1}{4}$, $\frac{1}{5}$.	.....	1582.	$\frac{1}{7}$, $\frac{2}{3}$, $\frac{5}{6}$.	.....
1574.	$\frac{1}{8}$, $\frac{1}{7}$.	.....	1583.	$\frac{3}{8}$, $\frac{2}{7}$, $\frac{7}{9}$.	.....
1575.	$\frac{2}{3}$, $\frac{3}{5}$.	.....	1584.	$\frac{2}{4}$, $\frac{5}{6}$, $\frac{3}{5}$.	.....
1576.	$\frac{4}{5}$, $\frac{3}{7}$.	.....	1585.	$\frac{2}{7}$, $\frac{1}{4}$, $\frac{2}{3}$.	.....
1577.	$\frac{5}{6}$, $\frac{2}{3}$.	.....	1586.	$\frac{2}{3}$, $\frac{5}{6}$, $\frac{4}{7}$.	.....
1578.	$\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$.	.....	1587.	$\frac{1}{3}$, $\frac{4}{6}$, $\frac{5}{12}$	.....
1579.	$\frac{1}{2}$, $\frac{3}{5}$, $\frac{2}{4}$.	.....	1588.	$\frac{5}{6}$, $\frac{6}{8}$, $\frac{7}{12}$	.....
1580.	$\frac{1}{3}$, $\frac{4}{5}$, $\frac{4}{6}$.	.....	1589.	$\frac{2}{4}$, $\frac{6}{8}$, $\frac{9}{12}$	.....

ADDITION OF FRACTIONS.

79. **Addition of fractions** is the process of finding the sum of two or more fractions.

Example. What is the sum of $\frac{5}{7}$ and $\frac{1}{4}$?

Solution. Reduce the fractions to a common denominator. $\frac{5}{7} = \frac{20}{28}$ and $\frac{1}{4} = \frac{7}{28}$; 20 twenty-eights and 7 twenty-eights are 27 twenty-eights.

OPERATION.

$\frac{5}{7} \times \frac{4}{4} = \frac{20}{28}$

$\frac{1}{4} \times \frac{7}{7} = \frac{7}{28}$

$\frac{20}{28} + \frac{7}{28} = \frac{27}{28}$

80. **Rule.** *I.—Reduce the fractions to a common denominator, add the numerators and place the sum over the common denominator.*

II.—If the numerator is greater than the denominator divide to find the units and annex the remainder as a fraction If thereare units add them and annex the fraction to the result.

Note.—Before reducing to a common denominator, reduce each fraction to its lowest terms, and also the result after addition.

What is the sum of the following fractions

1590. $\frac{1}{2}$ and $\frac{2}{3}$

1591. $\frac{3}{4}$ and $\frac{2}{5}$

1592. $\frac{5}{6}$ and $\frac{4}{7}$

1593. $\frac{3}{7}$ and $\frac{9}{15}$

1594. $\frac{2}{9}$ and $\frac{4}{12}$

1595. $2\frac{5}{7}$ and $3\frac{2}{4}$

1596. $3\frac{2}{3}$ and $2\frac{3}{8}$

1597. $\frac{2}{3}$, $\frac{1}{4}$ and $\frac{1}{8}$

1598. $\frac{1}{7}$, $\frac{1}{2}$ and $\frac{3}{4}$

1599. $\frac{4}{5}$, $\frac{4}{8}$ and $\frac{1}{2}$

1600. $\frac{5}{6}$, $\frac{1}{8}$ and $\frac{1}{8}$

1601. $\frac{2}{3}$, $\frac{7}{10}$ and $\frac{1}{12}$

1602. $\frac{5}{9}$, $\frac{7}{12}$ and $\frac{8}{15}$

1603. $5\frac{1}{10}$, $7\frac{5}{12}$ and $10\frac{3}{5}$

1604. $8\frac{5}{8}$, $9\frac{3}{10}$ and $11\frac{5}{17}$

1605. $7\frac{4}{9}$, $6\frac{4}{7}$ and $5\frac{5}{11}$

1606. $18\frac{2}{3}$, $10\frac{19}{20}$ and $21\frac{11}{30}$

1607. $31\frac{5}{18}$, $40\frac{1}{19}$ and $6\frac{11}{40}$

1608. John had $\frac{3}{8}$ of a farm and bought $\frac{1}{3}$ more; how much has he now?

1609. Louis had $\frac{3}{5}$ of a ton of coal, he buys $\frac{1}{4}$ more; how much has he at present?

1610. Martin had $\$2\frac{1}{3}$, he receives $\$5\frac{1}{4}$, how much has he?

1611. Stephen had $10\frac{1}{2}$ acres and buys $11\frac{1}{3}$ acres, how many acres has he?

1612. Prudent receives $15\frac{1}{2}$ bushels from one farmer, $10\frac{1}{5}$ from another, $14\frac{1}{3}$ from another; how much has he in all?

1613. A merchant had $107\frac{3}{8}$ yards of cloth and buys $145\frac{1}{2}$ yards, how many yards has he?

1614. Rogatian sold $14\frac{3}{8}$ yards of silk and has $49\frac{1}{3}$ yards remaining, how many yards had he?

1615. Bernard sold $57\frac{3}{8}$ pounds of honey to Jack Shallow, $35\frac{1}{4}$ to Dan Duffy and has $17\frac{1}{6}$ remaining; how many pounds had he at first?

SUBTRACTION.

81. **Subtraction of fractions** is the process of finding the difference between two fractions.

Example.—Subtract $\frac{3}{4}$ from $\frac{7}{9}$.

Solution.—Reduce the fractions to a common denominator $\frac{3}{4} = \frac{27}{36}$ and $\frac{7}{9} = \frac{28}{36}$; then 27 thirty-sixths from 28 thirty-sixths leave $\frac{1}{36}$. This gives the following

OPERATION.

$$\frac{7}{9} - \frac{3}{4} = \frac{28}{36} - \frac{27}{36} = \frac{1}{36}$$

82. **Rule.**—*Reduce the fractions to a common denominator and subtract the numerators, and place the result over the common denominator.*

If there are units subtract the fractions and then subtract the whole numbers.

Note.—Reduce both the fractions, and the difference to their lowest terms.

Subtract

1616.	$\frac{2}{5}$	from	$\frac{4}{5}$	1623.	$\frac{2}{7}$	from	$\frac{7}{7}$
1617.	$\frac{2}{7}$	from	$\frac{3}{4}$	1624.	$\frac{9}{10}$	from	$1\frac{3}{4}$
1618.	$\frac{4}{9}$	from	$\frac{6}{8}$	1625.	$6\frac{7}{8}$	from	$9\frac{1}{2}$
1619.	$\frac{3}{10}$	from	$\frac{1}{2}$	1626.	$10\frac{1}{14}$	from	$15\frac{1}{2}$
1620.	$\frac{1}{7}$	from	$\frac{5}{12}$	1627.	$2\frac{1}{3}$	from	$5\frac{1}{2}$
1621.	$\frac{1}{4}$	from	$\frac{2}{9}$	1628.	$13\frac{3}{5}$	from	$21\frac{3}{7}$
1622.	$\frac{7}{16}$	from	$\frac{19}{20}$	1629.	$14\frac{1}{3}$	from	$18\frac{1}{4}$

1630. John has $\frac{3}{4}$ of a dollar and he gave James $\frac{1}{3}$ of a dollar; what had he remaining?

1631. Mary has $\frac{7}{8}$ of a pie, she gave her sister $\frac{5}{8}$ of it; how much how much has she?

1632. From $\frac{7}{8}$ of a ton of hay a farmer sold $\frac{3}{4}$ of a ton; what has he remaining?

1633. A merchant has $\frac{1}{2}$ of a ship, he then bought $\frac{1}{4}$ of the ship and afterwards sold $\frac{1}{3}$ of the ship; what has he on hand?

1634. The sum of two fractions is $\frac{7}{8}$, one of the fractions is $\frac{3}{4}$, what is the other?

1635. Three fractions make together $\frac{13}{20}$, one is $\frac{1}{5}$ and another $\frac{1}{4}$, what is the third?

1636. A man has $\frac{9}{10}$ of a dollar he owes John $\frac{1}{5}$ of a dollar and Peter $\frac{1}{2}$; what will he have after paying his debts?

1637. From $42\frac{1}{2}$ pounds of butter, a man sells $10\frac{1}{3}$ and $14\frac{1}{4}$ pounds; how much has he on hand still?

1638. Joseph had $45\frac{1}{4}$ cords of wood, he buys $30\frac{1}{2}$ cords and then sells $40\frac{1}{3}$ cords; how many cords has he now?

1639. John has $20 and pays $9\frac{1}{2}$ for a coat, $2\frac{1}{3}$ for a hat, and $4\frac{1}{3}$ for shoes; how much has he remaining?

MULTIPLICATION OF FRACTIONS.

Multiplication of fractions is the process of multiplying when one or both terms are fractions.

Case I.—*To multiply a fraction by a whole number.*

Example.—Multiply $\frac{5}{9}$ by 6.

OPERATION.

Solution.—6 times $\frac{5}{9}=\frac{30}{9}$, which reduced to its lowest terms equals $\frac{10}{3}$.

$\frac{5}{9} \times 6 = \frac{30}{9}$

$\frac{30}{9} = \frac{10}{3}$.

84. **Rule.**—*Multiply the numerator by the whole number and reduce the result to its lowest terms.*

Multiply

1640.	$\frac{9}{16}$	× 7	1644.	$\frac{10}{11}$	× 22
1641.	$\frac{3}{4}$	× 6	1645.	$\frac{5}{6}$	× 18
1642.	$\frac{5}{8}$	× 10	1646.	$\frac{4}{7}$	× 36
1643.	$\frac{12}{15}$	× 12	1647.	$\frac{3}{7}$	× 14

1648. John has $\frac{3}{8}$ of an acre and Louis has 10 times as much; how many acres has Louis?

Case II.—*To multiply a fraction by a fraction.*

Example.—Multiply $\frac{3}{4}$ by $\frac{5}{6}$.

OPERATION.

Solution.—Multiply the numerators together for a new numerator, and the denominators for a new denominator. Reduce the result to its lowest terms.

$\frac{3}{4} \times \frac{5}{6} = \frac{15}{24}$

$\frac{15}{24} = \frac{5}{8}$

85. **Rule.**—*Multiply the numerators together for the numerator, and the denominators together for the denominator of the product.*

Note.—1. If there are units in one of the factors reduce to an improper fraction before multiplying. Ex. $2\frac{1}{2}$ multiplied by $3\frac{1}{4}$. $2\frac{1}{2}=\frac{5}{2}$ and $3\frac{1}{4}=\frac{13}{4}$; $\frac{5}{2}\times\frac{13}{4}=\frac{65}{12}=7\frac{7}{12}$.

2. Reduce the result to its lowest terms.

What is the product of

1649.	$\frac{3}{7}$	by	$\frac{2}{5}$?	1654.	$1\frac{7}{12}$	by	$\frac{3}{7}$?
1650.	$\frac{3}{5}$	by	$\frac{4}{4}$?	1655.	$2\frac{1}{4}$	by	$3\frac{1}{3}$?
1651.	$\frac{5}{6}$	by	$\frac{9}{10}$?	1656.	$7\frac{1}{2}$	by	$10\frac{2}{3}$?
1652.	$\frac{7}{18}$	by	$\frac{2}{3}$?	1657.	$18\frac{5}{6}$	by	$\frac{5}{9}$?
1653.	$\frac{10}{11}$	by	$\frac{3}{8}$?	1658.	$40\frac{1}{5}$	by	$8\frac{1}{5}$?

1659. John has $\frac{2}{3}$ of $\frac{5}{6}$ tons of hay, Peter has $4\frac{1}{2}$ tons more; how many tons has Peter?

1660. What remains after selling the $\frac{4}{5}$ of $10\frac{1}{2}$ pounds of honey?

1661. Find the cost of $9\frac{1}{2}$ yards of cotton at $11\frac{1}{3}$ cents a yard?

1662. John pays for $14\frac{5}{6}$ pounds of coffee at $15\frac{1}{4}$ cents a pound, how much did he spend?

1663. What will 9 tons of coal cost at $\$6\frac{3}{4}$ a ton?

1664. A farmer sells $14\frac{2}{3}$ pounds of butter at $21\frac{3}{4}$ cents a pound; what does he receive?

1665. Martin has $\frac{5}{6}$ of a load of hay, Tobias has $\frac{4}{5}$ as much plus $3\frac{1}{4}$ tons; how much has Tobias?

1666. I have \$25, I buy $6\frac{1}{2}$ pounds of tea at 60 cents a pound, and 4 teapots at $\$3\frac{3}{5}$ apiece; what have I remaining?

1667. At $\$3\frac{1}{8}$ a yard what will $9\frac{3}{8}$ yards of cloth cost?

1668. A man pays $\$10\frac{1}{4}$ for a coat and $\frac{1}{2}$ as much for a vest; what will both cost?

1669. In a room containing 56 persons, $\frac{5}{7}$ are boys, $\frac{3}{8}$ are girls, how many remain?

1670. A dozen of eggs cost $\$\frac{1}{2}\frac{7}{0}$; what will 25 dozen cost?

1671. Find the cost of $20\frac{1}{2}$ pounds of cheese at $11\frac{3}{4}$ cents a pound.

DIVISION OF FRACTIONS.

86. **Division of fractions** is the process of dividing when one or both of the terms are fractions.

Case I.—*To divide when the dividend is a fraction.*

Example.—Divide $\frac{1}{1}\frac{2}{7}$ by 4.

Solution.—$\frac{1}{1}\frac{2}{7}$ divided by $4=\frac{3}{1}\frac{}{7}$. When the numerator will not contain the divisor, multiply the denominator by that number.

OPERATION

$\frac{1}{1}\frac{2}{7} \div 4=\frac{3}{1}\frac{}{7}$

87. **Rule.**—*Divide the numerator or multiply the denominator by the divisor.*

Divide.

1672.	$\frac{9}{13}$	by	3	1676.	$1\frac{2}{13}$	by	6
1673.	$\frac{3}{4}$	by	6	1677.	$\frac{1}{7}$	by	9
1674.	$\frac{5}{8}$	by	12	1678.	$3\frac{1}{4}$	by	10
1675.	$\frac{7}{12}$	by	11	1679.	$5\frac{1}{7}$	by	12

1680. I gave $\$5\frac{1}{2}$ to 8 little boys, what did each receive?

Case II.—*To divide when the divisor is a fraction.*

Solution. $\frac{5}{6}$ divided by 1 equals $\frac{5}{6}$. Hence $\frac{5}{6}$ divided by $\frac{1}{4}$ equals 4 times $\frac{5}{6}$, and $\frac{5}{6}$ divided by $\frac{3}{4}$ equal $\frac{1}{3}$ of 4 times $\frac{5}{6}$ or $\frac{1}{3}$ times $\frac{5}{6}$ which give $\frac{20}{18}$ or $\frac{10}{9}$. Hence $\frac{5}{6} \div \frac{3}{4} = \frac{5}{6} \times \frac{4}{3} = \frac{20}{18}$ or $\frac{10}{9}$ we see that the divisor becomes inverted.

OPERATION.

88. **Rule.**—*Invert the divisor and multiply the dividend by the resulting fraction.*

Divide.

1681.	$\frac{2}{3}$	by	$\frac{4}{5}$	1686.	$2\frac{1}{2}$	by	$\frac{7}{8}$
1682.	$\frac{7}{8}$	by	$\frac{1}{2}$	1687.	$4\frac{1}{2}$	by	$\frac{3}{4}$
1683.	$\frac{10}{13}$	by	$\frac{2}{5}$	1688.	$7\frac{1}{5}$	by	$\frac{6}{7}$
1684.	$\frac{18}{25}$	by	$\frac{6}{7}$	1689.	$12\frac{3}{4}$	by	$2\frac{1}{8}$
1685.	$\frac{11}{12}$	by	$\frac{12}{11}$	1690.	$15\frac{7}{9}$	by	$3\frac{3}{5}$

1691. How many pounds of butter at $\$\frac{3}{5}$ can be had for $\$2\frac{1}{2}$?

1692. At $\$7\frac{1}{5}$ per ton how much coal can be had for $\$50$?

1693. Divide $\$156$ among a group giving each $\$10\frac{1}{2}$; how many persons can be paid?

1694. I had $\$200$ and spent $\$96\frac{1}{3}$, how many acres of land can I buy with the remainder at $\$15\frac{1}{2}$ an acre?

