MATHEMATICAL ROOTS UPROOTED,

INCLUDING SQUARE ROOT, CUBE ROOT, AND OTHER ROOTS.

A HIGHLY PRACTICAL, BRIEF AND UNIQUE METHOD FOR THE EXTRACTION OF ALL ARITHMETICAL ROOTS.

A SCIENTIFIC PROCESS NOT HERETOFORE PRESENTED IN ANY PUBLISHED WORK ON ARITHMETIC, AND

SAVING NINE-TENTHS OF THE LABOR

USUALLY NECESSARY FOR THE EXTRACTION OF ROOTS, AND ESPECIALLY OF CUBE ROOT, UNDER THE RULES NOW EMPLOYED.

FOR THE USE OF ALL GRADES AND ALL SCHOOLS ABOVE THE PRIMARY, AND FOR TEACHERS IN PARTICULAR.

—BY—

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Cleveland, Ohio.

DEDICATION.

TO MY WIFE,

THE SYMPATHETIC SHARER WITH ME OF THE MIXED
CUP OF FORTUNE INCIDENT TO
A LONG SCHOOL LIFE, THIS LITTLE VOLUME
IS AFFECTIONATELY INSCRIBED.

G. D. Hines.

PREFACE.

THIS little work needs but a short introduction. It is brevity itself, and whatever of merit it may possess, is largely due to its brevity and practicability. The methods of treating difficult roots, herein contained, and especially of cube root, were first suggested to the Author in the winter of '81 and '82, while teaching the Lincoln School, Plumas County, California. The pupils of that school, as is usual with most pupils, on first meeting the subject, were having trouble with cube root. This caused the teacher to put his wits to work in the almost hopeless effort to devise, if possible, some easier and shorter way of solution than the prolix processes extant in the arithmetics; and, after some days of close scrutiny of the meaning and relation of roots and powers, the Author detected, for the first time, a new method of teaching cube root. The treatment of other roots, and of surds, naturally followed; and the result has been what my fellow-teachers and others will find in the following pages of this work.

It is believed that the addenda of Interest, with its unique, brief, and simple treatment, will prove an attractive feature of the book.

This work is distinctly original. It details our own discoveries and is the product of our own thought respecting the treatment of that difficult subject, cube root. We send it forth on its mission, conscious that it must stand or fall on its own merits. We are fully persuaded, at the same time, that it needs only to be seen and understood to be appreciated; and that, if generally introduced, it must supplant the perplexing and unsatisfactory rules in the text-books on cube root and the higher roots, and on surds. We ask an impartial examination by our fellow-teachers everywhere, and believe they will find the little book helpful, if not indispensable, to them.

SELMA, CAL., MAY 28, 1886.

CUBE ROOT

AND OTHER ROOTS UPROOTED.

DEF.—A root is one of the equal factors that has been repeated *in multiplication* a given number of times, to produce a given power. *Ex.*—3 is the cube root of 27, having been twice repeated in multiplication, or thrice used as a factor, to produce the power. 27 is the cube root of 19683, having been twice repeated in multiplication, or thrice used as a factor, to produce the power. 15 is the fourth root of 50625, having been three times repeated in multiplication, or four times used as a factor, to produce the power. And so on for any other roots, integral or fractional, positive or negative. To find the roots of all powers that legitimately belong to arithmetic, is the chief object of this work.

Obs.—As this treatise deals chiefly with *cube* root and other *higher* roots, no extended notice of *square* root will be taken. Only an incidental usage will be made of it.

THE BASIS.

It is a well-known fact that the principles underlying Arithmetical evolution are derived from the mother science of Algebra, and that the arithmetical *rules* have been formulated out of the algebraic formulæ. No other rules for the extraction of roots have been presented in the arithmetics, and perhaps, substantially, no others can be framed than those which depend on algebraic principles. But certain rules can, nevertheless, be formulated, which, while they have reference to algebraic principles, completely revolutionize the old mammoth rules, and, in brevity, almost annul them.

THE NEW TREATMENT.

The methods about to be illustrated need have no reference to algebra, nor do they require any knowledge of that science. They annihilate the "cubic block" system, which clearly presents the principles of evolution to only the maturer scholars; and then only in *cube* root, and are of no real advantage in the actual work of even the *cube* root, in very large numbers, and certainly of no advantage in extracting any other than the *cube* root.

CUBE ROOT.

We will now present our method for the extraction of the *cube* root. Powers are either perfect or imperfect. 15625 is a perfect cube, while 18740 is an imperfect cube, or third power, and is called a surd.

We will present a rule for the extraction of the cube root of perfect third powers, and one also for that of surds.

Obs.—It may be remarked that a surd may be considered an imperfect power of any degree whatever. Thus, 18740 may be considered an imperfect square, cube, fourth power, or any other power; for we may require the approximate square root, cube root, fourth root, or any other root, of 18740. But it sometimes happens that a perfect power of one degree is a surd of another degree, and *vice versa*.

Ex.—25 is a perfect square, but an imperfect cube; while 27 is an imperfect square, but a perfect cube.

EXACT CUBES OF TWO PERIODS.

Let us extract the cube root of the following numbers, viz.:

13824	185193
74088	250047
262144	91125
166375	97336
704969	226981

A little observation and practice enable us to determine by inspection the root figure of the first period of the power. Thus, the root figure of 13, in the first of the preceding numbers, is 2. And by the new method, the root figure of the last period is 4, when the period ends in 4. Hence, the cube root of 13824 is 24. The root figure of the first period of 74088 is 4, and the root figure of the last period is 2, when the period ends in 8. (It is 8 when the period ends in 2.) So the cube root of the last number is 42. The cube root of 262144 is obtained in the same way. The root figure of 262 is 6, and of 144 it is 4. So the $\sqrt[3]{262144}$ is 64. Again, the root figure of the first period of 166375 is 5; and the root figure of the last period is 5, when the period ends in 5. So the $\sqrt[3]{166375}$ is 55. 704969 gives, for the first root figure, 8; and the last is 9, when the period ends in 9. So, the $\sqrt[3]{704969}$ is 89. In like manner, 185193 gives, for the first root figure, 5; and last figure is 7, when the period ends in 3. (It is 3, when the period ends in 7.) Thus, the $\sqrt[3]{185193}$ is 57. The cube root of 250047, for reasons already stated, is 63. The cube root of 91125, for similar reasons, is 45. The $\sqrt[3]{97336}$ is to be written out *impromptu*, just as the previous roots have been; making the last root figure 6, when the final period ends in 6. Also, the $\sqrt[3]{226981}$ is 61, the last root figure being 1, when the concluding period ends in 1. Observe that, in all perfect cubes, the final root figure is simply *chosen*, according to the character of the terminating figure of the power. This is a great saving of time and work, as will be shown hereafter.

EXPLANATION.

The reasons for the foregoing *selection* of the final root figure, depend on a very plain principle. In all perfect third powers, it is evident that the final figure of the *power* arises from the multiplication of the final figure of the *root twice* into itself. Now, if we multiply the nine digits, respectively, twice into themselves, we shall have this result, viz.:

$1 \times 1 \times 1 = 1$
$2 \times 2 \times 2 = 8$
$3 \times 3 \times 3 = 27$
$4 \times 4 \times 4 = 64$
$5 \times 5 \times 5 = 125$
$6 \times 6 \times 6 = 216$
$7 \times 7 \times 7 = 343$
$8 \times 8 \times 8 = 512$
$9 \times 9 \times 9 = 729$

Observing the final figures of these powers, we see that the final *root* figure 1 produces a 1, on being twice multiplied into itself. We see that the final root figure 2 produces an 8, and an 8 a 2; that 3 produces a 7, and a 7 a 3; that a 4 produces a 4; that a 5 produces a 5; that a 6 produces a 6, and that a 9 produces a 9.

Obs.—The cubes of the several digits, viz.: 1, 8, 27, 64, 125, 216, 343, 512, 729, must be so thoroughly familiar to the student that he can select the root figure of the first period *impromptu*.

If the first period is, in magnitude, between 1 and 8, the root figure is 1; if the first period is, in magnitude, between 8 and 27, the root figure is 2; if the first period is embraced between 27 and 64, the root figure is 3; if it is between 64 and 125, the root figure is 4; and so on.

1. What is the root figure of the first period, if the period is comprised between 512 and 729?
2. What is the root figure of the first period, if the period is larger than 729?

EXAMPLES.

Let it be required to extract the cube root of the following, by the foregoing principles, viz.:

$\sqrt[3]{970299} = 99$
$\sqrt[3]{681472} = 88$
$\sqrt[3]{456533} = 77$
$\sqrt[3]{287496} = 66$
$\sqrt[3]{6859} = 19$
$\sqrt[3]{59319} = 39$

Thus, we may write out, *impromptu*, according to the foregoing principles, the roots of these, and of *all* perfect cubes involving only two periods.

Let the student find the roots of the following, writing out the answers, off-hand, without any figuring or formal extraction, and choosing, at sight, the final root figure, according to the character of the terminal figure of the power, viz.:

1. $\sqrt[3]{39304}$
2. $\sqrt[3]{.091125}$
3. $\sqrt[3]{46656}$
4. $\sqrt[3]{405224}$
5. $\sqrt[3]{389017}$
6. $\sqrt[3]{474582}$
7. $\sqrt[3]{.000002744}$
8. $\sqrt[3]{.000024389}$
9. $\sqrt[3]{.000079507}$
10. $\sqrt[3]{.000614125}$
11. $\sqrt[3]{2.197000}$
12. $\sqrt[3]{941.192000}$

Obs.—The last six preceding numbers consist of three periods, but may be solved without premeditation by the same rules, respecting the terminal figure, as are given for powers of two periods.

EXACT CUBES OF THREE PERIODS.

Let us extract the cube root of the following numbers:

1. 44361864
2. 134217728
3. 12812904
4. 12.812904
5. 5545233
6. 2000376
7. 153990656
8. 387420489
9. 10077.696
10. 36.926037

Taking the first of the preceding numbers, and selecting the first root figure, 3, we take its cube from the period, and to the remainder attach the next period. Find the second root figure by dividing the partial dividend, save the two right-hand figures, by triple the square of the first root figure. Choose the last figure according to the character of the terminal figure of the power.

	44361864	354.
	27	*Ans.*
27	17.361	

In the same manner, the cube root of

	134217728 is	512.
	125	*Ans.*
75	92.17	

For a partial divisor we take three times the square of the first root figure, and again choose the last figure.

So, the cube root of 12812904 is | 234, found

	12812904 is	234, found
	8	
thus: Partial divisor 12	48.12	The last figure is simply chosen.

The cube root of 12:812904 is 2.34, the same in form but different in value.

The $\sqrt[3]{5545233} = 177$

| 1

3 | 45.45 Dividing and allowing for a completed divisor, we get 7 for the second root figure, and choose the last, which must be 7. Why?

The $\sqrt[3]{2000376} = 126$. *Ans.*

Partial divisor 3 | 1

| 10.00 Why is the last root figure 6?

No other figuring than the above is necessary.

The $\sqrt[3]{153990656} = 536$.

| 125

Divisor $5^2 \times 3 = 75$ | 289.90 Always triple the square of first root figure for a partial divisor of all but the two right-hand figures of the partial dividend.

The $\sqrt[3]{387420489} = 729$.

| 343

Divisor 147 | 444.20 Having obtained the second root figure, we choose the last unerringly. Why is it 9? How is 147 obtained?

The $\sqrt[3]{10077.696} = 21.6$.

| 8

Divisor 12 | 20.77 On the same principles the cube root of 36.926037 = 3.33.

| 27

and is found thus: 27 | 99.26

On the law of the terminal figure of the power depends the secret of this new method with cube root. It is worth much to the student. Let him verify all of the above answers, by going through the actual work in every case, and thus acquire the needed familiarity.

THIRD POWERS,

Involving periods of noughts at the left or right of the significant figures, and extracted by the foregoing rule.

The $\sqrt[3]{.000520476129} = .0809$.

| 512

Partial divisor 192 | 174.75 The partial divisor is not contained in the brought-down dividend shorn of its two right-hand figures, and we place a nought for the third figure of the root, and arbitrarily choose the last figure which is 9.

The $\sqrt[3]{.048228544000} = .3640$.

| 27

Divisor 27 | 212.28 Dividing, we find the partial divisor is contained in 212 only 6 times, allowing for the effect of a finished divisor. We choose the remainder of the root figures.

The $\sqrt[3]{.000,007,077,888} = .0192$.

| 1

Divisor 3 | 60.77 Dividing by the partial divisor, we find it will go into the partial dividend the largest possible number of times. (No divisor can go more than 9 times.) The last figure of the root is 2. Why?

The $\sqrt[3]{.000618470208} = .0852$. *Ans.*

| 512

Divisor 192 | 1064.70

1. How is the partial divisor, 192, obtained?

We select, *unerringly*, the last root figure.

ADDITIONAL EXAMPLES FOR THE STUDENT.

Find the cube root of the following, viz.:

1. 84604519.
2. 2803221.
3. 3176523.
4. 382657176.
5. 40.353607.
6. 1520875.

Find the value, also, of these:

7. $\sqrt[3]{13481272}$
8. $\sqrt[3]{8615.125000}$
9. $\sqrt[3]{738.763264}$
10. $\sqrt[3]{561.515625}$
11. $\sqrt[3]{21024576}$
12. $\sqrt[3]{67917312}$

In solving these examples, let it be understood that our only rule for cubes of three periods is, to take out by inspection the root figure of the first period, and, having taken its cube from that period and attached the next period to the remainder for a new dividend, to find the next root figure by dividing the partial dividend by triple the square of the first root figure, and arbitrarily *choose* the last figure of the root, according to principles already explained.

Perfect Cubes of More Than Three Periods.

We will now extract the cube root of some numbers of more than three periods, and show that the new method applies to them, with a very slight amount of additional work.

Let it be required to extract the cube root of the following numbers, viz.: 8024024008, 10460353203, 98867482624, 122615327232, 1544804416. Taking the first of the above numbers, we proceed as with powers of three periods, thus:

```
             8,024,024,008 | 2002.  Ans.
           | 8
           | —
Divisor 12.00 |  24.024
```

Explanation.—Finding the first root figure, deducting its cube, and attaching the next period for a dividend, we find that the partial divisor, 12, is not contained in the partial dividend, 24, of the second period, and we attach the next period. The root thus far found is 20, and triple its square is 1200, the next partial divisor, which is again not contained in the brought-down dividend shorn of the two right-hand figures, and the root now found is 200, and we choose the last figure.

```
          The ∛10460353203 = 2187.  Ans.
                | 8
                | —
      12.6.1    | 24.60
                | 1261
                | ————
  21² × 3 = 1323 | 11993.53
```

Explanation.—We divide, as usual, the first partial dividend by the triple square of the first root figure, which is 12, and obtain 1 for the second root figure. We finish the divisor, 12, by adding to it, successively, advanced one place to the right for each addition, the triple product of the two root figures, and the square of the last one. This finished divisor we multiply by the last root figure, and take the product from the brought-down dividend. We need only a second partial divisor, the triple square of 21, to find the third root figure, and we choose the last figure of the root, according to the character of the terminal figure of the power.

```
          The ∛98867482624 = 4624.  Ans.
                | 64
                | —
Divisor   48.36 | 348.67
            72  | 33336
          ————  | —————
Fin. div. 5556  | 15314.82
```

Using the same finished divisor as an approximate divisor, we find the next root figure to be 2, and then we select the last. Observe that 36 is put in the niche of the other two parts of the divisor, to save space.

Obs.—To insure accuracy in finding the third root figure, it is generally best to take for a divisor the triple square of the first two root figures. Even then there is an immense saving of work, time and space over the old methods. By the modes of solution practiced heretofore, as treated in the books, the work of the above example is absolutely overwhelming, covering, with the rule and the explanation, from three to five pages. Let the pupil, for the present, accept on *trust* such parts or features of the rule as he may not thoroughly understand. Further elucidation will be given in due time.

$\sqrt[3]{122615327232} = 4968.$

		64
1st Divisor	48.81	586.15
	108	53649
	5961	49663.27
		43218
2nd Divisor	$49^2 \times 3 = 7203$	
		6445

It is only necessary to frame a second partial divisor to obtain the third root figure, and then we arbitrarily choose the last figure of the root. What have we saved by this abbreviated method?

We have saved the completion of the second divisor, the formation of the third, the completion of the third divisor, and all the multiplications and subtractions connected with these last periods, the prolixity and difficulty of which rapidly increase, under old methods, as we approach the end.

The $\sqrt[3]{1544804416} = 1156.$ *Ans.*

1st divisor	3	1
Finished divisor	331	544
		331
2d divisor	363	
		2138.04
		1815

There is no necessity for multiplying the second partial divisor, 363, by the third root figure, 5. We do so here, to show that the remainder of the dividend divided, is less than the divisor.

The $\sqrt[3]{12,521,107,822,861} = 23221.$ *Ans.*

1st divisor	12	8
	18.9	
		45.21
Fin. divisor	1389	4167
2nd divisor	158.7	3541.07
		3174
		367
		317
		50

Explanation.—We complete the first partial divisor, and take its product, with the corresponding root figure, from the brought-down dividend. The triple of the square of the root now found is a partial divisor by which all the other root figures may be found, except the last, and that is simply chosen. Having framed the partial divisor, 1587, we ascertain how often it is contained in the corresponding partial dividend (always excepting the two right-hand figures), and multiply the divisor by the quotient figure, and subtract the result from the portion of the dividend divided, as in ordinary division. Having found the third figure of the root, we use for a dividend the remainder of the last partial dividend, and for a divisor we use the previous divisor shorn of its right-hand figure. And, in multiplying this divisor by the quotient figure, we reckon in the number of units that would be to carry from the figure cut off. If there were more periods than five, the process might be continued, by dropping figures, successively, from the right of the divisor. But the last figure of the root is always *chosen*. And, now, in what is said above, respecting the finding of some of the root figures by ordinary divison, lies the germ of the method herein treated, for the approximate extraction of the cube root of surds, to be explained in due time.

Take one more example involving five periods. Let it be required to extract the cube root of the number

599,183,710,672,625 | 84305. *Ans.*

1st divisor	192.16	512
	96	
		871.83
	20176	80704
2d divisor	$84^2 \times 3 = 2116.8$	64797.10
		63504
		1293

Elucidation.—Extract in the usual way to find the first two figures of the root. Then, as will be seen by inspecting the work, there is a necessity for finishing only one partial divisor, and afterward forming another one from the first two root figures. This second partial divisor we use to find two more root figures, and then choose the last root figure, which, from the character of the terminal figure of the power, must be 5.

Obs.—In the above solution, there is an immense saving of labor, time, and space. The student cannot realize the wide difference, if he has not gone through the labyrinths of the old methods, and the mazes of the old rule, in solving such problems. The rule and the explanation, under the old system, would cover several pages of this work. By the new method here taught, we save the completion of the second partial divisor, and the formation and completion of two other divisors, which it is the most desirable to obviate, because they become very large toward the end of the extraction, requiring much time and care in the work. But, for the encouragement of the student, it may be stated that few authors give numbers involving more than four periods; and it is also a rare thing in applied mathematics to find questions involving the roots beyond the fourth or fifth decimal, which are exceedingly easy by the method here taught, but long and tedious by the old method.

ADDITIONAL EXAMPLES FOR THE STUDENT.

Find the cube root of these numbers, viz.:

1. 2176782336.	4. 132963364864.
2. 87824421125.	5. 225199.600704.
3. 43132764843.	6. 754863.574332608.

Solve, also, the following:

7. $\sqrt[3]{\frac{4913}{15252992}}$	10. $\sqrt[3]{1\frac{217}{512}}$
8. $\sqrt[3]{173274\frac{31}{64}}$	11. $\sqrt[3]{\frac{46656}{15625}}$
9. $\sqrt[3]{2\frac{197}{1000}}$	12. $\sqrt[3]{\frac{1331}{3375}} \times \sqrt[3]{\frac{125}{512}}$

NOTE.—All perfect cubes of only two periods are to be solved at sight. Mixed numbers should be reduced to improper fractions, or to mixed decimals.

Find the value of this expression, viz.:

$$\sqrt[3]{16^6} \div \sqrt[3]{64} - (4 \times \sqrt[3]{.512}) =$$

Solution: $16^2 \div 4 - (4 \times .8) =$

$256 \div 4 - (\ 3.2\ ) =$

$64 - (\ 3.2\ ) = 60.8.$ *Ans.*

Find the value of these, viz.:

1. $\sqrt[3]{54.872}$	4. $\sqrt[3]{2326.203125}$
2. $\sqrt[3]{21.952}$	5. $\sqrt[3]{\frac{21952}{27}}$
3. $\sqrt[3]{2357947\frac{691}{1000}}$	6. $\sqrt[3]{64.964808}$
	7. $\sqrt[3]{\frac{27000}{32768}} \times \sqrt[3]{\frac{1331}{3179}}$

Answer to last: $\frac{165}{272}$. Let the student find it.

