

## ADDITION.

12. ADDITION is the operation of finding the *sum* of two or more numbers.

The *Sum* contains as many units as there are in all the numbers added.

## Addition Table.

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

1 and 1 are how many?	8 and 5 are how many?
2 added to 4, how many?	7 and 6 are how many?
3 and 9 cents, how many?	8 and 7 are how many?
9 and 10 are how many?	9 and 6 are how many?
8 and 5 are how many?	7 and 10 are how many?
7 and 4 are how many?	5 and 7 are how many?
9 and 9 are how many?	6 and 8 are how many?

## Of the Signs.

13. The sign, +, is called *plus*, which signifies, more. When placed between two numbers, it denotes that they are to be added.

The sign, =, is called the sign of equality. When placed between two numbers, it denotes that they are equal; that is, that they contain the same number of units. Thus,  $3 + 2 = 5$ , and is read, 3 plus 2 equals 5.

$$3 + 7 = \text{how many?}$$

$$1 + 2 + 3 = \text{how many?}$$

$$3 + 4 + 5 + 1 = \text{how many?}$$

$$1 + 0 + 2 + 3 + 3 = \text{how many?}$$

- |                              |                                 |
|------------------------------|---------------------------------|
| 1. $1 + 3$ , are how many?   | 21. $6 + 9 =$ how many?         |
| 2. $1 + 5$ , are how many?   | 22. $7 + 5 =$ how many?         |
| 3. $6 + 0$ , are how many?   | 23. $9 + 0 + 1 =$ how many?     |
| 4. $7 + 9$ , are how many?   | 24. $0 + 3 + 12 =$ how many?    |
| 5. $8 + 7$ , are how many?   | 25. $9 + 6$ , are how many?     |
| 6. $1 + 2 + 3 =$ how many?   | 26. $1 + 5 + 6$ , are how many? |
| 7. $1 + 6 + 0 =$ how many?   | 27. $3 + 9 =$ how many?         |
| 8. $9 + 5$ , are how many?   | 28. $7 + 5 =$ how many?         |
| 9. $10 + 5$ , are how many?  | 29. $9 + 0 =$ how many?         |
| 10. $1 + 9 + 10 =$ how many? | 30. $6 + 5 =$ how many?         |
31. How many fingers are 4 fingers and 2 fingers?
32. If an apple costs 3 cents, and an orange 5 cents, what is the cost of both?
33. What two numbers, added together, will make 8?
34. What two numbers, added together, will make 10?
35. A man earned 5 dollars on Monday, 6 dollars on Tuesday, and 7 dollars on Wednesday: how many dollars did he earn in the three days?
36. If a man spends 4 dollars for boots, 10 dollars for a coat, and 6 dollars for a hat, how much does he spend in all?

## Exercises for the Slate or Blackboard.

14. Pupils in Arithmetic should be taught, from the very commencement, to *read* the figures. By reading, we mean the use of those words only which declare the final results.

For example, 2 and 2 are 4. The word *four* names the result arising from adding 2 and 2 together.

Having written the following, and similar examples, on the slate or blackboard, let the pupils, separately and in concert, pronounce the sum of each column.

$$1. \left\{ \begin{array}{cccccccccc} 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ \hline 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \end{array} \right.$$

$$2. \left\{ \begin{array}{cccccccccc} 2 & 0 & 4 & 3 & 9 & 8 & 6 & 7 & 5 & 7 \\ \hline 3 & 4 & 5 & 9 & 0 & 4 & 3 & 8 & 9 & 0 \end{array} \right.$$

$$3. \left\{ \begin{array}{cccccccccc} 9 & 0 & 4 & 5 & 7 & 6 & 4 & 2 & 1 & 3 \\ \hline 7 & 4 & 6 & 9 & 8 & 5 & 3 & 0 & 2 & 1 \end{array} \right.$$

$$4. \left\{ \begin{array}{cccccccccc} 1 & 4 & 0 & 3 & 6 & 7 & 8 & 9 & 5 & 2 \\ \hline 2 & 3 & 4 & 5 & 6 & 4 & 3 & 8 & 0 & 9 \end{array} \right.$$

$$5. \left\{ \begin{array}{cccccccccc} 4 & 9 & 7 & 5 & 2 & 7 & 3 & 0 & 2 & 8 \\ \hline 3 & 0 & 6 & 0 & 1 & 9 & 7 & 6 & 0 & 1 \end{array} \right.$$

$$6. \left\{ \begin{array}{cccccccccc} 0 & 3 & 4 & 5 & 6 & 8 & 9 & 2 & 1 & 0 \\ \hline 3 & 9 & 0 & 3 & 8 & 7 & 4 & 6 & 0 & 5 \\ \hline 4 & 3 & 7 & 7 & 0 & 2 & 9 & 3 & 9 & 7 \end{array} \right.$$

$$7. \left\{ \begin{array}{cccccccccc} 9 & 8 & 6 & 5 & 0 & 4 & 2 & 3 & 1 & 9 \\ \hline 3 & 2 & 7 & 3 & 9 & 6 & 7 & 0 & 3 & 8 \\ \hline 4 & 8 & 0 & 6 & 7 & 8 & 4 & 9 & 6 & 7 \end{array} \right.$$