MENTAL EXERCISES IN REDUCTION.

1695. If an apple is divided into two equal parts, what do you call: 1.— One of these parts; 2.— Two of these parts?

1696. What is the half: of 8; of 12; of 16; of 28?

1697. If a pound of butter cost 18 cents; how much will half a pound cost?

1698. Thomas bought 24 sheep; in selling half of them, how many does he sell?

1699. If I divide an apple into three equal parts, how do you call: 1.— One of these parts, 2.— 2, and 3 of these parts.

1700. What is the third: of 6; of 12; of 18; of 21?

1701. Henry had 30 cents, and he lost the third; how many cents did he lose?

1702. How many thirds are there in: 3 units; 5 units; 8 units?

1703. Louis having 42 marbles, gave the third of them to Edward; how many had he remaining?

1704. What are the two-thirds; of 9; of 15; of 24; of 30; of 27; of 33?

1705. How many thirds in: 1.—$4\frac{2}{3}$; 2.— $3\frac{1}{3}$; 3.— $2\frac{2}{3}$; 4.—$5\frac{2}{3}$?

1706. Joseph had 21 cents; he gave $\frac{2}{3}$ of them to his sister. How many cents did she receive?

1707. John lost the $\frac{2}{3}$ of $36; how much has he remaining?

1708. How many units in: 1.— $\frac{2}{3}$; 2.— $\frac{10}{3}$; 3.— $\frac{14}{3}$; 4.— $\frac{18}{3}$?

1709. If an apple is divided into four equal parts, what do you call: 1.— One of these parts; 2.— Two of these parts; 3.— Three of these parts?

1710. What is the fourth: of 12; of 20; of 32; of 48?

1711. What are the two-fourths: of 16; of 40; of 24; of 36?

1712. What are the three-fourths: of 20; of 24; of 16; of 12?

1713. If a yard of cloth cost $16, how much will the $\frac{3}{4}$ of a yard cost?

1714. James gave his brother the $\frac{1}{4}$ and his sister the $\frac{3}{4}$ of 28 oranges; how many did each receive?

1715. How many fourths: in 5; in 7; in $4\frac{3}{4}$?

1716. How many units: in $\frac{5}{4}$; in $\frac{11}{4}$; in $\frac{16}{4}$; in $\frac{14}{4}$?

1717. Victor is 24 years old and Alfred is $\frac{3}{4}$ as old; what is Alfred's age?

1718. If you divide an orange into 5 equal parts, what do you call 1, 2, 3 and 4 of these parts?

1719. What is a fifth?

1720. What is the fifth: of 25; of 10; of 15; of 30?

1721. What are the two-fifths: of 15; of 30; of 45; of 50?

1722. What are the three-fifths: of 10; of 30; of 25; of 55?

1723. What are the four-fifths; of 55; of 35; of 40; of 50?

1724. James has 15 oranges and Maurus has $\frac{2}{5}$ of this number; how many oranges has Maurus?

1725. Julia is 25 years old and her sister is $\frac{1}{5}$ of her age; how old is her sister?

1726. How many fifths: in 5; in 8; in $4\frac{2}{5}$; $6\frac{3}{5}$?

1727. Andrew is 35 years old and his wife is $\frac{3}{5}$ of his age; what is her age?

1728. If you divide a melon into 6 equal parts, what do you call 1, 2, 3, 4 and 5 of these parts?

1729. What are the two-sixths ; of 24 ; of 18 ; of 36 ; of 60 ?

1730. What are the five-sixths : of 18 ; of 54 ; of 24 ; of 72 ; of 36 ?

1731. What will the $\frac{5}{8}$ of 36 yards of cloth cost, at the rate of $2 a yard ?

1732. How many sixths : in 5 ; in $2\frac{1}{6}$; in $4\frac{3}{6}$?

1733. How many units : in $\frac{14}{6}$; in $\frac{12}{5}$; in $\frac{15}{5}$; in $\frac{5}{4}$?

1734. Alfred had 12 tops, and Louis had only the $\frac{3}{6}$ of this number less 4 ; how many tops had Louis ?

1735. Frank had 60 plums ; he gave Jane $\frac{2}{6}$ of them, and Charles the $\frac{3}{8}$; how many had he remaining ?

1736. If a yard of cloth cost $\frac{3}{5}$ of 50 cents ; how many yards can be bought for 60 cents ?

1737. How many : 1.—Fourths in 21 ; 2.— Fifths in 24 ; 3.—Sixths in 23 ?

1738. How many dollars in $\$\frac{36}{5}$?

1739. Express in whole numbers : 1.— $\frac{24}{5}$; 2.— $\frac{66}{11}$; 3.— $\frac{86}{10}$?

1740. What are the relation of the following fractions to unity ; 1.—$\frac{4}{5}$; 2.— $\frac{9}{10}$; 3.—$\frac{7}{4}$; 4.—$\frac{5}{5}$; 5.— $\frac{9}{5}$?

1741. If you divide a melon into 7 equal parts, how do you call 1, 2, 3, 4, 5 and 6 of these parts ?

1742. What is the seventh : of 21 ; of 28 ; of 42 ; of 56 ?

1743. What are the two-sevenths : of 28 ; of 49 ; of 63 ; of 70 ?

1744. What are the three-sevenths : of 14 ; of 35 ; of 49 ; of 49 ?

1745. What are the four-sevenths : of 70 ; of 77 ; of 63 ; of 84 ?

1746. What are the five-sevenths : of 77 ; of 91 ; of 42 ; of 28 ?

1747. What are the six-sevenths : of 35 ; of 42 ; of 49 ; of 140 ?

1748. How many sevenths in $9\frac{1}{7}$ pounds ?

1749. What are the lowest terms : of $\frac{36}{28}$; of $\frac{60}{90}$; of $\frac{36}{48}$?

1750. What is required to complete the unity : in $\frac{1}{4}$; in $\frac{2}{5}$; in $\frac{5}{9}$; in $\frac{12}{15}$?

1751. Express in cents : 1.— the $\frac{3}{4}$ of a dollar ; 2.— the $\frac{2}{3}$ of $1.50.

1752. How many bushels of potatoes in $\frac{5}{6}$ of a bushel ?

1753. A watch which cost $70 was sold for the $\frac{6}{7}$ of its cost. What was the loss ?

1754. If the half of 10 yards of cloth cost $10, what will $\frac{1}{3}$ of 6 yards cost ?

1755. If you divide anything into 8 equal parts, how do you call one of these parts ?

1756. What is the eighth : of 24 ; of 48 ; of 72 ; of 88 ?

1757. What are the three-eights : of 16 ; of 64 ; of 80 ; of 96 ?

1758. What are the five-eighths: of 8; of 24; of 48; of 64?

1759. How many times: Three in $\frac{3}{8}$ of 24; 5 in $\frac{5}{8}$ of 40; 8 in $\frac{4}{5}$ of 80; 7 in $\frac{7}{8}$ of 56; 12 in $\frac{6}{8}$ of 64; 3 in $\frac{7}{8}$ of 72?

1760. How many fourths: in $2\frac{1}{4}$; in $7\frac{3}{4}$?

1761. How many sevenths: in $5\frac{6}{7}$; in $3\frac{1}{7}$?

1762. How many sixths: in $7\frac{1}{6}$; in $3\frac{2}{6}$?

1763. How many eighths: in $7\frac{3}{8}$; in $5\frac{7}{8}$?

1764. Reduce $\frac{2}{3}$ to 12ths. $\frac{5}{6}$ to 30ths.

1765. " $\frac{7}{8}$ to 16ths. $\frac{1}{12}$ to 36 ths.

1766. " $\frac{9}{10}$ to 20ths. $\frac{7}{9}$ to 81sts.

1767. How many units: in $\frac{14}{6}$; in $\frac{28}{14}$; in $\frac{15}{5}$; in $\frac{16}{2}$; in $\frac{17}{8}$; in $\frac{21}{9}$; in $\frac{15}{7}$; $\frac{27}{9}$?

1768. What must be added to the following fractions to complete 2 units: 1.— $\frac{4}{3}$; 2.—$\frac{5}{8}$; 3.— $\frac{3}{7}$; 4.— $\frac{3}{5}$?

1769. If you divide an orange into 9 equal parts what part of the orange would you obtain if you take 1, 2, 3, 4, 5, 6, 7, 8, and 9 of these parts?

1770. What are the $\frac{2}{3}$: of 18; of 27; of 45; of 36?

1771. What are the $\frac{4}{9}$: of 9; of 36; of 54; of 81?

1772. What are the $\frac{5}{9}$: of 54; of 72; of 63; of 27?

1773. What are the $\frac{7}{9}$: of 18; of 99; of 27; of 108?

1774. What are the lowest terms: of $\frac{10}{2}$; of $\frac{9}{15}$ of $\frac{12}{3}$; of $\frac{8}{12}$; of $\frac{16}{20}$; $\frac{13}{45}$; of $\frac{4}{42}$; $\frac{27}{36}$?

1775. What is the sum of: 1.— 3 times 6 and $\frac{2}{3}$ of 6; 2.— 4 times 12 and $\frac{3}{4}$ of 12; 3.— 5 times 10 and $\frac{7}{10}$ of 10; 4.— 5 times 7 and $\frac{4}{7}$ of 7; 5. — 9 times 8 and $\frac{5}{8}$ of 8?

1776. Louis bought 15 horses and after selling 6, found that he required 4 to have 20. How many had he at first?

1777. How much should you pay for a case of soap, if the $\frac{3}{4}$ of a case cost $15?

1778. If the $\frac{3}{5}$ of a yard of cloth cost $6, what will a yard cost?

1779. If 5 yards of cloth cost $2.50, how much will 6 yards cost?

1780. What must you pay for 10 peaches, if 3 peaches cost $4\frac{1}{2}$ cents?

1781. 2 apples cost $\frac{6}{5}$ cents, what will 5 apples cost?

1782. What is the cost of 9 lamps, if 5 lamps cost $\$\frac{10}{3}$?

1783. Of what number is: 1.—6, three times its $\frac{1}{2}$; 2.—8, twice its $\frac{1}{4}$; 3.—16, four times its $\frac{1}{8}$; 4.—9, three times its $\frac{1}{8}$?

1784. Frank's coat cost $10 which sum equals $\frac{1}{3}$ of 6 times the price of his hat; how much did his hat cost?

1785. Of what number is: 9 the $\frac{3}{4}$; 6 the $\frac{2}{3}$, 10 the $\frac{2}{5}$; 12 the $\frac{4}{5}$?

1786. How many fourths of dollars will 7 baskets of peaches cost at $2\frac{1}{4}$ a basket?

1787. What will 3 dozen of eggs cost at $18\frac{3}{8}$ cents a dozen?

1788. Three loads of hay cost $\$\frac{1}{3}$, what will 6 loads cost?

1789. Tobias purchased 5 pair of shoes for $\$18\frac{3}{4}$, what did they cost a pair?

1790. If a yard of cloth cost $\frac{3}{5}$ of 50 cents, how many yards can be had for 60 cents?

1791. How often do the $\frac{3}{8}$ of 32 contain the $\frac{1}{8}$ of 12?

1792. How often do the $\frac{2}{3}$ of 56 contain the $\frac{2}{3}$ of 42?

1793. How often do the $\frac{2}{3}$ of 27 contain the $\frac{2}{4}$ of 12?

1794. A farmer having reaped 60 bushel of oats, sells $\frac{1}{3}$ to Michael and the $\frac{2}{5}$ of the remainder to Bernard, how many bushels has he left?

1795. Augusta gave $\$\frac{1}{8}$ to Johanna, $\$\frac{3}{8}$ to Mary and $\$\frac{1}{8}$ to Sara; how much did she give away?

1796. What will 3 yards of cloth cost, if $\frac{3}{7}$ of a yard cost $6?

1897. $\frac{3}{8}$ of a bushel of plums cost $2, how much will be paid for 3 bushels?

1798. If the $\frac{1}{2}$ of 8 yards of cloth cost $3\frac{1}{2}$, how much will 9 yards cost?

1799. Mulvena is 4 years old; his age is $\frac{1}{9}$ of $\frac{1}{4}$ of the age of his father; what is his father's age?

WRITTEN EXERCISES.

1800. Reduce $\frac{4}{5}$ and $\frac{6}{7}$ to the same denominator?

1801. Which is the greater of the two fractions $\frac{3}{8}$ and $\frac{8}{11}$?

1802. Joseph empties $\frac{1}{5}$ of a tun in 8 hours; Louis empties the $\frac{1}{15}$ in the same time. Which is the more active?

1803. How many sixths: in $\frac{1}{2}$; in $\frac{1}{3}$; $\frac{2}{3}$?

1804. How many eighths: in $\frac{1}{2}$; in $\frac{1}{4}$; $\frac{3}{4}$?

1805. How many twelfths: in $\frac{1}{3}$; in $\frac{2}{4}$; in $\frac{7}{6}$.

1806. Reduce $\frac{2}{3}$, $\frac{3}{4}$, and $\frac{5}{6}$ to twelfths.

1807. Reduce $\frac{1}{2}$ and $\frac{1}{7}$ to a common denominator.

1808. If $2\frac{1}{2}$ yards of lace cost 13 cents what will 3 yards cost?

1809. How many fourths in $\frac{1}{2}$, $\frac{6}{8}$, $\frac{9}{12}$, $\frac{10}{8}$.

1810. What must you add to or substract from the following expressions to have $1\frac{1}{2}$:— $\frac{3}{4}$, $\frac{6}{3}$, $\frac{16}{2}$, $\frac{5}{6}$?

1811. How many fifteenths: in $\frac{2}{3}$; in $\frac{2}{5}$; in $\frac{4}{5}$; in $\frac{6}{3}$?

1812. Reduce the following fractions to a common denominator: $\frac{1}{2}$, $\frac{3}{8}$, $\frac{3}{4}$, $\frac{4}{5}$.

1813. Eugène lost 20 roses which were $\frac{2}{3}$ of all his number. How many had he?

1814. Write in order of their value $\frac{3}{8}$, $\frac{2}{5}$, $\frac{3}{4}$, $\frac{5}{8}$.

1815. How many sixths: in $\frac{1}{2}\frac{0}{2}$; $\frac{9}{1}\frac{}{8}$; in $\frac{3}{3}$; in $\frac{5}{1}\frac{}{2}$?

1816. Reduce: $\frac{6}{1}\frac{}{0}$ to fifths; $\frac{8}{1}\frac{}{2}$ to fourths; $\frac{7}{1}\frac{}{4}$ to halves; $\frac{9}{1}\frac{}{2}$ to fourths; $\frac{6}{8}$ to thirds; $\frac{8}{2}\frac{}{4}$ to sixths; $\frac{9}{2}\frac{}{1}$ to sevenths; $\frac{1}{3}\frac{8}{6}$ to nineths.

1817. If 8 is $\frac{4}{5}$ of a number, what is the $\frac{1}{5}$ of twice that number?

1818. Two boys buy coffee at 30 cents a pound, one buys $3\frac{1}{2}$ pounds; the second $2\frac{1}{3}$ pounds. Who spends the more?

1819. Reduce to a common denominator: 1.— $\frac{2}{3}$ and $\frac{3}{5}$, 2.— $\frac{1}{4}$ and $\frac{1}{5}$; 3.— $\frac{1}{3}$ and $\frac{1}{7}$; 4.—$\frac{3}{8}$ and $\frac{3}{8}$; 5.— $\frac{2}{3}$ and $\frac{2}{5}$; 6.— $\frac{3}{4}$ and $\frac{7}{1}\frac{}{0}$.