NOTE.—If the terms of a fraction are not perfect powers of the indicated root, let them be reduced to such powers, where possible, before the extraction begins.

The foregoing examples must suffice for illustration of the best method of extracting the root of exact cubes. The roots of higher powers will be discussed in connection with logarithms.

CUBIC SURDS.

We will now present a brief, easy, and practical method of treating *imperfect* powers of the third degree. In advance, we state that *that* method is, of course, one of approximation. Here it is impossible to choose the final figure, since there is no definite final root figure in surds.

Let it be required to find the cube root, correct to four decimals, of the fraction

	½ =	.500000000	.7937+
1st divisor	147.81	343	
	189		
		1570.00	
Finished divisor	16671	150039	
2d divisor	1872.3	69610.00	
		56169	
		13441	
		13106	
		335	

This answer is true to the fourth place, inclusive, as verified by logarithms. We extract in the usual way until we obtain half the number of root figures desired. We then form the second partial divisor, and with it obtain the other two root figures by a mode of contracted division, thus: Having found the third figure of the root and taken its product with the divisor from the partial dividend, use, instead of attaching other periods, the same partial dividend, and drop one figure from the right of the divisor last found, and ascertain how often it will go into the remainder of dividend accruing from the previous division, reckoning in the number that would be to carry from the figure dropped.

Find the $\sqrt[3]{.27}$ correct to four places.

1st divisor	108.16	.270000000	.6463+
	72	216	
	11536	540.00	
		46144	
2d divisor	1228.8		
		78560.00	
		73728	
		4832	
		3686	
		1146	

Observe that 16 is written in the niche of the other two parts of the divisor, to save space.

Explanation.—108 is the partial divisor. (How obtained?) This divisor gives the next root figure. 11536 is the finished divisor. (How obtained?) Observe that the two added parts, 72 and 16, are each advanced one place to the right. 12288 is the second partial, or approximate, divisor.

1. How is it obtained?
2. In the product of the root figure, 3, with the approximate divisor, 1228, account for the figure 6 in the result.

Obs.—Outside of mathematical astronomy, where, in a few instances, great precision is required, it is scarcely necessary to approximate a root beyond four decimal figures.

The $\sqrt[3]{.640000000 \text{ \&c.}} = .8617+$

1st divisor	192.36	512
	144	
		1280.00
	20676	124056
2d divisor	2218.8	39440.00
		22188
		17252
		15532
		1720

Observe that 36 is written in the niche of the other two parts of the divisor, to save space. 20676 is the only finished divisor it is necessary to make. After finding the third root figure, we add no other periods to the partial dividend, but use the same dividend, and use, as a divisor, the previous one shorn of its final figure. If we wish to find other root figures, we drop other figures from the divisor, one by one, and continue to divide as in common division. But it is well to bear in mind that if we wish to obtain accurately a definite number of decimals in the root, we must extract in the ordinary way, until we have obtained one-half of them, and then make a partial divisor from the root thus far found, and use that as an approximate divisor, to find the other root figures. But this is a very great saving, as it is the final periods that are to be dreaded in extraction. Do not fail to be familiar with the cubes 1, 8, 27, 64, 125, 216, 343, 512, 729. Otherwise you cannot select at sight the first root figure.

The $\sqrt[3]{2/3} = .666,666,666, \text{\&c.} = .8735+$

1st divisor	192.49	512
	168	
		1546.66
	20929	146503
2d divisor	2270.7	81636.66
		68121
		13515
		11353
		2162

See that 49 is written in the niche again, instead of being written thus:

192
168
49,

which would occupy too much space.

Obs.—In completing any divisor, we must advance each part one place to the right.

The $\sqrt[3]{.097672831790877} = .46053+$

1st divisor	48.36	64
	72	
		336.72
	5556	33336
2d divisor	63480.0	3368.317.90
		3174000
		194317
		190440
		3877

This is accurate as far as extracted; and, ye , there is a necessity to frame only a second approximate divisor. Referring to the third root figure, we see that the divisor is not contained in the partial dividend shorn of the last two figures, and we put a nought in the quotient, and two noughts to the right of the divisor, because the squaring of the root thus far found, namely 460, would give two noughts in the resulting partial divisor, 634800. Attaching another period, we use this divisor to find the remaining root figures.

Required the indicated roots of the following surds, accurate to four decimals, viz.:

1. $\sqrt[3]{.171467}$
2. $\sqrt[3]{2.42999}$
3. $\sqrt[3]{19.44}$
4. $\sqrt[3]{.571428}$
5. $\sqrt[3]{5}$
6. $\sqrt[3]{4\frac{1}{2}}$
7. $\sqrt[3]{42\frac{5}{7}}$
8. $\sqrt[3]{22.4}$
9. $\sqrt[3]{2}$
10. $\sqrt[3]{3}$
11. $\sqrt[3]{41.502}$
12. $\sqrt[3]{4}$
13. $\sqrt[3]{11}$
14. $\sqrt[3]{9\frac{1}{2}}$
15. $\sqrt[3]{9}$
16. $\sqrt[3]{7}$
17. $\sqrt[3]{48\times 4^2-18^2}$
18. $\sqrt[3]{300484}$
19. $\sqrt[3]{129.009}$
20. $\sqrt[3]{.6748-.2482}$
21. $\sqrt[3]{6}$

These examples must suffice for illustration of the brevity secured by this mode of approximating the cube root of surds, by which at least three-fourths of the work necessary under other methods is saved; while, in perfect cubes, nine-tenths of the usual work is obviated.

HIGHER ROOTS.

To "roots of all powers," so called, but a small space can be allotted in this brief work. Some authors, with what seems to be a strange love of novelty, rather than a desire for utility, have made quite an array of numbers requiring the 5th, 6th, 7th, 8th, 9th, 10th, 12th, 15th, 18th, 20th; and the 25th root, to be extracted. Now, it is needless to say that no such roots occur in nature, or in the course of applied mathematics. It is rare, indeed, in applied mathematics, that a number or quantity occurs requiring a root beyond the *third* or *fourth*. Then why should such numbers encumber that most practical of all the mathematical branches—arithmetic? One of the many authors on arithmetical science, whose works are in extensive use in this country, requires the 20th root of 617, the 15th root of 15, and the 25th root of 100. Wherefore? we ask; what the need? When will the necessity for their use arise? Such novelties are incubuses on the science of numbers, and ought to be relegated to the closets of defunct mathematics. But, if mathematicians must put such impractical problems in their books and have them solved, let them be solved by shorter and better methods than those presented in their works. That briefer and better method is by means of logarithms. Especially is this true for roots whose indices are not factorable into the square and cube roots. Indeed, even in this case, the logarithmic method would be far preferable, and, if once adopted, would supersede all other methods for the higher roots. For, although the 8th root can be taken by three successive extractions of the square root, the 9th root by two successive extractions of the cube root, and the 6th root by the cube root of the square root, or the square root of the cube root, still these roots can be much more easily and quickly taken by logarithms. We simply take, from a table of logarithms, the log. of the number whose root is sought; divide this log. by the index of the root, and find, in the same table, the number corresponding to the quotient, and it will be the required root.

Ex.—Find the cube root of 1.577635 —.

The log. of this number is .19800+; divide it by 9, the index, and the result is .02200+, and the number in the table corresponding to these figures is 1.0519, the required root. The same result is also easily obtained by the abbreviated method for cube root, thus:

				1st root. 2d root.
		1.577635 =		1.1641 + | 1.05 +. *Ans.*
Divisor	3.3.1	1		1
Divisor	363.36	5.77	3.00	1.641.00
	198	331		1500
	38316	2466.35		141
	=====	229896		
Divisor	403.6.8			
		16739		
		16147		
		592		
		404		
		188		

This is the answer to the example in the work from which it has been drawn; but it will be seen that the logarithmic method gives the answer more accurately. We have simply taken the cube root of the cube root by our method.

Find the 7th root of 308. The log. of 308, page 6 of the logarithmic table, is 2.48855; divide by the index of the root, $2.48855 \div 7 = .35550+$; and the number corresponding to this logarithmic quotient is $2.26729\pm$, the 7th root of 308. All that is necessary in order to extract, by logarithms, *any* root, is to look in a table of logarithms for the log. of the number to be extracted; divide this by the index of the root, and find, in the same table, the number corresponding to the quotient, and it will be the root sought. This method is vastly shorter, and only requires a little knowledge of logarithms, and a little facility in their use, to enable one to evolve, with despatch, *all* roots. But such roots belong rather to higher mathematics. We would advise that, by all means, all roots above the third be taken by means of logarithms. It is but an hour's work to teach, to anyone that can multiply and divide, the use of the table. The after work is simply *routine*, and much valuable time is saved.

As a matter of curiosity, we give below the 7th root of the same number, as presented by its author in one of the books of the day. That is, the 7th root of 308.

OPERATION.

$\sqrt[6]{308} = 2.59+$
$\sqrt[8]{308} = 2.04+$
$2.59 + 2.04 = 4.63$
$4.63 \div 2 = 2.31+$ assumed root.
$2.31^6 = 151.93$
$308 \div 151.93 = 2.0272+$
$2.31 \times 6 + 2.0272 = 15.8872$
$15.8872 \div 7 = 2.2696$ 1st approximation.
$2.2696^6 = 136.6748$
$308 \div 136.6748 = 2.253452+$
$2.2696 \times 6 + 2.253452 = 15.871052$
$15.871052 \div 7 = 2.267293$ 2d approx.

We have reached the second approximation. Consoling thought! And these are only *indicated* results, none of the multiplications, divisions, etc., being carried out. Now, if this belongs anywhere, and there is doubt of its having a place in applied mathematics, it belongs to higher mathematics. Such skirmishing in figures is calculated to keep one humble, by giving him a modest estimate of his attainments in evolution.

EVOLUTION BY LOGARITHMS.

Required the 25th root of 100. The log. of $100 = 2.000000$. $2.000000 \div 25 = .080000$, and the number corresponding is 1.202266+, which is the root sought. The solution of the same example, as given by a standard author, is as follows:

Now, as the 25th root must be less than the 24th root, let us take

The $\sqrt{100} = 10$
$\sqrt[4]{100} = \sqrt{10} = 3.1622$
$\sqrt[8]{100} = \sqrt{3.1622} = 1.7782$
$\sqrt[24]{100} = \sqrt[3]{1.7782} = 1.2115$
$1.2 =$ the assumed root.
$1.2^{24} = 79.49684+$
$100 \div 79.49684 = 1.25792+$
$1.2 \times 24 + 1.25792 = 30.05792$
$30.05792 \div 25 = 1.2023168$ 1st approx.
$1.2023168^{24} = 83.2677184$
$100 \div 83.2677184 = 1.2009492+$
$1.2023168 \times 24 + 1.2009492 = 30.0565524$
$30.0565524 \div 25 = 1.202262+$ 2d approx.

We breathe a sigh of relief. Of course, not much space can be devoted, in this small work, to such solutions. It is only to show the difficulty of the subject under the old methods, in contrast with the brevity and facility of the new, that we allow a little space for some solutions under existing methods.

Find, by the logarithmic method, the 6th root of 25632972850442049. The log. of this large number is 16.408800. Dividing by 6, we get 2.734800. The number found in the table, corresponding to this quotient, is 543, the sixth root of the above number. The foregoing number, treated by the new method, gives, for the square root, 160103007, and the

$\sqrt[3]{160103007} = 543$

	125
	—
75	351.03

Explanation.—With the approximate divisor, 75, find the second figure of the root, 4, and choose the last. Why is it 3? Thus, the work of the heretofore difficult cube root is almost annihilated.

What is the 20th root of 617? The log. of 617 is 2.790285. Dividing by 20, we have .139514, and the number corresponding is 1.378841, the ans.

Find the 5th root of 5. The log. of 5 is .69897. Divide by 5, and get .13979, and the number corresponding is 1.37973, the 5th root of 5.

The 5th root of 120 is: Log. $120 = \frac{2.07918}{5} = .41583+$; and the number corresponding is $2.60517\pm$, the root wanted.

Let the student find, by logarithms (see explanation of use of the table, pp. 62 and 63, etc.,) the roots of the following numbers, viz.:

1. The 8th root of 1099511627776.
2. The 12th root of 16.3939.
3. The 18th root of 104.9617.
4. The 7th root of 1.95678.
5. The 10th root of 743044.
6. The 3rd root of 4330747.

Find, also, by logarithms, or by the abbreviated method, at your option, the cube root of the following numbers, viz.:

7. 7023108918843072.
8. 7449353044230 23.
9. 109647435 89696.
10. 1881365963625.

Required the solution of these examples:

1. If a ball 10 inches in diameter weighs 125 lbs., what is the diameter of a ball that weighs 216 lbs.?

Solution.—$\sqrt[3]{125} : \sqrt[3]{216} :: 10 : \text{ans} = \sqrt[3]{\frac{216}{125}} \times 10 = 12.$
$5 : 6 :: 10 : \text{ans.}$ *Ans.* 12 inches.

2. How many balls ¼ inch in diameter will be required to make a ball 1 inch in diameter? *Ans.* 64 balls.

3. Suppose the diameter of the earth to be 7912 miles, and that it takes 1404928 bodies of the size of the earth to make one as large as the sun, what is the diameter of the sun?

$\sqrt[3]{\frac{1404928}{1}} \times 7912 = 112 \times 7912 = 886144$ miles. *Ans.*

4. A bin is 8 feet long, 4 feet wide, and 2 feet deep; what is the linear edge of a cubical box that will hold the same quantity of grain?

$\sqrt[3]{8 \times 4 \times 2} = \sqrt[3]{8 \times 8} = 2 \times 2 = 4$ feet. *Ans.*

Let the curt processes be used. Extract the factors of products in preference to taking the roots of the products.

5. If a stack of hay 24 feet high weighs 27 tons, what is the hight of a stack weighing 8 tons?

$\sqrt[3]{\frac{8}{27}} \times 24 = \frac{2}{3} \times 24 = 16$ feet. *Ans.*

6. If a bell 4 inches high, 3 inches in diameter, and ¼ of an inch thick, weighs 1 pound, what are the dimensions of a similar bell weighing 27 pounds?

Ans. 12 inches high, 9 inches diameter, and ¾ of an inch thick.

7. If a loaf of sugar 10 inches high weighs 8 pounds, what is the hight of a similar loaf weighing 1 pound?

$\sqrt[3]{\frac{1}{8}} \times 10 = \frac{1}{2} \times 10 = 5$ inches. *Ans.*

8. There is a bin 32 ft. long, 16 ft. wide, and 8 ft. deep; what must the side of a cubic bin be that shall contain the same quantity?

$\sqrt[3]{32 \times 16 \times 8} = \sqrt[3]{64 \times 64} = 4 \times 4 = 16$ ft. *Ans.*

9. What must be the side of a cubic bin that shall hold 350 bushels of grain?

SOLUTION.

$2150.4 \times 350 = 752640 \mid 90.96+ = 7$ ft. 6.96 in.

Divisor	24300.81	729 *Ans.*
	2430	——
		236.400.00
Fin. div.	245438.1	22089429
		1550571
		1472629
		77942

We use the finished divisor, shorn of the final figure, as an approximate divisor to obtain the fourth figure of the root. For practical purposes, the above is a close approximation.

10. If a sphere of gold 1 inch in diameter is worth $100, what is the diameter of a sphere that is worth $6400?

$\sqrt[3]{\frac{6400}{100}} = \sqrt[3]{64} \times 1 = 4$ inches. *Ans.*

11. The cubic metre is 61026.048 cubic inches; what is the linear metre?

Ans. 39.37 inches. Find it by approximation.

We give one more illustration, each, of the new method of taking the cube root of perfect and imperfect third powers:

The $\sqrt[3]{146113369163} = 5267$. *Ans.*

1st divisor	75	125
	30.4	——
	——	211.13
	7804	15608
	═══	——
2d divisor	8112	55053.69
		48672
		——
		6381

There is no necessity of the last multiplication, 6 times the second divisor. Satisfy yourself that the remainder will be less than the divisor, and then *choose* the last root figure, thus saving a vast amount of work. Why is the final root figure 7?

What is the value of $1.05^{\frac{5}{3}}$ to 6 decimals?

The log of 1.05 is .021189. Divide this by 3, and multiply the result by 5, and we get .035315; the number corresponding is 1.084715 ±, the answer. To solve the above example in the old way, will require about 30 minutes; by the logarithmic method, 2 or 3 minutes.

The $\sqrt[3]{1.1810108914205625}$, by the approximate method, accurate to 6 decimals, is 1.057023 ±. Find it. A more exact value is: 1.057,023,479,222,850

We have presented an unusually large number of solutions, in order that the cube root method herein set forth may be clearly apprehended by all. For, knowing its advantage in brevity and simplicity, and, consequently, its economy of time and space, we are thoroughly convinced that, if once adopted, it will be abandoned for no other. Let it be remembered, that if, in approximating the cube root of a number, it is desirable to extend the answer to a given number of decimal figures, one-half of *all* the root figures must be obtained by extraction in the usual way. The other half may be obtained by contracted division. For instance, in example 9 of the 12th page, 90.9 is obtained by extraction, and 625 is obtained by contracted division. If it be asked how we determine when a number is a perfect cube, and when it is a cubic surd, we answer that, in actual business, in applied mathematics, this fact is always known when the problem occurs in the course of our work. Perfect cubes are in the minority in the course of mathematics. The small number of problems given under the head of evolution by *logarithms*, will be sufficient to illustrate the subject. The student may work any, or all, of the others by logarithms, if he chooses. For this purpose, a table of logarithms is appended, calculated as accurately as possible to five decimal places. The table is extensive enough to enable us to find the roots of *all* numbers correct to five decimals. An explanation of the use of the table is also appended. Should anyone desire further aid in the matter of a knowledge and ready application of logarithms in the extraction of roots, the author will take pleasure in rendering all the assistance in his power. In conclusion, if any have their pet theories, methods, or processes, in cube root, to which they cleave with such a blind adherence that they cannot, or will not, see merit in anything else, this book is not made for them. If any are moved by prejudice,or jealousy, or envy at my good fortune, or by a spirit of criticism, or are unduly inflated with the importance of their own knowledge of the subject, through the belief that nothing new can be presented in evolution, the book is not written for any of these classes.

All true science consists, not in the discovery of any new truth,but in the right application of existing truth, so as to render it subservient, in the highest degree, to the interests and to the pleasure of mankind. If "brevity is the soul of wit," it is no less the key to successful business. The large curtailment of the amount of work done in book-keeping in the last few years, is only in harmony with the spirit of the age, and, reinforces the sentiment of "short profits and quick sales." So must our methods and processes in education be constantly improved and refined, so as to be the most highly contributory to the important interests of business and of society.

SIMPLE INTEREST.

Owing to the universal application and great practicality of this subject, we have thought proper to give it a place in this work, and a treatment that, for brevity, utility, and simplicity, is in keeping with the constant drafts made upon it by all classes of men—those of inferior, as well as those of superior, attainments. The subject is what the name signifies, but is made rather complex by some authors and teachers, owing to the multiplicity of rules and tedious methods of treatment used by them. In simple interest, there is scarcely a necessity for more than one uniform rule, whatever be the rate or the time.

Let us take some examples, by way of illustration:

What is the interest of $450.87 for 1 yr. 7 m. and 9 da., at 6 per cent.?

Operation.—

$$\frac{450.87}{1}\times\frac{19.3}{\cancel{12}}\times\frac{\overset{.005}{\cancel{.06}}}{1}=$$

450.87
.0965
225435
270522
405783
Ans. 43.508,955

9 days is .3 of a month, and the process is simply one of cancellation.

Find the interest of $125.16 for 1 yr. 11 m. 25 da., at 6 per cent.?

Process.—

$$\frac{\overset{10.43}{\cancel{125.16}}}{1}\times\frac{23.83+}{\cancel{12}}\times\frac{.06}{1}=$$

1.4298
10.43
42894
57192
14298
Ans. 14.91

One year and 11 months are 23 months, and 25 d. are .83+ of a mo. So that the *time* is 23.83+ mos., or 12ths of years, at the given rate per year. Let the cancellations, and all the multiplications possible, be done mentally.

