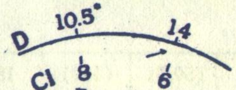


Fig 11

Set 6 on CI to 14 on D, against 8 on CI read 10.5 on D.

Squares and Square Root:

To extract squares roots, answers are found on the A and C scales

Example. 12

$3^2=9$ $3.52^2=12.4$

$\sqrt{25}=5$ $\sqrt{225}=15$

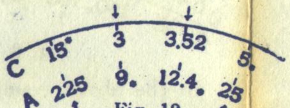


Fig. 12

Method of placing the decimal point for squares is the same as in multiplication.

In case of square roots, the given number is divided into several groups with two digits per group, counting from the decimal point in the direction of the first significant figure of a given number.

If the value in the top group is less than 10, the given number is set between 1−10 on A scale. If it is over 10, it is set between 10−100.

Place the decimal point of the answer, taking one digit per group.

How to use Constant "c"

There is a gauge mark "c" at point 1.128 …… on D scale, which is used for obtaining circle diameter and area. It is derived from the following formula,

area of circle $a=\frac{\pi}{4}d^2$ d=diameter of circle

Changing the form, $a=\left(\sqrt{\frac{\pi}{4}}\,d\right)^2=\left(d/\sqrt{\frac{4}{\pi}}\right)^2$

Denominator $\sqrt{\frac{4}{\pi}}$ in parentheses corresponds to the value of c.

Example 13. Find the area of a circle with diameter of 2.3m.

Ans. 4.15m²

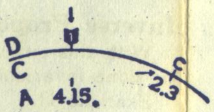


Fig. 13

Reference scale:

Calculation of circle areas from many given diameters by the use of the constant c at the same time is shown in the following example.

Example. 14.

Find circle area, given diameters of 2m, 2.3m, and 2.5m respectively.

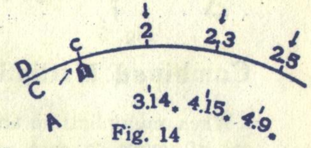


Fig. 14

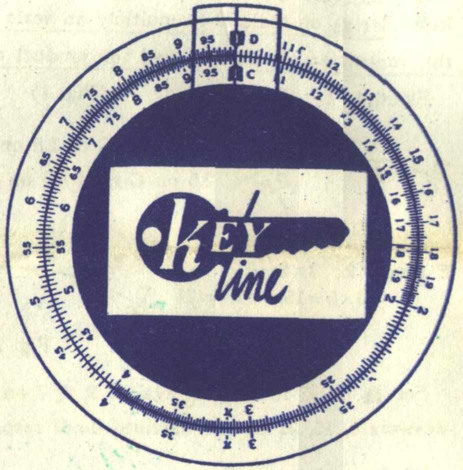
Cubes and Cube Roots:

These are to be done with the C and K scales.

Example 15. $2^3=8$, $\sqrt[3]{125}=5$

In the case of calculating cube roots, the given number is divided into several groups with 3 digits per group, counting from decimal point in the direction of the first significant figure. According to the significant figure in the first group being one, two or three, the given number is set in the section 1∼10, 10∼100, and 100∼1000 of K scale respectively.

The method of placing the decimal point is determined on the basis of one digit per group.



KEY LINE'S "CONCISE" CIRCULAR SLIDE RULE

Multiplication:

Of two given numbers:

Rule: Set the index on scale C to multiply on scale D, against the multiplier on scale C read the product on scale D.

Example 1. 1.8×2.5=4.5 (Fig. 1)

set the index on C to 1.8 on D, against 2.5 on C read 4.5 on D.

Fig. 1

Example 2. 3×2=6, 3×5=15, 3×7=21 (Fig. 2)

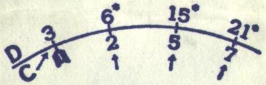


Fig. 2

Set the index on C to 3 on D, against 2, 5, 7 on C and the answers 6, 15, 21 can be obtained on D respectively.

Of three given numbers:

Example 3. 3×4×5=60 (Fig. 3)

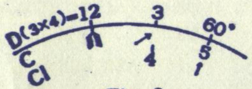


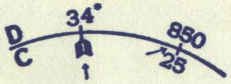
Fig. 3

Set 4 on CI to 3 on D, against 5 on C read 60 on D.

Division:

Of two given numbers:

Rule: Set the divisor on C to the dividend on D, against the index of C read the quotient on D.



F.g. 4

Example 4. 850÷25=34 (Fig. 4)

Set 25 on C to 850 on D, against the index on C read 34 on D.

Of three Given Numbers:

Example 5. 850÷25÷8=4.25 (Fig. 5)

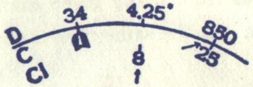


Fig. 5

Set 25 on C to 850 on D, against 8 on CI read 4.25 on D.

Combined Multiplication and Division:

When multiplication and division are combined, you can of course do each manipulation separately but there is a simpler method. You may do both at once. Such instances occur very often and you must keep the method at your finger tips.

Example 6. $\frac{3\times 6}{5}=3.6$ (Fig. 6)

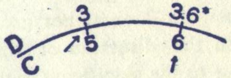


Fig. 6

Set 5 on C to 3 on D, against 6 on C read 3.6 on D.

Proportion:

As an example of Combined multipltication and division, we shall deal with proportion.

Proportions can be found by the use of C and D scales. This method is widely applied for conversion, indexes, proportional division, percentage and also sale and purchase of commodities.

Rule. In order to solve $a:b=c:x$, set a on C to b on D, against c on C read x on D.

Example 7. 5:2.4=8:x Ans. 3.84 (Fig. 7)

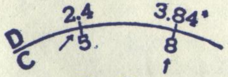


Fig. 7

Set 5 on C to 2.4 on D, against 8 on C read 3.84 on D.

Example 8. —Conversion:—

Complete the following table, given 1 lb=0.4536kg

lbs	45	63	(50.7)	(150)	180
kg	(20.4)	(28.6)	23	68	(81.6)

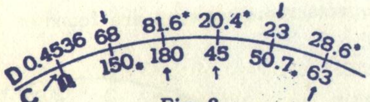


Fig. 8

In the above example, "lb" is set on C scale and "kg" on D scale

Example 9. —Percentage:—

Complete the following table:-

A	$ 350	(18.4)
B	450	(23.7)
C	500	(26.3)
D	600	(31.6)
sum	1900	(100.0)

Make the total sum of parts. 350+450+500+600=1900 set 100 on C to 1900 on D, against 350, 450, 500, 600, on C and the answers 18.4, 23.7, 26.3, 31.6 can be obtained on D.

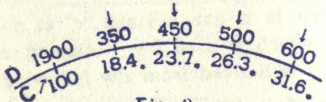


Fig. 9

Example 10. — Sale and Purchase: —

How much is 30 pcs. of a commodity @ 15 dollars per dozen: how many pcs. can be purchased at 40 dollars ?

Ans. $ 37.50,
32 Pcs.

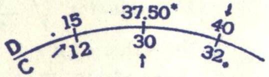


Fig. 10

Inverse Proportion:

With this circular slide rule, inverse proporition should be done invariably between D and CI.

Example 11.

There is a job 6 men complete in 14 days:
How many days will it take for 8 men to finish the job?

Ans. 10.5 days (Fig. 11)