1. What is the sum of 387 dollars, 579 dollars, and 793 dollars?

The numbers in this example are written down and added according to the following

OPERATION.

$$\begin{array}{r} 387 \\ 579 \\ \hline 793 \end{array}$$

Rule.

$$\begin{array}{r} 1759 \end{array}$$

I. Write the numbers to be added, so that units of the same value shall fall in the same column; that is, units under units, tens under tens, &c.

II. Add the column of units; set down the units of the sum, and then add the tens, if any, to the next column.

III. Add each column in the same way, and set down the entire sum of the last column.

Proof.

Begin at the top of the units column, and add all the columns downwards, carrying from one column to the other, as when the columns were added upwards. If the two results agree, the work is supposed to be right.

## Examples.

(1.)	(2.)	(3.)	(4.)	(5.)
870	241	998	306	327
<u>312</u>	<u>302</u>	<u>909</u>	<u>999</u>	<u>401</u>

(6.)	(7.)	(8.)	(9.)	(10.)
604	407	974	49	409
709	369	302	906	599
<u>999</u>	<u>421</u>	<u>981</u>	<u>429</u>	<u>999</u>

(11.)	(12.)	(13.)	(14.)
3704	8476	27047	81434
2905	9703	29091	92069
<u>6093</u>	<u>6949</u>	<u>67021</u>	<u>71470</u>
(15.)	(16.)	(17.)	(18.)
67041	91224	87263	97046
3027	90712	9126	21049
975	3049	445	3627
<u>69</u>	<u>274</u>	<u>371</u>	<u>294</u>
(19.)	(20.)	(21.)	(22.)
814724	493279	940045	4096274
31270	210316	97214	670421
9089	97632	8526	29365
416	7421	914	8647
<u>79</u>	<u>697</u>	<u>89</u>	<u>310</u>
(23.)	(24.)	(25.)	(26.)
370414	38076	451321	5976428
279143	91742	910487	5849207
970492	6849	614823	6408302
380421	6927	712104	876041
91273	874	87415	292804
94870	674	9747	380496
69044	914	8741	390419
79050	815	9168	81468
60704	460	8704	81410
8912	860	304	71487
2704	29	963	87049
7047	27	603	6704
8433	41	974	327
7411	91	89	897
<u>674</u>	<u>9</u>	<u>9</u>	<u>67</u>

27. What is the sum of  $297 + 496 + 3764 + 101 + 9056$ ?
28. Find the sum of  $56 + 479 + 2764$ , increased by the sum of  $960 + 575 + 2300 + 100 + 205$ .
29. What is the sum of  $54046 + 75 + 870423 + 999 + 87047 + 910468 + 874863 + 47049 + 372141$ ?
30. What is the sum of  $270999 + 310467 + 21 + 375 + 888880 + 9794967 + 73758941 + 47049 + 740416$ ?
31. What is the sum of  $67041 + 80046 + 97041 + 0 + 30967 + 814675 + 704069 + 70412704 + 90704 + 72304 + 99999$ ?
32. Find the sum of four hundred and sixty-five; one thousand, three hundred and thirty-three; four hundred and twenty-nine thousand, eight hundred and eight; forty-four millions, nine hundred and ninety thousand and sixty; five hundred and sixteen; and seven hundred thousand, seven hundred and seventy-five.
33. Find the sum of twenty-seven thousand, nine hundred and sixteen; nine millions, nine thousand and nine; one hundred and fifty-six millions, eight hundred and twenty-six thousand, eight hundred and eighty-seven; twelve hundred and forty-nine; sixty-nine thousand and sixty-nine; thirty-four; and two hundred and sixty-two.
34. Find the sum of six hundred and seventy-three billions, three hundred and twenty millions, two thousand, six hundred and one; three billions, nine hundred and sixty-seven millions, eighty-nine thousand and six; eighty-seven thousand, nine hundred and twelve; and one hundred and eleven.
35. Find the sum of forty-nine quadrillions, two thousand billions, six hundred millions, four hundred and sixty-nine thousand and seventeen; ninety-five quadrillions, fifty-nine millions, four hundred and nine thousand, six hundred and fifty-nine.