Find the interest of $1500.60 for 2 yr. 4 mo., at 6¼ per cent.?

$$\frac{\overset{125.05}{\cancel{1500.60}}}{1}\times\frac{28}{\cancel{12}}\times\frac{.06\frac{1}{4}}{1}=$$

125.05
1.75
62525
87535
12505
Ans. $218.8375

We take 6 times 28, plus the ¼ of 28, mentally, which gives 1.75.

Find the amount of $3050 for 4 yr. 8 m., at 5¼ per cent.?

$$\frac{3050}{1}\times\frac{\overset{14}{\cancel{56}}}{\underset{3}{\cancel{12}}}\times\frac{\overset{.0175}{\cancel{.0525}}}{1}=$$

1.2450
3050
62250
3735
Ans. $3797.250

In making multiplications mentally, after the cancellations have been made, let the smallest numbers be so multiplied. Thus 14 times .0175, and then add 1 to the result, to get the amount of $1 for the time, at the given rate. This result is then multiplied by the principal.

Required the interest of $250 for 1 yr. 10 m. 15 da., 6 per cent.

$$\frac{\overset{125}{\cancel{250}}}{1} \times \frac{22.5}{\underset{2}{\cancel{12}}} \times \frac{\overset{.01}{\cancel{.06}}}{1} =$$

```
     .225
     125
   ------
     1125
    2700
   ------
Ans. $28.125
```

If the amount had been required, we should have proceeded thus:

$$\frac{250}{1} \times \frac{22.5}{\cancel{12}} \times \frac{\overset{.005}{\cancel{.06}}}{1} =$$

```
      1.1125
         250
     -------
      556250
     22250
     -------
Ans. $278.1250
```

After the mental multiplication of the time and rate, add one to the result, before the final multiplication by the principle.

Find the interest of $51.10 for 10 m. and 3 da., 4 per cent.

$$\frac{51.10}{1} \times \frac{10.1}{\underset{3}{\cancel{12}}} \times \frac{\overset{.01}{\cancel{.04}}}{1} =$$

```
      51.10
      .101
     ------
        511
       511
     ------
  3 | 5.1611
     ------
Ans.  1.72
```

It may also be done thus:

$$\frac{\overset{17.033+}{\cancel{51.10}}}{1} \times \frac{10.1}{\underset{3}{\cancel{12}}} \times \frac{\overset{.01}{\cancel{.04}}}{1} =$$

```
          17.033
           .101
         -------
          17033
         17033
         -------
As before $1.720333
```

What is the interest of $175.40 for 15 m. 8 da., 10 per cent.?

$$\frac{175.40}{1} \times \frac{\overset{1.272+}{\cancel{15.266+}}}{\cancel{12}} \times \frac{.10}{1} =$$

```
       175.40
       .1272
      -------
        3508
      12278
     21048
     --------
Ans. $22.31088
```

The multiplications are made mentally, except one.

Required the amount of $1500 for 6 m. 24 da., 7½ per cent.

$$\frac{1500}{1} \times \frac{\overset{1.7}{\cancel{6.8}}}{\underset{3}{\cancel{12}}} \times \frac{\overset{.025}{\cancel{.075}}}{1} =$$

```
   1.0425 = amt. of $1.
     1500
  ---------
$1563.7500 Ans.
```

Required the amount of $84.25 for 1 yr. 5 m. 10 da., 6¼ per cent.

$$\frac{84.25}{1} \times \frac{\overset{1.444+}{\cancel{17.333+}}}{\cancel{12}} \times \frac{.06\frac{1}{4}}{1} =$$

```
        8664
         361
      -------
      1.09025
        84.25
      -------
       545125
      218050
     436100
    872200
    ---------
Ans. $91.85
```

After first multiplication, add 1 to the result, before the formal multiplication.

Find the interest of $112.50 for 3 m. 1 da. 9½ per cent.?

$$\frac{112.50}{1} \times \frac{\overset{.2527+}{\not{3.033}+}}{12} \times \frac{.09\frac{1}{2}}{1} = \frac{2274}{126}$$

```
  112.50
  .02400
  ------
   4500
  2250
  ------
```

Ans. $2.70

In multiplying the time and rate together, allow for the number of units that would be carried from 9 times 7.

What is the interest of $408 for 20 da., 6 per cent.?

$$\frac{408}{1} \times \frac{\overset{.333}{\not{.666}+}}{\not{12}\ \not{2}} \times \frac{\overset{.01}{\not{.06}}}{1} =$$

```
     408
  .00333
  ------
    1224
   1224
  1224
  ------
```

1.35864=$1.36. *Ans.*

Always divide the days by 3, since every three days is $\frac{1}{10}$ of a month, thus reducing the days to decimals of a month. More than 5 mills should be called a cent. Less than 5 mills should be disregarded.

Required the interest of $50 for 1 yr., 3 m., 27 da., 3⅓ per cent.

$$\frac{\overset{25}{\not{50}}}{1} \times \frac{\overset{5.3}{\not{15.9}}}{\not{12}\ \not{6}\ 3} \times \frac{\overset{.05}{\not{.10}}}{3} =$$

```
   1.25
    5.3
  -----
    375
   625
  -----
3 | 6.625
```

Ans. $2.208⅓

Find the interest of $384.50 for 2 yr., 8 m., 4 da., 8 per cent.

$$\frac{384.50}{1} \times \frac{\overset{10.71}{\not{32.13}+}}{\not{12}\ 3} \times \frac{\overset{.02}{\not{.08}}}{1} =$$

```
   384.50
    .2142
   ------
     7690
   15380
   3845
  7690
  -------
```

$82.35990=$82.36. *Ans.*

Solve this by other methods and see if you get a different answer.

Required the amount of $275 in 4 m., 25 da., 7 per cent.

$$\frac{275}{1} \times \frac{\overset{.4027+}{\not{4.833}+}}{\not{12}} \times \frac{.07}{1} =$$

```
  1.02818
      275
  -------
   514090
  719726
  205636
  -------
```

$282.74950=$282.75. *Ans.*

After multiplying .4027 by .07, we add 1 to the result, for the amount of $1, before we make the last multiplication. Multiply .402 by .07, but carry from 7 times 7.

Interest of $318.29 for 9 m., 10 da., 7¼ per cent.?

$$\frac{318.29}{1} \times \frac{\overset{.777+}{\not{9.333}+}}{\not{12}} \times \frac{.07\frac{1}{4}}{1} = \frac{5443}{194}$$

```
   318.29
   .05637
   ------
   222803
   95487
  190974
  159145
  -------
```

Ans. 17.94.20

Required the interest of $4684.68 for 11 da., 12½ per cent.

$$\frac{\overset{390.39}{\cancel{4684.68}}}{1} \times \frac{\overset{.183+}{\cancel{.366+}}}{\cancel{12}} \times \frac{.25}{\cancel{2}} =$$

```
  390.39
  .04582
  ------
   78078
 312312
195195
156156
------
$17.8876 = $17.89.  Ans.
```

In making the mental multiplication by 25, allow for the number that would be to carry, had the decimal .183+ been extended one figure further.

Find the interest of $127.36 for 1 yr. 6 m. 21 da., 4½ per cent.

$$\frac{\overset{\overset{5.306+}{\cancel{63.68}}}{\cancel{127.36}}}{1} \times \frac{18.7}{\cancel{12}} \times \frac{.09}{\cancel{2}} =$$

```
  5.306+
  1.683
  ------
   15918
  42448
 31836
 5306
 ------
$8.929998
```

Ans. $8.93.

Find the amount of $723.60 for 2 yr. 3 m. 18 da., 5¾ per cent.

$$\frac{723.60}{1} \times \frac{\overset{2.3}{\cancel{27.6}}}{\cancel{12}} \times \frac{.23}{4} = \frac{.529}{4} = .13225$$

```
   Add 1
  -------
  1.13225
    723.6
  -------
   679350
  339675
 226450
792575
-------
$819.296  Ans.
```

After cancelling and multiplying the expressions of time and rate, we add 1 to the product, to get the amt. of $1. This saves time and one operation in the work. Now, if the work is short with these peculiar and mixed rates, it is much mo‑e so with all ordinary rates. We will take only two or three illustrations:

Find the interest of $780.26 for 90 da., without grace, at 1¼ per cent. per month.

Operation.—

$$\frac{\overset{195.065}{\cancel{780.26}}}{1} \times \frac{\cancel{3}}{\underset{\cancel{4}}{\cancel{12}}} \times \frac{.15}{1} =$$

```
 195.065
     .15
 -------
 975325
195065
-------
Ans. $29.26975
```

What is the interest of $845 for 1 yr. 10 m. 6 da., at 1 per cent a month?

$$\frac{845}{1} \times \frac{22.2}{\cancel{12}} \times \frac{\overset{.01}{\cancel{.12}}}{1} =$$

```
   845
  .222
  ----
  1690
 1690
1690
-----
Ans. $187.590
```

Multiplying by .01 simply throws the point two places further to the left on the multiplicand.

Find the interest of 1040 for 1 yr. 9 m. 9 da. at 8 per cent.

$$\frac{1040}{1} \times \frac{\overset{7.1}{\cancel{21.3}}}{\underset{\cancel{3}}{\cancel{12}}} \times \frac{\overset{.02}{\cancel{.08}}}{1} =$$

```
 .142
 1040
 ----
 5680
142
-----
Ans. $147.680
```

This method is equally expeditious in reckoning up notes whereon partial payments have been made. Indeed, there is no department of interest where it may not be used with greater facility, and with much less work, than any other process. We have chosen to call it the Cancellation Method. The advantage lies in its simplicity, brevity, and uniformity of treatment, there being but one process for all problems, whatever the rate, time or other conditions. And surely this, of itself, is a great saving, to both teacher and pupil, of much labor and taxing of memory, under the numerous methods and rules of interest laid down in the books. The plan here presented is strictly mathematical, depending on the principle, that the annual rate on a dollar, multiplied by the number of dollars in the principal, is equal to the interest. The time is reduced to months and decimals of a month; and, then, the expression for months is divided by 12, thus expressing the time in years. Each example given in the foregoing pages, is simply a grouping of the sum at interest, the years, and the rate. Cancellation naturally follows. We might have reduced the time to days, dividing the number of days by 360, thus making it express years. For instance, 2 yr. 4 m. 20 da. is 720 da. + 120 da. + 20 da. = 860 da., or $\frac{860}{360}$ years. But this is considerably longer, requiring more work every way. The briefer the method of reckoning interest, the less liability to mistakes. The one herein set forth, takes the happy mean in all particulars.

EXAMPLES FOR THE STUDENT.

Let it be required to find the interest on the following, viz.:

1. \$300 for 2 yr. 7 m. 24 da., at 6 per cent.
2. \$700 for 1 yr. 9 m. 12 da., at 6 per cent.
3. \$400 for 2 yr. 6 m. 15 da., at 6 per cent.
4. \$350 for 3 yr. 8 m. 24 da., at 6 per cent.
5. \$450.87 for 1 yr. 7 m. 9 da., at 7 per cent.
6. \$375.50 for 2 yr. 1 m. 8 da., at 7 per cent.
7. \$125.16 for 1 yr. 11 m. 25 da., at 7 per cent.
8. \$658.25 for 1 yr. 2 m. 13 da., at 7 per cent.
9. \$187.44 for 1 yr. 10 m. 24 da., at $7\frac{3}{10}$ per cent.
10. \$444.84 for 1 yr. 1 m. 16 da., at 5 per cent.

(Examples 8–10:) Find the amount.

Also, reckon up the following promissory notes, on which indorsements have been made, viz.:

\$167.42. SELMA, Apr. 15, 1882.

1. For value received, I promise to pay Judge Fowler, or order, one hundred sixty-seven and $\frac{42}{100}$ dollars, in 6 months from date with interest.

TOM SCROGGINS.

INDORSEMENTS:

May 21, 1883, \$42.18; July 17, 1884, \$6.25; Sept. 9, 1884, \$48.16; Jan. 27, 1885, \$27.47. What was due Apr. 15, 1886? *Ans.* \$72.277.

\$472.76. SELMA, June 4, 1884.

2. For value received of Arrents & Longacre, I promise to pay them, or their order, four hundred seventy-two and $\frac{76}{100}$ dollars, in 6 months from date, with interest at 7 per cent. afterward.

JNO. GRUBS.

INDORSEMENTS:

Apr. 10, 1885, \$125.843; Nov. 28, 1885, \$133.724; Apr. 15, 1886, \$223.081. What will due Nov. 13, 1886? *Ans.* \$24.95.

Let these be done strictly by the abbreviated process—it saves half the usual work. These examples must suffice for our book. The student will find abundant material for practice from other sources.

We will present the solution of the last promisory note, to show the plan by the cancellation process.

We first write the dates in succession, thus;

1886, 11, 13 = 6 m. 28 da.
1886, 4, 15 = 4 m. 17 da.
1885, 11, 28 = 7 m. 18 da.
1885, 4, 10 = 4 m. 6 da.
1884, 12, 4 =

N. B.—The four cancellations and multiplications following, present the entire work, and not simply the *indicated* work:

$$\frac{472.76}{1}\times\frac{\overset{.35}{\cancel{4.2}}}{\cancel{12}}\times\frac{.07}{1}=$$

472.76
1.0245
236380
189104
94552
47276
\$484.342
Payment—125.843
\$358.499

$$\frac{358.50}{1}\times\frac{\overset{.63+}{\cancel{7.6}}}{\cancel{12}}\times\frac{.07}{1}=$$

358.50
1.0443
10755
14340
14340
3585
\$374.381
Payment—133.724
\$240.657

$$\frac{240.657}{1}\times\frac{\overset{.3805}{\cancel{4.566+}}}{\cancel{12}}\times\frac{.07}{1}=$$

1.026635
240.657

7186445
5133175
6159810
4106540
2053270

$247.06689
Payment—223.081
$23.99

$$\frac{23.99}{1}\times\frac{\overset{.57+}{\cancel{6.93+}}}{\cancel{12}}\times\frac{.07}{1}=$$

23.99
1.0399

21591
21591
7197
2399

$24.947 = $24.95. *Ans.*

$.57 \times .07 + 1 = 1.0399$ = amt. of $1.

In partial payments, most authors, in illustrating their methods, give simply a brief of *results*, as if they would make the work *appear* short. After cancellation and multiplication of the expressions for time and rate, let 1 be added to the result, for the amt. of $1, before the mechanical multiplication is made. See above. Observe the manner of writing the dates, all at once, and all in one group, from the latest to the earliest, and then the consecutive subtraction of them, thus giving the several periods of time at once, before the cancellation processes are commenced. This is a great saving of time, and promotes simplicity. And here it may be stated that, with respect to the subject of interest, the author does not so much claim to have discovered *new* truth, as he does a new and right *application* of it. Much of scientific truth is as good as lost, through the circuitous, obscure processes under which it is presented.

Required the interest on the following, viz.:

1. $1284.60 for 5 m. 12 da., at ⅔ per cent. a month.
2. $621.09 for 7 m. 16 da., at ¾ per cent. a month.
3. $818.26 for 9 m. 3 da., at ⅝ per cent. a month.
4. $220.38 for 2 m. 21 da., at 10½ per cent. per annum.
5. $62.96 for 1 yr. 8 m. 23 da., at 11 per cent per annum.

$$\frac{62.96}{1}\times\frac{\overset{1.73}{\cancel{20.76+}}}{\cancel{12}}\times\frac{.11}{1}=$$

62.96
.1903

18888
56664
6296

$11.9812 $11.98. *Ans. to last.*

$614.42. SELMA, CAL., May 1, 1886.

For value received, I promise to pay Dr. Wagner, or order, six hundred, fourteen and $\frac{42}{100}$ dollars, on demand, with interest at 6¾ per cent. JOHN DAVIS.

INDORSEMENTS:

May 15, 1886, $169.30; June 10, 1886, $88.40; Sept. 18, 1886, $325.80. How much will be due on this note Nov. 20, 1886?

	PAYMENTS.
1886, 11, 20 = 2 m. 2 da.	
1886, 9, 18 = 3 m. 8 da.	
1886, 6, 10 = 0 m. 25 da.	$325.80.
1886, 5, 15 = 0 m. 14 da.	88.40.
1886, 5, 1	169.30.

Write the dates in a group, as above; begin with the date of giving the note, and subtract each from the next succeeding, as 5 m. 1 da. from 5 m. 15 da., always making the subtractions mentally, and writing the payments opposite the intervening times. Find the amount of the original principal for the first term of time, and of each succeeding principal for its term of time, subtracting each payment, in order, from the corresponding amount, till you come to the maturity of the note. Then find the amount of the last principal for the corresponding term of time, and it will be the balance.

Solution of the last example:

$$\frac{614.42}{1}\times\frac{\overset{\overset{.0291}{\cancel{.1165}}}{\cancel{.466}}}{\cancel{12}\ \cancel{4}}\times\frac{\overset{.09}{\cancel{.27}}}{\cancel{4}}=$$

614.42
1.00262 amt. of $1.

122884
368652
122884
61442

$616.03
169.30

$446.73 2d prin.

```
                                      1.00468  amt. of $1.
                                        44673
                                      -------
          208  .02¼                    357384
446.73   .333   .27                   268038
------ × ---- × --- =                178692
  1       12     4                  44673
                                   -------
                                   $448.82
                                     88.40
                                   -------
                                   $360.42   3d prin.
                                      1.01836   amt. of $1.
                                       360.42
                                      -------
        .204   .09                     203672
360.42  3.266+ .27                    407344
------ × ----- × --- =               611016
  1       12     4                  305508
           4                       --------
                                   $367.037
                                    325.80
After multiplying .204             --------
by .09, prefix 1 to the result.     $41.24   4th prin.
                                     1.01162   amt. of $1.
        .1291                         41.24
        .5165  .09                   -------
41.24   2.066+ .27                    404648
------ × ----- × --- =               202324
  1       12     4                  101162
           4                       404648
                                  ----------
                              $41.719.  Ans. $41.72  Bal.
```

The above is the entire work. It is comparatively short, and is quickly done. Let the student use the stereotyped methods in use, and he will at once see a vast difference in favor of this curt cancellation process, uniform for *all* rates, times, and conditions, and equally easy for all questions in interest. For these and other reasons, this method, once adopted, will be used in preference to any other.

In reckoning up the balance due on promissory notes whereon partial payments have been made, let the cancellations be so managed that the uncancelled factors may, as far as possible, be multiplied together *mentally*; or, at least, may be reduced to one formal multiplication. The advantage of the cancellation process may be seen in the following problem:

Find the amount of $235.18 for 2 yr. 8 m. and 12 da., at 5⅓ per cent.

```
                                           $235.18
          .9                                 1.144
         10.8                              -------
235.18   32.4   .16                         94072
------ × ---- × --- =                      94072
  1       12     3                        258698
                                         --------
                              $269.04592 = $269.046.  Ans.
```

Observe that, after multiplying together the expressions of time and rate, .9 and .16, we add 1 to the result, which makes the amt. of $1. This multiplied into the principal gives the amt. of the debt. Hence, in the cancellations, it is not proper to cut down the principal, when the amount is to be found. If only the interest is required, factors may be stricken from any of the three parts.

Those who have not tried this method cannot realize how easily these factors (principal, time in years, and rate) can be thrown together, and cut down to the answer, with a very small amount of figuring, whatever be the nature of the parts. The years and months are reduced to months, simply by inspection, without a mental effort; the days are reduced to the decimal of a month, by dividing them by 3; and under this mixed expression we place 12, thus expressing the whole time in years.

We have little patience with sticklers for analysis in *everything*. It is very essential in some departments of arithmetical science, but is utterly useless in many of its most practical subjects. As an incidental feature, and as conducing to thoroughness in the fundamental principles of a mathematical education, analysis, in a few subjects in arithmetic, should be thoroughly taught to the young, but beyond this it is useless. In interest it is of no value. The banker, the lawyer, the real estete man, and all other practical people, have no use for analysis in any of the several departments of interest, but must have the most direct, curt processes for all problems arising under this broad department in the science of numbers. Teachers should not lose sight of the fact that, in our practical civilization, we are, in many things, reducing more and more to practicality. Hence, as business increases and ramifies into various new departments, thus multiplying our cares and duties, we must seek to do our work with the utmost despatch consistent with accuracy. The cancellation process in interest meets the demands of business, on the subject to which it belongs. It supersedes the necessity and the utility of any 6 per cent. method, or 12 per cent. method, or 1 per cent. method, or 10 per cent method, or any other specific method. It secures uniformity, simplicity, brevity, accuracy,

FINIS.

LOGARITHMS.