1820. Reduce to a common denominator; 1.— $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$; 2.— $\frac{1}{5}$, $\frac{1}{4}$, $\frac{1}{8}$; 3.— $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$; 4.— $\frac{1}{2}$, $\frac{1}{5}$, $\frac{1}{1}\frac{}{0}$.

1821. Joseph found 60 cents which equals $\frac{5}{4}$ of $\frac{1}{2}$ of what he then had; how much had he at first?

1822. Paul said to Arthur; "Would you prefer to receive the $\frac{5}{6}$ or the $\frac{3}{8}$ of my money and why"?

1823. Reduce the following fractions to their lowest terms: $\frac{1}{2}\frac{5}{4}$; $\frac{2}{3}\frac{4}{4}$; $\frac{2}{4}\frac{8}{0}$; $\frac{3}{6}\frac{5}{0}$; $\frac{2}{4}\frac{5}{5}$; $\frac{3}{3}\frac{5}{5}$.

1824. Four times 50 years is 10 years less than 10 times Philip's age. What is Philip's age?

1825. How many lemons would be required to pay 7 oranges, if 6 lemons equal $4\frac{2}{3}$ oranges.

1826. Which is the smallest of the following fractions: $\frac{1}{2}$, $\frac{4}{5}$, $\frac{5}{1}\frac{}{1}$, $\frac{5}{8}$?

1827. What will $3\frac{1}{3}$ pounds of sugar cost if $2\frac{1}{2}$ pounds cost 25 cents?

1828. A horseman can travel 21 miles in $3\frac{1}{2}$ hours, how far will he travel in $5\frac{1}{3}$ hours?

1829. Henry gives 16 cents to a beggar and John gives $\frac{1}{5}$ of a dollar. Who was the more generous and by how much?

1830. Reduce to their lowest terms: $\frac{5}{1}\frac{}{0}$, $\frac{8}{1}\frac{}{2}$ and $\frac{1}{1}\frac{5}{8}$; and then reduce to a common denominator.

1831. If it requires $8\frac{3}{4}$ yards of cloth for 2 coats, how many yards will 9 coats require?

1832. $\frac{3}{4}$ of 48 oranges cost 40 cents, what will $\frac{2}{3}$ of 12 oranges cost?

1833. It requires $1\frac{1}{4}\frac{0}{}$ days for 6 men to build a boat; how long will it take 8 men to build it?

1834. Reduce to an improper fraction:— $2\frac{3}{4}$; $5\frac{3}{5}$; $6\frac{2}{7}$; $4\frac{1}{3}$; $5\frac{2}{3}$; $2\frac{5}{8}$; $3\frac{3}{7}$; $8\frac{2}{3}$; $4\frac{2}{4}$; $6\frac{2}{7}$; $5\frac{1}{8}$; $9\frac{1}{8}$; $7\frac{3}{3}$; $8\frac{3}{4}$; $6\frac{5}{8}$; $9\frac{1}{3}$; $7\frac{3}{8}$; $8\frac{3}{4}$; $6\frac{6}{8}$; $9\frac{1}{4}$.

1835. A man earns $5\frac{1}{4}$ in 3 days, how much will he earn in 5 days?

1836. What should a man pay for 8 barrels of apples at $3\frac{3}{4}$ a barrel?

1837. How many: eights in $\frac{4}{16}$, $\frac{12}{24}$; fifths in $\frac{6}{15}$, $\frac{16}{20}$; sevenths $\frac{10}{21}$, $\frac{9}{21}$; nineths in $\frac{18}{18}$, $\frac{15}{17}$; tenths in $\frac{16}{20}$, $\frac{21}{30}$, $\frac{24}{40}$, $\frac{25}{50}$?

1838. Alfred owns 2 small bags of marbles, he has $\frac{1}{5}$ more in one than in the other. What improper fraction will represent all his marbles?

1839. Louis gave Joseph 48 cents; the $\frac{5}{8}$ of which equals 4 times what Louis still has; how much had he at first?

1840. What cost 36 oranges at $\frac{2}{3}$ of a cent each?

1841. What will you pay for $16\frac{2}{3}$ yards of calico at $9\frac{1}{2}$ cents a yard?

1842. Apples cost $2\frac{1}{2}$ per barrel; what will be paid for 84 barrels?

1843. A man paid $2\frac{1}{4}$ for 6 yards of tweed, what will one yard cost?

1844. At $18\frac{3}{4}$ cents a yard, what will $24\frac{2}{7}$ yards of ribbon cost?

1845. A butcher buys sheep at $8 a head, how many will he get for $46?

1846. A farmer has $14\frac{2}{3}$ tons of hay and sells $9\frac{5}{6}$ tons, what remains?

1847. A speculator has $125\frac{3}{8}$ yards of cloth, he buys $90\frac{3}{4}$ yards more, how many yards has he?

1848. Two fractions together give a sum of $1\frac{1}{8}$, one is $\frac{5}{7}$, what is the other?

1849. A boy earns $19\frac{3}{4}$ a month and spends $12\frac{2}{3}$, what will he have is 6 months?

1850. John gave his sister $40\frac{1}{4}$ pints of berries and has $14\frac{5}{8}$ remaining, how many pints had he?

1851. A merchant sold 6 more than the $\frac{1}{3}$ of 60 bushels of oats; how many bushels remain?

1852. How many yards of tweed at $\frac{5}{8}$ of a dollar a yard can be bought for $18\frac{3}{5}$.

1853. I sold $32\frac{3}{4}$ pounds of coffee at $16\frac{1}{2}$ cents and received $5, how much is due?

1854. How many sheep at $8\frac{1}{3}$ per head can a man buy for $200\frac{1}{2}$?

1855. I spent $1.86\frac{1}{3}$ for meat at $16\frac{1}{4}$ cents a pound, how many pounds did I buy?

1856. The product of two fractions is $\frac{5}{6}$, one of them is $\frac{2}{9}$, what is the other?

1857. The quotient of two numbers is $\frac{1}{2}$; the divisor is $\frac{1}{4}$ what is the dividend?

1858. By what number must you multiply $\frac{3}{5}$ to get $13\frac{1}{2}$?

1859. By what number must $3\frac{1}{5}$ be divided to get $\frac{4}{9}$?

1860. If $\frac{3}{4}$ of an acre of land cost $36, what will 8 acres cost?

1861. What is the distance from Montreal to Quebec, if $\frac{3}{5}$ of the distance is 108 miles?

1862. If $\frac{1}{8}$ of a farm cost $120, what would 8 similar farms cost?

1863. A barrel of flour costs $18, what will $\frac{1}{6}$ of a barrel cost?

1864. If $\frac{3}{4}$ of a barrel of flour cost $12, what will $\frac{2}{3}$ of a barrel cost?

1865. Louis had $1240 he spends $\frac{2}{5}$ of it and then $\frac{3}{4}$ of the remainder, how much has he now?

DENOMINATE NUMBERS.

104. A **Denominate** number is a concrete number in which the unit is a measure; as, 5 *pounds*, 6 *yards*, 3 *minutes*.

105. **Reduction** is the process of changing a number from one denomination to another, without changing its value.

It may be either **ascending** or **descending**.

CURRENCY.

106. **Money** is the measure by which we estimate the value of things.

Currency is money used as a circulating medium.

Table.

10	mills	(*m*)	equal	1	cent	*ct.*
10	cents		"	1	dime	*d.*
10	dimes		"	1	dollar	$.

107. Coins are made either of copper, silver or gold:

The 50 cts, 25 cts, 10 cts, and 5 cts, are made of silver.

The 1 ct, and 2 cts, of copper.

Exercises.

1865. How many cents in $3\frac{1}{2}$?

1866. How many 10 cent-pieces: 1.— in 50 cts; 2.— in $1; 3.— in $2.30; 4.— in $3.80?

1867. How many 5 cent-pieces would be required for: 1.— 65 cts; 2.— 90 cts; 3.— $1.70; 4.— $5.25?

1868. How many 25 cent-pieces: 1.— in $4.25; 2.— in $6.50; 3.— in $7.75?

1869. I owed Henry $4.20; I gave him 60 five-cent pieces. How much do I still owe him?

1870. I have 5 pieces of 50 cents, and 3 pieces of 25 cents. How many dollars and cents have I?

1871. How many cents in: 1.— $\frac{1}{2}$; 2.— $\frac{1}{4}$; 3.— $\frac{3}{4}$; 4.— $\frac{1}{8}$; 5.— $\frac{3}{8}$; 6.— $\frac{5}{8}$?

1872. What part of 8 cents is the $\frac{3}{5}$ of 10 cents?

ENGLISH MONEY.

108. **English money** is the money of Great Britain.

Table.

4 farthings (*far.*)	equal	1 penny	*d.*
12 pence	"	1 shilling	*s.*
20 shillings	"	1 pound or sovereign	*£.*
21 shillings	"	1 guinea	*g.*

Note.—The pound or sovereign is worth $4.866. A crown is worth 5 shillings.

Exercises.

1873. How many farthings in 10 d. and 3 far.?
1874. How many pence in 15s. and 9 d.?
1875. How many farthings in £ 15 5s. 3d.?
1876. How many shillings in 900 far.?
1877. Reduce 3178 pence to pounds?
1878. In 9760 farthings, how many pounds?

MEASURES OF WEIGHT.

Troy.

109. **Troy weight** is used in weighing gold, silver, jewels, &c.

Table.

24 grains (*gr.*)	equal	1 pennyweight	*pwt.*
20 pennyweights	"	1 ounce	*oz.*
12 ounces	"	1 pound	*lb.*

Exercises.

How many :

1879. Grains in 4 oz. 5 pwt ?
1880. Pounds in 7365 grs ?
1881. Grains in 3 lb. 4 oz. 6 pwt?
1882. Pennyweights in 2 lb. 3 oz ?
1883. Oz., and pwt., in 4170 grs ?
1884. lb., oz., and pwt. in 10302 grs?

Apothecaries'.

110. **Apothecaries' weight** is used in measuring medecines.

Table.

20 grains (*gr.*)	equal	1 scruple	*scr.*
3 scruples	"	1 dram	*dr.*
8 drams	"	1 ounce	*oz.*
12 ounces	"	1 pound	*lb.*

Exercises.

How many :

1885. Grains in 3 oz. 4 dr ?
1886. Drams in 2 lb. 3 oz. 5 dr ?
1887. Drams in 960 gr ?
1888. Pounds and oz. in 239 drams ?
1889. Oz. in 4800 grains ?
1890. Pounds, &c., in 91304 gr ?

AVOIRDUPOIS WEIGHT.

111. **Avoirdupois weight** is used in weighing all common goods.

Table.

16	ounces (*oz.*)	equal	1	pound	*lb.*
100	pounds	"	1	hundred-weight	*cwt.*
20	hundred-weight	"	1	ton	*T.*

Note. A quarter is one-fourth of a hundred-weight.

Exercises.

How many :

1891. Oz. in 3 cwt ?
1892. Pounds in 5 T 10 cwt ?
1893. Pounds in 976 oz ?
1894. Cwt in 1000 oz ?
1895. T in 15630 oz ?
1896. Ounces in 20 cwt 16 lbs 5 oz?

1897. How many ounces in : 1.— 3 lbs ; 2.— 5 lbs ; 3.— 8½ ?

1898. If I pay 3¾ cents for 5 ounces of soda, how much will I pay for : 1.— 2 lbs ; 2.— 5 lbs ; 3.— 6 lbs ; 4.— 7½ lbs ?

1899. For 4 ounces of camphor I pay 14 cents ; how many ounces can be bought for : 1.— 21 cents ; 2.— 35 cents ; 3.— 42 cents ?

MEASURE OF LENGTH.

112. **Measure of length or long measure** is used in measuring length, breadth, depth, etc.

Table.

12	inches (*in.*)	equal	1	foot	*ft.*
3	feet	"	1	yard	*yd.*
5½	yards or 16½ ft	"	1	rod	*rd.*
320	rods	"	1	mile	*mi.*
3	miles	"	1	league	*l.*

Note.—In the old tables 40 rods=1 furlong and 8 furlongs=1 mile.

Exercises.

1900. How many inches in : 1.— 3 ft.; 2.— 4 yds 6 ft ?

1901. How many inches in : 1.— 4 rd. 5 yds.; 2.— 5 yds. 2 ft. 4 in.?

1902. How many miles in : 1.— 13720 feet ; 2.— 870 rods ?

1903. How many yards in : 1.— 375 inches ; 2.— 97 ft. 5 in.?

1904. How many inches between Montreal and Quebec if the distance is 180 miles ?

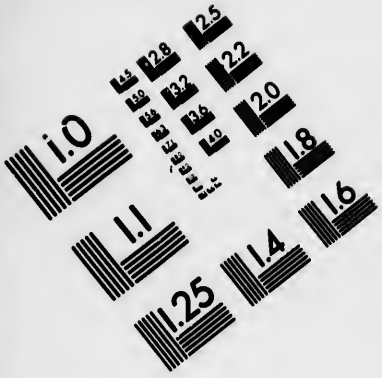
SURFACE OR SQUARE MEASURE.

113. **Surface or Square measure** is used in measuring surfaces; as, boards, lands, etc.

Table.

144	square inches (*sq. in.*)	equal	1	square foot	*sq. ft.*
9	square feet	"	1	square yard	*sq. yd.*
30¼	square yards	"	1	perch or square rod	*P.*
160	perches	"	1	acre	*A.*
640	acres	"	1	square mile	*sq. mi.*

[redacted]



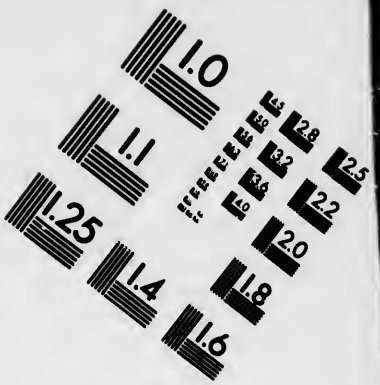
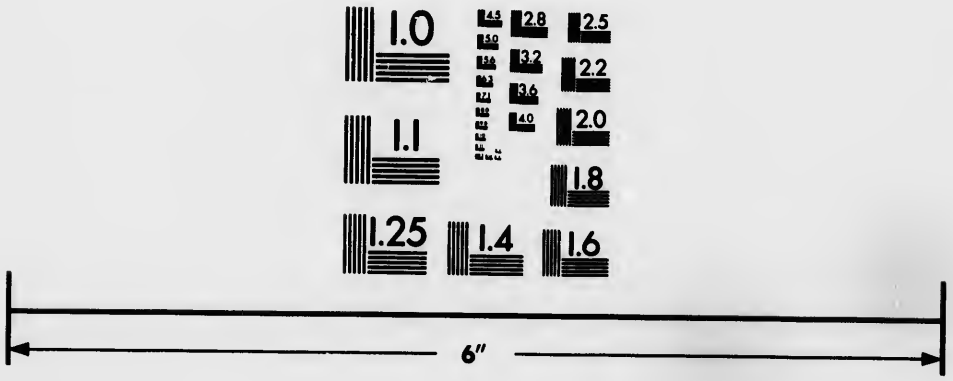


IMAGE EVALUATION
TEST TARGET (MT-3)



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Exercises.

How many :

1905. Square in. in 3 sq. yds. 7 sq. ft ?
1906. Perches in 9760 sq. ft ?
1907. Square feet in 3 A. 4 P. 5 sq. yds ?
1908. Square ft. in 3 P. 8 sq. yds. 3 sq. ft ?
1909. Acres in 120460 sq. ft ?
1910. Acres in 35670 square yards ?

CUBIC OR SOLID MEASURE.

114. **Cubic or Solid measure** is used in measuring things which have length, breadth and thickness.

Table.

1728	cubic inches	(*cu. in.*	equal	1 cubic foot	*cu. ft.*
27	cubic feet		"	1 cubic yard	*cu. yd.*
16	cubic feet		"	1 cord foot	*cd. ft.*
8 cord feet or 128 cubic feet			"	1 cord of wood	*cd.*

Exercises.