## Practical Questions.

1. If an apple costs 2 cents, an orange 6 cents, and a lemon 4 cents, what will the three cost?
2. What two numbers, added together, make 12?
3. If James pays 15 cents for a top, 75 cents for a knife, and 87 cents for a book, what does he pay in all?
4. John was born in the year 1840: in what year was he 21 years of age?
5. What is the cost of 3 city lots, the 1st costing 1457 dollars, the 2d 1259 dollars, and the 3d 965 dollars?
6. Add together five thousand nine hundred and sixty-five, 8759, and twenty thousand 846.
7. If two persons travel from the same point in opposite directions, the one 7 miles and the other 9 miles, how far apart will they then be?
8. James, after giving away 6 cents, spending 8 cents for a pie, and losing 9 cents, had 5 cents left: how much had he at first?
9. A boy who had bought a ball for 6 cents, wishes to sell it, so as to gain 4 cents: for what must he sell it?
10. A merchant bought a barrel of flour for 7 dollars, and a tub of butter for 9 dollars: for what must he sell the two, that he may gain 6 dollars on both?
11. A grocer bought some sugar for 8 dollars, and some tea for 7 dollars: what amount will he receive for the two, if he gains 2 dollars on the sugar and 3 dollars on the tea?
12. James and Joseph leave home in the morning, with an equal amount of money; during the day, James gains 10 dollars, and Joseph loses 7 dollars: at the close of the day, how much more has the one than the other?
13. James is 16 years old, and John is 24 years older: how old is John?
14. A merchant paid 450 dollars for sugar, 692 dollars

for teas, 275 dollars for coffee, 3760 dollars for flour, and 105 dollars for soap: what did he pay for all?

15. Suppose a merchant has 3756 dollars in bank-bills, 4793 dollars in gold, 264 dollars in silver, and 5 dollars in cents: how much has he?

16. A farmer, wishing to build a barn, estimated its cost as follows: for the lumber, 490 dollars; carpenter's work, 360 dollars; hardware, 75 dollars, and painting, 124 dollars: what was the estimated cost of the barn?

17. If a person pays 750 dollars for a lot of ground, 3986 dollars for the house on it, 642 dollars for furniture, and 975 dollars for the library, what is the cost of the whole?

18. A man paid 275 dollars for a horse: for what must he sell it, that he may gain 45 dollars?

19. A person who had received a certain sum of money, paid out 675 dollars, and had 7835 dollars left: what amount did he receive?

20. What would be the wages of a year, if a person receives 75 dollars per month for 6 months, and 90 dollars per month for the remaining 6 months?

21. James was born in 1834, and Samuel was born 25 years after him: in what year was Samuel born?

22. Daniel, who was born in 1812, was 37 years old when he died; and Reuben died 10 years after Daniel: in what year did Reuben die?

23. A drover bought some cattle for 4395 dollars, and, after having kept them for 3 weeks at an expense of 175 dollars, sold them at a profit of 396 dollars: for what did he sell them?

24. A merchant bought 25 barrels of flour for 150 dollars; 72 barrels, for 376 dollars; 317 barrels, for 1698 dollars; 764 barrels, for 4379 dollars. How many barrels did he buy, and what did they cost?

25. A gentleman bought a horse, a carriage, and harness: for the harness he paid 75 dollars; for the horse, 65 dol-

lars more than for the harness; and for the carriage, 172 dollars more than for the horse: what was the cost of the three?

26. A flour merchant bought a quantity of flour in St. Louis, for 5600 dollars, and sent it to New York: the freight amounted to 275 dollars, cartage to 196 dollars, storage to 50 dollars, and insurance to 25 dollars: for what must the flour be sold, to gain 800 dollars?

27. A merchant has in store, merchandise worth 25642 dollars; he has debts due him, to the amount of 5719 dollars; he has in bank 7695 dollars; he owns two houses, each worth 4965 dollars, a ship worth 35450 dollars, a farm worth 11290 dollars, and a factory worth 26475 dollars: what is his fortune?

28. A father bequeathed his fortune in the following manner: to his wife, 10600 dollars; to each of three sons, 6750 dollars; to each of 2 daughters, 4975 dollars; 2763 dollars to pay all his debts; 565 dollars to the Bible Society, and to the Education Society 725 dollars: what was the fortune?

29. A person having neglected to make a record, wished to know how many bushels of potatoes he had bought at a certain time. He had sold of them 496 bushels, had thrown away 15 bushels, given away 36 bushels, and had 247 bushels left: how many bushels had he bought?

30. The distance from Jersey City to Port Jervis is 88 miles; from Port Jervis to Deposit, 88 miles; from Deposit to Great Bend, 24 miles; from Great Bend to Binghampton, 14 miles; from Binghampton to Elmira, 59 miles; from Elmira to Corning, 18 miles; from Corning to Hornellsville, 40 miles; from Hornellsville to Olean, 64 miles; and from Olean to Dunkirk, 64 miles: what is the distance from Jersey City to Dunkirk?