A *Logarithm* is simply an exponent of a power. The logarithm of a *number* is the exponent of the power to which the *base* of the number must be raised, to produce the number. Thus, in the following equations:

$$5^0 = 1 \quad \text{and} \quad 10^0 = 1$$
$$5^1 = 5 \qquad 10^1 = 10$$
$$5^2 = 25 \qquad 10^2 = 100$$
$$5^3 = 125 \qquad 10^3 = 1000,$$

0, 1, 2, 3 are the logarithms of the respective nnmbers to which they stand opposite in the several equations. 5 is the *base* in the one set, and ten in the other. In any one of the above quotations, the value of the second member depends on the numerical value of the *base* and the *exponent* attached. In a *system* of logarithms, any number above 1 may be taken as a *base*, and, by suitably varying the exponent, the base being unaltered, all possible numbers may be represented. For example, $10^{3.82000}$ represents the number 6607, and 3.82000 is the log. of this number. $10^{3.74225}$ represents the number 5524, and 3.74225 is the log. of this number. It means that 10 must be raised to the power denoted by 3.74225 to produce 5524. In all practical mathematics, 10 is the *base*. The system is called the Common, or Brigg's system, and, in it, *all numbers*, *integral* or *fractional*, are regarded as some power of 10. 10^0 is *no* power of 10, and is equal to 10 divided by 10, or to 1. That is, the log. of 1 is 0. All numbers between 1 and 10 have, for their logarithm, a decimal fraction; all numbers between 10 and 100 have, for their logarithm, 1 + a decimal; and all numbers between 100 and 1000 have, for their logarithm, 2 + a decimal; and so on. See, page 1 of the table of logarithms, in column headed *N*, that numbers between 1 and 10, 10 and 100, and 100 and 1000, respectively, fulfill the above conditions. The log. of 7, for example, is .84510, and that of 25 is 1.39794, and these logs. are simply exponents. $10^{0.84510} = 7$, and $10^{1.39794} = 25$, signifying that 10 must be raised to these powers, respectively, to produce 7 and 25.

To find the logarithms of numbers over 100, and under 1000.—Look opposite the number, in column headed *O*, and find the logarithm. The log. of 398, page 7 of the table, is 2.59988.

To find the logarithms of numbers of four figures.—Look under caption *N* for the first three figures of the number, and at the top of the page for the fourth figure; and *opposite* the *one* part of the number and *under* the *other*, find the logarithm. Thus, the log. of 6982 is 3.84398. The decimal part of any logarithm is called the *mantissa*, and the integral part, the *characteristic*. In the log. of 1840, which is 3.26482, 3 is the *characteristic*, and .26482 is the *mantissa*. The characteristic of all numbers between 1 and 10 is 0.

To find the logarithms of numbers of more than four figures.—Find, for example, the logarithm of 248963. On page 4 we find, as previously directed, the *mantissa* corresponding to the first four figures, 2489, to be .39602; and, to this partial mantissa, there must be an addition for the remaining part of the number, 63. And since this addition affects only the decimal part, or mantissa, and not the characteristic, 63, the remaining part of the number must be regarded as a decimal. This decimal, .63, we multiply by the tabular difference, opposite the mantissa, in column *D*, which is 17+, or 17.5, and get $.63 \times 17.5 = 11.025$, giving 11 to be added to the final figures of the partial mantissa, .39602, already taken out, making .39613; and the characteristic is 5, being always one less than the number of figures in the integral part of the number whose logarithm is sought. Thus, the log. 248963 = 5.39613.

Required the logarithm of 142967542. The mantissa of the first four figures, 1429, page 2 of the table, is .15503, and the tabular difference is 30+, or 30.5. This multiplied into .67542, the remainder of the number treated as a decimal, gives 20.6, or 21, to be added to the terminal figures of the partial mantissa already taken out, making .15524, and the characteristic is 8. Thus, the log. 142967542 = 8.15524. In making additions to the mantissa, more than 5 decimal units should be reckoned 1; less than 5 should be disregarded.

For the *same figures*, in the *same order*, the mantissa is the same, whatever the *local value* or the figures. Thus, the mantissa of the logs. of these numbers, viz.: 8328, 832.8, 83.28, 8.328, .8328, .08328. .008328, etc., is .92054, the same for each of the numbers. The characteristic of the first is 3; of the second, 2; of the third, 1; of the fourth, 0; of the fifth, —1; of the sixth, —2; of the seventh, —3. The characteristic of a decimal is always negative, and numerically one more than the number of noughts prefixed to the decimal. The negative *sign* is usually written over the characteristic, thus $\bar{2}.69897$, in the log. of .05.

Find the logarithm of .6423. On page 12 we find the mantissa to be .80774, and the characteristic is $\bar{1}$, making $\bar{1}.80774$, for the log. of .6423.

To find the number corresponding to a given logarithm.—What is the number whose log. is 1.68124? Looking on page 1, we find this log. opposite 48. Hence, 48 is the number whose log. is 1.68124.

Find the number having for its logarithm 2.36305. Looking on page 4, we find opposite 230 and under 7, the number 230.7, the answer required.

Find the number having for its logarithm $\bar{2}.64367$. Looking for the nearest mantissa to the given one, we find it, page 8, opposite 440 and under 2, to be .64365. This mantissa we subtract from the given one, and divide the difference, 2, by the tabular difference, 10, and get .2. Appending this to the 4402, already taken out, we get 44022. And now, as the characteristic is —2, we prefix one 0 to the last result, and get .044022 for the required number.

What is the number having for its logarithm .29824? The nearest mantissa is .29820, page 3, opposite 198 and under 7; .29824 — .29820 = 4; 4 ÷ 22, the tab. diff., gives 1.8, or 2 nearly. Appending 2 to 1987, we have 19872—. And, since there is no characteristic, the integral part is 1. Hence, .29824 = log. 1.19872.

Find the cube root of .4986. The log. of .4986 (p. 9) is $\bar{1}.69775$. This we divide by 3, the index of the required root. But since the characteristic is negative, while the mantissa is always positive, we cannot directly divide the logarithm by the index 3. But $\bar{1}.69775 = \bar{3} + 2.69775$, in which the characteristic is exactly divisible by the index 3. Dividing, we get $\bar{1}.89925$. We now find the number corresponding to this logarithm. The nearest mantissa is .89922. Subtracting it from the given .89925, we get 3, which, divided by the corresponding tabular difference, 5+, gives 5. The number corresponding to the mantissa .89925 is 79295. To this prefix one 0, to correspond to the negative characteristic, and the cube root of .4986 is .079295.

When the characteristic is negative, and not divisible by the index of any root, add to it the smallest negative number that will render it divisible, and then prefix the same number, with a plus sign, to the mantissa.

What is the 5th root of 512.8? The log. of 512.8 = 2.70995; 2.70995 ÷ 5 = .54199; the nearest mantissa, opposite 348 and 3, is .54195; .54199 — .54195 = 4; and 4 ÷ 12+, the tab. diff., gives 3 to to be apended to 3.483, making 3.4833, for the 5th root of 512.8.

TABLE.

THE COMMON OR BRIGGS LOGARITHMS

—OF THE—

NATURAL NUMBERS

FROM 1 TO 10000.

1—100.

N	log	N	log	N	log	N	log	N	log
1	0. 00 000	21	1. 32 222	41	1. 61 278	61	1. 78 533	81	1. 90 849
2	0. 30 103	22	1. 34 242	42	1. 62 325	62	1. 79 239	82	1. 91 381
3	0. 47 712	23	1. 36 173	43	1. 63 347	63	1. 79 934	83	1. 91 908
4	0. 60 206	24	1. 38 021	44	1. 64 345	64	1. 80 618	84	1. 92 428
5	0. 69 897	25	1. 39 794	45	1. 65 321	65	1. 81 291	85	1. 92 942
6	0. 77 815	26	1. 41 497	46	1. 66 276	66	1. 81 954	86	1. 93 450
7	0. 84 510	27	1. 43 136	47	1. 67 210	67	1. 82 607	87	1. 93 952
8	0. 90 309	28	1. 44 716	48	1. 68 124	68	1. 83 251	88	1. 94 448
9	0. 95 424	29	1. 46 240	49	1. 69 020	69	1. 83 885	89	1. 94 939
10	1. 00 000	30	1. 47 712	50	1. 69 897	70	1. 84 510	90	1. 95 424
11	1. 04 139	31	1. 49 136	51	1. 70 757	71	1. 85 126	91	1. 95 904
12	1. 07 918	32	1. 50 515	52	1. 71 600	72	1. 85 733	92	1. 96 379
13	1. 11 394	33	1. 51 851	53	1. 72 428	73	1. 86 332	93	1. 96 848
14	1. 14 613	34	1. 53 148	54	1. 73 239	74	1. 86 923	94	1. 97 313
15	1. 17 609	35	1. 54 407	55	1. 74 036	75	1. 87 506	95	1. 97 772
16	1. 20 412	36	1. 55 630	56	1. 74 819	76	1. 88 081	96	1. 98 227
17	1. 23 045	37	1. 56 820	57	1. 75 587	77	1. 88 649	97	1. 98 677
18	1. 25 527	38	1. 57 978	58	1. 76 343	78	1. 89 209	98	1. 99 123
19	1. 27 875	39	1. 59 106	59	1. 77 085	79	1. 89 763	99	1. 99 564
20	1. 30 103	40	1. 60 206	60	1. 77 815	80	1. 90 309	100	2. 00 000
N	log	N	log	N	log	N	log	N	log

N	0	1	2	3	4	5	6	7	8	9	D
100	00 000	00 043	00 087	00 130	00 173	00 217	00 260	00 303	00 346	00 389	43
101	00 432	00 475	00 518	00 561	00 604	00 647	00 689	00 732	00 775	00 817	43
102	00 860	00 903	00 945	00 988	01 030	01 072	01 115	01 157	01 199	01 242	42
103	01 284	01 326	01 368	01 410	01 452	01 494	01 536	01 578	01 620	01 662	42
104	01 703	01 745	01 787	01 828	01 870	01 912	01 953	01 995	02 036	02 078	42
105	02 119	02 160	02 202	02 243	02 284	02 325	02 366	02 407	02 449	02 490	41
106	02 531	02 572	02 612	02 653	02 694	02 735	02 776	02 816	02 857	02 898	41
107	02 938	02 979	03 019	03 060	03 100	03 141	03 181	03 222	03 262	03 302	40
108	03 342	03 383	03 423	03 463	03 503	03 543	03 583	03 623	03 663	03 703	40
109	03 743	03 782	03 822	03 862	03 902	03 941	03 981	04 021	04 060	04 100	40
110	04 139	04 179	04 218	04 258	04 297	04 336	04 376	04 415	04 454	04 493	39
111	04 532	04 571	04 610	04 650	04 689	04 727	04 766	04 805	04 844	04 883	39
112	04 922	04 961	04 999	05 038	05 077	05 115	05 154	05 192	05 231	05 269	39
113	05 308	05 346	05 385	05 423	05 461	05 500	05 538	05 576	05 614	05 652	38
114	05 690	05 729	05 767	05 805	05 843	05 881	05 918	05 956	05 994	06 032	38
115	06 070	06 108	06 145	06 183	06 221	06 258	06 296	06 333	06 371	06 408	38
116	06 446	06 483	06 521	06 558	06 595	06 633	06 670	06 707	06 744	06 781	37
117	06 819	06 856	06 893	06 930	06 967	07 004	07 041	07 078	07 115	07 151	37
118	07 188	07 225	07 262	07 298	07 335	07 372	07 408	07 445	07 482	07 518	37
119	07 555	07 591	07 628	07 664	07 700	07 737	07 773	07 809	07 846	07 882	36
120	07 918	07 954	07 990	08 027	08 063	08 099	08 135	08 171	08 207	08 243	36
121	08 279	08 314	08 350	08 386	08 422	08 458	08 493	08 529	08 565	08 600	36
122	08 636	08 672	08 707	08 743	08 778	08 814	08 849	08 884	08 920	08 955	35+
123	08 991	09 026	09 061	09 096	09 132	09 167	09 202	09 237	09 272	09 307	35
124	09 342	09 377	09 412	09 447	09 482	09 517	09 552	09 587	09 621	09 656	35
125	09 691	09 726	09 760	09 795	09 830	09 864	09 899	09 934	09 968	10 003	35
126	10 037	10 072	10 106	10 140	10 175	10 209	10 243	10 278	10 312	10 346	34
127	10 380	10 415	10 449	10 483	10 517	10 551	10 585	10 619	10 653	10 687	34
128	10 721	10 755	10 789	10 823	10 857	10 890	10 924	10 958	10 992	11 025	34
129	11 059	11 093	11 126	11 160	11 193	11 227	11 261	11 294	11 327	11 361	33+
130	11 394	11 428	11 461	11 494	11 528	11 561	11 594	11 628	11 661	11 694	33
131	11 727	11 760	11 793	11 826	11 860	11 893	11 926	11 959	11 992	12 024	33
132	12 057	12 090	12 123	12 156	12 189	12 222	12 254	12 287	12 320	12 352	33
133	12 385	12 418	12 450	12 483	12 516	12 548	12 581	12 613	12 646	12 678	32+
134	12 710	12 743	12 775	12 808	12 840	12 872	12 905	12 937	12 969	13 001	32
135	13 033	13 066	13 098	13 130	13 162	13 194	13 226	13 258	13 290	13 322	32
136	13 354	13 386	13 418	13 450	13 481	13 513	13 545	13 577	13 609	13 640	32
137	13 672	13 704	13 735	13 767	13 799	13 830	13 862	13 893	13 925	13 956	31+
138	13 988	14 019	14 051	14 082	14 114	14 145	14 176	14 208	14 239	14 270	31
139	14 301	14 333	14 364	14 395	14 426	14 457	14 489	14 520	14 551	14 582	31
140	14 613	14 644	14 675	14 706	14 737	14 768	14 799	14 829	14 860	14 891	31
141	14 922	14 953	14 983	15 014	15 045	15 076	15 106	15 137	15 168	15 198	31
142	15 229	15 259	15 290	15 320	15 351	15 381	15 412	15 442	15 473	15 503	30+
143	15 534	15 564	15 594	15 625	15 655	15 685	15 715	15 746	15 776	15 806	30
144	15 836	15 866	15 897	15 927	15 957	15 987	16 017	16 047	16 077	16 107	30
145	16 137	16 167	16 197	16 227	16 256	16 286	16 316	16 346	16 376	16 406	30
146	16 435	16 465	16 495	16 524	16 554	16 584	16 613	16 643	16 673	16 702	30
147	16 732	16 761	16 791	16 820	16 850	16 879	16 909	16 938	16 967	16 997	29+
148	17 026	17 056	17 085	17 114	17 143	17 173	17 202	17 231	17 260	17 289	29
149	17 319	17 348	17 377	17 406	17 435	17 464	17 493	17 522	17 551	17 580	29
150	17 609	17 638	17 667	17 696	17 725	17 754	17 782	17 811	17 840	17 869	29
N	0	1	2	3	4	5	6	7	8	9	

N	0	1	2	3	4	5	6	7	8	9	D
150	17 609	17 638	17 667	17 696	17 725	17 754	17 782	17 811	17 840	17 869	29
151	17 898	17 926	17 955	17 984	18 013	18 041	18 070	18 099	18 127	18 156	29
152	18 184	18 213	18 241	18 270	18 298	18 327	18 355	18 384	18 412	18 441	28+
153	18 469	18 498	18 526	18 554	18 583	18 611	18 639	18 667	18 696	18 724	28
154	18 752	18 780	18 808	18 837	18 865	18 893	18 921	18 949	18 977	19 005	28
155	19 033	19 061	19 089	19 117	19 145	19 173	19 201	19 229	19 257	19 285	28
156	19 312	19 340	19 368	19 396	19 424	19 451	19 479	19 507	19 535	19 562	27
157	19 590	19 618	19 645	19 673	19 700	19 728	19 756	19 783	19 811	19 838	28
158	19 866	19 893	19 921	19 948	19 976	20 003	20 030	20 058	20 085	20 112	27
159	20 140	20 167	20 194	20 222	20 249	20 276	20 303	20 330	20 358	20 385	27
160	20 412	20 439	20 466	20 493	20 520	20 548	20 575	20 602	20 629	20 656	27
161	20 683	20 710	20 737	20 763	20 790	20 817	20 844	20 871	20 898	20 925	27
162	20 952	20 978	21 005	21 032	21 059	21 085	21 112	21 139	21 165	21 192	27
163	21 219	21 245	21 272	21 299	21 325	21 352	21 378	21 405	21 431	21 458	27
164	21 484	21 511	21 537	21 564	21 590	21 617	21 643	21 669	21 696	21 722	26
165	21 748	21 775	21 801	21 827	21 854	21 880	21 906	21 932	21 958	21 985	26
166	22 011	22 037	22 063	22 089	22 115	22 141	22 167	22 194	22 220	22 246	26
167	22 272	22 298	22 324	22 350	22 376	22 401	22 427	22 453	22 479	22 505	26
168	22 531	22 557	22 583	22 608	22 634	22 660	22 686	22 712	22 737	22 763	26
169	22 789	22 814	22 840	22 866	22 891	22 917	22 943	22 968	22 994	23 019	26
170	23 045	23 070	23 096	23 121	23 147	23 172	23 198	23 223	23 249	23 274	25
171	23 300	23 325	23 350	23 376	23 401	23 426	23 452	23 477	23 502	23 528	25
172	23 553	23 578	23 603	23 629	23 654	23 679	23 704	23 729	23 754	23 779	25
173	23 805	23 830	23 855	23 830	23 905	23 930	23 955	23 980	24 005	24 030	25
174	24 055	24 080	24 105	24 130	24 155	24 180	24 204	24 229	24 254	24 279	25
175	24 304	24 329	24 353	24 378	24 403	24 428	24 452	24 477	24 502	24 527	25
176	24 551	24 576	24 601	24 625	24 650	24 674	24 699	24 724	24 748	24 773	25
177	24 797	24 822	24 846	24 871	24 895	24 920	24 944	24 969	24 993	25 018	24+
178	25 042	25 066	25 091	25 115	25 139	25 164	25 188	25 212	25 237	25 261	24
179	25 285	25 310	25 334	25 358	25 382	25 406	25 431	25 455	25 479	25 503	24
180	25 527	25 551	25 575	25 600	25 624	25 648	25 672	25 696	25 720	25 744	24
181	25 768	25 792	25 816	25 840	25 864	25 888	25 912	25 935	25 959	25 983	24
182	26 007	26 031	26 055	26 079	26 102	26 126	26 150	26 174	26 198	26 221	24
183	26 245	26 269	26 293	26 316	26 340	26 364	26 387	26 411	26 435	26 458	24
184	26 482	26 505	26 529	26 553	26 576	26 600	26 623	26 647	26 670	26 694	23+
185	26 717	26 741	26 764	26 788	26 811	26 834	26 858	26 881	26 905	26 928	23
186	26 951	26 975	26 998	27 021	27 045	27 068	27 091	27 114	27 138	27 161	23
187	27 184	27 207	27 231	27 254	27 277	27 300	27 323	27 346	27 370	27 393	23
188	27 416	27 439	27 462	27 485	27 508	27 531	27 554	27 577	27 600	27 623	23
189	27 646	27 669	27 692	27 715	27 738	27 761	27 784	27 807	27 830	27 852	23
190	27 875	27 898	27 921	27 944	27 967	27 989	28 012	28 035	28 058	28 081	23
191	28 103	28 126	28 149	28 171	28 194	28 217	28 240	28 262	28 285	28 307	23
192	28 330	28 353	28 375	28 398	28 421	28 443	28 466	28 488	28 511	28 533	23
193	28 556	28 578	28 601	28 623	28 646	28 668	28 691	28 713	28 735	28 758	22+
194	28 780	28 803	28 825	28 847	28 870	28 892	28 914	28 937	28 959	28 981	22
195	29 003	29 026	29 048	29 070	29 092	29 115	29 137	29 159	29 181	29 203	22
196	29 226	29 248	29 270	29 292	29 314	29 336	29 358	29 380	29 403	29 425	22
197	29 447	29 469	29 491	29 513	29 535	29 557	29 579	29 601	29 623	29 645	22
198	29 667	29 688	29 710	29 732	29 754	29 776	29 798	29 820	29 842	29 863	22
199	29 885	29 907	29 929	29 951	29 973	29 994	30 016	30 038	30 060	30 081	22
200	30 103	30 125	30 146	30 168	30 190	30 211	30 233	30 255	30 276	30 298	22
N	0	1	2	3	4	5	6	7	8	9	