How many :

1911. Cu. in. in 5 cu. yds. 6 cu. ft. 4 cu. in ?
1912. Cubic yards in 24560 cu. in. ?
1913. Cu. ft. in 9 cords of wood ?
1914 Cords in 8756 cu. ft. ?

LIQUID MEASURE.

115. **Liquid measure** is used in measuring nearly all kinds of liquids.

Table.

4 gills (*gi*)	equal	1 pint	*pt.*
2 pints	"	1 quart	*qt.*
4 quarts	"	1 gallon	*gal.*
31½ gallons	"	1 barrel	*bbl.*
63 gallons	"	1 hogshead	*hhd.*

Exercises.

How many :

1915. Gills in 6 quarts 4 pints ; in 5 gals ; in 4 quarts ?
1916. Quarts, in 1 barrel ; in 16 gals ; in 2 hhds ?
1917. Gallons in 560 pints ; Hhds in 1000 quarts ; bbls. in 760 gals ?

DRY MEASURE.

116. **Dry measure** is used in measuring dry substances; as, grain, fruit, salt, &c.

Table.

2 pints (*pt*)	equal	1 quart.	*qt.*
8 quarts	"	1 peck.	*pk.*
4 pecks	"	1 bushel.	*bu.*

Exercises.

1918. In 170 pints how many pecks; how many bushels in 200 quarts?

1919. How many pints in 2 bushels; in 3 pecks 2 quarts?

1920. What part of 3 pecks are 6 pints?

1921. At 10 cents a peck, how many bushels of corn can I buy for $3?

1922. I gave 5 quarts of salt at 15 cents a pint, for potatoes at 50 cents a bushel; how many bushels of potatoes will I receive?

MEASURE OF TIME.

117. **Measures of time** are those used to measure periods of duration.

The *unit* of the measure of time is the day.

Minor divisions of the day and year.

60 seconds (*sec.*)	equal	1 minute.	*m.*
60 minutes	"	1 hour.	*hr.*
24 hours	"	1 day.	*da.*
7 days	"	1 week.	*wk.*
4 weeks	"	1 month.	*mo.*
12 month or 52 weeks	"	1 year.	*yr.*
365 days	"	1 common year.	

Names of the twelve months of the year with their respective number of days.

January	31 days.	July	31 days.
February	28 " (29)	August	31 "
March	31 "	September	30 "
April	30 "	October	31 "
May	31 "	November	30 "
June	30 "	December	31 "

Exercises.

1923. How many seconds in : 1.— 2 minutes ; 2.— 3 minutes ; 3.— 6 minutes ; 4.— 1 day ?

1924. How many minutes in : 1.— 3 hours ; 2.— 4 days ; 3.— 120 seconds ?

1925. How many hours in : 1.— 2 days ; 2.— 240 seconds ; 3.— 1 year ?

1926. How many days in : 1.— 3 weeks ; 2.— 8 weeks ; 3.— 48 hours ?

1927. How many minutes : in 1 year ; 2.— hours in 53,780 seconds ?

CIRCULAR MEASURE.

118. **Circular measure** is used to measure angles.

Table.

60 seconds (″)	equal	1 minute.	′
60 minutes	"	1 degree.	°
30 degrees	"	1 sign.	*S*
12 Signs, or 360 degrees	"	1 circle	*C*

Exercises.

How many :

1928. Seconds in 5 minutes ?

1929. Minutes in 8 degrees ?

1930. Seconds in 4° 3′ 2″ ?

1931. Minutes in 500 seconds ?

1932. Degrees in 1750 seconds ?

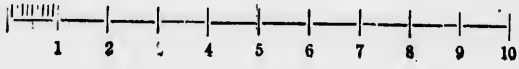
1933. Minutes in 15 ?

DECIMAL FRACTIONS.

119. **A Decimal Fraction**, or simply a **decimal**, is a number of the decimal divisions of a number ; that is, a number divided into *ten*, a *hundred*, etc. equal parts.

120. When the unit is divided into ten parts each part is a *tenth* ; if into a hundred parts, *hundredths*, etc.

If a line be divided into ten parts, each part will be one **tenth** of the unit which is here the line, two parts will be two tenths, etc.



Should one tenth be divided into ten equal parts, each of these parts would be a **hundredth**; if one hundredth be divided into ten equal parts, each one will be a **thousandth**,..

Tenths are then ten times less than unity, the hundredths ten times less than tenths, thousandths ten times less than hundredths,.....

121. A decimal fraction is generally expressed by placing a point before the numerator and omitting the denominator. Thus, .6 represents $\frac{6}{10}$; .06 represents $\frac{6}{100}$.

The point is called the *decimal point*.

Numeration and Notation Table.

8th.	7th.	6th.	5th.	4th.	3d.	2d.	1st.	2d.	3d.	4th.	5th.	6th.	7th.	8th.
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Ten-millions.	Millions.	Hundred-thousands.	Ten-thousands.	Thousands.	Hundreds.	Tens.	Units.	Tenths.	Hundredths.	Thousandths.	Ten-thousandths.	Hundred-thousandths.	Millionths.	Ten-millionths.

EXERCISES IN NUMERATION.

Example. Read the decimal .47.

Solution. This expresses 4 tenths and 7 hundredths, 4 tenths equal 40 hundredths and 40 hundredths plus 7 hundredths equal 47 hundredths. Hence

122. **Rule.** *Read the decimal as a whole number and give it the denominator of the last term on the right; numerate towards the point to determine the numerator, and from the point for the denominator.*

To read a decimal number, read the whole number and then the decimal part to which the name of the decimal unity of the last figure is given.

Thus .8 is read eight *tenths*.
.75 " seventy-five *hundredths*.
.004 " four *thousandths*.
.0705 " seven hundred and five *ten-thousandths*.
26.4 " twenty-six and four *tenths*.
24.07 " twenty-four and seven *hundredths*.
11.017 " eleven and seventeen *thousandths*.
108.00012 " one hundred and eight and twelve *hundred-thousandths*.

EXERCISES.

I. Read the following decimal numbers:

1934.	.01	.001	.0001	.00001	.000001
1935.	.02	.020	.200	.0200	.002
1936.	.025	.205	.25	.250	.2005
1937.	.20050	.3008	.803	.8300	.80030
1938.	.80003	.027	.4006	.3010	.30607
1939.	.123456	.500	.00500	.00005	.10407
1940.	.36092	.0876	.0051	.00051	.50001
1941.	.54321	.908006	.9864	.100200	.00605
1942.	.10065	.00705	.003281	.004682	.1067390
1943.	.015	.2004	.1206007	.06987	.698765

1944.	1.5	2.21	3.60	25.05
1945.	50.70	75.07	320.32	10.09
1946.	96.006	309.0870	123.987	56.6543
1947.	5701.4	6542.004	8.01045	5070.006
1948.	8965.00009	104.00185	37.010849	185.0678
1949.	12345.07	2083.0102	105.102343	24.00956
1950.	4005.005	17.0306	9.30051	8.05063
1951.	15073.2	1061.075	34.00703	145.7
1952.	231.0061	24.0208	439.115	5402.509
1953.	7.00075	10.01023	25.6403	198.2047

EXERCISES IN NOTATION.

Example.—Express 36 hundredths in the form of a decimal.

Solution.(1) 36 hundredths equal 3 tenths and 6 hundreds, and this is expressed by writing a decimal point before 36, thus .36.

Rule. *Write the decimal as you would a whole number, placing the decimal point so as to give each figure its proper place, using ciphers after the decimal point if necessary.*

III. Express the following decimal fractions in figures.

1954. Three *tenths*, four *hundredths*, seven *thousandths*.

1955. Six *ten-thousandths*, twelve *hundredths*, thirteen *thousandths*.

1956. Seven *hundred-thousandths*, eight *millionths*.

1957. Nine *ten-millionths*, fourteen *ten-thousandths*.

1958. Fifteen *hundred-thousandths*, one hundred and twenty-four *ten-thousandths*.

1959. Two hundred and twenty-eight *hundred-millionths*.

1960. Four thousand four hundred *ten-thousandths*.

1961. Eight hundred and fifty-six *hundred-thousandths*.

1962. Twenty-three thousand nine hundred *millionths*.

1963. One hundred and seven thousand and eighteen *ten-millionths*.

1964. Thirty thousand four hundred and seventy-two *hundred-thousandths*.

1965. Seven hundred and ninety *billionths*.

1966. Thirty-four tenths, two thousand and thirty-five hundredths.

1967. Four hundred and twenty-seven thousand and eighteen thousandths.

1968. Fifteen thousand three hundred and thirty-four hundredths.

1969. Three hundred and forty and five tenths.

1970. Fifty-six and sixty-five hundredths.

1971. One hundred and twenty-three and forty-eight thousandths.

1972. Eight hundred and fifty-two dollars and fifteen cents.

1973. Sixteen and two thousand four hundred and twenty ten-thousandths.

1974. Nine thousand eight hundred and twelve dollars and three cents.

1975. Seventy-five and thirty-two millionths.

1976. Six hundred and twenty-four dollars and ninety cents.

(1) Young pupils are sometimes helped to seize the method of writing decimals, by being told to call the point *a unit of the order of the decimal number to be written*. Thus seven thousandths are written as one thousand and seven=.007 in like manner four thousand and one millionths, would be written as one million four thousand and one=.004001.

1977. Five hundred thousand and six ten-millionths.
1978. One thousand and four and twenty five ten-thousandths.
1979. Five cents, one hundred dollars and ten cents.
1980. Ninety three and fifty thousandths.

123. **Principles.**—1. *Changing the decimal point one place towards the right multiplies the number by* 10; *two places, by* 100, *etc.*

2. *Changing the decimal point one place towards the left divides the number by* 10; *two places, by* 100, *etc.*

3. *Placing a cipher between the decimal point and a decimal divides the decimal by* 10; *placing two, by* 100, *etc.*

Thus: To multiply 67 by 10 we would write 670; by 100, 6700. In like manner to divide 67 by 10 we would write 6.7; by 100, .67; adding a cipher to .0175, changes the number to .00175 which is ten times smaller than .0175.

124. The value of a decimal is not changed when one, two, three, etc., zeros are written to the right of it, because after this operation the number obtained contains ten times, one hundred times, etc., more parts, but these parts are ten, a hundred or a thousand times smaller than the first.

Exercises on the Method used to make a number 10, 100, 1000, etc., times greater or less.

1981. Make the number 25

1.	10	Times greater.
2.	100	
3.	1000	
4.	10000	
5.	100000	
6.	1000000	

1982. Make the number 4.75

1.	10	Times greater.
2.	100	
3.	1000	
4.	10000	
5.	100000	
6.	1000000	

1983. Make the number 0.05

1.	10	Times greater.
2.	100	
3.	1000	
4.	10000	
5.	100000	
6.	1000000	

1984. Make the number 48946.04

1.	10	Times less.
2.	100	
3.	1000	
4.	10000	
5.	100000	
6.	1000000	

1985. Make the number 3.65

1.	10	Times less.
2.	100	
3.	1000	
4.	10000	
5.	100000	
6.	1000000	

1986. Make the number 137.006

1.	10	Times less.
2.	100	
3.	1000	
4.	10000	
5.	100000	
6.	1000000	

1987. Make the following numbers each 10 times greater :
1.— 47 ; 2.— $2.60 ; 3.— 6.2 ; 4.— 5.30 5.— $14.35.

1988. Make the following numbers each 100 times greater :
1.— 3.18 ; 2.— 632 ; 3.— $5.39 ; 4.— 8.3 ; 5.— 0.025.

1989. Make the following numbers each 1000 times greater :
1.— 97 ; 2.— $24.50 ; 3.— 0.019 ; 4.— 28 ; 5.— $1.05.

1990. Make the following numbers 10 times smaller :
1.— 82 ; 2.— 6 ; 3.— $518 ; 4.— 0.07 ; 5.— $3.00.

1991. Make the following numbers 100 times smaller :
1.— 604 ; 2.— $5.15 ; 3.— 7.4 ; 4.— $202 ; 5.— $5.40.

1992. Make the following numbers 1000 times smaller :
1.— 1344 ; 2.— $33.09 ; 3.— 14.5 ; 4.— 65 ; 5.— 0.0165.

1993. Make the number 15.04 : 1.— 10 times greater ; 2.— 1000 times smaller ; 3.— 100 times greater ; 4.— 10 times smaller ; 5.— 100000 times greater ; 6.— 100 times smaller.

Oral Exercises.

1994. How many tenths in a unit ? hundredths ?

1995. How many tenths would be required to make a unit ?

1996. How many hundred-thousandths would be required to make one ten-thousandth ?

1997. How many thousandths in a hundredth ? How many ten-thousandths ?

1998 What number of ten-thousandths will be required to make a unit ?

1999. In one tenth how many thousandths ?

2000. How many thousandths in a unit ?

2001. In one thousandth, how many millionths ?

2002. How many ten-thousandths in one tenth ?

2003. To what are one hundred tenths equal ? one hundred hundredths ?

2004. How many thousandths in one thousand ?

2005. To write a thousandth, how many figures will be required ?

2006. How many to write a millionth ?

2007. How many figures in ten-millionths ? in hundred-thousandths ?

REDUCTION OF DECIMALS.

125. The **Reduction of Decimals** is the process of changing their form without changing their value.

There are two cases:

1. To reduce decimals to common fractions,

2. To reduce common fractions to decimals.

126. **Case I.** *To reduce a decimal to a common fraction.*

Example. Reduce .75 to a common fraction.

Solution. .75 expressed as a common fraction, is $\frac{75}{100}$, which reduced to its lowest terms equals $\frac{3}{4}$. Hence

127. **Rule.**—*Write the denominator under the decimal omitting the decimal point, and reduce the fraction to its lowest terms.*

Reduce the following decimals to common fractions:

2008.	.45	2013.	9.48
2009.	.60	2014.	13.725
2010.	.48	2015.	.075
2011.	.130	2016.	.0325
2012.	.0175	2017.	.01025

128. **Case II.** *To reduce a common fraction to a decimal.*

Example. Reduce $\frac{3}{8}$ to a decimal.

Solution. $\frac{3}{8} = \frac{1}{8}$ of 3. 3 equals 30 tenths, and $\frac{1}{8}$ of 30 tenths is 3 tenths and 6 tenths remaining. 6 tenths equal 60 hundredths, and $\frac{1}{8}$ of 60 hundredths is 7 hundredths and 4 hundredths remaining. 4 hundredths equal 40 thousandths, $\frac{1}{8}$ of 40 thousandths is 5 thousandths: therefore $\frac{3}{8}$=.675. Hence the

129. **Rule.**—1. *Annex ciphers to the numerator and divide by the denominator;*

2. *Point off as many places in the quotient as there are ciphers annexed.*

Reduce the following common fractions to decimals:

2018.	$\frac{1}{4}$	2023.	$\frac{9}{16}$
2019.	$\frac{3}{4}$	2024.	$\frac{11}{25}$
2020.	$\frac{5}{8}$	2025.	$\frac{14}{25}$
2021.	$\frac{1}{5}$	2026.	$\frac{15}{64}$
2022.	$\frac{5}{16}$	2027.	$\frac{9}{75}$

ADDITION OF DECIMALS.

Example. Required the sum of 23.04, 675.632 and 7509.857.

Solution. Write the numbers so that the figures of the same order stand in the same column, and proceed as in the addition of whole numbers.

OPERATION.

23.04
675.632
7509.857
8208.529

130. **Rule.**—1. *Write the numbers so that the units of the same order shall stand in the same column;*

2. *Add, as in whole numbers, placing the decimal point at its proper place in the sum.*

Exercises.

2028.	0.3	2029.	0.715	2030.	4 21	2031.	0.12015
	0.2		1.20		0.352		3.022
	0.4		3.5		2.2		15.0254
	0.01		1.07		0.4012		0.3503
	Ans.		Ans.		Ans.....		Ans.....
2032.	0 32	2033.	0.700	2034.	0.923	2035.	0.003
	0.40		0.210		5.007		0.06009
	0.102		0.342		0.05		213.4
	0.226		12.025		0.2003		0.1215
	Ans.		Ans.		Ans.		Ans.

