# EASY INSTRUCTIONS FOR OPERATING THE

CONTROLLED-KEY

## COMPTOMETER

REG. U. S. PAT. OFF.

COMPTOMETER DIVISION

FELT AND TARRANT MFG. CO.

1735 NORTH PAULINA ST.

CHICAGO 22, ILLINOIS

	STH <b>S</b>	6	THS BTHS 12THS		2THS	1	бтнв		
1 2 3	.25 .5 .75	1 2 3	.1667 .3333 .5	1 2 3	.125 .25 .375	1 2 3	.0833 .1667 .25	1 2 3	.0625 .125 .1875
<b>4</b> .6667 <b>5</b> .8333		4 5 6	.5 .625 .75	456	.3333 .4167 .5	4 5 6	.25 .3125 .375		
			7	.875	7 8 9	.5833 .6667 .75	7 8 9	.4375 .5 .5625	
1 2	.0156	22 23	.3438 .3594	43	.6719 .6875	11 .9167   11 .687		.625 .6875 .75	
3 4 5	.0469 .0625 .0781	24 25 26	.375 .3906 .4063	45 46 47	.7031 .7188 .7344			13 14 15	.8125 .875 .9375
6	.0938	27	.4219	48	.75		32NDs		
7 8 9	.1094 .125 .1406	28 29 30	.4375 .4531 .4688	49 50 51	.7656 .7813 .7969	1 2 3	.03125 .0625 .09375	17 18 19	.53125 .5625 .59375
10 11 12	.1563 .1719 .1875	31 32 33	.4844 .5 .5156	52 53 54	.8125 .8281 .8438	4 5 6	.125 .15625 .1875	20 21 22	.625 .65625 .6875
13 14 15	.2031 .2188 .2344	34 35 36	.5313 .5469 .5625	55 56 57	.8594 .875 .8906	789	.21875 .25 .28125	23 24 25	.71875 .75 .78125
16 17 18	.25 .2656 .2813	37 38 39	.5781 .5938 .6094	58 59 60	.9063 .9219 .9375	10 11 12	.3125 .34375 .375	26 27 28	.8125 .84375 .875
19 20 21	.2969 .3125 .3281	40 41 42	.625 .6406 .6563	61 62 63	.9531 .9688 .9844	13 14 15	.40625 .4375 .46875	29 30 31	.90625 .9375 .96875
						16	.5		

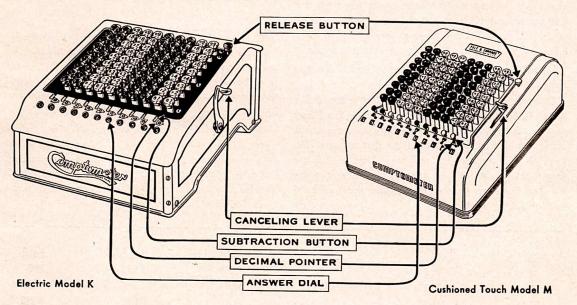
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COMPTOMETER Instructions

#### INTRODUCTION

THE COMPTOMETER is a key-driven adding and calculating machine which performs quickly and easily all forms of arithmetical figuring involving addition, multiplication, division, and subtraction.

each key top is a large and small figure. The large figures are used for addition and multiplication; the small figures for division and subtraction. The answer dials show the result of the calculation. The lever at the right, called the canceling lever, clears



Method of operation is the same for Models J, K, and M.

Operation is exceedingly simple—no operating lever to pull, no crank to turn, no preliminary setting of dials. Nothing to do but press the keys and read the answer-the machine does the rest.

The keyboard is arranged in eight or more columns\* of nine keys each, which are grouped in alternating sections, colored green and white. On

the answer dials. The pointers above the answer dials are used to point off decimals. The cut-offs or buttons at the left of each column are used for subtraction. The red release key at the upper righthand corner unlocks the keyboard after an incomplete key stroke error has been corrected. See page 5 for proper use of controlled-key.

\*The Comptometer is manufactured in three standard sizes: 8, 10, and 12-columns. A 20-column Comptometer is also manufactured for use in heavy statistical and distribution work.

#### ADDITION

#### General Instructions

THE two columns of white keys on the right side of the keyboard are for adding units and tens of cents. The next three columns of green keys are for adding units, tens, and hundreds of dollars. The adjoining three columns of white keys are for adding thousands, tens of thousands, and hundreds of thousands, amounts. Keys farther to the left are for adding correspondingly higher denominations.

In addition always use the large figures on the keys.

Only one key should be operated at a time. For example, in adding \$3.45, first press down the 3 key in the third column, then the 4 key in the second column and then the 5 key in the first column. No keys are depressed for ciphers. Always lift the finger slightly off the key after each stroke. For the first few days go slowly, memorizing the keyboard and acquiring rhythm.

Remember to place the finger on the key desired and press it down until you feel it strike bottom. This push-stroke requires practice. It differs distinctly from the sharp staccato blow of the typewriter. It is the easiest known stroke on the finger. It eliminates the impact of striking the key.

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#### Full Keyboard Method

Below are six columns of figures to be added. Use only the index and second finger. The index finger is to be used for all figures except the right-hand figure which should be added with the second

Use the full keyboard, adding each item across from left to right. If you find the keyboard locked it is a positive signal of misoperation. The rule for correcting operating errors is explained on page 5. For the first few days go slowly. Speed will come later. Depress only one key at a time.

No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
41.79	91.59	79.27	42.67	21.25	96.57
18.57	78.25	65.76	58.14	15.96	5.82
21.45	451.35	413.45	87.00	43.21	68.42
4.67	6.47	135.00	45.50	87.65	102.19
432.35	5.60	223.57	235.00	1.92	79.18
14.46	12.35	86.40	57.68	218.19	517.29
5.38	38.00	240.00	68.77	93.15	61.48
432.25	913.50	33.46	433.24	37.92	43.27
165.70	42.34	5.67	700.00	479.99	197.52
540.62	78.16	41.71	307.20	45.55	37.25
	The state of the state of the state of	By State Land Company of the Land Company		9,1179; <del></del> 9,7179;	All Victoria

Add each column and write the total obtained. Then prove at once by re-adding the column. For practice add each column at least four times. If

an error is made it is usually the result of trying to go too fast.

#### TOUCH METHOD

OUCH method of addition provides the greatest degree of speed and accuracy and is simple and easy to learn. Touch method is highly recommended, because it eliminates time spent in looking from the work to the keyboard. Only the lower half of the keyboard is used in touch addition; all keys are within easy reach of the fingers.