N	0	1	2	3	4	5	6	7	8	9	D
200	30 103	30 125	30 146	30 168	30 190	30 211	30 233	30 255	30 276	30 298	22
201	30 320	30 341	30 363	30 384	30 406	30 428	30 449	30 471	30 492	30 514	22
202	30 535	30 557	30 578	30 600	30 621	30 643	30 664	30 685	30 707	30 728	21+
203	30 750	30 771	30 792	30 814	30 835	30 856	30 878	30 899	30 920	30 942	21
204	30 963	30 984	31 006	31 027	31 048	31 069	31 091	31 112	31 133	31 154	21
205	31 175	31 197	31 218	31 239	31 260	31 281	31 302	31 323	31 345	31 366	21
206	31 387	31 408	31 429	31 450	31 471	31 492	31 513	31 534	31 555	31 576	21
207	31 597	31 618	31 639	31 660	31 681	31 702	31 723	31 744	31 765	31 785	21
208	31 806	31 827	31 848	31 869	31 890	31 911	31 931	31 952	31 973	31 994	21
209	32 015	32 035	32 056	32 077	32 098	32 118	32 139	32 160	32 181	32 201	21
210	32 222	32 243	32 263	32 284	32 305	32 325	32 346	32 366	32 387	32 408	21
211	32 428	32 449	32 469	32 490	32 510	32 531	32 552	32 572	32 593	32 613	20+
212	32 634	32 654	32 675	32 695	32 715	32 736	32 756	32 777	32 797	32 818	20
213	32 838	32 858	32 879	32 899	32 919	32 940	32 960	32 980	33 001	33 021	20
214	33 041	33 062	33 082	33 102	33 122	33 143	33 163	33 183	33 203	33 224	20
215	33 244	33 264	33 284	33 304	33 325	33 345	33 365	33 385	33 405	33 425	20
216	33 445	33 465	33 486	33 506	33 526	33 546	33 566	33 586	33 606	33 626	20
217	33 646	33 666	33 686	33 706	33 726	33 746	33 766	33 786	33 806	33 826	20
218	33 846	33 866	33 885	33 905	33 925	33 945	33 965	33 985	34 005	34 025	20
219	34 044	34 064	34 084	34 104	34 124	34 143	34 163	34 183	34 203	34 223	20
220	34 242	34 262	34 282	34 301	34 321	34 341	34 361	34 380	34 400	34 420	20
221	34 439	34 459	34 479	34 498	34 518	34 537	34 557	34 577	34 596	34 616	20
222	34 635	34 655	34 674	34 694	34 713	34 733	34 753	34 772	34 792	34 811	19+
223	34 830	34 850	34 869	34 889	34 908	34 928	34 947	34 967	34 986	35 005	19
224	35 025	35 044	35 064	35 083	35 102	35 122	35 141	35 160	35 180	35 199	19
225	35 218	35 238	35 257	35 276	35 295	35 315	35 334	35 353	35 372	35 392	19
226	35 411	35 430	35 449	35 468	35 488	35 507	35 526	35 545	35 564	35 583	19
227	35 603	35 622	35 641	35 660	35 679	35 698	35 717	35 736	35 755	35 774	19
228	35 793	35 813	35 832	35 851	35 870	35 889	35 908	35 927	35 946	35 965	19
229	35 984	36 003	36 021	36 040	36 059	36 078	36 097	36 116	36 135	36 154	19
230	36 173	36 192	36 211	36 229	36 248	36 267	36 286	36 305	36 324	36 342	19
231	36 361	36 380	36 399	36 418	36 436	36 455	36 474	36 493	36 511	36 530	19
232	36 549	36 568	36 586	36 605	36 624	36 642	36 661	36 680	36 698	36 717	19
233	36 736	36 754	36 773	36 791	36 810	36 829	36 847	36 866	36 884	36 903	19
234	36 922	36 940	36 959	36 977	36 996	37 014	37 033	37 051	37 070	37 088	18+
235	37 107	37 125	37 144	37 162	37 181	37 199	37 218	37 236	37 254	37 273	18
236	37 291	37 310	37 328	37 346	37 365	37 383	37 401	37 420	37 438	37 457	18
237	37 475	37 493	37 511	37 530	37 548	37 566	37 585	37 603	37 621	37 639	18
238	37 658	37 676	37 694	37 712	37 731	37 749	37 767	37 785	37 803	37 822	18
239	37 840	37 858	37 876	37 894	37 912	37 931	37 949	37 967	37 985	38 003	18
240	38 021	38 039	38 057	38 075	38 093	38 112	38 130	38 148	38 166	38 184	18
241	38 202	38 220	38 238	38 256	38 274	38 292	38 310	38 328	38 346	38 364	18
242	38 382	38 399	38 417	38 435	38 453	38 471	38 489	38 507	38 525	38 543	18
243	38 561	38 578	38 596	38 614	38 632	38 650	38 668	38 686	38 703	38 721	18
244	38 739	38 757	38 775	38 792	38 810	38 828	38 846	38 863	38 881	38 899	18
245	38 917	38 934	38 952	38 970	38 987	39 005	39 023	39 041	39 058	39 076	18
246	39 094	39 111	39 129	39 146	39 164	39 182	39 199	39 217	39 235	39 252	18
247	39 270	39 287	39 305	39 322	39 340	39 358	39 375	39 393	39 410	39 428	18
248	39 445	39 463	39 480	39 498	39 515	39 533	39 550	39 568	39 585	39 602	17+
249	39 620	39 637	39 655	39 672	39 690	39 707	39 724	39 742	39 759	39 777	17
250	39 794	39 811	39 829	39 846	39 863	39 881	39 898	39 915	39 933	39 950	17
N	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	

N	0	1	2	3	4	5	6	7	8	9	D
250	39 794	39 811	39 829	39 846	39 863	39 881	39 898	39 915	39 933	39 950	17
251	39 967	39 985	40 002	40 019	40 037	40 054	40 071	40 088	40 106	40 123	17
252	40 140	40 157	40 175	40 192	40 209	40 226	40 243	40 261	40 278	40 295	17
253	40 312	40 329	40 346	40 364	40 381	40 398	40 415	40 432	40 449	40 466	17
254	40 483	40 500	40 518	40 535	40 552	40 569	40 586	40 603	40 620	40 637	17
255	40 654	40 671	40 688	40 705	40 722	40 739	40 756	40 773	40 790	40 807	17
256	40 824	40 841	40 858	40 875	40 892	40 909	40 926	40 943	40 960	40 976	17
257	40 993	41 010	41 027	41 044	41 061	41 078	41 095	41 111	41 128	41 145	17
258	41 162	41 179	41 196	41 212	41 229	41 246	41 263	41 280	41 296	41 313	17
259	41 330	41 347	41 363	41 380	41 397	41 414	41 430	41 447	41 464	41 481	17
260	41 497	41 514	41 531	41 547	41 564	41 581	41 597	41 614	41 631	41 647	17
261	41 664	41 681	41 697	41 714	41 731	41 747	41 764	41 780	41 797	41 814	17
262	41 830	41 847	41 863	41 880	41 896	41 913	41 929	41 946	41 963	41 979	16+
263	41 996	42 012	42 029	42 045	42 062	42 078	42 095	42 111	42 127	42 144	16+
264	42 160	42 177	42 193	42 210	42 226	42 243	42 259	42 275	42 292	42 308	16
265	42 325	42 341	42 357	42 374	42 390	42 406	42 423	42 439	42 455	42 472	16
266	42 488	42 504	42 521	42 537	42 553	42 570	42 586	42 602	42 619	42 635	16
267	42 651	42 667	42 684	42 700	42 716	42 732	42 749	42 765	42 781	42 797	16
268	42 813	42 830	42 846	42 862	42 878	42 894	42 911	42 927	42 943	42 959	16
269	42 975	42 991	43 008	43 024	43 040	43 056	43 072	43 088	43 104	43 120	16
270	43 136	43 152	43 169	43 185	43 201	43 217	43 233	43 249	43 265	43 281	16
271	43 297	43 313	43 329	43 345	43 361	43 377	43 393	43 409	43 425	43 441	16
272	43 457	43 473	43 489	43 505	43 521	43 537	43 553	43 569	43 584	43 600	16
273	43 616	43 632	43 648	43 664	43 680	43 696	43 712	43 727	43 743	43 759	16
274	43 775	43 791	43 807	43 823	43 838	43 854	43 870	43 886	43 902	43 917	16
275	43 933	43 949	43 965	43 981	43 996	44 012	44 028	44 044	44 059	44 075	16
276	44 091	44 107	44 122	44 138	44 154	44 170	44 185	44 201	44 217	44 232	16
277	44 248	44 264	44 279	44 295	44 311	44 326	44 342	44 358	44 373	44 389	16
278	44 404	44 420	44 436	44 451	44 467	44 483	44 498	44 514	44 529	44 545	16
279	44 560	44 576	44 592	44 607	44 623	44 638	44 654	44 669	44 685	44 700	15+
280	44 716	44 731	44 747	44 762	44 778	44 793	44 809	44 824	44 840	44 855	15+
281	44 871	44 886	44 902	44 917	44 932	44 948	44 963	44 979	44 994	45 010	15
282	45 025	45 040	45 056	45 071	45 086	45 102	45 117	45 133	45 148	45 163	15
283	45 179	45 194	45 209	45 225	45 240	45 255	45 271	45 286	45 301	45 317	15
284	45 332	45 347	45 362	45 378	45 393	45 408	45 423	45 439	45 454	45 469	15
285	45 484	45 500	45 515	45 530	45 545	45 561	45 576	45 591	45 606	45 621	15
286	45 637	45 652	45 667	45 682	45 697	45 712	45 728	45 743	45 758	45 773	15
287	45 788	45 803	45 818	45 834	45 849	45 864	45 879	45 894	45 909	45 924	15
288	45 939	45 954	45 969	45 984	46 000	46 015	46 030	46 045	46 060	46 075	15
289	46 090	46 105	46 120	46 135	46 150	46 165	46 180	46 195	46 210	46 225	15
290	46 240	46 255	46 270	46 285	46 300	46 315	46 330	46 345	46 359	46 374	15
291	46 389	46 404	46 419	46 434	46 449	46 464	46 479	46 494	46 509	46 532	15
292	46 538	46 553	46 568	46 583	46 598	46 613	46 627	46 642	46 657	46 672	15
293	46 687	46 702	46 716	46 731	46 746	46 761	46 776	46 790	46 805	46 820	15
294	46 835	46 850	46 864	46 879	46 894	46 909	46 923	46 938	46 953	46 967	15
295	46 982	46 997	47 012	47 026	47 041	47 056	47 070	47 085	47 100	47 114	15
296	47 129	47 144	47 159	47 173	47 188	47 202	47 217	47 232	47 246	47 261	15
297	47 276	47 290	47 305	47 319	47 334	47 349	47 363	47 378	47 392	47 407	15
298	47 422	47 436	47 451	47 465	47 480	47 494	47 509	47 524	47 538	47 553	15
299	47 567	47 582	47 596	47 611	47 625	47 640	47 654	47 669	47 683	47 698	14+
300	47 712	47 727	47 741	47 756	47 770	47 784	47 799	47 813	47 828	47 842	14+
N	0	1	2	3	4	5	6	7	8	9	

N	0	1	2	3	4	5	6	7	8	9	D
300	47 712	47 727	47 741	47 756	47 770	47 784	47 799	47 813	47 828	47 842	14+
301	47 857	47 871	47 885	47 900	47 914	47 929	47 943	47 958	47 972	47 986	14
302	48 001	48 015	48 029	48 044	48 058	48 073	48 087	48 101	48 116	48 130	14
303	48 144	48 159	48 173	48 187	48 202	48 216	48 230	48 244	48 259	48 273	14
304	48 287	48 302	48 316	48 330	48 344	48 359	48 373	48 387	48 401	48 416	14
305	48 430	48 444	48 458	48 473	48 487	48 501	48 515	48 530	48 544	48 558	14
306	48 572	48 586	48 601	48 615	48 629	48 643	48 657	48 671	48 686	48 700	14
307	48 714	48 728	48 742	48 756	48 770	48 785	48 799	48 813	48 827	48 841	14
308	48 855	48 869	48 883	48 897	48 911	48 926	48 940	48 954	48 968	48 982	14
309	48 996	49 010	49 024	49 038	49 052	49 066	49 080	49 094	49 108	49 122	14
310	49 136	49 150	49 164	49 178	49 192	49 206	49 220	49 234	49 248	49 262	14
311	49 276	49 290	49 304	49 318	49 332	49 346	49 360	49 374	49 388	49 402	14
312	49 415	49 429	49 443	49 457	49 471	49 485	49 499	49 513	49 527	49 541	14
313	49 554	49 568	49 582	49 596	49 610	49 624	49 638	49 651	49 665	49 679	14
314	49 693	49 707	49 721	49 734	49 748	49 762	49 776	49 790	49 803	49 817	14
315	49 831	49 845	49 859	49 872	49 886	49 900	49 914	49 927	49 941	49 955	14
316	49 969	49 982	49 996	50 010	50 024	50 037	50 051	50 065	50 079	50 092	14
317	50 106	50 120	50 133	50 147	50 161	50 174	50 188	50 202	50 215	50 229	14
318	50 243	50 256	50 270	50 284	50 297	50 311	50 325	50 338	50 352	50 365	14
319	50 379	50 393	50 406	50 420	50 433	50 447	50 461	50 474	50 488	50 501	14
320	50 515	50 529	50 542	50 556	50 569	50 583	50 596	50 610	50 623	50 637	14
321	50 651	50 664	50 678	50 691	50 705	50 718	50 732	50 745	50 759	50 772	13+
322	50 786	50 799	50 813	50 826	50 840	50 853	50 866	50 880	50 893	50 907	13+
323	50 920	50 934	50 947	50 961	50 974	50 987	51 001	51 014	51 028	51 041	13
324	51 055	51 068	51 081	51 095	51 108	51 121	51 135	51 148	51 162	51 175	13
325	51 188	51 202	51 215	51 228	51 242	51 255	51 268	51 282	51 295	51 308	13
326	51 322	51 335	51 348	51 362	51 375	51 388	51 402	51 415	51 428	51 441	13
327	51 455	51 468	51 481	51 495	51 508	51 521	51 534	51 548	51 561	51 574	13
328	51 587	51 601	51 614	51 627	51 640	51 654	51 667	51 680	51 693	51 706	13
329	51 720	51 733	51 746	51 759	51 772	51 786	51 799	51 812	51 825	51 838	13
330	51 851	51 865	51 878	51 891	51 904	51 917	51 930	51 943	51 957	51 970	13
331	51 983	51 996	52 009	52 022	52 035	52 048	52 061	52 075	52 088	52 101	13
332	52 114	52 127	52 140	52 153	52 166	52 179	52 192	52 205	52 218	52 231	13
333	52 244	52 257	52 270	52 284	52 297	52 310	52 323	52 336	52 349	52 362	13
334	52 375	52 388	52 401	52 414	52 427	52 440	52 453	52 466	52 479	52 492	13
335	52 504	52 517	52 530	52 543	52 556	52 569	52 582	52 595	52 608	52 621	13
336	52 634	52 647	52 660	52 673	52 686	52 699	52 711	52 724	52 737	52 750	13
337	52 763	52 776	52 789	52 802	52 815	52 827	52 840	52 853	52 866	52 879	13
338	52 892	52 905	52 917	52 930	52 943	52 956	52 969	52 982	52 994	53 007	13
339	53 020	53 033	53 046	53 058	53 071	53 084	53 097	53 110	53 122	53 135	13
340	53 148	53 161	53 173	53 186	53 199	53 212	53 224	53 237	53 250	53 263	13
341	53 275	53 288	53 301	53 314	53 326	53 339	53 352	53 364	53 377	53 390	13
342	53 403	53 415	53 428	53 441	53 453	53 466	53 479	53 491	53 504	53 517	13
343	53 529	53 542	53 555	53 567	53 580	53 593	53 605	53 618	53 631	53 643	13
344	53 656	53 668	53 681	53 694	53 706	53 719	53 732	53 744	53 757	53 769	13
345	53 782	53 794	53 807	53 820	53 832	53 845	53 857	53 870	53 882	53 895	13
346	53 908	53 920	53 933	53 945	53 958	53 970	53 983	53 995	54 008	54 020	12+
347	54 033	54 045	54 058	54 070	54 083	54 095	54 108	54 120	54 133	54 145	12+
348	54 158	54 170	54 183	54 195	54 208	54 220	54 233	54 245	54 258	54 270	12+
349	54 283	54 295	54 307	54 320	54 332	54 345	54 357	54 370	54 382	54 394	12
350	54 407	54 419	54 432	54 444	54 456	54 469	54 481	54 494	54 506	54 518	12
N	0	1	2	3	4	5	6	7	8	9	

N	0	1	2	3	4	5	6	7	8	9	D
350	54 407	54 419	54 432	54 444	54 456	54 469	54 481	54 494	54 506	54 518	12
351	54 531	54 543	54 555	54 568	54 580	54 593	54 605	54 617	54 630	54 642	12
352	54 654	54 667	54 679	54 691	54 704	54 716	54 728	54 741	54 753	54 765	12
353	54 777	54 790	54 802	54 814	54 827	54 839	54 851	54 864	54 876	54 888	12
354	54 900	54 913	54 925	54 937	54 949	54 962	54 974	54 986	54 998	55 011	12
355	55 023	55 035	55 047	55 060	55 072	55 084	55 096	55 108	55 121	55 133	12
356	55 145	55 157	55 169	55 182	55 194	55 206	55 218	55 230	55 242	55 255	12
357	55 267	55 279	55 291	55 303	55 315	55 328	55 340	55 352	55 364	55 376	12
358	55 388	55 400	55 413	55 425	55 437	55 449	55 461	55 473	55 485	55 497	12
359	55 509	55 522	55 534	55 546	55 558	55 570	55 582	55 594	55 606	55 618	12
360	55 630	55 642	55 654	55 666	55 678	55 691	55 703	55 715	55 727	55 739	12
361	55 751	55 763	55 775	55 787	55 799	55 811	55 823	55 835	55 847	55 859	12
362	55 871	55 883	55 895	55 907	55 919	55 931	55 943	55 955	55 967	55 979	12
363	55 991	56 003	56 015	56 027	56 038	56 050	56 062	56 074	56 086	56 098	12
364	56 110	56 122	56 134	56 146	56 158	56 170	56 182	56 194	56 205	56 217	12
365	56 229	56 241	56 253	56 265	56 277	56 289	56 301	56 312	56 324	56 336	12
366	56 348	56 360	56 372	56 384	56 396	56 407	56 419	56 431	56 443	56 455	12
367	56 467	56 478	56 490	56 502	56 514	56 526	56 538	56 549	56 561	56 573	12
368	56 585	56 597	56 608	56 620	56 632	56 644	56 656	56 667	56 679	56 691	12
369	56 703	56 714	56 726	56 738	56 750	56 761	56 773	56 785	56 797	56 808	12
370	56 820	56 832	56 844	56 855	56 867	56 879	56 891	56 902	56 914	56 926	12
371	56 937	56 949	56 961	56 972	56 984	56 996	57 008	57 019	57 031	57 043	12
372	57 054	57 066	57 078	57 089	57 101	57 113	57 124	57 136	57 148	57 159	12
373	57 171	57 183	57 194	57 206	57 217	57 229	57 241	57 252	57 264	57 276	12
374	57 287	57 299	57 310	57 322	57 334	57 345	57 357	57 368	57 380	57 392	12
375	57 403	57 415	57 426	57 438	57 449	57 461	57 473	57 484	57 496	57 507	12
376	57 519	57 530	57 542	57 553	57 565	57 576	57 588	57 600	57 611	57 623	11+
377	57 634	57 646	57 657	57 669	57 680	57 692	57 703	57 715	57 726	57 738	11+
378	57 749	57 761	57 772	57 784	57 795	57 807	57 818	57 830	57 841	57 852	11+
379	57 864	57 875	57 887	57 898	57 910	57 921	57 933	57 944	57 955	57 967	11
380	57 978	57 990	58 001	58 013	58 024	58 035	58 047	58 058	58 070	58 081	11
381	58 092	58 104	58 115	58 127	58 138	58 149	58 161	58 172	58 184	58 195	11
382	58 206	58 218	58 229	58 240	58 252	58 263	58 274	58 286	58 297	58 309	11
383	58 320	58 331	58 343	58 354	58 365	58 377	58 388	58 399	58 410	58 422	11
384	58 433	58 444	58 456	58 467	58 478	58 490	58 501	58 512	58 524	58 535	11
385	58 546	58 557	58 569	58 580	58 591	58 602	58 614	58 625	58 636	58 647	11
386	58 659	58 670	58 681	58 692	58 704	58 715	58 726	58 737	58 749	58 760	11
387	58 771	58 782	58 794	58 805	58 816	58 827	58 838	58 850	58 861	58 872	11
388	58 883	58 894	58 906	58 917	58 928	58 939	58 950	58 961	58 973	58 984	11
389	58 995	59 006	59 017	59 028	59 040	59 051	59 062	59 073	59 084	59 095	11
390	59 106	59 118	59 129	59 140	59 151	59 162	59 173	59 184	59 195	59 207	11
391	59 218	59 229	59 240	59 251	59 262	59 273	59 284	59 295	59 306	59 318	11
392	59 329	59 340	59 351	59 362	59 373	59 384	59 395	59 406	59 417	59 428	11
393	59 439	59 450	59 461	59 472	59 483	59 494	59 506	59 517	59 528	59 539	11
394	59 550	59 561	59 572	59 583	59 594	59 605	59 616	59 627	59 638	59 649	11
395	59 660	59 671	59 682	59 693	59 704	59 715	59 726	59 737	59 748	59 759	11
396	59 770	59 780	59 791	59 802	59 813	59 824	59 835	59 846	59 857	59 868	11
397	59 879	59 890	59 901	59 912	59 923	59 934	59 945	59 956	59 966	59 977	11
398	59 988	59 999	60 010	60 021	60 032	60 043	60 054	60 065	60 076	60 086	11
399	60 097	60 108	60 119	60 130	60 141	60 152	60 163	60 173	60 184	60 195	11
400	60 206	60 217	60 228	60 239	60 249	60 260	60 271	60 282	60 293	60 304	11
N	0	1	2	3	4	5	6	7	8	9	