2036. 0.496+0.03+0.1316+0.07+0.18.
2037. 0.02+0.108+0.316+0.24+0.007.
2038. 0.2801+0.0034+0.0025+0.7.
2039. 0.05072+0.5072+0.072+0.65.
2040. 0.2302+0.91402+0.702+0.08.
2041. 0.1023+0.83+0.00442+0.7+0.954.
2042. 0.90086+0.121+0.21+0.12115+0.82.
2043. 0.2+0.21+0.215+0.2015+0.000453+0.04.
2044. 0.0024+0.54121+0.0032+0.203+0.76+0.03.
2045. 12.025+4.25+4.003+213.4+57.10032+3.09.
2046. 247.07+76.295+7849.089+84676.007.

2047. 3.0025+32.4053+313.006+178.17+11213.7.

2048. 23.456007+0.40789+152204+27.1+0.003.

2049. 4754 807 + 29.005 + 679387.07 + 84696.695 + 757878.454 + 689374.275.

2050. 49.87 + 875.755 + 74784.389 + 897576.5 + 49854.354 + 976489 675.

2051. 48776.37 + 84.35 + 7469.879 + 489374.207 + 684978.654 + 97.95.

2052. 687.85+678798.475 + 705875.309 + 74207.75 + 397689.876 + 79787.765.

2053. 8.45 + 7569.875 + 876474.769 + 97895.395 + 789784.7 + 895887.876.

2054. Add together 25 and 4 tenths, 1205 and 6 tenths, 9 and 52 thousandths, fifty and 19 hundredths, 104 and 2 hundred-thousandths.

2055. Add 3 and 25 thousandths, 1075 and 45 hundredths, 96 and 482 thousandths.

2056. Find the sum of 12025 and 8 tenths, 5702 and 44 thousandths, 77 and 149 thousandths.

2057. What is the total of 17 hundred-thousandths, 600 ten-thousandths, 2303 thousandths, 15 ten-thousandths, 37 hundredths, nine and 45 hundred-thousandths, 1 and 91008 ten-thousandths?

2058. Find the total of 1023 ten-thousandths, 21 hundred-thousandths, 96 thousandths, 9 thousandths, and 1032 hundred-thousandths.

2059. What is the sum of 45 and 5 hundredths, 104 and 8 tenths, 1003 and 25 thousandths, 7 and 1038 ten-thousandths?

2060. Add 814 and 27 hundredths, 12 and 704 thousandths, 1003 and 4 tenths, and 57 and 1004 ten-thousandths.

2061. Find the sum of 113 and 25 hundredths, 12915 and 423 ten-thousandths, and 45 and 2131 hundred-thousandths.

2062. What is the sum of 567 ten-thousandths, 12 and 2131 ten-thousandths, 452 and 233 hundred-thousandths, 5 and 36 hundredths?

2063. Add together 11 and 3 tenths, 305 and 4 ten-thousandths, 56678 millionths, and 12780 and 125 thousandths.

2064. What is the total of 1130 and 42 tenths, 300 hundredths, 10563 ten-thousandths, and 78 and 710003 millionths?

2065. Find the sum of 1203 thousandths, 1003 and 70 tenths, 7810 and 345 ten-millionths, and 37 and 302 hundredths.

SUBTRACTION OF DECIMALS.

Example. Subtract 73.435 from 156.78.

Solution. Place the terms as for the subtraction of whole numbers so that the units of the same order be in the same column. Place the decimal point 3 figures from the right, and the difference is 83345 thousandths or 83.345.

	156.78
	73.435
	83.345

131. Rule.—1. *Write the numbers so that the figures of the same order stand in the same column;*

2. *Subtract as in whole numbers and place the decimal point in its proper place in the difference.*

Exercises.

2066.	764907.05	—	87929.795
2067.	246.572	—	26.372
2068.	346176.007	—	78487.878
2069.	741 7236	—	330 6126
2070.	656450.054	—	78677.09
2071.	702.432	—	601.53
2072.	376570.005	—	87745.15
2073.	987.5293	—	983.4193
2074.	752475.754	—	89287.95
2075.	5.86196	—	5.76006
2076.	897450.07	—	98776.095
2077.	87.5009	—	13.916
2078.	423750.5	—	56879.75
2079.	27.72369	—	7.72138
2080.	356842.25	—	47974.745
2081.	246.72361	—	127.9506
2082.	754754.7	—	37679.25
2083.	5.80106	—	2.59
2084.	267475.75	—	79797.975
2085.	37.52	—	18.642
2086.	764704.23	—	87957.747
2087.	27.532086	—	19.8421
2088.	465742.5	—	98298.25
2089.	1.3	—	1.2456
2090.	576427.9	—	89550.957
2091.	47.006	—	46.29864
2092.	654652.5	—	73475.76

2093.	51.019	—	17.02984
2094.	843276.75	—	77787.985
2095.	387.	—	300.6721
2096.	357402.5	—	69776.756
2097.	4.160196	—	4.06309
2098.	654565.5	—	78749.895
2099.	0.00831	—	0.0077
2100.	467517.5	—	89349.756
2101.	23.501006	—	9.4619
2102.	489476.376	—	4787.45
2103.	6.1	—	0.011196
2104.	467465.75	—	8234.975
2105.	0.7002	—	0.56203
2106.	748760.4	—	279429.75
2107.	112.023	—	91.90909
2108.	476435.5	—	285489.875
2109.	0.5	—	0.0006
2110.	378989.01	—	189471.875
2111.	37.	—	0.02345
2112.	641764.05	—	576376.476
2113.	0.00235	—	0.000139
2114.	870079.04	—	198789 958
2115.	0.1	—	0.019
2116.	578576.5	—	289709.769
2117.	0.023	—	0.007412
2118.	487854.5	—	198965.428
2119.	45.00035	—	39.000419
2120.	745600.05	—	87740.275
2121.	477456.72	—	98748.809
2122.	789576.5	—	99767.357
2123.	742576.853	—	179407.07
2124.	754252.5	—	272189.756

2125. What must be added to eighty-three units and four thousand one hundred and ninety-three hundred-thousandths, to have nine hundred and eighty-seven and fifty-two thousand nine hundred and twenty hundred-thousandths?

2126. Diminish three hundred units and twenty-three ten-thousandths by twenty-seven and nine hundredths.

2127. Subtract fifty-seven and fifty-three thousandths from one one hundred and two hundred and nineteen hundred-thousandths.

2128. How much do three hundred and forty-five and seventy-two thousand three hundred and sixty-one hundred-thousandths, exceed three hundred and forty-four and eight-thousand two hundred and three ten-thousandths?

2129. What remains when seventy-six tenths are diminished by seventy-six thousandths?

2130. How much greater are two hundred and thirty-seven and seven hundred and two hundred-thousandths than one hundred and thirty-six and twenty-five millionths?

MULTIPLICATION OF DECIMALS.

Example. Find the product of 48.5 by 6.23.

Solution. We multiply as in whole numbers, and if the multiplicand alone were tenths the answer would be 30215.5, but since the multiplier is also hundredths, the product is one-hundredth of 30215.5, which by moving the decimal point two places to the left becomes 302.155. Hence the

```
 48.5
 6.23
 ----
 1455
 970
2910
------
302.155
```

132. **Rule.**—*Multiply as in whole numbers and point off as many decimal places in the product as there are decimals in both multiplicand and multiplier, prefixing ciphers if necessary.*

Exercises.

2131.	787254.25 ×	74	2146.	764527.907 ×	679
2132.	765679.854 ×	78	2147.	176986.465 ×	8479
2133.	794377.225 ×	59	2148.	149653.805 ×	4987
2134.	487789.095 ×	57	2149.	239576.003 ×	7968
2135.	883749.005 ×	89	2150.	690523.414 ×	47907
2136.	354835.27 ×	459	2151.	470075.237 ×	89423
2137.	795678.745 ×	786	2152.	450845.74 ×	47496
2138.	287407.617 ×	897	2153.	705496.855 ×	9496
2139.	198793.001 ×	974	2154.	970075.085 ×	79826
2140.	25490.005 ×	678	2155.	845974.075 ×	20327
2141.	647972.829 ×	984	2156.	943765.45 ×	37048
2142.	47907.853 ×	685	2157.	345678.075 ×	44695
2143.	774357.907 ×	568	2158	745643.25 ×	84796
2144.	557800.004 ×	786	2159.	545676 ×	29.125
2145.	980017.004 ×	678	2160.	937004 ×	9.875

2161.	674347	× 154.7	2193.	0.79645	× 0.85
2162.	471089	× 9.765	2194.	0.45654	× 9.75
2163.	345807	× 29.025	2195.	0.3747	× 4.495
2164.	674257	× 49.054	2196.	7.4748	× 0.405
2165.	647835	× 42.05	2197.	0.9876	× 7.009
2166.	980075	× 547.076	2198.	8.07594	× 0.004
2167.	975687	× 906.078	2199.	0.5632	× 0.479
2168.	547374	× 700.09	2200.	0.0797	× 9.4004
2169.	856374	× 596.007	2201.	0.4356	× 0.7409
2170.	937095	× 670.007	2202.	8.907	× 9.405
2171.	534624	× 53.075	2203.	5.045	× 3 217
2172.	950357	× 149.078	2204.	9.565	× 3.007
2173.	456089	× 78.08	2205.	6.425	× 7.907
2174.	789376	× 764.576	2206.	2.6789	× 3.007
2175.	687009	× 87.870	2207.	4.8055	× 4.975
2176.	746589	× 698.765	2208.	7.5675	× 3 764
2177.	859407	× 524.689	2209.	4.205	× 9.7475
2178.	975009	× 47.007	2210.	6.4765	× 9.805
2179.	607456	× 874.95	2211.	808954.305	× 407.005
2180.	670407	× 854 354	2212.	804950.075	× 874.09
2181.	651476	× 97.005	2213.	764205.456	× 307.54
2182.	542805	× 37.450	2214.	689424.760	× 9.05
2183.	807904	× 752.459	2215.	547485.927	× 6.07
2184.	0.75425	× 0.054	2216.	589770.054	× 4.225
2185.	0.87565	× 0.745	2217.	579745.089	× 87.009
2186.	0.4896	× 0.37	2218.	879476.875	× 47.95
2187.	0.6546	× 0.05	2219.	474605.085	× 47.05
2188.	0.706	× 0.89	2220.	585467.057	× 78.09
2189.	0.4586	× 0.07	2221.	764562.080	× 876.04
2190.	0.6458	× 0.03	2222.	679405.907	× 576.47
2191.	0.03767	× 0.024	2223.	974354.02	× 976.007
2192.	0.0747	× 0.145	2224.	675489.007	× 847.0 25

2225. What is the product of twenty-three by twenty-two and thirty-five hundredths?

2226. Multiply twenty-five and forty-three thousandths by nine and two hundred and sixty-four thousandths.

2227. What is the product of twenty-seven and five hundred and five thousandths by seventy-two hundredths?

2228. How much are one hundred and sixteen and one hundred and twenty-four ten-thousandths multiplied by thirty-four thousandths?

2229. If you multiply fifty-seven thousandths by thirteen and one hundred and sixty-seven thousandths, what will be the product?

2230. What is the result of sixty-three ten-thousandths multiplied by seventy-two hundred thousandths?

2231. What number do you obtain by multiplying thirty-five hundredths by thirty-seven millionths?

DIVISION OF DECIMALS.

Example. Divide 7.96618 by 3.14.

Solution. Divide as in whole numbers and the quotient is 2537; now since the dividend is the product of the quotient and the divisor, the number of decimal places in the dividend must equal the number in the divisor and in the quotient; hence the number of decimals in the quotient equals the number of places in the dividend dimished by those of the divisor; there are then 5 less 2 = 3 decimal places in the quotient; the answer then is 2.537. Hence the

OPERATION.

7.96618 (3.14
628 2.537
1686
1570
1161
942
2198
2198

133. **Rule.** *Divide as in whole numbers, and point off as many decimal places in the quotient as the number of decimals in the dividend exceeds the number in the divisor.*

Note.—1. When there are not so many decimals in the dividend as in the divisor, annex ciphers to make the number of places equal.

2. When the number of figures in the quotient is less than the excess of decimal places in the dividend over those in the divisor, prefix ciphers to the quotient.

3. When a division has a remainder, decimals may be had in the quotient by adding ciphers to the dividend and continuing the division.

Exercises.

2232.	76.04	÷	8	2247.	415.02	÷	719
2233.	89.026	÷	14	2248.	905.025	÷	795
2234.	74.205	÷	25	2249.	874.05	÷	978
2235.	45.255	÷	15	2250.	967.85	÷	796
2236.	84.015	÷	30	2251.	807.025	÷	986
2237.	195.3	÷	45	2252.	60.	÷	0.08
2238.	87.017	÷	50	2253.	144.	÷	0.36
2239.	307.50	÷	12	2254.	216.	÷	0.03
2240.	550.85	÷	40	2255.	525.	÷	0.015
2241.	635.85	÷	75	2256.	672.	÷	0.0012
2242.	873.45	÷	72	2257.	1280.	÷	0.32
2243.	647.96	÷	32	2258.	1010.	÷	0.025
2244.	716.451	÷	434	2259.	123.	÷	1.20
2245.	607.88	÷	550	2260.	542.	÷	2.5
2246.	745.801	÷	754	2261.	454.	÷	6.40

2262.	643.	÷	1.60	2291.	5 2474	÷	0.72
2263.	747.	÷	4.5	2292.	4.7054	÷	0.805
2264.	795.	÷	9.60	2293.	0 7524	÷	4.0072
2265.	875.	÷	2.5	2294.	70.257	÷	7.9
2266.	8945.	÷	76.805	2295.	0.5374	÷	2.819
2267.	9764.	÷	32.005	2296.	47.1154	÷	9.007
2268.	29754.	÷	395.125	2297.	16.017	÷	8.05
2269.	379745.	÷	395.14	2298.	17.042	÷	9.05
2270.	924807.	÷	79.305	2299.	54.5	÷	7.95
2271.	895476.	÷	547.085	2300.	84.375	÷	16.5
2272.	4205684.	÷	987.675	2301.	97.6	÷	23.51
2273.	7466854.	÷	4761.25	2302.	157.050	÷	9.1
2274.	0.175	÷	0.5	2303.	457.075	÷	12.079
2275.	0.14	÷	0.56	2304.	845.08	÷	47.805
2276.	0.16	÷	0.4	2305.	509.74	÷	27.56
2277.	0.125	÷	0.25	2306.	405.7	÷	79.27
2278.	0.54	÷	0.75	2307.	817.405	÷	99.99
2279.	0.5406	÷	0.30	2308.	352.1	÷	12.812
2280.	0.3954	÷	0.25	2309.	379.035	÷	9.009
2281.	0.7155	÷	0.5	2310.	807.4	÷	29.05
2282.	0.795	÷	0.25	2311.	957.025	÷	17.005
2283.	0.3754	÷	0.032	2312.	6428.5	÷	340.5
2284.	0.3217	÷	0.740	2313.	7467.08	÷	154.4
2285.	0.5742	÷	0.7526	2314.	8421.51	÷	111.11
2286.	0.3251	÷	0.437	2315.	6703.01	÷	201.1
2287.	0.4	÷	0.2107	2316.	7507.4	÷	107.6
2288.	0.9	÷	0.105	2317.	8421.55	÷	235.07
2289.	0.0075	÷	0.12	2318.	9205.04	÷	717.004
2290.	0.0025	÷	0.14	2319.	5412.02	÷	641.07

2320. How many times are 7 and fifty-five hundredths contained in five thousand three hundred and fifty-five ?

2321. The product of two numbers is one hundred and eighty-five and six hundred and twenty-five thousandths ; one number is one and four hundred and eighty-five thousandths ; what is the other number ?

2322. How many times can you take two and six hundredths from forty-two and eight hundred and sixty-four thousandths ?

2323. Divide forty-two and five tenths by fifteen and three hundred and eighty-five thousandths ?

2324. The product of a multiplication is nine thousand nine hundred and seventy-four ten-thousandths and the multiplier is one hundred and five thousandths. What is the multiplicand ?