To add 6, strike 3 twice

To add 7, strike 3 and 4

To add 8, strike 4 twice

To add 9, strike 4 and 5

Upon examining the keys it will be noticed that the odd-numbered keys: 1, 3, 5, etc., are concave. The even keys: 2, 4, etc., are flat-topped. This is to facilitate touch operation.

With this in mind add the following examples.

Begin at the top of each column and add down. Use the first finger for adding in the tens column only and the second finger for adding the units column only. Keep each finger on its own column. Find the keys by sense of touch, as much as possible.

In adding it is necessary to acquire a smooth rhythmic stroke. Hold a pencil between the thumb and palm of the operating hand. This helps to balance the hand and the pencil is always in readiness for writing down answers.

A Comptometer improperly placed is detrimental to speed and ease of operation. It should be placed at right angles or slightly to the right of the operator with the left edge in a direct line with the center of the body. The desk and the seat of the chair should be of a height to permit the feel to touch the floor and the fingers to rest comfortably on the keys.

No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
22	33	43	23	67	84	25
23	34	33	36	43	47	92
33	43	- 12	43	77	63	14
34	32	54	48	65	84	52
44	31	23	35	95	93	71
45	35	32	49	48	32	42
55	53	24	43	64	26	35
54	25	25	36	23	82	92
43	24	35	42	72	48	25
353	310	281	355	554	559	448

with that shown at foot of column. For practice add rhythmic stroke. Speed will come with practice.

Add each column and compare the total obtained each column at least four times. Practice for a full

#### TOUCH METHOD

#### Adding Whole Numbers and Dollars and Cents

NO ADD the following three and four-figure items use the index finger for all figures except the extreme right-hand figure. The second finger is used only in adding the extreme right-hand figure.

With eyes on the work-no glancing back and

forth from keyboard to work sheet-it is apparent that the danger of misreading figures is greatly reduced. The superior adaptability of the Comptometer to touch operation gives it a positive advantage in speed-with-accuracy.

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No. 1	No. 2	No 9	No. 4	V	V. 6	
Control of the last of the las	NO. 2	No. 3		No. 5	No. 6	No. 7
212	367	378	24.36	54.56	33.45	70.00
364	238	265	42.67	43.21	65.34	543.21
543	762	532	43.24	32.61	77.21	29.00
267	926	461	62.42	11.33	43.12	98.23
845	545	637	17.56	32.24	63.33	378.80
963	823	572	24.36	82.27	63.44	345.45
787	415	726	21.11	72.56	14.55	896.87
312	564	847	32.35	23.24	54.33	454.22
357	382	623	46.54	72.27	25.98	30.00
386	637	549	22.66	44.45	65.67	27.42
			HI. DA			and the same of the same of

Add each column and write the total obtained. Then prove at once by re-adding the column. For practice add each column four times in order to fix firmly in mind the combinations used.

#### "Split" Method of Addition

In adding long columns it is often an advantage to split the items, adding first the cents and then the dollars. Add columns number 4, 5, 6 and 7 using this method. First add cents only, adding the tens with the first finger and the units with the second finger, leaving the total of cents in the answer dials.

Then add the dollars, using the first finger for the tens and the second finger for the units. Correct selection of keys is made entirely by sense of touch. In adding column number 7 use the first finger for both hundreds and tens of dollars.

Add each column and write the total obtained. Then prove at once by re-adding the column. For practice add each column at least four times in order to fix firmly in mind the combinations used.

As previously mentioned under General Addition Instructions, a locked keyboard is a positive signal of misoperation. The rule for correcting misoperation is found on page 5.

#### CONTROLLED-KEY

THE "Controlled-Key" is a positive system of automatic control which prevents operating errors caused by fumbled or incomplete key strokes. The "Controlled-Key" mechanism gives instant signal of an operating error, by locking all columns except the column in which the incomplete key stroke was made—and this is left open for correction. With positive protection against operating errors, the operator can speed up safely and be assured of a higher degree of first time accuracy.

After correcting the incomplete key stroke, touch the red release key and continue adding.

#### How to Correct an Incomplete Key Stroke

There is no guesswork required in using Controlled-Key, neither is there a complicated formula to follow.

In adding, when a locked keyboard signals an operating error, the use of Controlled-Key is as simple as going back to the last key operated. If this key is left open for correction, complete the stroke, touch the red release button and continue adding, starting on the key that locked and signaled the error as shown in the example.

#### Example:

In adding this short column, intentionally press the 5 cent key part way down. On attempting to strike the 2-key, you find it locked. Go back and depress again the last key operated (5), touch the red release button and the correction is made. Continue adding on the key that locked and signaled the error, 2.

In adding, when a locked keyboard signals an operating error and the last key operated is found locked, touch the red release button, add in the previous key in same column, and continue adding with the key that locked and signaled the error as shown in the example.

#### Example:

1.14

In adding this column, intentionally press the 30-key part way down. Then give the (3) .75 40-key a regular stroke. On attempting to strike the 5-key, you find it locked. To correct, go back to the last key depressed (40). and you will find it locked. Touch the red release button and add in the previous key (30). This completes the correction. Continue adding, beginning on the key that locked and signaled the error, 5.

#### In Multiplication and Division

When the key locks, the positive danger signal prevents an error slipping into an answer without the knowledge of the operator.

Owing to the speed of the Comptometer, it is simpler, and faster to cancel and go over the problem than to stop and make the correction.

.22

.16

03.

.20

2.13

#### Instructions

#### MULTIPLICATION

#### Example: Multiply 1364 x 57

PLACE the first finger of the left hand on the 50 key and the first finger of the right hand on the 7 key. Strike the 57 is the 7 key. Strike the 57 in this position as many times as the right-hand figure (4) of the multiplicand indicates. Move both fingers one column to the left and strike as many times as indicated by the second figure (6) of the multiplicand. Continue to move to the left, striking in each column the multiplier as many times as indicated by the successive figures (3-1) of the multiplicand.

In beginning multiplication confine yourself to the use of the first finger of the right hand and the first finger of the left hand.

After the fingers have been positioned on the keys representing the multiplier, strike slowly, giving each key a full push-stroke, until you feel it strike bottom. Raise the fingers slightly above the keys after each stroke. Speed will develop quickly.

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After placing the fingers on the proper keys, look at the example, rather than the keyboard, so that the figures will not be misread.