## SUBTRACTION.

15. SUBTRACTION is the operation of finding the difference between two numbers.

The DIFFERENCE is such a number as, added to the less, will give the greater.

Table.

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



## SUBTRACTION OF

$$3. \left\{ \begin{array}{ccccccccc} 5 & 4 & 9 & 8 & 7 & 6 & 3 & 5 & 9 \\ \underline{3} & \underline{3} & \underline{3} & \underline{3} & \underline{3} & \underline{3} & \underline{3} & \underline{3} & \underline{3} \end{array} \right.$$

$$4. \left\{ \begin{array}{ccccccccc} 6 & 7 & 9 & 8 & 4 & 5 & 6 & 8 & 7 \\ \underline{4} & \underline{4} & \underline{4} & \underline{4} & \underline{4} & \underline{4} & \underline{4} & \underline{4} & \underline{4} \end{array} \right.$$

$$5. \left\{ \begin{array}{ccccccccc} 7 & 6 & 5 & 8 & 9 & 10 & 11 & 12 & 13 \\ \underline{5} & \underline{5} & \underline{5} & \underline{5} & \underline{5} & \underline{5} & \underline{5} & \underline{5} & \underline{5} \end{array} \right.$$

$$6. \left\{ \begin{array}{ccccccccc} 8 & 6 & 10 & 12 & 13 & 9 & 7 & 16 & 17 \\ \underline{6} & \underline{6} & \underline{6} & \underline{6} & \underline{6} & \underline{6} & \underline{6} & \underline{6} & \underline{6} \end{array} \right.$$

$$7. \left\{ \begin{array}{ccccccccc} 8 & 7 & 9 & 10 & 14 & 15 & 12 & 10 & 17 \\ \underline{7} & \underline{7} & \underline{7} & \underline{7} & \underline{7} & \underline{7} & \underline{7} & \underline{7} & \underline{7} \end{array} \right.$$

$$8. \left\{ \begin{array}{ccccccccc} 9 & 8 & 10 & 12 & 14 & 16 & 18 & 11 & 17 \\ \underline{8} & \underline{8} & \underline{8} & \underline{8} & \underline{8} & \underline{8} & \underline{8} & \underline{8} & \underline{8} \end{array} \right.$$

$$9. \left\{ \begin{array}{ccccccccc} 10 & 12 & 9 & 14 & 15 & 17 & 18 & 19 & 20 \\ \underline{9} & \underline{9} & \underline{9} & \underline{9} & \underline{9} & \underline{9} & \underline{9} & \underline{9} & \underline{9} \end{array} \right.$$

20. Write the subtrahend under the minuend: thus,

	(1.)	(2.)	(3.)	(4.)
Minuend,	9	12	13	15
Subtrahend,	<u>5</u>	<u>4</u>	<u>8</u>	<u>6</u>
Remainder,	4			
	(5.)	(6.)	(7.)	(8.)
From	27	56	35	67
Take	<u>13</u>	<u>21</u>	<u>25</u>	<u>26</u>
				(9.)
				87
				<u>63</u>

## SIMPLE NUMBERS.

	(10.)	(11.)	(12.)	(13.)	(14.)
From	436	375	679	974	899
Take	<u>125</u>	<u>341</u>	<u>576</u>	<u>973</u>	<u>791</u>

	(15.)	(16.)	(17.)	(18.)
From	570	290	695	809
Take	<u>210</u>	<u>170</u>	<u>364</u>	<u>705</u>

	(19.)	(20.)	(21.)	(22.)
From	8749	9999	8847	9097
Take	<u>2647</u>	<u>1789</u>	<u>8746</u>	<u>2096</u>

21. From 545 dollars take 194 dollars.

Write the less number under the greater, and perform the subtraction according to the following Rule.  
 Let the pupil read the result in each subtraction.

OPERATION.			
5	4	5	Minuend.
1	9	4	Subtrahend.
3	5	1	Remainder.

## Rule.

I. Write the less number under the greater, so that units of the same value shall fall in the same column.

II. Begin at the right hand, and subtract each figure of the subtrahend from the one directly over it, when the upper figure is the greater.

III. When the upper figure is the less, add 10 to it, before subtracting, and then add 1 to the next figure of the subtrahend.

## Proof.

Add the remainder to the subtrahend. If the work is right, the sum will be equal to the minuend.