2325. By what number will you divide fifty-six thousandths to have one thousand four hundred thousandths as quotient ?

2326. The dividend is two hundred thousandths and the quotient two hundredths ; what is the divisor ?

2327. By what number will you divide two hundredths to have a quotient of two hundred-thousandths ?

2328. What is the quotient of 564 and 48 hundredths by 36 ?

2329. The product of two fractions is 9, one of the factors is 1 and 8 tenths ; find the other.

BILLS.

134. A **Bill** is a memorandum of articles sold to a person with their prices.

Models of Bills.

Quebec, January 6, 1893.

Mr. PAUL R. DILLON,

Bought of S. P. LEAHY.

5 lbs.	Coffee	à $ .36	$1	80
12 "	Lard	.14		
4 "	Ham	.12		
8 "	Salt Beef	.10		
12 "	Butter	.22		
6 "	Cheese	.16		
15 "	Maple Sugar	.08		
			$9	56

Recd Payt,

S. P. LEAHY.

Levis, March 6, 1893.

Messrs. COLLINS & Co.,

Bought of STEPHEN BROS.

6 prs	Men's shoes, buff	at	$1.80	$
5 "	Lady's "		1.20	
4 "	Boy's "		.80	
8 "	Children's Laced shoes		.90	
5 "	Men's shoes, calf		3.50	
3 "	Lady's ", buff		1.50	
				$ 49 20

Recd Payt,

STEPHEN BROS.

per J. HEALY,

Montreal, January 4, 1893.

Mr. L. T. MOORE,

Bought of J. C. HART,

7 yds.	Ribbon	at	$ .24	$
10 "	English Tweed	"	2.25	
10 "	Merino	"	1.75	
8 "	Red Flannel	"	.30	
6 "	Flanders Linen	"	.45	
4 "	Grey Cotton	"	.08	
	Total			$

Halifax, July 7, 1893.

Mr. F. PERRY,

Bought of EDWARD FRASER,

5	doz.	Rhubarb	at $ .30	$
3	bunches	Radish	" .40	
8	"	Asparagus	" .20	
2	bushels	Spinage	" .75	
4	pints	Strawberries	" .25	
6		Cucumbers	" .05	
2	bunches	Carrots	" .12	
2	"	Turnips	" .10	
		Total		$

Quebec, October 2, 1893.

Mr. A. PATTON,

Bought of JOSEPH MCDONALD,

12	bush.	Oats	at $ .45	$
15	"	Barley No. 1	" .68	
8	"	" No. 2	" .65	
20	"	Peas	" .85	
35	"	Potatoes	" .48	
45	"	Spring Wheat	" 1.09	
24	"	Autumn "	" 1.07	
				$

Recd Payt,

JOSEPH MCDONALD.
Per D. KEARNEY.

Montreal, May 10, 1893.

Mr. L. C. Morrisson,

To D. R. Barrow, Dr.

1893			$	
April	3	For M. Kitz, 1¼ yds. Broadcloth.... @ $4.60		
"	"	1¼ yds. Lining..... @ .35		
"	"	Cut and furnishing	1	60
May	7	5⅞ yds. Vervins, Mantle Cloth..... @ 5.10		
"	"	2¼ yds. Blk. Velvet, for furnishing and collar..... @ 5.20		
"	"	Buttons and cut.....	3	40

Three Rivers, September 6, 1893.

Mr. J. A. Drayton,

To Arthur Kelly. Dr

1893			$	
March	20	2 lbs. Ginger..... at $ .15		
"	"	50 " Whiting ..... " .09		
"	"	3 bbls. Salt..... " 1.18		
April	2	4½ doz. Eggs..... " .20		
"	"	5 lbs. Butter..... " .18		
"	"	3 bottles Blue Ink..... " .36		
"	"	4 gal. Kerosene oil..... " 1.12½		
May	7	12 lbs. Soap..... " .08½		
"	"	5 " Valentia Grapes ..... " .09		
"	"	25 lbs Prunes..... " .11		
"	"	5½ " Cheese..... " .18		

Quebec, December 5, 1893.

Mr. O. Sweet,

To T. G. Morrison, Dr.

1893						
Jan.	2	To 45 lbs. Coffee.....	at $ .40	$		
Feb.	6	" 18 yds. Broadcloth.....	" 3.50			
"	17	" 30 " Merino.....	" .75			
		Cr.				
Jan.	20	By 20 bush Oats.....	at $ .45			
March	3	" 40 " Potatoes.....	" .36			
		Balance due.....				$
						$

Recd Payt.

T. G. Morrisson.

BILLS AND ACCOUNTS.

2330. Montreal, Feb., 2nd, 1893, Mr. John Hogan bought of Mr. Jos. Levin, viz : 7 lbs. Chocolate at 25 cts. ; 15 lbs. Candles at 22 cts. ; 12 lbs. White Sugar at 15 cts.; 18 lbs. Flour at 24 cts. What is the amount of the bill ?

2331. Mr. John Kearney of Quebec sold to H. Perrault, Feb. 6th : 18 yds. Lace at $2.45 ; 5 pairs Kid Gloves at 45 cts. ; 12 Ladies Fans at 70 cts.; 2 Lace Curtains at 55 cts.; 4 doz. Lamb Skins at 25 cts. per pair ; 12 Needle Cases at 24 cts. What is the amount of his purchase ?

2332. Feb. 24th, A. Orsali bought of O. Kearney : 2 doz. Colored Shirts at $7.80 ; 3 doz. Handkerchiefs at $4.40 ; 1½ doz. Neck-ties at $3.40 ; ½ doz. Shirt buttons at 12½ cts. apiece ; 12 yds. Rose ribbon at 15 cts.; 10¾ yds. Cotton at 18 cts. Find the amount of the bill.

2333. J. Sweeney of Chicago sold J. McGee, Jan. 5th, 1893, viz : 37 yds. Sheeting at 26 cts.; 43 yds. Merino at 82 cts.; Feb. 6th.: 75 yds. Holland Linen at 45 cts.; 209 yds. Calico at 14 cts.; 330 yds. Wrapping Linen at 16 cts. What is the footing of the bill ?

2334. May 15th, 1893, C. Hart sold to E. Cadieux : 8 "Lessons in English", Elementary Course, Pupil's Edition at 25 cts.; 2 "Lessons in English," Elementary Course, Teacher's Edition at 75 cts.; 6 "Lessons in English," Intermediate Course, Pupil's Edition at 40 cts.; 2 "Lessons in English," Intermediate Course, Teacher's Edition at $1.00 ; 4 "Lessons in English," Superior Course, Pupil's Edition at 60 cts.; 1 "Lessons in English, "Superior Course, Teacher's Edition at $1.75. Find the amount of the purchase ?

2335. March 18th, 1893, Mr. F. Irwin bought of T. Love : 4 yds. Silk at $3.60 ; 4½ yds. Ribbon at 56 cts.; 6⅔ yds. Serge at 72 cts ; 1½ yds. Cassimere at $2.20 ; 1½ yds. Blue Cloth at $3.40 ; 8 pair Slippers at 36 cts.; 2½ yds. Linen at 68 cts.; 1⅔ doz. Shirt Collars at 92 cts. What is the amount due ?

2336. March 20th 1893, Mr. T. Doran bought of Brown Bros : 52 lbs. Maple Sugar at 7½ cts.; 4 bbls. Flour (extra) at $7.80 ; 9½ lbs Cheese at 16 cts.; 15 lbs Currants at 8 cts.; 7 lbs. Black Pepper at 42 cts.; 20 lbs Butter at 24 cts.; 1½ bush. Peas at 70 cts.; 3 bush. Beans at $1.10 ; 14½ lbs Ham at 16 ; What is the amount of the bill ?

2337. Mrs. Jas. Shea bought of Messrs Duggan Bros. on May 21 : 1 pair Black Socks at $1.07. July 2nd, 2 pair Hunting Shoes at $2.90. Sept. 10th, 2 pair Gaiters at $1.80 ; 1 pair English Laced Shoes at $1.30. What is the amount of the bill ?

2338. Mr. T. O'Connor sold M. Fanning as follows ; March 9th, 1893, 15 pair Hunting Shoes at $3.75 ; 8 pair Woolen Socks at 86 cts. April 17th, 12 pair Gaiters at $2 72. March 26th, M. Fanning gave in payment : 12 bbls. Apples at $3.15 ; April 25th, $10.50 cash. How much does he still owe ?

2339. C. Hart sold W. O'Brien as follows : May 3rd 1893, 15 lbs. White Sugar at 14 cts.; 7 lbs. of Butter at 18 cts.; 4 gals. Petroleum oil at 45 cts.; 7½ lbs. Coffee at 32 cts.; 12 lbs. Rice at 7½ cts.; 9 lbs. Tea at 48 cts.; 5 bbls. Apples at $1.80 ; 20 gals. Syrup at 72 cts.; 1 bag Salt at 37 cts.; 15 lbs. Prunes at 8 cts. What is the amount of this transaction ?

2340. J. C. Kearney of Pt St. Charles sold W. C. Rogers, June 4th 1893 : 20 lbs. Coffee at 24 cts.; 50 lbs. Brown Sugar at 7 cts.; 75 lbs. Starch at 13 cts.; 12 gals. Syrup at 65 cts.; 90 lbs. Butter cakes at 9 cts.; 54 lbs. Sweet Biscuits at 11 cts. What is the footing of the bill ?

2341. S. Carsley sold F. Irwin, July 14th, 1893 : 5 yds. of Black Cloth at $3.50 ; 1 Satin Waistcoat at $5.50 ; 3 yds. Gray Linen at 19 cts.; 10 yds. Gray Fringe at 68 cts.; 3 pcs. Ribbon at 31 cts.; 3 yds. Blk. Cassimere at $2.25 ; 7½ yds. Alpaca at 55 cts.; 16 yds. Lining at 10½ cts.; 4 skeins Silk at 5½ cts.; 4 yds. Wadding at 6 cts.; 9 yds. White Flannel at 90 cts.; 2 Cravats at $1.12½ ; 4¼ yds. Green Fastening at 58 cts.; 6 Collar Shirts at 15½ cts. What is the amount of the invoice ?

2342. March 10th, 1893, A. Howard sold C. Cunningham : 18 lbs. Tobacco at 32 cts.; 25 lbs. Powdered Tobacco at 40 cts.; 72 lbs. Tobacco in leaves at 18 cts.; 54 lbs. White Sugar at 12 cts.; 20 lbs. Soap at 14 cts.; 45 gals. Molasses at 37 cts. April 8th, he received in payment $3.00. What amount remains due ?

2343. June 5th, P. McKenna bought of Hart & Tuckwell of Montreal : 32 bls. Apples at $2.95 ; 56 cases Oranges at $2.25 ; 16 cases Lemons at $1.80 ; 40 boxes Raisins at $2.75 ; 20 boxes Figs at $1.04½. What is the amount of the bill ?

2344. May, 20th, 1893, W. Rogers of Ottawa sold J. J. McGee : 40 lbs. of Sugar at 7 cts.; 15 lbs. Coffee at 36 cts.; 76 bush. Potatoes at 45 cts.; 12½ gals. Syrup at 40 cts.; 95 lbs. Sugar Biscuits at 8 cts. What was the amount of the sale ?

2345. On Feb. 4th, 1893. Mr. G. Harris bought of A. L. Fortier : 17 yds. Broadcloth at $5.25 ; Feb. 15th, 29 yds Cassimere at $1.62 ; March 13th, 60 yds. Linen at 17 cts.; March 14th, 49 yds. Canvas at 27 cts.; the 15th, 18 yds. Blue Cloth at $3.19 ; July 17th, 27 yds. Grey Cloth at $2.75 ; Sept. 3rd, 75 yds. Red Flannel at 61 cts. Mr. Harris gave on account : Feb. 28th, 1893, Cash $83 ; July 25th, 14 bls. of Flour at $7.20. Having settled on Sept. 4th, what was the balance due ?

2346. January 10th 1894, A. Richards sold to S. V. Poston : 174¼ lbs. Quinquina at 60 cts.; 321⅜ Gum lacque at $1.45 ; 607½ lbs. Rhubarb at $2 90 ; 720 lbs. Gum Arabic at 25 cts.; 509½ lbs. Sassafras at 15⅜ cts. What is the amount of the sale ?

2347. April 15th, 1893, Mr. H. Farrel bought of Orsali O'Hara : 8 spools White Thread at 7 cts.; 6½ yds. Merino at $1.08 ; 7¼ yds. Prints at 15 cts.; Cloth and Lining for coat $7.60 ; 1⅜ yds. Cassimere for pants at $3.12 ; Lining for pants 37 cts.; 18½ yds. Irish Linen at 52 cts.; 3 yds. Green Ribbon at 35 cts.; what was the amount of the purchase ?

2348. Sold by D. Raymond to M. A. Scott, August 28th, 1893 ; 12 lbs. Brazilian Coffee at 37½ cts.; 9 lbs. Green Tea at 56 cts.; 2 boxes

Chocolate 70 lbs. at 22 cts.; 2 boxes Grapes at $3.25 ; 25½ lbs. Porto Rico Cassonade at 7 cts.; 34⅔ lbs. Butter at 19 cts.; Onions 32 cts.; 4 yds. Black Cloth at $2.75.; 9½ yds. Belgium Linen at 27 cts.; 6 pair Kid Gloves at 87 cts.; 1½ doz. White Handkerchiefs at $2.15 ; what amount does A. Scott owe ?

2349. On May 17th 1893, J. Hardy & Co sold to Mr. F. X. Burns, the following : 2½ doz. Common Glasses at 40 cts.; 1½ doz. Blue Plates at 75 cts.; 3 gals. Honey at 90 cts.; ½ gal. Molasses at 46 cts.; 3½ gals. Linseed Oil at $1.25 ; 15 lbs. Cheese at 18 cts.; 4 lbs. Salmon at 12 cts.; ½ doz. Bottles Olive oil at 56 cts. each ; 2 lbs. Pepper at 45 cts ; 12 lbs. Fresh Butter at 26 cts.; 7½ lbs Pork Chops at 10 cts.; find the amount of this sale ?

2350. Sold by L. Gingras to Madam H. Smith, June 20th 1893 : 5 lbs. Coffee at 32 cts.; 7 lbs. Sugar at 8 cts.; Pepper 15 cts.; 12½ lbs. Maple Sugar at 10 cts.; ½ lb. Tea at 54 cts.; 1½ gals Syrup at 70 cts.; ½ bush. Dry Apples at $2.12 ; 1½ doz. Small Plates at 48 cts.; 9½ lbs. Rice at 6 cts.; 6 lbs. Black Tea at 56 cts.; 8 Tablets Perfumed Soap at 8 cts.; 20 lbs. Mackerel at 9½ cts.; 6 lbs. Candy at 22½ cts.; find the amount of the sale ?

2351. May 9th 1893, T. Lynch & Co. sold to J. Conlon : 14 yds. Heavy Cloth at $3.60 ; 18 yds. Satin at $1.12½ ; 24 yds. Merino at $1.90 ; 48 yds. Cassimere ot $1.37½ ; 64 yds. Colored Flannel at 75 cts. Find the amount of the bill ?

2352. June 10th 1893, J. O. Kearney bought of J. Sweeney the following articles : 7½ lbs. Green Tea at 85 cts.; 14¼ lbs. Black Tea at 45 cts.; 10⅔ lbs. Pepper at 54 cts.; 21 lbs. Common Tea at $1.07 ; 19 lbs. Superior Tea at $1.60 ; 18½ lbs. Soo-Choo Tea at 96 cts. What is the amount of the bill ?

2353. W. O'Brien owes M. R. Sullivan for merchandise : July 15th 1893, 3 gross Shirt Buttons at 85 cts.; July 17th 1893, 15 doz. Woolen Stockings at $3.18½ ; July 17 1893, 3 doz. Shirt Fronts at $5.05 ; August 2nd, 1893, 12½ yds. Ribbon at 27 cts.; 30 pair Gloves at $1.37½ , 4 doz. Napkins at $2.85 ; 22½ yds. Ticking at 45 cts. Find the amount ?