In each of the following examples use the first finger of the left hand for the tens figure of the multiplier and the first finger of the right hand for the unit figure:

No. 5	No. 4	No. 3	No. 2	No. 1
84,143	23,456	5,315	12,456	24,531
79	75	64	68	35
No. 10	No. 9	No. 8	No. 7	No. 6
14,683	36,341	45,673	15.341	35,642
47	23	28	88	45
No. 15	No. 14	No. 13	No. 12	No. 11
14,312	94,345	65,418	15,366	89,986
86	63	31	15	37
		W 10		
No. 20	No. 19	No. 18	No. 17	No. 16
46.533	46,812	63.222	46,541	26,433
11	61	83	91	19

#### Example: Multiply 314 x 45

Place the first and second fingers of the right hand on the keys in the right-hand columns representing the multiplier (45), and strike as many times as indicated by the right-hand figure (4) of the multiplicand; move the fingers one column to the left and strike as many times as the second figure (1) of the multiplicand indicates. Continue to move to the left, striking as many times as the succeeding figure (3) of the multiplicand indicates.

The first and second fingers of both hands are more commonly used than any of the other fingers. A safe rule to follow is to use the longest finger for the highest number.

Multiply each of the following problems, using the fingers as shown by the abbreviations in front of, and following the multiplier. 1L and 2L indicate first and second fingers of the left hand. 1R and 2R indicate first and second fingers of the right hand.

Raise the fingers slightly above the keys after each stroke.

<u>No. 1</u>	No. 2	No. 3	<u>No. 4</u>	No. 5
43	13	47	83	276
IR 34 2R	2R 42 1R	1L 62 1R	1L 37 1R	1L 345 1 & 2R
<u>No. 6</u>	No. 7	No. 8	<u>No. 9</u>	<u>No. 10</u>
19	342	43	43	56
2R 54 IR	IL 153 2 & IR	1L 39 1R	1L 13 1R	89 1 & 2R
			4.7	
No. 11	No. 12	No. 13	No. 14	No. 15
75	83	28	284	104
IR 46 2R	1L <u>87</u> 1R	1L 19 1R	1L 324 1 & 2R	1L 678 1 & 2R

For practice purposes it may be convenient to split the multiplier when it contains four figures. Example: Multiply 12,365 x 8,379. First multiply 12,365 by 79, leaving the result in the machine. Then multiply 12,365 by 83, starting the 83 in the fourth and third columns.

NOTE: A hyphen indicates where the multiplier should be split. When multiplying with two figures, the first finger of each hand is usually used. Point off as many places from the right as there are decimals in both factors.

No. 16	No. 17	No. 18	<u>No. 19</u>	No. 20
67.44	245.6	5613	584.26	5362
1L 735 1 & 2R	65–35	27–18	53-78	1L .523 1 & 2R

Instructions

N- 01	11- 00	V- 00	W- 04	N- 05
No. 21	<u>No. 22</u>	No. 23	No. 24	No. 25
17465	15082	13461	13723	191.47
43-45	1L 31.04 1 & 2R	19–19	73–65	92–23
No. 26	No. 27	No. 28	No. 29	No. 30
4817	.5447	6714	3672	574.4
37-29	1L 625 1 & 2R	73–68	94-45	16–17

#### Large Decimal Multiplications

TN MULTIPLYING large numbers containing decimals, it is advisable to strike from the left toward the right. Hold the multiplier with its left-hand figure on the left-hand column of the machine. Strike here as many times as is shown by the left-hand figure of your multiplicand, and then move one column to the right, etc. Point off as many answer dials from the left as the sum of the whole places in the multiplicand and multiplier.

#### Example: Multiply 12.345 x 4.356

Hold 4356 with the 4 on the left-hand column of

No. 2

the machine and in this position strike once. Move each finger one column to the right and strike two times; one more column to the right and strike three times-then four times, then five times. The result as it stands in the answer dials is 053774820. (An eight column Comptometer was used in figuring this problem.) There are two whole places in 12.345 and one in 4.356, making together three answer dials to point off from the left of the machine, and the answer is 53.77482.

NOTE: Hyphen in multiplier indicates where it may be split.

No. 4

#### Examples:

No. 1

346.21	14.374	2.2635	.35624
1L 4.67 1 & 2R	2 & 1L 32.78 1 & 2R	9.4–56	91.–47
No 5	No. 6	No. 7	No. 8
No. 5 11.463	4627.1	26.516	314.62
1L 37.8 1 & 2R	1L .846 1 & 2R	2 & 1L 21.68 1 & 2R	7.3-49
No. 9	No. 10	No. 11	No. 12
243.82	986.4	328.64	304.69
\$ 1L 53.33 1 & 2R	2 & IL 31.32 2 & IR	16.–17	2 & 1L 216.7 1 & 2R

#### Three-Factor Multiplication

HEN three numbers are to be multiplied such as, 57 bolts of 12 yards each at \$1.25 per yard, proceed as follows: Multiply 57 x 12 on the right of the machine. Leave the result 684 in the answer dials. Since 684 is registered in the machine once it is necessary to multiply it only 124 times more. Therefore, hold 124 with the 4 over the

left-hand figure (6) of the 684. Strike the number of times indicated, six; move to the right one column and strike the number of times indicated, eight. Move one more column to the right and strike four times. The answer is \$855.00. In moving from left to right, the figure in the answer dial under the 4 key shows the number of times 124 should be struck.

#### Examples:

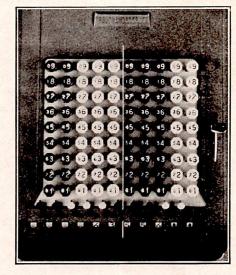
No. 1	No. 2	No. 3	No. 4
345 x 289 x .56	789 x 88 x 5.46	6452 x 344 x .66	33 x 875 x 4.58
No. 5	No. 6	No. 7	No. 8
645 x 4456 x .28	389 x 673 x 438	75 x 6489 x 567	372 x 44 x 8879

NOTE: Point off as many places from the right as the sum of the decimals in the three factors.

#### Permanent Decimal Point Multiplication

THEN factors contain changing decimals it will be easier and faster for the operator to use a method of working the multiplications over a fixed or Permanent Decimal Point. Between the fifth and sixth column of keys, directly over Decimal Pointer No. 5, is the position known as the Permanent Decimal Point. See illustration.

Usually the price factor is held on the keyboarddollars to the left of the Permanent Decimal Point, and cents to the right of the Permanent Decimal Point. With the price factor in this position strike it in as many times as the unit figure of the quantity indicates.



Permanent Decimal Point-this is located between the fifth and sixth column of keys, directly over Decimal Pointer No. 5.

2 &

Move price factor one column to the left for each additional whole number in the quantity, and one column to the right for each column of decimals in the quantity.

#### Example:

345 lbs. @ \$.65 per lb.