N	0	1	2	3	4	5	6	7	8	9	D
400	60 206	60 217	60 228	60 239	60 249	60 260	60 271	60 282	60 293	60 304	11
401	60 314	60 325	60 336	60 347	60 358	60 369	60 379	60 390	60 401	60 412	11
402	60 423	60 433	60 444	60 455	60 466	60 477	60 487	60 498	60 509	60 520	11
403	60 531	60 541	60 552	60 563	60 574	60 584	60 595	60 606	60 617	60 627	11
404	60 638	60 649	60 660	60 670	60 681	60 692	60 703	60 713	60 724	60 735	11
405	60 746	60 756	60 767	60 778	60 788	60 799	60 810	60 821	60 831	60 842	11
406	60 853	60 863	60 874	60 885	60 895	60 906	60 917	60 927	60 938	60 949	11
407	60 959	60 970	60 981	60 991	61 002	61 013	61 023	61 034	61 045	61 055	11
408	61 066	61 077	61 087	61 098	61 109	61 119	61 130	61 140	61 151	61 162	11
409	61 172	61 183	61 194	61 204	61 215	61 225	61 236	61 247	61 257	61 268	11
410	61 278	61 289	61 300	61 310	61 321	61 331	61 342	61 352	61 363	61 374	11
411	61 384	61 395	61 405	61 416	61 426	61 437	61 448	61 458	61 469	61 479	11
412	61 490	61 500	61 511	61 521	61 532	61 542	61 553	61 563	61 574	61 584	10+
413	61 595	61 606	61 616	61 627	61 637	61 648	61 658	61 669	61 679	61 690	10+
414	61 700	61 711	61 721	61 731	61 742	61 752	61 763	61 773	61 784	61 794	10+
415	61 805	61 815	61 826	61 836	61 847	61 857	61 868	61 878	61 888	61 899	10+
416	61 909	61 920	61 930	61 941	61 951	61 962	61 972	61 982	61 993	62 003	10
417	62 014	62 024	62 034	62 045	62 055	62 066	62 076	62 086	62 097	62 107	10
418	62 118	62 128	62 138	62 149	62 159	62 170	62 180	62 190	62 201	62 211	10
419	62 221	62 232	62 242	62 252	62 263	62 273	62 284	62 294	62 304	62 315	10
420	62 325	62 335	62 346	62 356	62 366	62 377	62 387	62 397	62 408	62 418	10
421	62 428	62 439	62 449	62 459	62 469	62 480	62 490	62 500	62 511	62 521	10
422	62 531	62 542	62 552	62 562	62 572	62 583	62 593	62 603	62 613	62 624	10
423	62 634	62 644	62 655	62 665	62 675	62 685	62 696	62 706	62 716	62 726	10
424	62 737	62 747	62 757	62 767	62 778	62 788	62 798	62 808	62 818	62 829	10
425	62 839	62 849	62 859	62 870	62 880	62 890	62 900	62 910	62 921	62 931	10
426	62 941	62 951	62 961	62 972	62 982	62 992	63 002	63 012	63 022	63 033	10
427	63 043	63 053	63 063	63 073	63 083	63 094	63 104	63 114	63 124	63 134	10
428	63 144	63 155	63 165	63 175	63 185	63 195	63 205	63 215	63 225	63 236	10
429	63 246	63 256	63 266	63 276	63 286	63 296	63 306	63 317	63 327	63 337	10
430	63 347	63 357	63 367	63 377	63 387	63 397	63 407	63 417	63 428	63 438	10
431	63 448	63 458	63 468	63 478	63 488	63 498	63 508	63 518	63 528	63 538	10
432	63 548	63 558	63 568	63 579	63 589	63 599	63 609	63 619	63 629	63 639	10
433	63 649	63 659	63 669	63 679	63 689	63 699	63 709	63 719	63 729	63 739	10
434	63 749	63 759	63 769	63 779	63 789	63 799	63 809	63 819	63 829	63 839	10
435	63 849	63 859	63 869	63 879	63 889	63 899	63 909	63 919	63 929	63 939	10
436	63 949	63 959	63 969	63 979	63 988	63 998	64 008	64 018	64 028	64 038	10
437	64 048	64 058	64 068	64 078	64 088	64 098	64 108	64 118	64 128	64 137	10
438	64 147	64 157	64 167	64 177	64 187	64 197	64 207	64 217	64 227	64 237	10
439	64 246	64 256	64 266	64 276	64 286	64 296	64 306	64 316	64 326	64 335	10
440	64 345	64 355	64 365	64 375	64 385	64 395	64 404	64 414	64 424	64 434	10
441	64 444	64 454	64 464	64 473	64 483	64 493	64 503	64 513	64 523	64 532	10
442	64 542	64 552	64 562	64 572	64 582	64 591	64 601	64 611	64 621	64 631	10
443	64 640	64 650	64 660	64 670	64 680	64 689	64 699	64 709	64 719	64 729	10
444	64 738	64 748	64 758	64 768	64 777	64 787	64 797	64 807	64 816	64 826	10
445	64 836	64 846	64 856	64 865	64 875	64 885	64 895	64 904	64 914	64 924	10
446	64 933	64 943	64 953	64 963	64 972	64 982	64 992	65 002	65 011	65 021	10
447	65 031	65 040	65 050	65 060	65 070	65 079	65 089	65 099	65 108	65 118	10
448	65 128	65 137	65 147	65 157	65 167	65 176	65 186	65 196	65 205	65 215	10
449	65 225	65 234	65 244	65 254	65 263	65 273	65 283	65 292	65 302	65 312	10
450	65 321	65 331	65 341	65 350	65 360	65 369	65 379	65 389	65 398	65 408	10
N	0	1	2	3	4	5	6	7	8	9	

N	0	1	2	3	4	5	6	7	8	9	D
450	65 321	65 331	65 341	65 350	65 360	65 369	65 379	65 389	65 398	65 408	10
451	65 418	65 427	65 437	65 447	65 456	65 466	65 475	65 485	65 495	65 504	10
452	65 514	65 523	65 533	65 543	65 552	65 562	65 571	65 581	65 591	65 600	10
453	65 610	65 619	65 629	65 639	65 648	65 658	65 667	65 677	65 686	65 696	10
454	65 706	65 715	65 725	65 734	65 744	65 753	65 763	65 772	65 782	65 792	10
455	65 801	65 811	65 820	65 830	65 839	65 849	65 858	65 868	65 877	65 887	9+
456	65 896	65 906	65 916	65 925	65 935	65 944	65 954	65 963	65 973	65 982	9+
457	65 992	66 001	66 011	66 020	66 030	66 039	66 049	66 058	66 068	66 077	9+
458	66 087	66 096	66 106	66 115	66 124	66 134	66 143	66 153	66 162	66 172	9+
459	66 181	66 191	66 200	66 210	66 219	66 229	66 238	66 247	66 257	66 266	9+
460	66 276	66 285	66 295	66 304	66 314	66 323	66 332	66 342	66 351	66 361	9
461	66 370	66 380	66 389	66 398	66 408	66 417	66 427	66 436	66 445	66 455	9
462	66 464	66 474	66 483	66 492	66 502	66 511	66 521	66 530	66 539	26 549	9
463	66 558	66 567	66 577	66 586	66 596	66 605	66 614	66 624	66 633	66 642	9
464	66 652	66 661	66 671	66 680	66 689	66 699	66 708	66 717	66 727	66 736	9
465	66 745	66 755	66 764	66 773	66 783	66 792	66 801	66 811	66 820	66 829	9
466	66 839	66 848	66 857	66 867	66 876	66 885	66 894	66 904	66 913	66 922	9
467	66 932	66 941	66 950	66 960	66 969	66 978	66 987	66 997	67 006	67 015	9
468	67 025	67 034	67 043	67 052	67 062	67 071	67 080	66 089	67 099	67 108	9
469	67 117	67 127	67 136	67 145	67 154	67 164	67 173	67 182	67 191	67 201	9
470	67 210	67 219	67 228	67 237	67 247	67 256	67 265	67 274	67 284	67 293	9
471	67 302	67 311	67 321	67 330	67 339	67 348	67 357	67 367	67 376	67 385	9
472	67 394	67 403	67 413	67 422	67 431	67 440	67 449	67 459	67 468	67 477	9
473	67 486	67 495	67 504	67 514	67 523	67 532	67 541	67 550	67 560	67 569	9
474	67 578	67 587	67 596	67 605	67 614	67 624	67 633	67 642	67 651	67 660	9
475	67 669	67 679	67 688	67 697	67 706	67 715	67 724	67 733	67 742	67 752	9
476	67 761	67 770	67 779	67 788	67 797	67 806	67 815	67 825	67 834	67 843	9
477	67 852	67 861	67 870	67 879	67 888	67 897	67 906	67 916	67 925	67 934	9
478	67 943	67 952	67 961	67 970	67 979	67 988	67 997	68 006	68 015	68 024	9
479	68 034	68 043	68 052	68 061	68 070	68 079	68 088	68 097	68 106	68 115	9
480	68 124	68 133	68 142	68 151	68 160	68 169	68 178	68 187	68 196	68 205	9
481	68 215	68 224	68 233	68 242	68 251	68 260	68 269	68 278	68 287	68 296	9
482	68 305	68 314	68 323	68 332	68 341	68 350	68 359	68 368	68 377	68 386	9
483	68 395	68 404	68 413	68 422	68 431	68 440	68 449	68 458	68 467	68 476	9
484	68 485	68 494	68 502	68 511	68 520	68 529	68 538	68 547	68 556	68 565	9
485	68 574	68 583	68 592	68 601	68 610	68 619	68 628	68 637	68 646	68 655	9
486	68 664	68 673	68 681	68 690	68 699	68 708	68 717	68 726	68 735	68 744	9
487	68 753	68 762	68 771	68 780	68 789	68 797	68 806	68 815	68 824	68 833	9
488	68 842	68 851	68 860	68 869	68 878	68 886	68 895	68 904	68 913	68 922	9
489	68 931	68 940	68 949	68 958	68 966	68 975	68 984	68 993	69 002	69 011	9
490	69 020	69 028	69 037	69 046	69 055	69 064	69 073	69 082	69 090	69 099	9
491	69 108	69 117	69 126	69 135	69 144	69 152	69 161	69 170	69 179	69 188	9
492	69 197	69 205	69 214	69 223	69 232	69 241	69 249	69 258	69 267	69 276	9
493	69 285	69 294	69 302	69 311	69 320	69 329	69 338	69 346	69 355	69 364	9
494	69 373	69 381	69 390	69 399	69 408	69 417	69 425	69 434	69 443	69 452	9
495	69 461	69 469	69 478	69 487	69 496	69 504	69 513	69 522	69 531	69 539	9
496	69 548	69 557	69 566	69 574	69 583	69 592	69 601	69 609	69 618	69 627	9
497	69 636	69 644	69 653	69 662	69 671	69 679	69 688	69 697	69 705	69 714	9
498	69 723	69 732	69 740	69 749	69 758	69 767	69 775	69 784	69 793	69 801	9
499	69 810	69 819	69 827	69 836	69 845	69 854	69 862	69 871	69 880	69 888	9
500	69 897	69 906	69 914	69 923	69 932	69 940	69 949	69 958	69 966	69 975	9
N	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	

N	0	1	2	3	4	5	6	7	8	9	D
500	69 897	69 906	69 914	69 923	69 932	69 940	69 949	69 958	69 966	69 975	9
501	69 984	69 992	70 001	70 010	70 018	70 027	70 036	70 044	70 053	70 062	9
502	70 070	70 079	70 088	70 096	70 105	70 114	70 122	70 131	70 140	70 148	9
503	70 157	70 165	70 174	70 183	70 191	70 200	70 209	70 217	70 226	70 234	9
504	70 243	70 252	70 260	70 269	70 278	70 286	70 295	70 303	70 312	70 321	9
505	70 329	70 338	70 346	70 355	70 364	70 372	70 381	70 389	70 398	70 406	9
506	70 415	70 424	70 432	70 441	70 449	70 458	70 467	70 475	70 484	70 492	9
507	70 501	70 509	70 518	70 526	70 535	70 544	70 552	70 561	70 569	70 578	9
508	70 586	70 595	70 603	70 612	70 621	70 629	70 638	70 646	70 655	70 663	8+
509	70 672	70 680	70 689	70 697	70 706	70 714	70 723	70 731	70 740	70 749	8+
510	70 757	70 766	70 774	70 783	70 791	70 800	70 808	70 817	70 825	70 834	8+
511	70 842	70 851	70 859	70 868	70 876	70 885	70 893	70 902	70 910	70 919	8+
512	70 927	70 935	70 944	70 952	70 961	70 969	70 978	70 986	70 995	71 003	8+
513	71 012	71 020	71 029	71 037	71 046	71 054	71 063	71 071	71 079	71 088	8+
514	71 096	71 105	71 113	71 122	71 130	71 139	71 147	71 155	71 164	71 172	8
515	71 181	71 189	71 198	71 206	71 214	71 223	71 231	71 240	71 248	71 257	8
516	71 265	71 273	71 282	71 290	71 299	71 307	71 315	71 324	71 332	71 341	8
517	71 349	71 357	71 366	71 374	71 383	71 391	71 399	71 408	71 416	71 425	8
518	71 433	71 441	71 450	71 458	71 466	71 475	71 483	71 492	71 500	71 508	8
519	71 517	71 525	71 533	71 542	71 550	71 559	71 567	71 575	71 584	71 592	8
520	71 600	71 609	71 617	71 625	71 634	71 642	71 650	71 659	71 667	71 675	8
521	71 684	71 692	71 700	71 709	71 717	71 725	71 734	71 742	71 750	71 759	8
522	71 767	71 775	71 784	71 792	71 800	71 809	71 817	71 825	71 834	71 842	8
523	71 850	71 858	71 867	71 875	71 883	71 892	71 900	71 908	71 917	71 925	8
524	71 933	71 941	71 950	71 958	71 966	71 975	71 983	71 991	71 999	72 008	8
525	72 016	72 024	72 032	72 041	72 049	72 057	72 066	72 074	72 082	72 090	8
526	72 099	72 107	72 115	72 123	72 132	72 140	72 148	72 156	72 165	72 173	8
527	72 181	72 189	72 198	72 206	72 214	72 222	72 230	72 239	72 247	72 255	8
528	72 263	72 272	72 280	72 288	72 296	72 304	72 313	72 321	72 329	72 337	8
529	72 346	72 354	72 362	72 370	72 378	72 387	72 395	72 403	72 411	72 419	8
530	72 428	72 436	72 444	72 452	72 460	72 469	72 477	72 485	72 493	72 501	8
531	72 509	72 518	72 526	72 534	72 542	72 550	72 558	72 567	72 575	72 583	8
532	72 591	72 599	72 607	72 616	72 624	72 632	72 640	72 648	72 656	72 665	8
533	72 673	72 681	72 689	72 697	72 705	72 713	72 722	72 730	72 738	72 746	8
534	72 754	72 762	72 770	72 779	72 787	72 795	72 803	72 811	72 819	72 827	8
535	72 835	72 843	72 852	72 860	72 868	72 876	72 884	72 892	72 900	72 908	8
536	72 916	72 925	72 933	72 941	72 949	72 957	72 965	72 973	72 981	72 989	8
537	72 997	73 006	73 014	73 022	73 030	73 038	73 046	73 054	73 062	73 070	8
538	73 078	73 086	73 094	73 102	73 111	73 119	73 127	73 135	73 143	73 151	8
539	73 159	73 167	73 175	73 183	73 191	73 199	73 207	73 215	73 223	73 231	8
540	73 239	73 247	73 255	73 263	73 272	73 280	73 288	73 296	73 304	73 312	8
541	73 320	73 328	73 336	73 344	73 352	73 360	73 368	73 376	73 384	73 392	8
542	73 400	73 408	73 416	73 424	73 432	73 440	73 448	73 456	73 464	73 472	8
543	73 480	73 488	73 496	73 504	73 512	73 520	73 528	73 536	73 544	73 552	8
544	73 560	73 568	73 576	73 584	73 592	73 600	73 608	73 616	73 624	73 632	8
545	73 640	73 648	73 656	73 664	73 672	73 679	73 687	73 695	73 703	73 711	8
546	73 719	73 727	73 735	73 743	73 751	73 759	73 767	73 775	73 783	73 791	8
547	73 799	73 807	73 815	73 823	73 830	73 838	73 846	73 854	73 862	73 870	8
548	73 878	73 886	73 894	73 902	73 910	73 918	73 926	73 933	73 941	73 949	8
549	73 957	73 965	73 973	73 981	73 989	73 997	74 005	74 013	74 020	74 028	8
550	74 036	74 044	74 052	74 060	74 068	74 076	74 084	74 092	74 099	74 107	8
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550	74 036	74 044	74 052	74 060	74 068	74 076	74 084	74 092	74 099	74 107	8
551	74 115	74 123	74 131	74 139	74 147	74 155	74 162	74 170	74 178	74 186	8
552	74 194	74 202	74 210	74 218	74 225	74 233	74 241	74 249	74 257	74 265	8
553	74 273	74 280	74 288	74 296	74 304	74 312	74 320	74 327	74 335	74 343	8
554	74 351	74 359	74 367	74 374	74 382	74 390	74 398	74 406	74 414	74 421	8
555	74 429	74 437	74 445	74 453	74 461	74 468	74 476	74 484	74 492	74 500	8
556	74 507	74 515	74 523	74 531	74 539	74 547	74 554	74 562	74 570	74 578	8
557	74 586	74 593	74 601	74 609	74 617	74 624	74 632	74 640	74 648	74 656	8
558	74 663	74 671	74 679	74 687	74 695	74 702	74 710	74 718	74 726	74 733	8
559	74 741	74 749	74 757	74 764	74 772	74 780	74 788	74 796	74 803	74 811	8
560	74 819	74 827	74 834	74 842	74 850	74 858	74 865	74 873	74 881	74 889	8
561	74 896	74 904	74 912	74 920	74 927	74 935	74 943	74 950	74 958	74 966	8
562	74 974	74 981	74 989	74 997	75 005	75 012	75 020	75 028	75 035	75 043	8
563	75 051	75 059	75 066	75 074	75 082	75 089	75 097	75 105	75 113	75 120	8
564	75 128	75 136	75 143	75 151	75 159	75 166	75 174	75 182	75 189	75 197	8
565	75 205	75 213	75 220	75 228	75 236	75 243	75 251	75 259	75 266	75 274	8
566	75 282	75 289	75 297	75 305	75 312	75 320	75 328	75 335	75 343	75 351	8
567	75 358	75 366	75 374	75 381	75 389	75 397	75 404	75 412	75 420	75 427	8
568	75 435	75 442	75 450	75 458	75 465	75 473	75 481	75 488	75 496	75 504	8
569	75 511	75 519	75 526	75 534	75 542	75 549	75 557	75 565	75 572	75 580	8
570	75 587	75 595	75 603	75 610	75 618	75 626	75 633	75 641	75 648	75 656	8
571	75 664	75 671	75 679	75 686	75 694	75 702	75 709	75 717	75 724	75 732	8
572	75 740	75 747	75 755	75 762	75 770	75 778	75 785	75 793	75 800	75 808	8
573	75 815	75 823	75 831	75 838	75 846	75 853	75 861	75 868	75 876	75 884	8
574	75 891	75 899	75 906	75 914	75 921	75 929	75 937	75 944	75 952	75 959	8
575	75 967	75 974	75 982	75 989	75 997	76 005	76 012	76 020	76 027	76 035	7+
576	76 042	76 050	76 057	76 065	76 072	76 080	76 087	76 095	76 103	76 110	7+
577	76 118	76 125	76 133	76 140	76 148	76 155	76 163	76 170	76 178	76 185	7+
578	76 193	76 200	76 208	76 215	76 223	76 230	76 238	76 245	76 253	76 260	7+
579	76 268	76 275	76 283	76 290	76 298	76 305	76 313	76 320	76 328	76 335	7+
580	76 343	76 350	76 358	76 365	76 373	76 380	76 388	76 395	76 403	76 410	7+
581	76 418	76 425	76 433	76 440	76 448	76 455	76 462	76 470	76 477	76 485	7+
582	76 492	76 500	76 507	76 515	76 522	76 530	76 537	76 545	76 552	76 559	7+
583	76 567	76 574	76 582	76 589	76 597	76 604	76 612	76 619	76 626	76 634	7
584	76 641	76 649	76 656	76 664	76 671	76 678	76 686	76 693	76 701	76 708	7
585	76 716	76 723	76 730	76 738	76 745	76 753	76 760	76 768	76 775	76 782	7
586	76 790	76 797	76 805	76 812	76 819	76 827	76 834	76 842	76 849	76 856	7
587	76 864	76 871	76 879	76 886	76 893	76 901	76 908	76 916	76 923	76 930	7
588	76 938	76 945	76 953	76 960	76 967	76 975	76 982	76 989	76 997	77 004	7
589	77 012	77 019	77 026	77 034	77 041	77 048	77 056	77 063	77 070	77 078	7
590	77 085	77 093	77 100	77 107	77 115	77 122	77 129	77 137	77 144	77 151	7
591	77 159	77 166	77 173	77 181	77 188	77 195	77 203	77 210	77 217	77 225	7
592	77 232	77 240	77 247	77 254	77 262	77 269	77 276	77 283	77 291	77 298	7
593	77 305	77 313	77 320	77 327	77 335	77 342	77 349	77 357	77 364	77 371	7
594	77 379	77 386	77 393	77 401	77 408	77 415	77 422	77 430	77 337	77 444	7
595	77 452	77 459	77 466	77 474	77 481	77 488	77 495	77 503	77 510	77 517	7
596	77 525	77 532	77 539	77 546	77 554	77 561	77 568	77 576	77 583	77 590	7
597	77 597	77 605	77 612	77 619	77 627	77 634	77 641	77 648	77 656	77 663	7
598	77 670	77 677	77 685	77 692	77 699	77 706	77 714	77 721	77 728	77 735	7
599	77 743	77 750	77 757	77 764	77 772	77 779	77 786	77 793	77 801	77 808	7
600	77 815	77 822	77 830	77 837	77 844	77 851	77 859	77 866	77 873	77 880	7