## Examples.

	(1.)	(2.)	(3.)	(4.)
From	7041	10904	40709	59756
Take	<u>2104</u>	<u>8759</u>	<u>27047</u>	<u>30093</u>
	(5.)	(6.)	(7.)	(8.)
From	67045	27041	10000	10000
Take	<u>10916</u>	<u>3709</u>	<u>3001</u>	<u>1</u>
	(9.)	(10.)	(11.)	(12.)
	dollars.	days.	feet.	yards.
From	47055	32704	60413	29041
Take	<u>34093</u>	<u>10419</u>	<u>209</u>	<u>3098</u>
	(13.)	(14.)	(15.)	(16.)
	inches.	men.	sheep.	cows.
From	2741	97041	370456	919904
Take	<u>1909</u>	<u>2074</u>	<u>909</u>	<u>99999</u>
	(17.)	(18.)	(19.)	(20.)
	weeks.	hours.	pounds.	rods.
From	4097	2749	8946	9049
Take	<u>3209</u>	<u>1940</u>	<u>2078</u>	<u>2104</u>

21. From 674187 take 2704. *Ans.* 671483.  
 22. From 2947049 subtract 21470. *Ans.* 2925579.  
 23. Subtract 97048 from 9704909. *Ans.* 9607861.  
 24. How many are 496087 - 22041? *Ans.* 474046.  
 25. 479630 - 29472 = how many? *Ans.* 450158.  
 26. 1100910 - 974609 = how many? *Ans.* 126301.  
 27. 100000 - 10999 = how many? *Ans.* 89001.  
 28. 6900760 - 294099 = how many? *Ans.* 6606661.  
 29. Subtract 910969 from 1000000. *Ans.* 89031.

## Practical Questions.

- Take twenty-five from twenty-five hundred.
- 100000 - 444 = how many?
- 1000000 - 404404 = how many?
- From ten thousand take one.
- 2360064 - 194506 = how many?
- From a log 45 feet long, 37 feet were cut off: how many feet were left?
- If one lot of ground costs 350 dollars, and another 315 dollars, how much more did one cost than the other?
- A person bought a quantity of goods for 1860 dollars and sold them for 2512 dollars: how much was gained?
- A merchant sold, for 2710 dollars, goods which had cost 1964 dollars: what was the gain?
- A man paid 3645 dollars for a house and lot, and sold them for 2987 dollars: what was the loss?
- A vessel that cost 7682 dollars, was sold for 6995 dollars: what was the loss?
- A gentleman received in 1860 a salary of 3000 dollars, but now receives 495 dollars less: what is his salary?
- A person sold his horse for 3750 dollars, and by so doing gained 968 dollars: how much had he paid for it?
- A person in 1861 was seventy-five years old: in what year was he born?
- A person was born in 1765 and died in 1810: how old was he when he died?
- How many years elapsed between the landing of Columbus in 1492 and the era of the Revolution in 1775?
- The difference of the ages of two persons was 49 years: the younger person was born in 1850: in what year was the older born?
- The Revolutionary war began in 1775 and the Great Rebellion in 1861: how many years elapsed between these two events?



## Examples combining Addition and Subtraction.

1. There were 27 pear-trees in one row, and 26 in another, and 15 were blown down: how many were left standing?
2. Laura has 75 cents in one hand, and 36 in the other; she buys an Arithmetic for 69 cents: how many cents has she left?
3. There are 106 scholars in the Primary department of a school, and 359 in the higher department; of the whole, 279 are boys: how many girls are there?
4. James has 87 cents; he pays 25 cents for a whistle, and 40 cents for a knife: how much has he left?
5. A merchant bought 1250 yards of cloth of one person, 3270 yards of another, and then sold 1459 yards: how many yards had he left?
6. A farmer has 425 sheep, 30 cows, 16 horses, 20 calves, and 6 colts; if he sells the sheep, how many animals will he have left?
7. By the census of 1850, the entire population of the United States was 23191876; the slave population 3204313; free colored 434495: what was the white population?
8. A man's income is 1849 dollars a year; he spends for food, 450 dollars; for clothing, 129 dollars; and for other things, 627 dollars: how much does he save?
9. A grocer bought a lot of flour for 216 dollars; some rye for 127 dollars; and some corn for 420 dollars; he sold the whole for 999 dollars: what did he make?
10. Mr. Jones owes his butcher, grocer, and baker 365 dollars; he owes his grocer 219 dollars: how much does he owe the other two?
11. James and John start from the same point and travel in opposite directions; James goes 20 miles, and John 17; how far are they then apart?