Answer \$224.25

Hold price factor \$.65 so that the 6 key is held in the fifth column and the 5 key in the fourth column. Strike the price factor five times for the unit figure of quantity. Move price factor one column to the left and strike it four times for the TENS figure of quantity. Move price factor again one column to the left 5. 241 bolts @ .67 each

and strike it three times for the HUNDREDS figures of the quantity-\$224.25 now appears in the answer dials correctly pointed off.

Work the following problems over the Permanent Decimal Point, following the explanation in the previous paragraph.

#### Examples:

1.	307	hrs.	@	\$ .45	per	hr.	=	\$138.15
2.	65	doz.	@	.22	per	doz.	=	14.30
3.	45	tons	@	7.75	per	ton	=	348.75
4.	15	days	@	4.50	per	day	=	67.50
_	941	Lalla.	0	67		_	1	161 47

### Accumulative Multiplication Using Permanent Decimal

RAPID and accurate method of checking and proving original multiplications is by accumulation. This method is very effective in proving payrolls, cost sheets, material requisitions, inventory sheets, invoices, etc.; in fact it should be used wherever it is desired to total the products of several multiplications. To obtain the best results from accumulative multiplication, it should be performed over the fixed or Permanent Decimal Point. This Permanent Decimal Point is between the fifth and sixth columns, or as previously explained, directly over Decimal Pointer No. 5.

It is easy to remember that the sixth (white) column of keys is UNITS of DOLLARS; the fifth column is TENS of CENTS and the fourth column is UNITS of CENTS.

#### Example:

```
43/4 (4.75) yards @ $1.25
16½ (16.5) yards @
1481/4 (148.25) yards @
                        .061/4
Accumulated Product $20.90
```

Hold the price \$1.25 with the 1 in the sixth (white) column, the 2 in the fifth and the 5 in the fourth column. Multiply toward the right; strike four times, seven times, and five times. The answer dials show \$5.9375. LEAVE THIS IN THE MACHINE.

Multiply the second item in a similar manner holding .345 with the 3 in the fifth, 4 in the fourth, and 5 in the third columns, respectively. As the yardage commences in the TENS COLUMN, move the price position one column to the left before commencing

the multiplication. Strike from left to right one, six, and five times, respectively, and the accumulation in answer dials now shows \$11.63. LEAVE THIS IN THE MACHINE.

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For the third item hold .0625 with the 6 in the fourth column. As the yardage commences in the HUN-DREDS COLUMN, move the price position two columns to the left before starting the multiplication. Strike in the keys one, four, eight, two, and five times in their respective columns. The accumulated answer of \$20.895 now appears in answer dials. If at any time fingers drop off the keyboard on THE RIGHT-HAND SIDE, continue to strike with fingers that still remain on keyboard.

By the use of this method positive proof is obtained on:

- (a) Each individual extension
- (b) Decimal point in the final result
- (c) Addition of items

Always take the price position on keyboard as previously explained—if the quantity has more than one whole number move the price position (before multiplying) one column to the left on the keyboard for each additional whole number in the quantity. For instance, move one column to the left for 483/4, two columns for 2363/4, etc.

#### Example No. 1

11/8	(1.125)	yards	@	\$ .48
121/4	(12.25)	yards	@	.643/4
67		yards	@	.50
63/8	(6.375)	yards	@	1.23
	Accumulo	ated Total	\$	49.81

#### Example No. 2

162/3	(16.667)	yards	@	\$ .341/2
172		yards	@	.061/2
251/4	(25.25)	yards	@	1.89
256		yards	@	.19
	Accumulo	ted Total	S	113.29

#### FIRST-TIME ACCURACY

NLY when machine figuring becomes entirely automatic and the human element of error in operation ceases to be a factor, can there be dependable first-time accuracy in mechanical calculation.

This is evidenced by the fact that accounting offices in which first-time results are accepted without being checked or refigured, are so few as to be negligible. When working against a predetermined total such proof is, of course, unnecessary.

First-time machine figuring, however, should closely approximate absolute accuracy on all classes of figure work.

With the Comptometer it does that.

In figuring a recent inventory of a chain of 100 grocery stores, the first-time accuracy of the Comptometer was 99.551%.

#### Subtraction

Subtraction is the process of finding the difference between two numbers. This is performed on the Comptometer by using the small figures on the key-tops and the subtraction "cut-off" or button.

NOTE: When using the Model M Comptometer do not hold the subtraction button after setting it for a subtraction. It returns to normal when the carry has been foiled.

Example: 
$$98 - 75 = 23$$
.

Put 98 in the right of keyboard. Hold back "cut-off" or button (see note) at the left of the figure 9; depress a small 7 in the second column and a small 4 (5 less 1) in the first column — answer 23. To prove. add 75 to 23 in machine. Answer 98 agrees with amount started with.

Example: 
$$845 - 702 = 143$$
.

Put 845 in the right of keyboard. Hold back "cut-off" or button (see note) at the left of the figure 8; depress a small 7 in the third column, a small cipher in the second column, and a small 1 (2 less 1) in the first column — answer 143. To prove, add 702 to 143 in machine. Answer 845 agrees with amount started with.

Put 28.64 in right of keyboard. Hold back "cut-off" or button (see note) at left of figure 2. Borrow from fourth column by depressing cipher key; as there are no small 9 figures, ignore the 9 in the third column, depress small 6 in the second column and a small 1 (2 less 1) in the first column — answer \$19.02. To prove, add \$9.62 to \$19.02 in machine. Answer \$28.64 agrees with amount started with.

The processes to follow in subtraction:

- 1. Put larger amount in the Comptometer.
- 2. Hold back "cut-off" or button at the left of an amount in the register equal to or larger than the amount to be subtracted.
- 3. Holding back the "cut-off" or button depress the amount to be subtracted in small figures, less one.
- 4. If necessary to borrow, hold back the "cut-off" or button at the left of the column or columns from which you borrow. Depress the small cipher key in such column or columns.

Cipher keys are used in the amount to be subtracted if they come between figures of value, but are ignored if at the end of a number. The 9's are ignored unless they come at the end of a number when one less than nine (8) is depressed.

The apostrophe in the following problems indicates where the "cut-off" or button is to be held back

1.	4.36	Add large figures	2.	'8.34	Add large figures
		Small figures 124		.68	Small figures 067
	3.11			7.66	
3.	'21.43	Add large figures	4.		Add large figures
		Small figures 0641		.85	Small figures 0084
	15.01			169.51	
5.	The Control of the Co	Add large figures	6.	'6.42	Add large figures
		Small figures 30**		1.93	Small figures 1*2
	34.23			4.49	
7.		Add large figures	8.	'48.50	Add large figures
960		Small figures 0882		9.60	Small figures 0*5
	6.77			38.90	

#### Use of Small Figures in Subtraction or Division

NOTE 1. In subtracting or dividing, use the keys with the corresponding small figures, except for the right-hand figure of value, for which one less must be used.