N 0 1 2 3 4 5 6 7 8 9

N	0	1	2	3	4	5	6	7	8	9	D
600	77 815	77 822	77 830	77 837	77 844	77 851	77 859	77 866	77 873	77 880	7
601	77 887	77 895	77 902	77 909	77 916	77 924	77 931	77 938	77 945	77 952	7
602	77 960	77 967	77 974	77 981	77 988	77 996	78 003	78 010	78 017	78 025	7
603	78 032	78 039	78 046	78 053	78 061	78 068	78 075	78 082	78 089	78 097	7
604	78 104	78 111	78 118	78 125	78 132	78 140	78 147	78 154	78 161	78 168	7
605	78 176	78 183	78 190	78 197	78 204	78 211	78 219	78 226	78 233	78 240	7
606	78 247	78 254	78 262	78 269	78 276	78 283	78 290	78 297	78 305	78 312	7
607	78 319	78 326	78 333	78 340	78 347	78 355	78 362	78 369	78 376	78 383	7
608	78 390	78 398	78 405	78 412	78 419	78 426	78 433	78 440	78 447	78 455	7
609	78 462	78 469	78 476	78 483	78 490	78 497	78 504	78 512	78 519	78 526	7
610	78 533	78 540	78 547	78 554	78 561	78 569	78 576	78 583	78 590	78 597	7
611	78 604	78 611	78 618	78 625	78 633	78 640	78 647	78 654	78 661	78 668	7
612	78 675	78 682	78 689	78 696	78 704	78 711	78 718	78 725	78 732	78 739	7
613	78 746	78 753	78 760	78 767	78 774	78 781	78 789	78 796	78 803	78 810	7
614	78 817	78 824	78 831	78 838	78 845	78 852	78 859	78 866	78 873	78 880	7
615	78 888	78 895	78 902	78 909	78 916	78 923	78 930	78 937	78 944	78 951	7
616	78 958	78 965	78 972	78 979	78 986	78 993	79 000	79 007	79 014	79 021	7
617	79 029	79 036	79 043	79 050	79 057	79 064	79 071	79 078	79 085	79 092	7
618	79 099	79 106	79 113	79 120	79 127	79 134	79 141	79 148	79 155	79 162	7
619	79 169	79 176	79 183	79 190	79 197	79 204	79 211	79 218	79 225	79 232	7
620	79 239	79 246	79 253	79 260	79 267	79 274	79 281	79 288	79 295	79 302	7
621	79 309	79 316	79 323	79 330	79 337	79 344	79 351	79 358	79 365	79 372	7
622	79 379	79 386	79 393	79 400	79 407	79 414	79 421	79 428	79 435	79 442	7
623	79 449	79 456	79 463	79 470	79 477	79 484	79 491	79 498	79 505	79 511	7
624	79 518	79 525	79 532	79 539	79 546	79 553	79 560	79 567	79 574	79 581	7
625	79 588	79 595	79 602	79 609	79 616	79 623	79 630	79 637	79 644	79 650	7
626	79 657	79 664	79 671	79 678	79 685	79 692	79 699	79 706	79 713	79 720	7
627	79 727	79 734	79 741	79 748	79 754	79 761	79 768	79 775	79 782	79 789	7
628	79 796	79 803	79 810	79 817	79 824	79 831	79 837	79 844	79 851	79 858	7
629	79 865	79 872	79 879	79 886	79 893	79 900	79 906	79 913	79 920	79 927	7
630	79 934	79 941	79 948	79 955	79 962	79 969	79 975	79 982	79 989	79 996	7
631	80 003	80 010	80 017	80 024	80 030	80 037	80 044	80 051	80 058	80 065	7
632	80 072	80 079	80 085	80 092	80 099	80 106	80 113	80 120	80 127	80 134	7
633	80 140	80 147	80 154	80 161	80 168	80 175	80 182	80 188	80 195	80 202	7
634	80 209	80 216	80 223	80 229	80 236	80 243	80 250	80 257	80 264	80 271	7
635	80 277	80 284	80 291	80 298	80 305	80 312	80 318	80 325	80 332	80 339	7
636	80 346	80 353	80 359	80 366	80 373	80 380	80 387	80 393	80 400	80 407	7
637	80 414	80 421	80 428	80 434	80 441	80 448	80 455	80 462	80 468	80 475	7
638	80 482	80 489	80 496	80 502	80 509	80 516	80 523	80 530	80 536	80 543	7
639	80 550	80 557	80 564	80 570	80 577	80 584	80 591	80 598	80 604	80 611	7
640	80 618	80 625	80 632	80 638	80 645	80 652	80 659	80 665	80 672	80 679	7
641	80 686	80 693	80 699	80 706	80 713	80 720	80 726	80 733	80 740	80 747	7
642	80 754	80 760	80 767	80 774	80 781	80 787	80 794	80 801	80 808	80 814	7
643	80 821	80 828	80 835	80 841	80 848	80 855	80 862	80 868	80 875	80 882	7
644	80 889	80 895	80 902	80 909	80 916	80 922	80 929	80 936	80 943	80 949	7
645	80 956	80 963	80 969	80 976	80 983	80 990	80 996	81 003	81 010	81 017	7
646	81 023	81 030	81 037	81 043	81 050	81 057	81 064	81 070	81 077	81 084	7
647	81 090	81 097	81 104	81 111	81 117	81 124	81 131	81 137	81 144	81 151	7
648	81 158	81 164	81 171	81 178	81 184	81 191	81 198	81 204	81 211	81 218	7
649	81 224	81 231	81 238	81 245	81 251	81 258	81 265	81 271	81 278	81 285	7
650	81 291	81 298	81 305	81 311	81 318	81 325	81 331	81 338	81 345	81 351	7
N	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	

N	0	1	2	3	4	5	6	7	8	9	D
650	81 291	81 298	81 305	81 311	81 318	81 325	81 331	81 338	81 345	81 351	7
651	81 358	81 365	81 371	81 378	81 385	81 391	81 398	81 405	81 411	81 418	7
652	81 425	81 431	81 438	81 445	81 451	81 458	81 465	81 471	81 478	81 485	7
653	81 491	81 498	81 505	81 511	81 518	81 525	81 531	81 538	81 544	81 551	7
654	81 558	81 564	81 571	81 578	81 584	81 591	81 598	81 604	81 611	81 617	7
655	81 624	81 631	81 637	81 644	81 651	81 657	81 664	81 671	81 677	81 684	7
656	81 690	81 697	81 704	81 710	81 717	81 723	81 730	81 737	81 743	81 750	7
657	81 757	81 763	81 770	81 776	81 783	81 790	81 796	81 803	81 809	81 816	7
658	81 823	81 829	81 836	81 842	81 849	81 856	81 862	81 869	81 875	81 882	7
659	81 889	81 895	81 902	81 908	81 915	81 921	81 928	81 935	81 941	81 948	7
660	81 954	81 961	81 968	81 974	81 981	81 987	81 994	82 000	82 007	82 014	7
661	82 020	82 027	82 033	82 040	82 046	82 053	82 060	82 066	82 073	82 079	7
662	82 086	82 092	82 099	82 105	82 112	82 119	82 125	82 132	82 138	82 145	7
663	82 151	82 158	82 164	82 171	82 178	82 184	82 191	82 197	82 204	82 210	6
664	82 217	82 223	82 230	82 236	82 243	82 249	82 256	82 263	82 269	82 276	6+
665	82 282	82 289	82 295	82 302	82 308	82 315	82 321	82 328	82 334	82 341	6+
666	82 347	82 354	82 360	82 367	82 373	82 380	82 387	82 393	82 400	82 406	6+
667	82 413	82 419	82 426	82 432	82 439	82 445	82 452	82 458	82 465	82 471	6+
668	82 478	82 484	82 491	82 497	82 504	82 510	82 517	82 523	82 530	82 536	6+
669	82 543	82 549	82 556	82 562	82 569	82 575	82 582	82 588	82 595	82 601	6+
670	82 607	82 614	82 620	82 627	82 633	82 640	82 646	82 653	82 659	82 666	6+
671	82 672	82 679	82 685	82 692	82 698	82 705	82 711	82 718	82 724	82 730	6+
672	82 737	82 743	82 750	82 756	82 763	82 769	82 776	82 782	82 789	82 795	6+
673	82 802	82 808	82 814	82 821	82 827	82 834	82 840	82 847	82 853	82 860	6
674	82 866	82 872	82 879	82 885	82 892	82 898	82 905	82 911	82 918	82 924	6
675	82 930	82 937	82 943	82 950	82 956	82 963	82 969	82 975	82 982	82 988	6
676	82 995	83 001	83 008	83 014	83 020	83 027	83 033	83 040	83 046	83 052	6
677	83 059	83 065	83 072	83 078	83 085	83 091	83 097	83 104	83 110	83 117	6
678	83 123	83 129	83 136	83 142	83 149	83 155	83 161	83 168	83 174	83 181	6
679	83 187	83 193	83 200	83 206	83 213	83 219	83 225	83 232	83 238	83 245	6
680	83 251	83 257	83 264	83 270	83 276	83 283	83 289	83 296	83 302	83 308	6
681	83 315	83 321	83 327	83 334	83 340	83 347	83 353	83 359	83 366	83 372	6
682	83 378	83 385	83 391	83 398	83 404	83 410	83 417	83 423	83 429	83 436	6
683	83 442	83 448	83 455	83 461	83 467	83 474	83 480	83 487	83 493	83 499	6
684	83 506	83 512	83 518	83 525	83 531	83 537	83 544	83 550	83 556	83 563	6
685	83 569	83 575	83 582	83 588	83 594	83 601	83 607	83 613	83 620	83 626	6
686	83 632	83 639	83 645	83 651	83 658	83 664	83 670	83 677	83 683	83 689	6
687	83 696	83 702	83 708	83 715	83 721	83 727	83 734	83 740	83 746	83 753	6
688	83 759	83 765	83 771	83 778	83 784	83 790	83 797	83 803	83 809	83 816	6
689	83 822	83 828	83 835	83 841	83 847	83 853	83 860	83 866	83 872	83 879	6
690	83 885	83 891	83 897	83 904	83 910	83 916	83 923	83 929	83 935	83 942	6
691	83 948	83 954	83 960	83 967	83 973	83 979	83 985	83 992	83 998	84 004	6
692	84 011	84 017	84 023	84 029	84 036	84 042	84 048	84 055	84 061	84 067	6
693	84 073	84 080	84 086	84 092	84 098	84 105	84 111	84 117	84 123	84 130	6
694	84 136	84 142	84 148	84 155	84 161	84 167	84 173	84 180	84 186	84 192	6
695	84 198	84 205	84 211	84 217	84 223	84 230	84 236	84 242	84 248	84 255	6
696	84 261	84 267	84 273	84 280	84 286	84 292	84 298	84 305	84 311	84 317	6
697	84 323	84 330	84 336	84 342	84 348	84 354	84 361	84 367	84 373	84 379	6
698	84 386	84 392	84 398	84 404	84 410	84 417	84 423	84 429	84 435	84 442	6
699	84 448	84 454	84 460	84 466	84 473	84 479	84 485	84 491	84 497	84 504	6
700	84 510	84 516	84 522	84 528	84 535	84 541	84 547	84 553	84 559	84 566	6
N	0	1	2	3	4	5	6	7	8	9	

N	0	1	2	3	4	5	6	7	8	9	D
700	84 510	84 516	84 522	84 528	84 535	84 541	84 547	84 553	84 559	84 566	6
701	84 572	84 578	84 584	84 590	84 597	84 603	84 609	84 615	84 621	84 628	6
702	84 634	84 640	84 646	84 652	84 658	84 665	84 671	84 677	84 683	84 689	6
703	84 696	84 702	84 708	84 714	84 720	84 726	84 733	84 739	84 745	84 751	6
704	84 757	84 763	84 770	84 776	84 782	84 788	84 794	84 800	84 807	84 813	6
705	84 819	84 825	84 831	84 837	84 844	84 850	84 856	84 862	84 868	84 874	6
706	84 880	84 887	84 893	84 899	84 905	84 911	84 917	84 924	84 930	84 936	6
707	84 942	84 948	84 954	84 960	84 967	84 973	84 979	84 985	84 991	84 997	6
708	85 003	85 009	85 016	85 022	85 028	85 034	85 040	85 046	85 052	85 058	6
709	85 065	85 071	85 077	85 083	85 089	85 095	85 101	85 107	85 114	85 120	6
710	85 126	85 132	85 138	85 144	85 150	85 156	85 163	85 169	85 175	85 181	6
711	85 187	85 193	85 199	85 205	85 211	85 217	85 224	85 230	85 236	85 242	6
712	85 248	85 254	85 260	85 266	85 272	85 278	85 285	85 291	85 297	85 303	6
713	85 309	85 315	85 321	85 327	85 333	85 339	85 345	85 352	85 358	85 364	6
714	85 370	85 376	85 382	85 388	85 394	85 400	85 406	85 412	85 418	85 425	6
715	85 431	85 437	85 443	85 449	85 455	85 461	85 467	85 473	85 479	85 485	6
716	85 491	85 497	85 503	85 509	85 516	85 522	85 528	85 534	85 540	85 546	6
717	85 552	85 558	85 564	85 570	85 576	85 582	85 588	85 594	85 600	85 606	6
718	85 612	85 618	85 625	85 631	85 637	85 643	85 649	85 655	85 661	85 667	6
719	85 673	85 679	85 685	85 691	85 697	85 703	85 709	85 715	85 721	85 727	6
720	85 733	85 739	85 745	85 751	85 757	85 763	85 769	85 775	85 781	85 788	6
721	85 794	85 800	85 806	85 812	85 818	85 824	85 830	85 836	85 842	85 848	6
722	85 854	85 860	85 866	85 872	85 878	85 884	85 890	85 896	85 902	85 908	6
723	85 914	85 920	85 926	85 932	85 938	85 944	85 950	85 956	85 962	85 968	6
724	85 974	85 980	85 986	85 992	85 998	86 004	86 010	86 016	86 022	86 028	6
725	86 034	86 040	86 046	86 052	86 058	86 064	86 070	86 076	86 082	86 088	6
726	86 094	86 100	86 106	86 112	86 118	86 124	86 130	86 136	86 141	86 147	6
727	86 153	86 159	86 165	86 171	86 177	86 183	86 189	86 195	86 201	86 207	6
728	86 213	86 219	86 225	86 231	86 237	86 243	86 249	86 255	86 261	86 267	6
729	86 273	86 279	86 285	86 291	86 297	86 303	86 308	86 314	86 320	86 326	6
730	86 332	86 338	86 344	86 350	86 356	86 362	86 368	86 374	86 380	86 386	6
731	86 392	86 398	86 404	86 410	86 415	86 421	86 427	86 433	86 439	86 445	6
732	86 451	86 457	86 463	86 469	86 475	86 481	86 487	86 493	86 499	86 504	6
733	86 510	86 516	86 522	86 528	86 534	86 540	86 546	86 552	86 558	86 564	6
734	86 570	86 576	86 581	86 587	86 593	86 599	86 605	86 611	86 617	86 623	6
735	86 629	86 635	86 641	86 646	86 652	86 658	86 664	86 670	86 676	86 682	6
736	86 688	86 694	86 700	86 705	86 711	86 717	86 723	86 729	86 735	86 741	6
737	86 747	86 753	86 759	86 764	86 770	86 776	86 782	86 788	86 794	86 800	6
738	86 806	86 812	86 817	86 823	86 829	86 835	86 841	86 847	86 853	86 859	6
739	86 864	86 870	86 876	86 882	86 888	86 894	86 900	86 906	86 911	86 917	6
740	86 923	86 929	86 935	86 941	86 947	86 953	86 958	86 964	86 970	86 976	6
741	86 982	86 988	86 994	86 999	87 005	87 011	87 017	87 023	87 029	87 035	6
742	87 040	87 046	87 052	87 058	87 064	87 070	87 075	87 081	87 087	87 093	6
743	87 099	87 105	87 111	87 116	87 122	87 128	87 134	87 140	87 146	87 151	6
744	87 157	87 163	87 169	87 175	87 181	87 186	87 192	87 198	87 204	87 210	6
745	87 216	87 221	87 227	87 233	87 239	87 245	87 251	87 256	87 262	87 268	6
746	87 274	87 280	87 286	87 291	87 297	87 303	87 309	87 315	87 320	87 326	6
747	87 332	87 338	87 344	87 349	87 355	87 361	87 367	87 373	87 379	87 384	6
748	87 390	87 396	87 402	87 408	87 413	87 419	87 425	87 431	87 437	87 442	6
749	87 448	87 454	87 460	87 466	87 471	87 477	87 483	87 489	87 495	87 500	6
750	87 506	87 512	87 518	87 523	87 529	87 535	87 541	87 547	87 552	87 558	6
N	0	1	2	3	4	5	6	7	8	9	