12. If two men start from the same place and travel in the same direction: how far will they be apart after one has travelled 55 miles, and the other 37 miles?
13. A father is 26 years older than his eldest son, and 52 years older than his youngest: what is the difference of the sons' ages?
14. A farmer has 50 sheep in one pasture, 38 in a second, and 25 in a third; if 9 sheep escape from the first, 3 from the second, and 1 from the third: how many sheep will be left?
15. From four thousand three hundred and twenty-seven, plus two hundred and thirty-one, subtract 287.
16. From three millions six hundred and five, plus 217, subtract one thousand and 9.
17. From one million, subtract one thousand plus 6.
18. From six millions, subtract  $200+5$ .
19. A man gains 512 dollars, then loses 401 dollars; a second time he gains 512 dollars, and loses 104 dollars: how many dollars has he left?
20. A merchant bought 120 hogsheads of sugar for 6000 dollars, and paid 325 dollars freight; he then sold the whole for 7529 dollars: how much did he gain?
21. I agree to pay Mr. Squires 36 dollars for ploughing a piece of land; 167 dollars for fencing it, and 139 dollars for cultivating it: how much shall I owe him after paying him 287 dollars?
22. Mr. Jones has a yearly income of 6750 dollars; he pays 475 dollars for rent, 1325 dollars for family expenses, and 950 dollars for his horses and carriage: how much has he left?
23. Mr. James has a fortune of 37689 dollars, which he divides among his four sons; he gives John 10421 dollars, William 9875, and Charles 8751 dollars: how many dollars has Reuben?

## MULTIPLICATION.

22. MULTIPLICATION is the operation of taking one number as many times as there are units in another.

23. The MULTIPLICAND is the number to be taken.

24. The MULTIPLIER is the number denoting how many times the multiplicand is to be taken.

25. The PRODUCT is the result of the operation.

26. The MULTIPLICAND and MULTIPLIER are called FACTORS.

27. The sign  $\times$ , is called the sign of multiplication. When placed between two numbers it denotes that they are to be multiplied together; thus:

$$7 \times 5 = 35; \text{ and is read, 5 times 7 are 35.}$$

Multiplication Table.

Once 1 is 1	2 times 1 are 2	3 times 1 are 3
Once 2 is 2	2 times 2 are 4	3 times 2 are 6
Once 3 is 3	2 times 3 are 6	3 times 3 are 9
Once 4 is 4	2 times 4 are 8	3 times 4 are 12
Once 5 is 5	2 times 5 are 10	3 times 5 are 15
Once 6 is 6	2 times 6 are 12	3 times 6 are 18
Once 7 is 7	2 times 7 are 14	3 times 7 are 21
Once 8 is 8	2 times 8 are 16	3 times 8 are 24
Once 9 is 9	2 times 9 are 18	3 times 9 are 27
Once 10 is 10	2 times 10 are 20	3 times 10 are 30
Once 11 is 11	2 times 11 are 22	3 times 11 are 33
Once 12 is 12	2 times 12 are 24	3 times 12 are 36
4 times 1 are 4	5 times 1 are 5	6 times 1 are 6
4 times 2 are 8	5 times 2 are 10	6 times 2 are 12
4 times 3 are 12	5 times 3 are 15	6 times 3 are 18
4 times 4 are 16	5 times 4 are 20	6 times 4 are 24
4 times 5 are 20	5 times 5 are 25	6 times 5 are 30
4 times 6 are 24	5 times 6 are 30	6 times 6 are 36
4 times 7 are 28	5 times 7 are 35	6 times 7 are 42
4 times 8 are 32	5 times 8 are 40	6 times 8 are 48
4 times 9 are 36	5 times 9 are 45	6 times 9 are 54
4 times 10 are 40	5 times 10 are 50	6 times 10 are 60
4 times 11 are 44	5 times 11 are 55	6 times 11 are 66
4 times 12 are 48	5 times 12 are 60	6 times 12 are 72

7 times 1 are 7	8 times 1 are 8	9 times 1 are 9
7 times 2 are 14	8 times 2 are 16	9 times 2 are 18
7 times 3 are 21	8 times 3 are 24	9 times 3 are 27
7 times 4 are 28	8 times 4 are 32	9 times 4 are 36
7 times 5 are 35	8 times 5 are 40	9 times 5 are 45
7 times 6 are 42	8 times 6 are 48	9 times 6 are 54
7 times 7 are 49	8 times 7 are 56	9 times 7 are 63
7 times 8 are 56	8 times 8 are 64	9 times 8 are 72
7 times 9 are 63	8 times 9 are 72	9 times 9 are 81
7 times 10 are 70	8 times 10 are 80	9 times 10 are 90
7 times 11 are 77	8 times 11 are 88	9 times 11 are 99
7 times 12 are 84	8 times 12 are 96	9 times 12 are 108
10 times 1 are 10	11 times 1 are 11	12 times 1 are 12
10 times 2 are 20	11 times 2 are 22	12 times 2 are 24
10 times 3 are 30	11 times 3 are 33	12 times 3 are 36
10 times 4 are 40	11 times 4 are 44	12 times 4 are 48
10 times 5 are 50	11 times 5 are 55	12 times 5 are 60
10 times 6 are 60	11 times 6 are 66	12 times 6 are 72
10 times 7 are 70	11 times 7 are 77	12 times 7 are 84
10 times 8 are 80	11 times 8 are 88	12 times 8 are 96
10 times 9 are 90	11 times 9 are 99	12 times 9 are 108
10 times 10 are 100	11 times 10 are 110	12 times 10 are 120
10 times 11 are 110	11 times 11 are 121	12 times 11 are 132
10 times 12 are 120	11 times 12 are 132	12 times 12 are 144