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	R	ight-H	land Fi	gure
To subtract or divide with Use small figures	462	127	3600	4620
	461	126	35	461

NOTE 2. The small cipher keys should be depressed the same as any other figure when they appear between figures of value, as in 704, but should be disregarded if they are at the right of the amount, as in 7500. 704 To subtract or divide with Use small figures 703 To subtract or divide with 7500 74 Use small figures To subtract or divide with 46005 Use small figures 46004

To subtract or divide with	63500
Use small figures	634

amount is a 1, then one less is 0, and this small cipher should be struck. 3241 To subtract or divide with 3240 Use small figures To subtract or divide with 3100 30 Use small figures

NOTE 3. If the right-hand figure of value in the

NOTE 4. As there are no small 9 keys, pass any column which contains 9; except where 9 is the right-hand figure of value, then the small 8 is used.

To subtract or divide with	8947
Use small figures	8 46
To subtract or divide with	1695
Use small figures	16 4
To subtract or divide with	983
Use small figures	82
To subtract or divide with	379
Use small figures	378

<sup>\*</sup>Used to designate columns in which no keys are depressed.

in statistics of all kinds.

#### DIVISION

IVISION is the process of finding the number of times one number is contained in another. Although division is not used as frequently in the average office as addition and multiplication, it is, however, very important and used extensively

The machine method of division is more simple on the Comptometer than the mental or written process for it consists merely of a series of subtractions and the quotient, or answer figure, is a record of the number of subtractions made.

Division on the Comptometer is as simple as any other operation. The underlying principle of division is explained in the following example:

#### Example: 1477.63 ÷ 133

Place 147763 (the dividend) into the left side of the Comptometer using large figures.

Pull down the decimal pointer on the machine in the same position as it appears in the written dividend. (1477/63). The divisor (133) contains three

#### DIVIDEND DECIMAL

whole numbers; that is, it has three figures to the left of its decimal point. Move your finger to the left of the dividend decimal position three places. Pull down the pointer in this position. You have now established the decimal point for your answer. (1|47763).

ANSWER DECIMAL

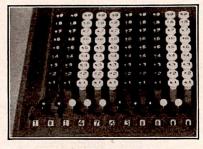


Hold 133 (the divisor) using small figures less one (132) directly over 147. Depress these divisor keys until the amount in the register dials at the base of the columns in which you are holding the divisor is less than 133.

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In this example, the remainder is 014, which is less than your divisor, 133.

Move your divisor position, held on the keyboard, one place to the right. You are now holding your divisor over 147 in the register dials.



Remainder is 014.

Depress 132 (divisor figures). Remainder is 014 which is less than your divisor 133.

Move your divisor position, held on keyboard, one place to the right. You are now holding your divisor over 146 in the register dials.

Depress 132 (divisor figures). The remainder is 013 which is less than your divisor, 133.

Move your divisor position, held on keyboard, one place to the right. You are now holding your divisor over 133 in the register dials.

Depress 132 (divisor figures). The remainder is 000.

Copy your answer — 11.11.

#### Example: 8153.40 ÷ 254

Place 815340 (the dividend) into the left side of the Comptometer using large-numbered keys.

Locate your dividend decimal position: 8153|40. DIVIDEND DECIMAL

Establish your answer decimal point position:

ANSWER DECIMAL

8|15340.

Hold your divisor 254 (using small-figured keys 253) ower 815 in the register dials.

Depress 253 (divisor figures) until the remainder in the register dials is less than the divisor, 254. Remainder is 053.

Move your divisor position, held on keyboard, one place to the right over 533 in the register dials.

Repeat depressing and moving until the entire problem is completed.

Answer: 32.10.

#### Practice Division Problems

 $4775.38 \div 226 = 21.13$  $2326.59 \div 189 =$ 12.31  $6265.45 \div 145 =$  $95061.75 \div 175 = 543.21$  $978879.74 \div 487 = 2010.02$ 

When we have a problem in division such as:

 $194.25 \div 875$ 

Put 19425 (the dividend) into the Comptometer.

Establish dividend decimal point.

Point off three places to the left of the dividend decimal position to establish the answer decimal position.

Hold 875 (divisor figures), using small figures 874, over 194. 194 is less than divisor 875.

Move your divisor position, held on keyboard, one place to the right. You are now holding your divisor over 1942 in the register dials.

This is the only difference in the operation of division you have learned so far.

Depress 874 (divisor figures) as many times as shown by the figure in the register dial at the left of the columns in which you are holding the divisor.

The figure 1 appears to the left of these columns.

Depress 874 (divisor figures) one time. The figure 1 changed to 2.

Depress 874 one more time to equal the figure 2. 192 (remainder figure) is less than 875.

Move your divisor position, held on keyboard, one place to the right.

The number in the register dial at the left of the columns in which you are holding the divisor is 1.

Depress 874 (divisor figures) one time. The figure 1 changed to 2.

Depress 874 (divisor figures) one more time to equal the figure 2. 175 (remainder figure) is less than 875.

Move your divisor position, held on keyboard, one place to the right.



Hold the Divisor over 1942 in the Register Dials.

The number in the register dial at the left of the columns in which you are holding the divisor is 1.

Depress 874 (divisor figures) one time.

The number l in the register dial at the left of the columns in which you are holding the divisor did not change.

The remainder is 875. Depress 874 (divisor figures) one time.

Answer is .222.

For all practical purposes it is unnecessary to carry division beyond the fourth figure to the right of the decimal point.

#### POINTING OFF IN DIVISION

Pointing off on the Comptometer in division is very simple and accurate. Turn down the decimal pointer in the register to agree with the decimal point in the dividend. To establish the ANSWER DECIMAL POINT turn down the pointer as many places to the left of the dividend decimal pointer as there are figures to the left of the decimal point in the divisor. See Illustration.

#### Example: $134.5 \div 25 = 5.38$

Put the dividend 134.5 into the left side of keyboard. Pull down the decimal pointer between the 4 and 5 to correspond to the decimal point appearing in the dividend. As 25 is a whole number with two figures (2 and 5) we turn down the decimal pointer to the left of the dividend decimal point two places between the 1 and 3. See illustration. This simple method of establishing an accurate decimal position in the answer is found only on the Comptometer.

Drill carefully on the following problems and check your answers with those shown here.