2354. R. O'Neil sold to J. Sweeney, July 11th 1893 : 473 gals. Alcohol at 92 cts.; 308½ gals. Old Rum at $1.85 ; 610⅝ gals. Holland Gin at $1.12 ; August 5th, 207⅔ gals. Rum at $1.80 ; 119½ gals. Cognac at $2.75 ; Sept. 22nd, 401 gals. Scotch Gin at $1.05. Received in payment Oct. 4th, 30 bbls. Salmon at $8.75 ; Nov. 6th, Checque on Merchants' Bank for $70 ; Nov. 21st, Cash $500. What amount remains due to R. O'Neil ?

2355. June 18th 1893, C. Wilson bought of P. Downes : 1½ lb. Red Radish at 75 cts.; 14 oz. Pepper at 5 cts.; 5 oz. Cucumbers at 9 cts.; 8½ oz. Lettuce at 12 cts.; 19 oz. Onions at 10 cts.; 6 oz. Asparagus at 6 cts.; 8 oz. Carrots at 6½. What is the amount of the bill ?

2356. Ross & Co., of Montreal sold to E. McMillan, Quebec : March 2nd, 1893, 110 pr. Men's Calf Boots at $3.75 ; 28 pr. Boots, Children's at 86 cts.; March 15th, 40 pr. Slippers at 85 cts.; April 3rd Men's Slippers at $1.15 ; April 3rd, 120 pr. Ladies Laced Boots at $1.25. He received in payment : Nov. 27th, Cash $280 ; April 15th, 110 cases Lemons at $3.20. What amount remains due to Ross & Co.

2357. July 4th, 1893, R. Power of Quebec sold to C. Jones : 23 yds. Silk at 95 cts.; 15 yds. Ribbon at 45 cts.; 12 yds. Muslin at 18 cts.; July 10th, 4 yds. Blue Cloth at $3.60 ; 3 yds. Blk. Cloth at $4.50 ; 9 yds. Satin at $1.25 ; 1 Cravat $1.30 ; Aug. 15th, 5 pair Calf Boots at $6.50 ; 3 doz. Sleeves at $2.40 ; 1 doz. Buttons 50 cts. On this, payment was made as follows : July 20th, 8 bbls. Apples at $3.20 ; 15 bush. Potatoes at 22 cts.; Aug. 20th, Cash $7.30. When the account was settled, what balance was due ?

2358. L. O'Eyrne of Pt. St Charles sold to G. Taylor : 50 lbs. Maple Sugar at 7 cts.; 75 lbs. White Sugar at 13 tts.; 20 lbs. Coffee at 24 cts.; 12 gals. Syrup at 65 cts.; 90 lbs. Sweet Biscuits at 9 cts.; 54 lbs. Butter Biscuits at 11 cts. What is the amount of G. Taylor's bill ?

MISCELLANEOUS PROBLEMS.

2359. A fruit merchant sold 4000 apples during a week; at the rate of 16 apples for 5 cts; find the amount of the receipts?

2360. Henry gave $\frac{2}{3}$ of 33 oranges to his sister; how many had he remaining?

2361. A merchant sold 4910 yds of cotton, what did he gain, at the rate of $2.05 on every 100 yds.

2362. We received 6 cases of merchandise each weighing 852 lbs including the boxes; what is the net weight of the 6 cases of merchandise knowing that each box weighs 70 lbs?

2363. Reduce $10\frac{3}{5}$ units to an improper fraction.

2364. When 740 eggs cost $7.40, how many dozen can be purchased with $2.28?

2365. If to pay 3 loaves weighing 4 lbs each, at the rate of 3 cts. a pound, you give a baker a 25 cent-piece and an other of 50 cts.; how much change will you receive?

2366. A wire 18 yards long is to be employed to make points, each point is 9 lines long; how many dozen points can be made?

2367. A man having 50 sheep, sells $\frac{4}{5}$ of them and then buys 32 others; how many has he now?

2368. I bought 10 dozen hats at $2.75 each. I gave in payment 40 yards of cloth at $2.50 a yard. How much do I still owe?

2369. A crockery dealer buys 3500 plates for $140, transportation costs, $3.00 and commission $1.20; what will be his profit if he sells them at the rate of 100 for $5.10?

2370. How many units are contained in the fraction $\frac{1111}{10}$?

2371. Thirteen barrels of wine cost $635, $190 were paid for duty and $54 for transportation. How much should I sell it a pint to gain $145 on the whole, knowing that a barrel contains 30 gallons?

2372. A person bought 15 dozen pencils at 9 cts. a dozen; what is his gain if he sells them at one cent apiece?

2373. I bought certain goods for $152. If I had sold them $8.00 more I would have gained $12. How much did I sell them for?

2374. Reduce to the same denominator $\frac{1}{7}$, $\frac{5}{11}$ and $\frac{3}{14}$.

2375. Seven heirs are to share in a donation of $8589; two of them give their part to 24 orphans. How much will each orphan receive?

2376. A Father was 48 years old when his son was born, and 52 years old at the birth of his daughter; what will be the age of the father and daughter when the son is 15 years old?

2377. A workman gained $80.25 in 75 days. How much would he have received, had he worked 15 days less?

2378. James gave $70 for a watch, and $\frac{3}{7}$ of this sum for a chain; and he sold the two for $90. How much did he lose?

2379. When 10 shirts are bought for $3.50; how much should each shirt be sold to gain 90 cts. on the whole?

2380. The sum of two numbers is 1439 and their difference 318. What are the two numbers?

2381. Two men working together during 30 days gained $72; one of them gains, $1.25 a day; how much does the other gain?

2382. Nellie had $360; she spends $\frac{1}{3}$ for a pouey, $\frac{1}{4}$ for a watch and $\frac{1}{8}$ for a sleigh. How much has she left?

2383. If I buy 3 oranges for 5 cts.; how many could I purchase for $1.90?

2384. A gentleman boards in a hotel for 80 cts. a day; how many weeks did he remain knowing that he paid $44.80?

2385. I bought 3546 oranges at 2 cts. apiece; how much will I gain if I sell them at 30 cents a dozen?

2386. A retail dealer bought 8 dozen of hats at $1.90; and gives in payment 46 yards of velvet at $2.15. How much more does he owe?

2387. Two pieces of linen cost $71.28. I sell 15 yards for $21.00 and by so doing gain 32 cents per yard. How many yards are there in the two pieces?

2388. What is the simplest expression of $\frac{14}{15}$?

2389. The apartments of a family are composed of 4 like pieces; one of which is divided into two cabinets for the children; the rent is $160, a year what should be paid for 3 months?

2390. What is the price of an orange knowing that 486 dozen cost $147.80?

2391. A workman puts 18 cents aside each day; what shall be his savings at the end of 12 years, 3 of which contain 366 days and the others 365?

2392. A bag of wheat weighing 200 lbs costs $4.50. How much should I sell it a lb. to gain 6 cts. on a pound?

2393. Reduce to the same denominator $\frac{3}{16}$ and $\frac{5}{12}$?

2394. A man spends 10 minutes in smoking a pipe; find how many hours will he spend in a year, knowing that he smokes 3 times a day?

2395. In a family, they eat 2 loaves of bread of 4 lbs each at 6 cts for two lbs, what is the expense for bread at the end of a week of 7 days?

2396. A farmer while bringing eggs to the markets breaks 35, gives 3

to the poor, and sells 7 dozen on the way and arrives with 476; how many had he when he started ?

2397. A farmer starts out with 480 eggs; he breaks 27 and sells 6 dozen on the way; how many had he when he arrived at the market ?

2398. Two persons start the same day; one from Quebec and the other from Three Rivers; one travels 6 miles and the other 9 miles a day. The distance between these two cities is 90 miles. In how many days will they meet and how many miles will each have traveled ?

2399. A fruit dealer sets out with 600 oranges, he throws 42 bad ones away and when he arrived at market he had 456. How many did he sell on the way ? .

2400. A little boy picked $\frac{3}{4}$ of a bushel of strawberries and sells half of them; how many gallons has he left ?

2401. A clerk who gains $45 per month, was paid $315; how many months remain to finish the year ?

2402. What is the salary of a clerk per year knowing that he received $450 for 9 months ?

2403. Conde died 108 years before Florian; Fenelon 29 years after Conde, Bossuet 11 years before Fenelon and Florian died in 1794. Find the year of the death of each of these men.

2404. A baker wants $115 more to buy 70 bbls flour at $6.30; how much money has he ?

2405. A hatter bought 15 hats which he sells for $42 and gains 40 cents on each hat; how much did a hat cost him ?

2406. A person bought a house for $10367.20, repairs amounted to $637.95. For how much did he sell it knowing that he gained $392.16.

2407. From a sum of $1745, 14 sergeants took $52 each. What portion of the remainder shall each soldier receive knowing that there are 450 soldiers ?

2408. I wish to divide $544 between 15 persons; if the first 7 receive $24 each; how much shall each of the remaining 8 receive ?

2409. What shall be the price of 10 dozen of penknives when 6 cost $4.50 ?

2410. What will be the cost of 7 barrels of apples, if $2\frac{1}{4}$ barrels cost $9 ?

2411. How much money had John, knowing that after his parents had given him $10, he gave to 12 beggars 25 cts. each and had $21.50 remaining ?

2412. Charles bought a piece of cloth at $2.40 a yard. In selling it for $3, he makes a gain of $30. What was the length of the piece ?

2413. An individual has an annual revenue of $2530. In 12 years

he puts aside $8460. What were his daily expenses allowing 365 days for a year ?

2414. What is the cost of some goods knowing that they were sold for $1600, and that if they had been sold for $175 more, the gain would have been $575 ?

2415. I bought 45 pieces of cloth of equal length, at $2 a yard. In reselling them at $2.40 I gain $900. What is the length of each piece ?

2416. What sum does Louis possess knowing that if I gave him $14.50 he could pay a debt of $75.50 and would have $12.75 remaining ?

2417. H. Harrington says that if his salary were augmented by $28.80, he could spend $1.30 each day. What is his revenue ?

2418. A furniture dealer receives 60 cases and pays $1846 for the lot. 30 cost $34 each ; 20 cost $18 each. What is the price paid for the remainder ?

2419. 50 dozen of pencils cost $6 ; how many will $5 buy ?

2420. A person bought 4 baskets of pears each of 75 dozen at 9 cents a dozen ; if they are sold 14 cents a dozen, how much will be gained ?

2421. A hundred bricks cost $5 ; what must be paid for 3 carts which which contain 1380 each ?

2422. What will a drummer get for selling 6 casks of wine of 85 gals. each, at the rate of 80 cents for every 10 gallons sold ?

2423. If 100 needles cost 30 cents ; how many can be had for $2.40 ?

2424. A fruit dealer bought 5400 lemons on condition that he would receive 112 for every hundred. How many should he receive ?

2425. A traveller walks during 12 days at the rate of 16 miles a day, if he wishes to return in 8 days, how many miles will he have to travel per day ?

2426. A man travels during 32 days at the rate of 20 miles per day, he wishes to recommence his voyage and take 8 days longer. At what rate will he have to travel per day ?

2427. A cask was made up of 52 gals. of wine at $1.20 and 8 gals. of water. What is the price of a gallon of the mixture ?

2428. What is the price of a butt of wine containing 55 gallons, knowing that it is a mixture of 37½ gals. at 75 cents and 17½ gals. at 60 cents ?

2429. What is the price of a butt of wine of 60 gallons, knowing that it contains 37½ gals. of wine at $0.50 and 22½ gals. at $1.10 ?

2430. A merchant bought 654¾ yds. of cloth for $915.99 ; 957 yds. of Linen for $190.51 ; 456½ yds. of Calico for $9.00 and 145⅝ yds. of Ribbon for $116.36. How many yards did he buy and how much did he pay ?

2431. In a church four collections were made ; the first netted $37.00; the second $9.00 more than the first ; the third $52 and the fourth as much as the first and second together. How much money was gathered in the 4 collections ?

2432. A merchant bought 16 plates at 6½ cts.; 24 dishes at 11 cts.; 64 glasses at 4½ cts.; 36 decanters at 17 cts.; he sells the plates at 7½ cts.; the dishes at 12½ cts.; the glasses at 7½ cts., and the decanters at 25 cts.; what will he gain on each article ?

2433. In a family the father receive $1.25 per day, the mother 65 cents ; if the expenses are $1.40 per day ; how much will be saved in a month of 30 days of which 26 are working days ?

2434. What is the amount of the following bill : 17 yds. Fine Serge at 75 cts.; 18 yds. of Drugget at 15 cts.; 15 yds. Scarlet Stuff at $4.50 ; 16⅕ Merino at $4.72 ; 25¾ yds. Print at 36 cts ; 17 yds. Gray Stuff at $3.70 ?

2435. A work comprises 12 sheets : if each sheet cost $35 for composition and $2½ for press-work ; what will 8000 copies cost ?

2436. Four persons divide $16999.50 between them, what will each receive if the first gets $1157 more than the second ; and the second $1249 more than the third, and the fourth $325 more than the third ?

2437. A shoemaker finishes 16 pair of shoes for $42 ; he sold half of them at $2.80 a pair. How should he sell the balance to gain $5.20 on all ?

2438. A merchant buys nuts at 16 cts. a hundred and retails them at 10 for 2 cts. What will he gain daily, if he sells $14 worth ?

2439. A detachment of 15 soldiers received $14.50 for 2 days pay. Another detachment received $20.80 for 13 days. How many men in the last company ?

2440. A man set out on a journey and traveled at the rate of 20 miles for 9 days, he returned at the rate of 12 miles a day. How long did he take to return ?

2441. I owe $556.75 : I gave in payment 123 yds. Merino at $1.66 ; 111 yds. Calico at 42 cts.; $184.15 Cash and the remainder in Linen at 75 cts. a yard. How many yards of linen did I give ?

2442. May 12th, 1893, I bought of J. Kearny : 18 Ploughs at $11 ; 23 Saws at $3.50 ; 90 Spades at 86 cts.; May 30th 1893, 86 Shovels at 50 cts.; 46 cwt. Iron at $12 ; June 7th 1898, 17 Hammers at 62 cts.; 12 Mill Saws at $12.12. June 7th, I paid on account $140 ; July 2nd $775. What balance do I still owe ?

2443. A bookseller buys 20 reams of paper at $1.70 ; 3 dozen books at 15 cts. each ; 50 gross pens at 17 cts. ; 6 registers at 47 cts. ; 5

dozen pencils at 1½ cts., and 28 dozen penknives at $3.20 a dozen. What change should he receive on $200?

2444. 137 joists were sold, 43 were paid $731; each of the others were sold for $5.50 each less than the first lot. What was the price of one of the second lot?

2445. In a shop there are 40 workmen, 15 are paid $1.30 per day, 18 $1.05 and the others $1.60; what gain will the contractor make if he receives $17660 and pays $468 for rent, the workmen being employed for 297 days?

2446. James bought 987 yards linen at 53 cts.; 15 pieces each of 93⅜ yards at 45 cts.; 7 pieces each of 101 yards at 39 cts.; he gave on account 17 pieces of cloth each 24½ yards at $1.95; 15 pieces calico 94⅜ yards each at 17 cts.; the balance was paid cash, what amount was given?

2447. A contractor purchased 20 loads each of 3400 bricks at $5.10 a thousand, he paid 30 cts. a thousand for transportation and 10 cts. for loading. What did he spend?

2448. A horse dealer sold horses for $44834.40; he lost $4.74 on each horse sold, his total loss was $1478.88. How much did each horse cost?

2449. June 30, 1893, C. M. Hart, sold W. Rogers, 473 gals Alcohol at 95 cts.; 308 gals Old Rhum at $1.90; 610 gals Holland Gin at $1.05; Aug. 5, 207 gals Rum at $1.75; 119 gals Cognac at $2.10; Sept. 22, 401 gals Scotch Whisky at $1.15. Mr. Rogers has paid as follows: Oct. 4, 30 brls Salmon at $8.75; Nov. 6, Cash $520; Nov. 22, a draft on London at 30 days for balance. What was the amount of the draft.