3 times 5 are how many?	0 times 4 are how many?
6 times 7 are how many?	5 times 0 are how many?
4 times 5 are how many?	6 times 9 are how many?
4 times 9 are how many?	7 times 12 are how many?
2 times 10 are how many?	11 times 12 are how many?
6 times 5 are how many?	9 times 8 are how many?
5 times 9 are how many?	10 times 12 are how many?
9 times 6 are how many?	12 times 12 are how many?
10 times 11 are how many?	5 times 9 are how many?
12 times 12 are how many?	6 times 8 are how many?
12 times 7 are how many?	9 times 10 are how many?
11 times 5 are how many?	12 times 7 are how many?
12 times 8 are how many?	9 times 9 are how many?
6 times 5 are how many?	8 times 7 are how many?
9 times 9 are how many?	12 times 5 are how many?

## Practical Questions.

1. If an orange is worth 6 cents, how many cents are 3 oranges worth?
2. What is the cost of 8 yards of cloth at 5 dollars a yard?
3. How much will a man earn in 6 days, if he earns 7 dollars per day?
4. If a man's expenses are 4 dollars per day, what are his expenses for 6 days?
5. If a horse travels 8 miles per hour, how far will he travel in 9 hours?
6. A bushel contains 4 pecks: how many pecks are there in 5 bushels?
7. If a pail holds 3 gallons of water, how many gallons are required to fill 8 pails?
8. If a father gives to each of 7 children 9 dollars, how many dollars will he give to all?
9. If 8 yards of cloth are required for a suit of clothes, how many yards will be required for 7 suits?
10. If a mechanic earns 15 dollars per week and spends 9 dollars, how much will he save in 6 weeks?
11. If a man earns 4 dollars per day, how much will he earn in 7 days?
12. If a sheet of paper can be folded in 8 leaves, how many leaves will 9 sheets make?
13. If a carpenter, in measuring a piece of timber, lays his measuring rod, which is 6 feet long, 10 times along the piece, how long is it?
14. In how many days can 1 man do as much work as 3 men can do in four days?
15. If 6 men can do a piece of work in 7 days, in how many days can 1 man do the same work?
16. If 5 men can build a wall in 9 days, how many men can build it in 1 day?

## CASE I.

28. When the multiplier does not exceed 9.

1. What is the product of 325 multiplied by 5?

	OPERATION.	
ANALYSIS.—Since 325 is to be taken 5 times, each order of its units must be taken 5 times: hence, the product must contain 25 units, 10 tens, and 15 hundreds:	$\begin{array}{r} 325 \\ \times 5 \\ \hline 15 \\ 10 \\ 15 \end{array}$	units. tens. hundreds.

Therefore, the product is . . . 1 6 2 5

In practice, the operation is performed thus:

Say, 5 times 5 are 25; set down the 5, and then say, 5 times 2 are 10 and 2 to carry are 12; set down the 2, and then say, 5 times 3 are 15 and 1 to carry are 16; set down the 16, and the product, as before, is	OPERATION.	
	$\begin{array}{r} 325 \\ \times 5 \\ \hline 1625 \end{array}$	Multiplicand. Multiplier. Product.

## Rule.

*Multiply each figure of the multiplicand by the multiplier, carrying and setting down as in Addition.*

NOTE.—In performing the multiplication, the pupil should be taught to pronounce only the final result of each operation. Thus, in the example above, he should say, 25; then 12 (instead of 5 times 2 are 10 and 2 to carry are 12); then, 16.