1. 
$$41.778 \div 45 = .9284$$
  
2.  $16.7772 \div 44 = .3813$ 

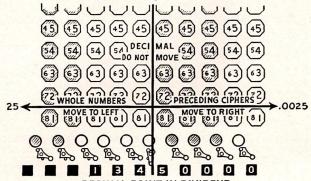
3. 
$$297.364 \div 34 = 8.746$$

5. 
$$1307.68 \div 22 = 59.44$$

$$4. 2377.2 \div 56 = 42.45$$

If the divisor is a decimal without preceding ciphers the answer pointer is the same as the dividend pointer; but if the divisor has preceding ciphers like .0025 the answer pointer is as many places to the right of the dividend pointer as there are ciphers immediately to the right of the decimal point in the divisor. See illustration.

As there are no small 9 figured keys, leave blank any column which contains 9; except where 9 is the right-hand figure of value, then the small 8 key is used.



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DECIMAL POINT IN DIVIDEND

Illustration Showing Direction to Move Decimal Point in Division.

The small cipher keys should be depressed the same as any other figure when they appear between figures of value, as in 704, but should be disregarded if they are at the right of the amount, as in 7500. In the latter case, the divisor 7500 would be held as 75 less one (74).

#### Long Division

Easy Method for Dividing by Five or More Figures, Using Four-Place Trial Divisor and Obtaining Three Answer Figures at a Time

Example: 4567.89 ÷ 2436.65 =

Apply rules for pointing off as indicated in illustration above.

After pointing off, register shows 0'456789.

Divide by first four figures of divisor, using small figures on keys (not taking one less) and don't stop dividing until you get the first three answer figures. After getting the third answer figure, continue to hold with left hand the position of the two left-hand figures of divisor.

Place fingers of right hand on columns immediately to right of the two columns held with left hand, on keys for the remaining unused figures\* of divisor, holding according to small figures and one less for the extreme right-hand figure of value of divisor. Leave left hand inactive on keyboard.

Depress keys held by right hand the number of times as indicated by first of the three answer figures already obtained. Then move right hand one position to right and strike as many times as indicated by the second answer figure. Again move right hand one position to right and strike as many times as indicated by the third answer figure already obtained.

The left hand remains inactive on keyboard.

Resume holding first four figures of divisor, with position for first two figures on the columns marked with left hand, and the position for next two figures on columns immediately to the right.

(If remainder, in register under columns held, should be equal to or larger than the divisor, depress complete divisor once more.)

Move finger position one place to right, and divide to get the next three answer figures, exactly the same way as the first three were obtained.

It is not necessary to strike in the remaining figures of divisor the second time, as these figures would not affect a six-place answer.

Divide 0'456789 by 2436 (holding small figures 2436 with two hands) and don't stop dividing until you get the first three answer figures-187. Don't take the fingers of the left hand from keys 24.

Right-hand fingers take positions on small figures 64 (65 less 1) on columns immediately to right of position held with the left hand.

From left to right, strike small figures 64 once, then move to right and strike eight times, then move to right and strike seven times. Register shows 1'87113545.

Fingers of right hand take position on small figures 36. Right and left hand now hold small figures

Remainder 1135 is not larger than 2436.

Move both hands one position to the right and divide again by 2436 to get three more answer figures.

Register shows 1'87465. Answer 1.87465.

\* If it is not convenient to hold all at once with the right hand the remaining unused figures of the divisor, then hold one or two of the remaining figures at a time.

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#### Division Short Cut

In practical every day work, division is used a great deal in the figuring of averages and percentages. For this reason it is unnecessary in many cases to obtain more than three or four decimal places in the answer.

#### Example:

Sales \$48,672,392 2,782,679 Profit Find percent of profit to sales = .0572 or 5.72%

Dividing four figures of the dividend (2782) by four figures of the divisor (4867 minus 1) will provide an answer sufficient for practical purposes. A safe rule to follow is to hold one more figure of the divisor than figures desired in the answer.

The carrying out of decimals beyond the actual number of places required is a needless waste of time and energy.

#### Reciprocal Division

The use of reciprocal division in cost, payroll, and statistical work will be very helpful to the operator. The simplicity of this method of division, in addition to its time-saving feature, makes its use very desirable. This method is nothing more than converting division into a multiplication process.

Multiplying any dividend by the reciprocal of its divisor produces the same answer as that obtained by actual division. To obtain the reciprocal of any number, merely divide that number into the figure 1.

#### Illustration:

Reciprocal of 8 is 1 - 8 or .125

Reciprocal of 413 is 1 - 413 or .00242130

Reciprocal of 555 is 1 - 555 or .00180180

Reciprocal of 755 is 1 - 755 or .00132450

(See Payroll Example)

(See Statistical Example)

(See Cost Example)

Reciprocals (See Back Page) of any number from 1 to 2,000 will be found on Reciprocal Card No. 9; and from 1 to 10.000 in Reciprocal Book, form 192.

The easiest way to do reciprocal divisions is to hold the dividend over Permanent Decimal Pointer No. 5, multiplying it from left to right by the reciprocal of the divisor. Always point off to the left of the Permanent Decimal Point as many places as there are whole numbers in the divisor. The decimal point and preceding ciphers in the reciprocal are entirely disregarded if the problem is worked over the Permanent Decimal Point.

#### Example of Cost Work:

755 pieces cost \$66.06. What is the average cost per piece? Answer, \$.0875. \$66.06 - 755 is the same as \$66.06 x .0013245 (reciprocal of 755).

Hold the dividend \$66.06 over Permanent Decimal Pointer No. 5 and multiply it by the reciprocal of 755. From left to right strike in the dividend one, three, two, four, and five times respectively. As the

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divisor (755) contains three whole numbers, it requires pointing off to the left of Permanent Decimal Pointer No. 5 three places. The answer dial now shows \$.0875.

#### Example of Payroll Work:

\$35.00 earned in 41.3 hours. What is the average hourly rate? Answer, \$.847. \$35.00  $\div$  41.3 is the same as \$35.00 x .0024213 (reciprocal of 413).

Hold the dividend \$35.00 to left of Permanent Decimal Pointer No. 5 and multiply it by the reciprocal of 413. From left to right strike in the dividend two, four, two, one, and three times respectively.

As the divisor (41.3) contains two whole numbers, it requires pointing off to the left of Permanent Decimal Pointer No. 5 two places. The answer dial now shows \$.847.

#### Example of Statistical Work:

Department	A	Sales	\$104.56	=	.1884	or	18.84%
Department	B	Sales	75.54	=	.1361	or	13.61%
Department	C	Sales	344.21	=	.6202	or	62.02%
Department	D	Sales	22.14	=	.0399	or	3.99%
Department	E	Sales	8.55	=	.0154	or	1.54%
			\$555.00		1.0000		100.00%

It is desired to know what percent of the total sales is represented by each department. This requires dividing each of the amounts by the total, or \$555.00.