N	0	1	2	3	4	5	6	7	8	9	D
750	87 506	87 512	87 518	87 523	87 529	87 535	87 541	87 547	87 552	87 558	6
751	87 564	87 570	87 576	87 581	87 587	87 593	87 599	87 604	87 610	87 616	6
752	87 622	87 628	87 633	87 639	87 645	87 651	87 656	87 662	87 668	87 674	6
753	87 679	87 685	87 691	87 697	87 703	87 708	87 714	87 720	87 726	87 731	6
754	87 737	87 743	87 749	87 754	87 760	87 766	87 772	87 777	87 783	87 789	6
755	87 795	87 800	87 806	87 812	87 818	87 823	87 829	87 835	87 841	87 846	6
756	87 852	87 858	87 864	87 869	87 875	87 881	87 887	87 892	87 898	87 904	6
757	87 910	87 915	87 921	87 927	87 933	87 938	87 944	87 950	87 955	87 961	6
758	87 967	87 973	87 978	87 984	87 990	87 996	88 001	88 007	88 013	88 018	6
759	88 024	88 030	88 036	88 041	88 047	88 053	88 058	88 064	88 070	88 076	6
760	88 081	88 087	88 093	88 098	88 104	88 110	88 116	88 121	88 127	88 133	6
761	88 138	88 144	88 150	88 156	88 161	88 167	88 173	88 178	88 184	88 190	6
762	88 195	88 201	88 207	88 213	88 218	88 224	88 230	88 235	88 241	88 247	6
763	88 252	88 258	88 264	88 270	88 275	88 281	88 287	88 292	88 298	88 304	6
764	88 309	88 315	88 321	88 326	88 332	88 338	88 343	88 349	88 355	88 360	6
765	88 366	88 372	88 377	88 383	88 389	88 395	88 400	88 406	88 412	88 417	6
766	88 423	88 429	88 434	88 440	88 446	88 451	88 457	88 463	88 468	88 474	6
767	88 480	88 485	88 491	88 497	88 502	88 508	88 513	88 519	88 525	88 530	6
768	88 536	88 542	88 547	88 553	88 559	88 564	88 570	88 576	88 581	88 587	6
769	88 593	88 598	88 604	88 610	88 615	88 621	88 627	88 632	88 638	88 643	6
770	88 649	88 655	88 660	88 666	88 672	88 677	88 683	88 689	88 694	88 700	6
771	88 705	88 711	88 717	88 722	88 728	88 734	88 739	88 745	88 750	88 756	6
772	88 762	88 767	88 773	88 779	88 784	88 790	88 795	88 801	88 807	88 812	6
773	88 818	88 824	88 829	88 835	88 840	88 846	88 852	88 857	88 863	88 868	6
774	88 874	88 880	88 885	88 891	88 897	88 902	88 908	88 913	88 919	88 925	6
775	88 930	88 936	88 941	88 947	88 953	88 958	88 964	88 969	88 975	88 981	6
776	88 986	88 992	88 997	89 003	89 009	89 014	89 020	89 025	89 031	89 037	6
777	89 042	89 048	89 053	89 059	89 064	89 070	89 076	89 081	89 087	89 092	6
778	89 098	89 104	89 109	89 115	89 120	89 126	89 131	89 137	89 143	89 148	6
779	89 154	89 159	89 165	89 170	89 176	89 182	89 187	89 193	89 198	89 204	6
780	89 209	89 215	89 221	89 226	89 232	89 237	89 243	89 248	89 254	89 260	6
781	89 265	89 271	89 276	89 282	89 287	89 293	89 298	89 304	89 310	89 315	6
782	89 321	89 326	89 332	89 337	89 343	89 348	89 354	89 360	89 365	89 371	6
783	89 376	89 382	89 387	89 393	89 398	89 404	89 409	89 415	89 421	89 426	5+
784	89 432	89 437	89 443	89 448	89 454	89 459	89 465	89 470	89 476	89 481	5+
785	89 487	89 492	89 498	89 504	89 509	89 515	89 520	89 526	89 531	89 537	5+
786	89 542	89 548	89 553	89 559	89 564	89 570	89 575	89 581	89 586	89 592	5+
787	89 597	89 603	89 609	89 614	89 620	89 625	89 631	89 636	89 642	89 647	5+
788	89 653	89 658	89 664	89 669	89 675	89 680	89 686	89 691	89 697	89 702	5+
789	89 708	89 713	89 719	89 724	89 730	89 735	89 741	89 746	89 752	89 757	5+
790	89 763	89 768	89 774	89 779	89 785	89 790	89 796	89 801	89 807	89 812	5+
791	89 818	89 823	89 829	89 834	89 840	89 845	86 851	89 856	89 862	89 867	5+
792	89 873	89 878	89 883	89 889	89 894	89 900	89 905	89 911	89 916	89 922	5+
793	89 927	89 933	89 938	89 944	89 949	89 955	89 960	89 966	89 971	89 977	5+
794	89 982	89 988	89 993	89 998	90 004	90 009	90 015	90 020	90 026	90 031	5+
795	90 037	90 042	90 048	90 053	90 059	90 064	90 069	90 075	90 080	90 086	5+
796	90 091	90 097	90 102	90 108	90 113	90 119	90 124	90 129	90 135	90 140	5+
797	90 146	90 151	90 157	90 162	90 168	90 173	90 179	90 184	90 189	90 195	5
798	90 200	90 206	90 211	90 217	90 222	90 227	90 233	90 238	90 244	90 249	5
799	90 255	90 260	90 266	90 271	90 276	90 282	90 287	90 293	90 298	90 304	5
800	90 309	90 314	90 320	90 325	90 331	90 336	90 342	90 347	90 352	90 358	5
N	0	1	2	3	4	5	6	7	8	9	

N	0	1	2	3	4	5	6	7	8	9	D
800	90 309	90 314	90 320	90 325	90 331	90 336	90 342	90 347	90 352	90 358	5
801	90 363	90 369	90 374	90 380	90 385	90 390	90 396	90 401	90 407	90 412	5
802	90 417	90 423	90 428	90 434	90 439	90 445	90 450	90 455	90 461	90 466	5
803	90 472	90 477	90 482	90 488	90 493	90 499	90 504	90 509	90 515	90 520	5
804	90 526	90 531	90 536	90 542	90 547	90 553	90 558	90 563	90 569	90 574	5
805	90 580	90 585	90 590	90 596	90 601	90 607	90 612	90 617	90 623	90 628	5
806	90 634	90 639	90 644	90 650	90 655	90 660	90 666	90 671	90 677	90 682	5
807	90 687	90 693	90 698	90 703	90 709	90 714	90 720	90 725	90 730	90 736	5
808	90 741	90 747	90 752	90 757	90 763	90 768	90 773	90 779	90 784	90 789	5
809	90 795	90 800	90 806	90 811	90 816	90 822	90 827	90 832	90 838	90 843	5
810	90 849	90 854	90 859	90 865	90 870	90 875	90 881	90 886	90 891	90 897	5
811	90 902	90 907	90 913	90 918	90 924	90 929	90 934	90 940	90 945	90 950	5
812	90 956	90 961	90 966	90 972	90 977	90 982	90 988	90 993	90 998	91 004	5
813	91 009	91 014	91 020	91 025	91 030	91 036	91 041	91 046	91 052	91 057	5
814	91 062	91 068	91 073	91 078	91 084	91 089	91 094	91 100	91 105	91 110	5
815	91 116	91 121	91 126	91 132	91 137	91 142	91 148	91 153	91 158	91 164	5
816	91 169	91 174	91 180	91 185	91 190	91 196	91 201	91 206	91 212	91 217	5
817	91 222	61 228	91 233	91 238	91 243	91 249	91 254	91 259	91 265	91 270	5
818	91 275	91 281	91 286	91 291	91 297	91 302	91 307	91 312	91 318	91 323	5
819	91 328	91 334	91 339	91 344	91 350	91 355	91 360	91 365	91 371	91 376	5
820	91 381	91 387	91 392	91 397	91 403	91 408	91 413	91 418	91 424	91 429	5
821	91 434	91 440	91 445	91 450	91 455	91 461	91 466	91 471	91 477	91 482	5
822	91 487	91 492	91 498	91 503	91 508	91 514	91 519	91 524	91 529	91 535	5
823	91 540	91 545	91 551	91 556	91 561	91 566	91 572	91 577	91 582	91 587	5
824	91 593	91 598	91 603	91 609	91 614	91 619	91 624	91 630	91 635	91 640	5
825	91 645	91 651	91 656	91 661	91 666	91 672	91 677	91 682	91 687	91 693	5
826	91 698	91 703	91 709	91 714	91 719	91 724	91 730	91 735	91 740	91 745	5
827	91 751	91 756	91 761	91 766	91 772	91 777	91 782	91 787	91 793	91 798	5
828	91 803	91 808	91 814	91 819	91 824	91 829	91 834	91 840	91 845	91 850	5
829	91 855	91 861	91 866	91 871	91 876	91 882	91 887	91 892	91 897	91 903	5
830	91 908	91 913	91 918	91 924	91 929	91 934	91 939	91 944	91 950	91 955	5
831	91 960	91 965	91 971	91 976	91 981	91 986	91 991	91 997	92 002	92 007	5
832	92 012	92 018	92 023	92 028	92 033	92 038	92 044	92 049	92 054	92 059	5
833	92 065	92 070	92 075	92 080	92 085	92 091	92 096	92 101	92 106	92 111	5
834	92 117	92 122	92 127	92 132	92 137	92 143	92 148	92 153	92 158	92 163	5
835	92 169	92 174	92 179	92 184	92 189	92 195	92 200	92 205	92 210	92 215	5
836	92 221	92 226	92 231	92 236	92 241	92 247	92 252	92 257	92 262	92 267	5
837	92 273	92 278	92 283	92 288	92 293	92 298	92 304	92 309	92 314	92 319	5
838	92 324	92 330	92 335	92 340	92 345	92 350	92 355	92 361	92 366	92 371	5
839	92 376	92 381	92 387	92 392	92 397	92 402	92 407	92 412	92 418	92 423	5
840	92 428	92 433	92 438	92 443	92 449	92 454	92 459	92 464	92 469	92 474	5
841	92 480	92 485	92 490	92 495	92 500	92 505	92 511	92 516	92 521	92 526	5
842	92 531	92 536	92 542	92 547	92 552	92 557	92 562	92 567	92 572	92 578	5
843	92 583	92 588	92 593	92 598	92 603	92 609	92 614	92 619	92 624	92 629	5
844	92 634	92 639	92 645	92 650	92 655	92 660	92 665	92 670	92 675	92 681	5
845	92 686	92 691	92 696	92 701	92 706	92 711	92 716	92 722	92 727	92 732	5
846	92 737	92 742	92 747	92 752	92 758	92 763	92 768	92 773	92 778	92 783	5
847	92 788	92 793	92 799	92 804	92 809	92 814	92 819	92 824	92 829	92 834	5
848	92 840	92 845	92 850	92 855	92 860	92 865	92 870	92 875	92 881	92 886	5
849	92 891	92 896	92 901	92 906	92 911	92 916	92 921	92 927	92 932	92 937	5
850	92 942	92 947	92 952	92 957	92 962	92 967	92 973	92 978	92 983	92 988	5

N	0	1	2	3	4	5	6	7	8	9	D
850	92 942	92 947	92 952	92 957	92 962	92 967	92 973	92 978	92 983	92 988	5
851	92 993	92 998	93 003	93 008	93 013	93 018	93 024	93 029	93 034	93 039	5
852	93 044	93 049	93 054	93 059	93 064	93 069	93 075	93 080	93 085	93 090	5
853	93 095	93 100	93 105	93 110	93 115	93 120	93 125	93 131	93 136	93 141	5
854	93 146	93 151	93 156	93 161	93 166	93 171	93 176	93 181	93 186	93 192	5
855	93 197	93 202	93 207	93 212	93 217	93 222	93 227	93 232	93 237	93 242	5
856	93 247	93 252	93 258	93 263	93 268	93 273	93 278	93 283	93 288	93 293	5
857	93 298	93 303	93 308	93 313	93 318	93 323	93 328	93 334	93 339	93 344	5
858	93 349	93 354	93 359	93 364	93 369	93 374	93 379	93 384	93 389	93 394	5
859	93 399	93 304	93 409	93 414	93 420	93 425	93 430	93 435	93 440	93 445	5
860	93 450	93 455	93 460	93 465	93 470	93 475	93 480	93 485	93 490	93 495	5
861	93 500	93 505	93 510	93 515	93 520	93 526	93 531	93 536	93 541	93 546	5
862	93 551	93 556	93 561	93 566	93 571	93 576	93 581	93 586	93 591	93 596	5
863	93 601	93 606	93 611	93 616	93 621	93 626	93 631	93 636	93 641	93 646	5
864	93 651	93 656	93 661	93 666	93 671	93 676	93 682	93 687	93 692	93 697	5
865	93 702	93 707	93 712	93 717	93 722	93 727	93 732	93 737	93 742	93 747	5
866	93 752	93 757	93 762	93 767	93 772	93 777	93 782	93 787	93 792	93 797	5
867	93 802	93 807	93 812	93 817	93 822	93 827	93 832	93 837	93 842	93 847	5
868	93 852	93 857	93 862	93 867	93 872	93 877	93 882	93 887	93 892	93 897	5
869	93 902	93 907	93 912	93 917	93 922	93 927	93 932	93 937	93 942	93 947	5
870	93 952	93 957	93 962	93 967	93 972	93 977	93 982	93 987	93 992	93 997	5
871	94 002	94 007	94 012	94 017	94 022	94 027	94 032	94 037	94 042	94 047	5
872	94 052	94 057	94 062	94 067	94 072	94 077	94 082	94 086	94 091	94 096	5
873	94 101	94 106	94 111	94 116	94 121	94 126	94 131	94 136	94 141	94 146	5
874	94 151	94 156	94 161	94 166	94 171	94 176	94 181	94 186	94 191	94 196	5
875	94 201	94 206	94 211	94 216	94 221	94 226	94 231	94 236	94 240	94 245	5
876	94 250	94 255	94 260	94 265	94 270	94 275	94 280	94 285	94 290	94 295	5
877	94 300	94 305	94 310	94 315	94 320	94 325	94 330	94 335	94 340	94 345	5
878	94 349	94 354	94 359	94 364	94 369	94 374	94 379	94 384	94 389	94 394	5
879	94 399	94 404	94 409	94 414	94 419	94 424	94 429	94 433	94 438	94 443	5
880	94 448	94 453	94 458	94 463	94 468	94 473	94 478	94 483	94 488	94 493	5
881	94 498	94 503	94 507	94 512	94 517	94 522	94 527	94 532	94 537	94 542	5
882	94 547	94 552	94 557	94 562	94 567	94 571	94 576	94 581	94 586	94 591	5
883	94 596	94 601	94 606	94 611	94 616	94 621	94 626	94 630	94 635	94 640	5
884	94 645	94 650	94 655	94 660	94 665	94 670	94 675	94 680	94 685	94 689	5
885	94 694	94 699	94 704	94 709	94 714	94 719	94 724	94 729	94 734	94 738	5
886	94 743	94 748	94 753	94 758	94 763	94 768	94 773	94 778	94 783	94 787	5
887	94 792	94 797	94 802	94 807	94 812	94 817	94 822	94 827	94 832	94 836	5
888	94 841	94 846	94 851	94 856	94 861	94 866	94 871	94 876	94 880	94 885	5
889	94 890	94 895	94 900	94 905	94 910	94 915	94 919	94 924	94 929	94 934	5
890	94 939	94 944	94 949	94 954	94 959	94 963	94 968	94 973	94 978	94 983	5
891	94 988	94 993	94 998	95 002	95 007	95 012	95 017	95 022	95 027	95 032	5
892	95 036	95 041	95 046	95 051	95 056	95 061	95 066	95 071	95 075	95 080	5
893	95 085	95 090	95 095	95 100	95 105	95 109	95 114	95 119	95 124	95 129	5
894	95 134	95 139	95 143	95 148	95 153	95 158	95 163	95 168	95 173	95 177	5
895	95 182	95 187	95 192	95 197	95 202	95 207	95 211	95 216	95 221	95 226	5
896	95 231	95 236	95 240	95 245	95 250	95 255	95 260	95 265	95 270	95 274	5
897	95 279	95 284	95 289	95 294	95 299	95 303	95 308	95 313	95 318	95 323	5
898	95 328	95 332	95 337	95 342	95 347	95 352	95 357	95 361	95 366	95 371	5
899	95 376	95 381	95 386	95 390	95 395	95 400	95 405	95 410	95 415	95 419	5
900	95 424	95 429	95 434	95 439	95 444	95 448	95 453	95 458	95 463	95 468	5
N	0	1	2	3	4	5	6	7	8	9	

N	0	1	2	3	4	5	6	7	8	9	D
900	95 424	95 429	95 434	95 439	95 444	95 448	95 453	95 458	95 463	95 468	5
901	95 472	95 477	95 482	95 487	95 492	95 497	95 501	95 506	95 511	95 516	5
902	95 521	95 525	95 530	95 535	95 540	95 545	95 550	95 554	95 559	95 564	5
903	95 569	95 574	95 578	95 583	95 588	95 593	95 598	95 602	95 607	95 612	5
904	95 617	95 622	95 626	95 631	95 636	95 641	95 646	95 650	95 655	95 660	5
905	95 665	95 670	95 674	95 679	95 684	95 689	95 694	95 698	95 703	95 708	5
906	95 713	95 718	95 722	95 727	95 732	95 737	95 742	95 746	95 751	95 756	5
907	95 761	95 766	95 770	95 775	95 780	95 785	95 789	95 794	95 799	95 804	5
908	95 809	95 813	95 818	95 823	95 828	95 832	95 837	95 842	95 847	95 852	5
909	95 856	95 861	95 866	95 871	95 875	95 880	95 885	95 890	95 895	95 899	5
910	95 904	95 909	95 914	95 918	95 923	95 928	95 933	95 938	95 942	95 947	5
911	95 952	95 957	95 961	95 966	95 971	95 976	95 980	95 985	95 990	95 995	5
912	95 999	96 004	96 009	96 014	96 019	96 023	96 028	96 033	96 038	96 042	5
913	96 047	96 052	96 057	96 061	96 066	96 071	96 076	96 080	96 085	96 090	5
914	96 095	96 099	96 104	96 109	96 114	96 118	96 123	96 128	96 133	96 137	5
915	96 142	96 147	96 152	96 156	96 161	96 166	96 171	96 175	96 180	96 185	5
916	96 190	96 194	96 199	96 204	96 209	96 213	96 218	96 223	96 227	96 232	5
917	96 237	96 242	96 246	96 251	96 256	96 261	96 265	96 270	96 275	96 280	5
918	96 284	96 289	96 294	96 298	96 303	96 308	96 313	96 317	96 322	96 327	5
919	96 332	96 336	96 341	96 346	96 350	96 355	96 360	96 365	96 369	96 374	5
920	96 379	96 384	96 388	96 393	96 398	96 402	96 407	96 412	96 417	96 421	5
921	96 426	96 431	96 435	96 440	96 445	96 450	96 454	96 459	96 464	96 468	5
922	96 473	96 478	96 483	96 487	96 492	96 497	96 501	96 506	96 511	96 515	5
923	96 520	96 525	96 530	96 534	96 539	96 544	96 548	96 553	96 558	96 562	5
924	96 567	96 572	96 577	96 581	96 586	96 591	96 595	96 600	96 605	96 609	5
925	96 614	96 619	96 624	96 628	96 633	96 638	96 642	96 647	96 652	96 656	5
926	96 661	96 666	96 670	96 675	96 680	96 685	96 689	96 694	96 699	96 703	5
927	96 708	96 713	96 717	96 722	96 727	96 731	96 736	96 741	96 745	96 750	5
928	96 755	96 759	96 764	96 769	96 774	96 778	96 783	96 788	96 792	96 797	5
929	96 802	96 806	96 811	96 816	96 820	96 825	96 830	96 834	96 839	96 844	5
930	96 848	96 853	96 858	96 862	96 867	96 872	96 876	96 881	96 886	96 890	5
931	96 895	96 900	96 904	96 909	96 914	96 918	96 923	96 928	96 932	96 937	5
932	96 942	96 946	96 951	96 956	96 960	96 965	96 970	96 974	96 979	96 984	5
933	96 988	96 993	96 997	97 002	97 007	97 011	97 016	97 021	97 025	97 030	5
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941	97 359	97 364	97 368	97 373	97 377	97 382	97 387	97 391	97 396	97 400	5
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945	97 543	97 548	97 552	97 557	97 562	97 566	97 571	97 575	97 580	97 585	5
946	97 589	97 594	97 598	97 603	97 607	97 612	97 617	97 621	97 626	97 630	5
947	97 635	97 640	97 644	97 649	97 653	97 658	97 663	97 667	97 672	97 676	5
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998	99 913	99 917	99 922	99 926	99 930	99 935	99 939	99 944	99 948	99 952	4
999	99 957	99 961	99 965	99 970	99 974	99 978	99 983	99 987	99 991	99 996	4
1000	00 000	00 004	00 009	00 013	00 017	00 022	00 026	00 030	00 035	00 039	4
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ANSWERS.

PAGE 4.

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PAGE 10.

1. .5555+
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3. 2.6888+
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7. 3.4956+
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9. 1.2599+
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11. 3.4622+
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13. 2.2239+
14. 2.1179+
15. 2.08008+
16. 1.9129+
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PAGE 12.

1. 32
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