## Examples.

	(1.)	(2.)	(3.)	(4.)
Multiplicand,	2704	3049	1648	6146
Multiplier,	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Product,	5408	9147	6592	30730

## MULTIPLICATION OF

(5.) 15049 <hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 6	(6.) 30413 <hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 7	(7.) 24604 <hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 8	(8.) 41970 <hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 9
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(9.) 104700 <hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 7	(10.) 970421 <hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 8	(11.) 874909 <hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 9	(12.) 919905 <hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 9
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(13.) 190804 <hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 5	(14.) 987672 <hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 8	(15.) 695143 <hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 7	(16.) 794169 <hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 9
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17. Multiply 30746 by 8. | 21. Multiply 490767 by 5.  
 18. Multiply 99099 by 9. | 22. Multiply 540992 by 7.  
 19. Multiply 670497 by 8. | 23. Multiply 888888 by 8.  
 20. Multiply 270496 by 7. | 24. Multiply 999999 by 9.
25.  $3567064 \times 9 =$  what product?  
 26.  $51606 \times 8 =$  what product?  
 27. Multiply sixty-five thousand six hundred and forty-eight, by eight.  
 28. Multiply seven hundred and eighty-six thousand nine hundred and ninety-five, by five.  
 29. Multiply the sum of 9756 and 2864, by 9.  
 30. Multiply the difference of 7050 and 4986, by 6.  
 31. The multiplicand is 25689 and the multiplier is 5: what is the product?  
 32. If one horse costs 175 dollars, what will be the cost of 6 horses at the same rate?  
 33. In one cord of wood there are 128 solid feet: how many solid feet are there in 8 cords?  
 34. What would be the cost of 7 houses, each costing 3759 dollars?  
 35. What is the product of 19700685 multiplied by 8?

## CASE II.

## 29. When the multiplier contains two or more figures.

## 1. Multiply 3046 by 504.

ANALYSIS.—The multiplicand is to be taken 504 times: taking it 4 times, we obtain 12184. When we come to take it 5 hundred times, the *lowest order of units* in the product will be hundreds: hence, 0, the first figure of the product, must be written in the third place.

OPERATION.	
	3 0 4 6 Multiplicand.
	5 0 4 Multiplier.
	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/>
	1 2 1 8 4
	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/>
	1 5 2 3 0
	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/>
	1 5 3 5 1 8 4 Product.

NOTE.—The product obtained by multiplying by a single figure of the multiplier, is called a *partial product*. The sum of the partial products, is the required product.

## Rule.

- I. Write the multiplier under the multiplicand, placing units of the same order in the same column.
- II. Beginning with the units' figure, multiply the multiplicand by each significant figure of the multiplier, and write the first figure of each partial product directly under its multiplier.

III. Then add the partial products, and their sum will be the required product.

## Proof.

Write the multiplicand in the place of the multiplier, and find the product, as before. If the two products are the same, the work is supposed to be right.

## Examples.

(1.)	(2.)	(3.)
7406	9046	9046
<u>306</u>	<u>204</u>	<u>805</u>
44436	36184	45230
<u>22218</u>	<u>18092</u>	<u>72368</u>
2266236	1845384	7282030
(4.)	(5.)	(6.)
564	8946	80269
<u>23</u>	<u>18</u>	<u>16</u>
(7.)	(8.)	(9.)
7692	62567	47619
<u>19</u>	<u>25</u>	<u>32</u>
(10.)	(11.)	(12.)
500675	951046	802706
<u>65</u>	<u>79</u>	<u>68</u>
(13.)	(14.)	(15.)
547654	940573	64609
<u>85</u>	<u>125</u>	<u>246</u>

16. Multiply the number 50687 by 264.
17. Multiply the number 67094 by 568.
18. Multiply the number 260407 by 2426.
19. Multiply the number 175905 by 15435.
20. Multiply the number 875606 by 404.
21. Multiply the number 470065 by 20605.
22. Multiply the number 471002 by 340106.

23.  $450604 \times 6094 =$  how many?
24.  $569074 \times 21702 =$  how many?
25. The multiplicand is 47568 and the multiplier is 5964 : what is the product?
26. The multiplicand is 495 and the multiplier is 17964 : what is the product?
27. What is the product of 16084 taken 1207 times?
28. Multiply one million eight hundred and sixty thousand five hundred and six, by one thousand and sixty-two.
29. Multiply two hundred and seven millions four hundred and sixteen thousand seven hundred and sixteen, by two thousand six hundred and forty-seven.
30. What is the product of 2845 and 796?
31. What is the product of 165, 962, and 175?
32. What is the product of 2, 45, 166, and 205?
33. Multiply 1009 by one thousand and nine.
34. Multiply five hundred and six by itself.
35. Multiply the number 3000 by 46985.
36. Multiply the number 8704057 by 6939484.

## CONTRACTIONS.

30. A COMPOSITE NUMBER is one which may be produced by multiplying together two or more numbers.
31. A FACTOR is any one of the numbers which, multiplied together, produce a composite number.

Thus,  $2 \times 3 = 6$ , 2 and 3 are the factors of the composite number 6.

Also, 12 is a composite number,  $= 6 \times 2 = 3 \times 2 \times 2$ , in which the factors are 6 and 2, or 3, 2, and 2.

What are the factors of 9? of 14? of 16? of 20?  
What are the factors of 4? of 15? of 18? of 24?