As 555 contains three whole numbers, it requires pointing off three places to the left of Permanent Decimal Pointer No. 5. Hold the first dividend, \$104.56, to the left of Permanent Decimal Pointer No. 5, and multiply it by the reciprocal of 555. From left to right strike in the dividend one, eight, zero, one, and eight times respectively. The answer dial shows .1884 or 18.84%. In the same manner hold the other departments and multiply by the same reciprocal. To prove accuracy of the work add the results obtained; these should total 1 or 100%, as the case may be.

In the ordinary division problems found in cost, payroll, and statistical work a four-figure answer is usually sufficient. In order to obtain four-figure accuracy it will be necessary to use six figures of the reciprocal. A safe rule to follow is to use two more figures of the reciprocal than desired figure places in the answer-that is, if a four-place answer is desired use six of the reciprocal figures, if a fiveplace answer is desired use seven figures of the reciprocal.

With a little practice and the use of Reciprocal Card No. 9, the operator will develop speed on this simple method of division.

			100	200	300	4	00	500	0	600	7	00	800		900	ALC:				1100		200	12	00	1400	1500	1600	1700	1800	1900
	1 1000.00 2 500.00	M	00 10.0000 01 9.90099 02 9.80392	200 5.0000 01 4.9751 02 4.9505	0 300 3.3 2 01 3.3 0 02 3.3	33333 400 32226 01 31126 02	2.50000 2.49377 2.48756	500	00000	600 1.6	6667 70	0 1.4285	800 1	.25000	900 1 01 1 02 1	.11111 .10988 .10865		1	001 .9990	1100 1101 1102	.90909 .90827 .90744	1200 .8 1201 .8 1202 .8	3333 13 3264 13 3195 13	00 .76923 01 .76864 02 .76805	1400 .71429 1401 .71378 1402 .71327	1500 .66667 1501 .66622 1502 .66578	1600 .62500 1601 .62461 1602 .62422	1700 .58824 1701 .58789 1702 .58754	1800 .55556 1801 .55525 1802 .55494	1900 .52632 1901 .52604 1902 .52576
	5 200.00 6 166.66	00	02 9.80392 03 9.70874 04 9.61538 05 9.52381 06 9.43396	03 4.9261 04 4.9019 05 4.8780	1 03 3.3 6 04 3.2 5 05 3.2	30033 03 28947 04 27869 05	2.48139 2.47525 2.46914	03 04 05	1.98807 1.98413 1.98020	03 1.6 04 1.6 05 1.6	5837 C 5563 C 5289 C	5 1.4184	05 1	.24378	04 1	10742		i	003 .9970 004 .9960 005 .9950	1 1103 2 1104 2 1105	.90662 .90580 .90498	12038 1204 .8 1205 .8	3,126 13 3056 13 2988 13	03 .76746 04 .76687 05 .76628	1403 .71276 1404 .71225 1405 .71174	1503 .66534 1504 .66489 1505 .66445	1603 .62383 1604 .62344 1605 .62305	1703 .58720 1704 .58685 1705 .58651	1803 .55463 1804 .55432 1805 .55402	1903 .52549 1904 .52521 1905 .52493
	7 142.85 8 125.00 9 111.11	57	06 9.43396 07 9.34579 08 9.25926 09 9.17431	04 4.9019 05 4.8780 06 4.8543 07 4.8309 08 4.8076 09 4.7846	7 06 3.2 2 07 3.2 9 08 3.2 9 09 3.2	25733 07 25733 07 24675 08	2.45700 2.45700 2.45098	06 07 08	1.97628 1.97239 1.96850 1.96464	06 1.6 07 1.6 08 1.6	5017 0 4745 0 4474 0	6 1.4164 7 1.4144 8 1.4124 9 1.4104	07 1 08 1	.24069 .23916 .23762 .23609	07 1 08 1	.10375 .10254 .10132 .10011		1	006 .9940 007 .9930 008 .9920 009 .9910	4 1106 5 1107 6 1108	.90416 .90334 .90253	1207 .8	2919 13 2850 13 2781 13 2713 13	06 .76570 07 .76511 08 .76453 09 .76394	1406 .71124 1407 .71073 1408 .71023 1409 .70972	1506 .66401 1507 .66357 1508 .66313	1606 .62267 1607 .62228 1608 .62189 1609 .62150	1706 .58617 1707 .58582 1708 .58548 1709 .58514	1806 .55371 1807 .55340 1808 .55310 1809 .55279	1906 .52406 1907 .52438 1908 .52411 1909 .52383
10	10 100.00 11 90.90 12 83.33	00 1	9.09091 1 9.00901 2 8.92857	210 4.7619 11 4.7393 12 4.7169	0 310 3.2 4 11 3.2 8 12 3.2	22581 410 21543 11 20513 12	2.43902 2.43309 2.42718	510 11 12	1.96078 1.95695	610 1.6 11 1.6 12 1.6	3934 71 3666 1	0 1.40845 1 1.40647 2 1.40449	810 1	.23457 .23305 .23153	910 1 11 1	.0989 <b>0</b> .09769 .09649	1	10	010 .99010 011 .9891	8 1109 0 1110 2 1111 4 1112	.90171 .90090 .90009	1210 .8	2645 13 2576 13	10 .76336	1410 .70922 1411 .70872	1510 .66225 1511 .66181 1512 .66138	1610 .62112 1611 .62073 1612 .62035	1710 .58480 1711 .58445 1712 .58411	1810 .55249 1811 .55218 1812 .55188	1910 .52356 1911 .52329 1912 52301
	14 71.428	31	4 8.77193	14 4 6729	13 3.1	9489 13	2.42131	13	94932	13 1.6	3132 1	3 1.4025	13 1	.23001 .22850	13 1 14 1 15 1	.09529 .09409 .09290		1111	012 .9881 013 .9871 014 .9861	7 1113 9 1114 2 1115	.89847 .89767	1214 .8	2372 13 2305 13	11 .76278 12 .76220 13 .76161 14 .76104 15 .76046	1412 .70822 1413 .70771 1414 .70721	1513 .66094 1514 .66050 1515 .66007	1613 .61996 1614 .61958 1615 .61920	1713 .58377 1714 .58343 1715 .58309	1813 .55157 1814 .55127 1815 .55096	1913 .52274 1914 .52247 1915 .52219