2450. I had at my disposal $1139 to do a certain piece of work; every day the receipts were $79.60 and the expenses $83. How many days did the money last?

2451. A speculation that was commenced with $8000 capital lasted 478 hours, the receipts amounted to $380 every day. What were the daily expenses?

2452. From a sum of $76366.75, $813.25 were given to the poor, each of 43 persons received $247.25; the remainder was divided among a certain number of persons each receiving $168.55. How many persons were there?

2453. Reduce to the same denominator the following fractions $\frac{3}{7}$, $\frac{7}{8}$, $\frac{5}{9}$, $\frac{9}{11}$.

2454. I owe $4867 to Thomas: I pay him at one time $3475, afterwards I give him $950, and I sell him 10 cords of wood for $44; if he deducts $1795; how much do I still owe him?

2455. I mix 647 dozen of oranges at 15 cents with 355 dozen at 23

cents ; at what price per dozen should I sell them so as to gain $21.70 on the whole ?

2456. The daily receipts of a factory are $522, the expenses during 174 days were $7308 ; find the daily gain ?

2457. In selling 14 casks of wine each containing 57½ gallons, I lost $102.50 on the cost price of $1881.20. At what price per gallon did I retail it ?

2458. John sold 217 riding-coats for $1844.50 ; on each coat he spent $4.37 for cloth ; 95 cents for lining and $2.08 for cutting and make up. What did he gain on each coat ?

2459. In a family the father earns $1.50 a day, Alex earns 90 cts., Henry 50 cts. and Peter 25 cts. How much do the four earn in 17 months, working 25 days each month ?

2460. A clerk's income amounts to $2041.75, his daily expenses are $4.25 ; how much will he have saved if he works 3 years, of 365 days each ?

2461. If a clerk received $2041.75 as salary for 7 months ; what should he receive for a year ?

2462. A mechanic receives $45 a month as salary, suppose he draws $405 ; how much remains due on his salary for one year.

2463. If 96 eggs cost 90 cts. to a merchant who retails them at 8 for 10 cts. ; what would he gain on 2 bls each containing 480 ?

2464. Peter bought one dozen penknives for $5.40, if he sells them at 60 cts. apiece, what gain will he make on 8 penknives ?

2465. What is the amount of a bill for 27 yards Silk at $3.75, 75 yards Cloth at $2.45 and 29 yards Velvet at $1.75 ?

2466. What will be the cost of 5⅝ lbs. of Beef, if 2 lbs. cost 32 cts. ?

2467. A horsedealer bought 18 horses for which he paid $50 each, 28 at $68, 15 at $40 and 22 at $35 ; he sells 24 at $68, 21 at $70, 18 at $41.20 and the remainder at $39. What is his gain ?

2468. A boy wears yearly, 3 pair of pants at $1.11, 2 coats at $3.30, 2 vests at 50 cents, 2 pair of shoes at $1.20, 1 hat at $1.42 and 3 pair stockings at 25 ; if his father earns $1.60 per day and his mother $1.50 ; how many days will they have to work to pay the expenses of their son ?

2469. The difference between two numbers is 504, the smaller is 9207, what would remain if from the greater you subtract 748 ?

2470. I sold 180 barrels of oil at $43.60 a barrel and made $1782 net gain ; what was the price per barrel ?

2471. Two men owe together $963[illegible] 75. The first gives at one time $1346.35, then $2346.75 ; what remains to be paid knowing that the debt of the second is $5464.80 ?

2472. A father of a family takes 7 hours for rest, 10 hours for work and 2 hours for his meals ; what time does he employ for each of these occupations during a week of 6 days ?

2473. A man-of-war having made a seizure, the captain received $18740.25 ; 11 officers each $9643.75 ; 15 sub-officers each $5649.05 and 240 men each $943.75 ; what was the amount of the seizure ?

2474. A clerk whose yearly salary is $840, received $700 ; how many month's salary did he lose ?

2475. I bought 340 volumes for $204, I paid $150 on account ; how many volumes remain to be paid ?

2476. A wheel turns 24 times a minute, and each turn the carriage advances $5\frac{1}{5}$ yds.; what space would it cover in 2 hours 25 minutes ?

2477. If I had sold goods for $2537.60, I would have gained $840 ; for how much did I sell them knowing that I gained $715 ?

2478. I gained $543.25 on goods which I sold ; if I had gained $631.40 I would have sold them $4927.35 ; for how much were the goods sold ?

2479. If I had $924 more, I could pay $12432 and I would have $643 left ; how much have I ?

2480. Owen having a certain sum of money borrows $590 ; he pays a debt of $847.75 and receives $545.85 which were due to him ; he finds on his return home that he has $946.86, after spending $12.45. What sum had he at first ?

2481. What is the cost of a house, knowing that if it had been bought for $1875 less, by selling it for $87977 the buyer would have gained $6476 ?

2482. A farmer mixed 120 bushels of wheat at $1.25 with 83 bushels at $1.18 and 74 bushels at $1.05. He sold the wheat at $1.21 a bushel ; how much did he gain ?

2483. A bookseller buys 756 volumes at 43 cts. a volume ; as he received 13 books for 12, he gets 819 which he sells at 47 cts. a volume ; what is his gain ?

2484. One of my friends borrows $450.75 from me, another $879.25 ; I paid $14825 and I have $248 left. How much had I before lending any?

2485. Wolfred lends $875.25 ; and he lacks $346.75 to pay two debts one of $1425.85 and one of $978.75. How much had he before lending any ?

2486. A lot of goods were bought for $8460 ; how much must it be sold so as to gain $\frac{1}{3}$ of the cost price plus $174.45 ?

2487. A lot of goods were bought for $760.40 ; if they had been sold for $46.70 more I would have gained half the cost price. How much were the goods sold for ?

2488. If a merchant in selling goods for $1240 gains ¼ of the cost price plus $40.80, how much did he pay for them ?

2489. The 1st of four persons has $1507 ; the 2nd $181 less than the first ; the third has $75 more than the second ; the fourth $206.70 less than the first. What is each one's share ?

2490. Three partners share in a certain sum ; the 1st takes $450.60, the 2nd takes the double of the first minus $46.70, the 3rd takes ⅓ of the first and ½ of the second plus $54.75 ; what is the sum divided ?

2491. Two men are to share $945.75 so that the part of the second be double that of the first ; what are the two parts ?

2492. A wood-dealer buys 546 cords of wood, half at $2.75 a cord and the rest at $3.03. How much did he disburse if he paid 12½ cts. per cord for cutting it ?

2493. On adding $194.40 to a certain sum it becomes three times itself. What is the sum ?

2494. On adding $146.80 to a certain sum, it wants $24.20 to be tripled. What is the sum ?

2495. A lot of goods were bought for $1240.80 ; how much must I sell them to gain ⅛ of the cost price ?

2496. After taking $495.45 from a certain sum ; $845.75 more should be taken in order to have one-third of the sum ; what is this sum ?

2497. I have $345.75 ; how much should I borrow to pay two debts, one of $879.85 and the other $1245.95, and buy 12 yards of cloth at $4.87½ a yard ?

2498. I bought goods for $946.20 and by selling them for $43 more than I did I would have gained ⅛ of the cost price. How much did I sell them for ?

2499. Three persons spent a certain sum : the first spent $784.30, the second $241.00 more than the first, and the third $301.70 more than the second. What were the amounts spent by the last two ?

2500. A wine merchant bought 12 casks at $87 each. He sells 4 for $380, how much must he receive for the others so as to realize a profit of $156 on the whole ?

2501. A merchant pays $3 for every 100 plates he buys, he bought 1640 ; now how much must he sell each plate to gain $9.20 on the whole, knowing that 40 were broken during the trip and that other expenses amounted to $2.40 ?

2502. What will I pay for 34 barrels of wine of 55 gallons each, which cost $78 a barrel, knowing that the duty on wine per pint is 5 cts. and transportation, 75 cts. per barrel ?

2503. A tap which gives 14 pints in 1 minute, fills a basin in 2 hours. How many gallons can the basin hold?

2504. A basin can hold 2380 gallons; how long will it take to fill it, the tap running 12 pints a minute?

2505. Two taps which run 12 and 16 pints respectively can fill a basin in 3 hours 15 m.; how many gallons can the basin hold?

2506. A basin can hold 5688 gallons and can be filled in 3 hours 57 minutes, by two taps one of which gives 16 gallons a minute; how many gallons must the other give?

2507. A bookseller pays $3.50 for a certain book; how much will he sell a dozen so as to gain 70 cts. on each book; knowing that he gives 13 books for 12?

2508. A bookseller pays $14.50 a dozen for 852 books; but he receives 13 for 12. What is his gain, if he sells each volume $1.65?

2509. A merchant bought 50 doz. of locks at 91 cts. each, and got 13 for every 12; in arranging them he lost 2. What will he gain if he sells the others at $1.10 each?

2510. A merchant received a box containing 50 turkeys which should be sold at 90 cts. each. He gave five to his friends. What should he sell the others so as to lose nothing?

2511. A man bought 48 dozen of glasses at 14 cts. apiece and he received 13 for a dozen. He sold them at 20 cts. apiece. What was his gain?

2512. A man bought 12 volumes at $200. He received 13 for 12. What did each volume cost him?

2513. A milkman brought to the city 18 gals. of milk which he desired to sell at 20 cts. a gallon. But an accident caused the loss of 3 gals., what should he sell the remainder for so as to lose nothing?

2514. What is the length of a piece of cloth that cost $175.50, knowing that I sold 25 yards for $87.50 and gained 50 cents a yard?

2515. I bought 60 pieces of cloth of equal length at $2.60 a yard and sold them at $3.10 with a gain of $2100. What is the length of each piece?

2516. A merchant bought 80 yards of cloth for $240: what is his gain on 50 yards which he sells at $3.10 a yard?

2517. I bought 16 apples for 14 cts. and sold them for 20 cts.: what will be my gain on 400 apples?

2518. A man buys 16 apples for 14 cts. and sells them for 20 cts.: what will be his gain on a sale of $18?

2519. A watch gained 20 hours during 50 days: how many minutes did it gain hourly?

2520. During the last 36 hours, a watch gained 2 minutes every 3 hours: what o'clock is it when the hands point to 25 minutes to 5?

2521. From 4 o'clock in the morning, a watch gains 2 minutes every 3 hours, what is the time when the hands mark 7 p. m.?

2522. A watch gains 3 minutes every 4 hours, what will it have gained at the end of a week?

2523. A watch lost during the last 33 hours at the rate of 2 minutes every 3 hours, what hour will the clock mark when it is 8 minutes past 3 o'clock.

2524. A clock was started at 6 p. m. and lost 3 minutes every 2 hours, what hour will it mark at 10 a.m. next day?

2525. A person promises to give 90 cents to the poor every time he gains $12.25; what should he give when he gains $47?

2526. A merchant gives $1.75 in alms for every $17.75 he gains; what sum did he gain when he gave $38.50 in alms?

2527. Every time a man gains $13.75, he gives a certain sum to the poor; find this sum knowing that when he gave $7 to the poor he had $185.50 remaining?

2528. Each time a boys saves $6.75 his father gives him $1.25; if the boy saves $81, what will he have after his father adds his sum?

2529. For every $75 a boy gains, his father pays him $1.50; what sum did the boy gain when, after his father's gift, he had $99?

2530. Each time a young man earns $6.25, his father gives him a certain sum, what was this sum, if when the young man earns $93.75 his father gives him $1.25?

2531. $\frac{3}{5}$ of a sum of money is $96, what is the sum.

2532. A man spends $\frac{3}{5}$ of his money, then $\frac{1}{4}$ and after $\frac{1}{3}$, what has he remaining on $600?

2533. John has half as much as Joseph, who has $\frac{3}{4}$ of $96. What was John's money?

2534. A ship cost $7500. Peter's share is $\frac{1}{3}$, John's is $\frac{2}{5}$ of Peter and Joseph's the balance; what does each own.

2535. $\frac{3}{4}$ of 56 is the $\frac{3}{5}$ of what number?

2536. $\frac{5}{6}$ of $900 is the $\frac{2}{3}$ of $\frac{1}{4}$ of John's fortune, what has he?

2537. One fraction is $\frac{5}{6}$ and the product $\frac{1}{2}\frac{3}{4}$, what is the other fraction?

2538. Tobias spends $\frac{1}{4}$ of the day in study, $\frac{1}{8}$ in recreation, $\frac{1}{3}$ in sleep and the rest in business; how long does he give to business?

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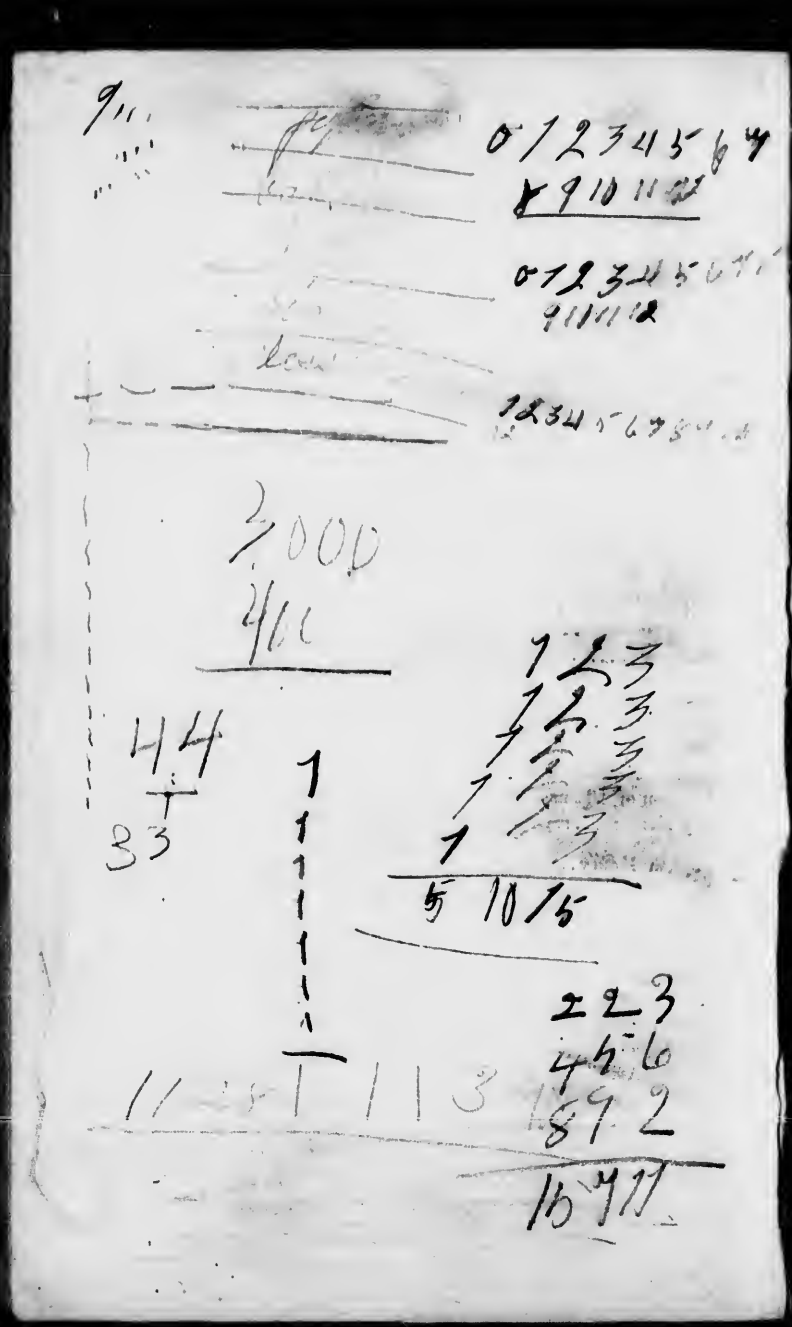

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