	16 62.500 17 58.823 18 55.555 19 52 631	35 56	8.69565 8.62069 17 8.54701 18 8.47458 19 8.40336	16 4.6296 17 4.6082 18 4.5871	3 16 2.1 9 17 3.1 6 18 3.1	16456 16 15457 17 14465 18	2.40385 2.39808 2.39234	16 17 18	1.93798 1.93424 1.93050	16 1.6 17 1.6 18 1.6	2338   1 2075   1 1812   1	6 1.3966 7 1.3947 8 1.3927	16 1 17 1 18 1	.22549 .22399 .22249 .22100	17 1	.09170 .09051 .08932		i	016 .9842 017 .9832 018 .9823	5 1116 8 1117 2 1118	.89606 .89526 .89445 .89366	1216 .8 1217 .8 1218 .8	2102 13	15 .76046 16 .75988 17 .75930 18 .75873 19 .75815	1416 .70621 1417 .70572 1418 .70522 1419 .70472	1516 .65963 1517 .65920 1518 .65876	1616 .61881 1617 .61843 1618 .61805	1716 .58275 1717 .58241 1718 .58207 1719 .58173	1816 .55066 1817 .55036 1818 .55006 1819 .54975	1916 .52192 1917 .52165 1918 .52138 1919 .52110
20	20 50.000 21 47.619 22 45.454	00 1	19 8.40336 20 8.33333 21 8.26446 22 8.19672 23 8.13008 24 8.06452	220 4.5454 21 4.5248 22 4.5045	5 320 3.1 9 21 3.1 0 22 3.1	12500 420 11526 21 10559 22	2.38095 2.37530 2.36967	520 21 22	1.92308 1.91939 1.91571	620 1.6 21 1.6 22 1.6	1290 72 1031 2	1 1.3888 1 1.3869 2 1.3850	9 820 1 5 21 1 6 22 1	.21951	920 1 21 1	.08696 .08578 .08460	2	20	019 .9813 020 .9803 021 .9794	5 1119 9 1120 3 1121 7 1122	.89286 .89286 .89206	1220 .8 1221 .8	2034 13 1967 13 1900 13 1833 13	19 .75815 20 .75758 21 .75700 22 .75643 23 .75586 24 .75529	1420 .70422 1421 .70373 1422 .70323	1520 .65789 1521 .65746 1522 65703	1620 .61728 1621 .61690 1622 .61652	1720 .58140 1721 .58106 1722 .58072	1820 .54945 1821 .54915 1822 .54885	1920 .52083 1921 .52056 1922 .52029
	23 43.478 24 41.666 25 40.000	83 67	23 8.13008 24 8.06452 25 8.00000	23 4.4843 24 4.4642 25 4.4444	1 23 3.0 9 24 3.0 4 25 3.0	09598 23 08642 24 07692 25	2.36407 2.35849 2.35294	23 24 25	1.91205 1.90840	23 1.6 24 1.6 25 1.6	0514 2 0256 2	3 1.3831 4 1.3812 5 1.3793	2 23 1 2 24 1 1 25 1	.21212	23 1 24 1 25 1	.08342 .08225		1	122 .9784 123 .9775 124 .9765	2 1123 6 1124	.89047 .88968	1223 .8 1224 .8		23 .75586 24 .75529 25 .75472	1423 .70274 1424 .70225	1525 .65574	1623 .61614 1624 .61576 1625 .61538	1723 .58038 1724 .58005 1725 .57971	1823 .54855 1824 .54825 1825 .54795	1923 .52002 1924 .51975 1925 .51948
	26 38.461 27 37.037 28 35.714	70 43	25 8.00000 26 7.93651 27 7.87402 28 7.81250 7.75194	26 4.4247 27 4.4052 28 4.3859	8 26 3.0 9 27 3.0 6 28 3.0	06748 26 05810 27 04878 28	2.34742 2.34192 3.2.33645	26 27 28	1.90114 1.89753 1.89394	26 1.5 27 1.5 28 1.5	9744 9490 9236	6 1.3774 7 1.3755 8 1.3736	26 1 2 27 1 3 28 1	.21065 .20919 .20773	26 1 27 1 28 1	.07991 .07875 .07759		1	925 .9756 926 .9746 927 .9737 928 .9727	1 1127 6 1128	.88810 .88731 .88652	1226 .8 1227 .8	1566 13 1500 13 1433 13	25 .75472 26 .75415 27 .75358 28 .75301	1426 .70126 1427 .70077 1428 .70028	1526 .65531 1527 .65488 1528 .65445 1529 .65402	1626 .61501 1627 .61463 1628 .61425 1629 .61387	1726 .57937 1727 .57904 1728 .57870 1729 .57837	1826 .54765 1827 .54735 1828 .54705 1829 .54675	1926 .51921 1927 .51894 1928 .51867
-	31 32.25	81	30 7.69231 31 7.63359 32 7.57576	31 4.3290 32 4.3103	3 330 3.0 0 31 3.0 4 32 3.0	03030 430 02115 31 01205 32	2.32558 2.32019 2.3148 2.30947 2.30418	530 31 12	1 88679	630 1 5	8730 173	1.3698 11 1.3679 12 1.3661	6 830 1 9 31 1	.20627 .20482 .20337 .20192	31 1	.07527 .07411 .07296	3	30	9718 30 .9708 31 .9699	2 1129 7 1130 3 1131	.88574 .88496 .88417	1221 9	1367 13 1301 13 1235 13	29 .75245 30 .75188 31 .75131	1429 .69979 1430 .69930 1431 .69881 1432 .69833	1529 .65402 1530 .65359 1531 .65317	1630 .61350 1631 .61312 1632 61275	1730 .57803 1731 .57770 1732 .57737	1830 .54645 1831 .54615 1832 .54585	1930 .51813 1931 .51787 1932 .51760
30	33 30.303 34 29.411 35 28.571	18	34 7.46269	33 4.2918	34 2.6	00300 33 99401 34 98507 35	2.30947 2.30415 2.29885	33 34 35	1.87617 1.87266	31 1.5 32 1.5 33 1.5 34 1.5 35 1.5	7978 7729	3 1.3642 4 1.3624 5 1.3605	8 33 1 0 34 1 4 35 1	.20048	33 1 34 1	.07181		1	33 .9689 33 .9680 34 .9671	9 1132 5 1133 2 1134	.88339 .88261 .88183	1232 .8 1233 .8 1234 8	1169 13 1103 13 1037 13	31 .75131 32 .75075 33 .75019 34 .74963	1433 .69784 1434 .69735	1532 .65232 1534 .65189	1633 .61237 1634 .61200	1733 .57703 1734 .57670 1735 .57637	1833 .54555 1834 ,54526 1835 .54496	1933 .51733 1934 .51706 1935 .51680
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