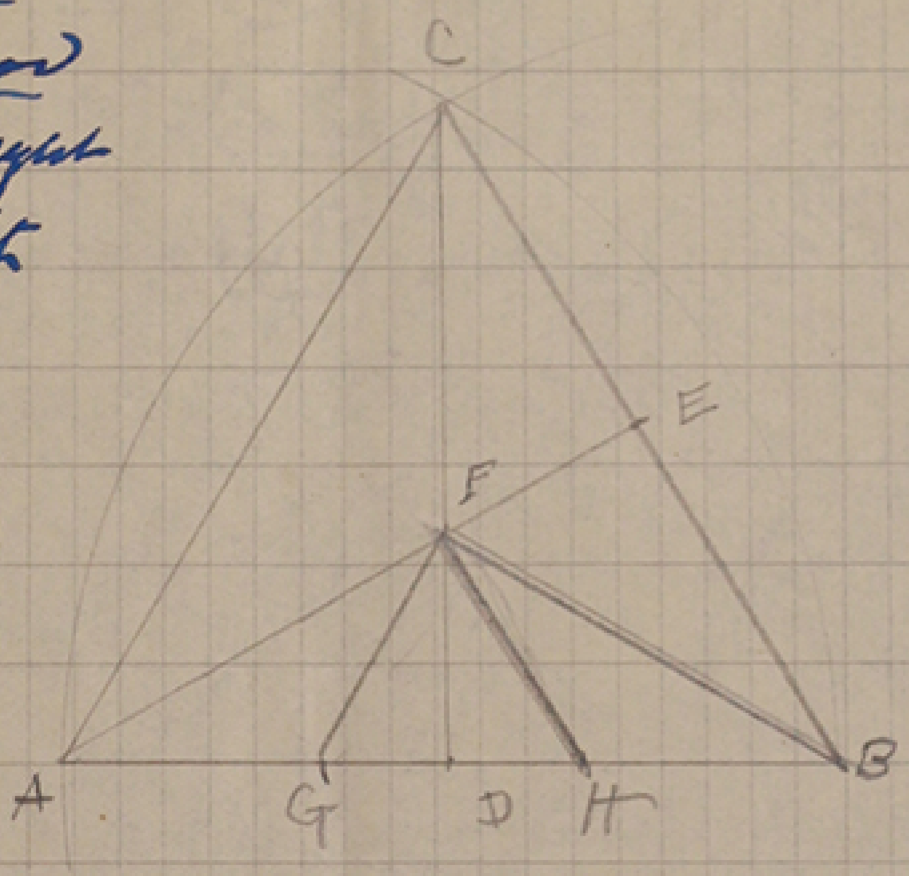
1st Method

To trisect a straight line of any length



(1)

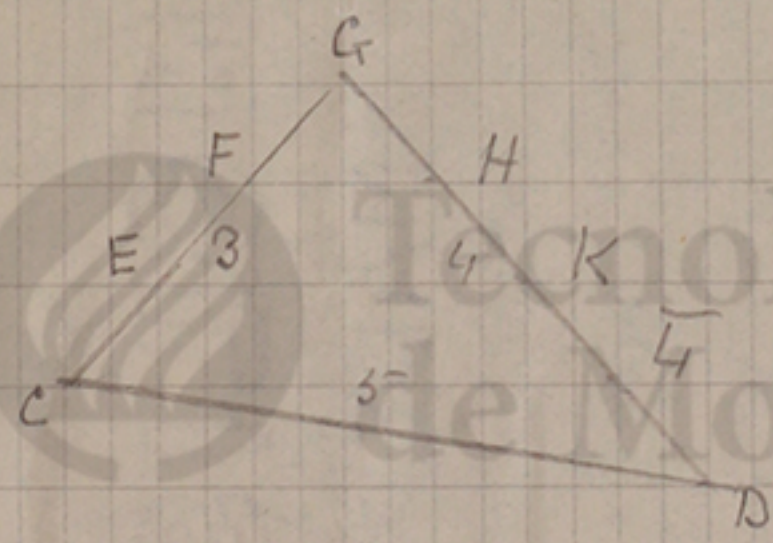
Let AB be the str: line. On it describe the eq: △
ABC. Bisect the base i.e. the given line at D.
Join DC. Bisect either the angle BAC, or CAB
cutting CD at F. Join FB. Then AFB is obviously
an angle of 120° and AFB is an isosceles △ & the ⊥.
DFC bisects it. ∴ AFD = s DFB = 60°. Bisect each
of these ∠'s by FG & FH cutting AB at G & H. GH trisects AB
For ∵ AFD = 60° & is bisected by FG ∴ ∠GFA = ∠GAF =
30° ∴ ∠AGF = 120° & ∠FGA = 120° And ∵ AGF is an
isosceles △ GF = GA. Similarly BH = s HF
But the ∠ DGF = twice 30°. So also does the ∠ DHF
and the ∠ GFH ∴ △GFH is an eq: △. ∴ GF = s HF
But AG = GF = GH and BH = HF i.e. GF = GH
∴ the line AB is trisected by G & H

Q. E. F

2d Method by means of which any straight line can also be divided into any number of equal parts

(2)

Let A B be the given line.
Draw any line of 3 equal parts
and at right ∠s to it another of 4 equal parts
of the same length (This is always possible
Then $3^2+4^2 = 9+16 = 25$ ∴ CD = 5.
To C G. apply the line A B so that from A coincides



with from. to C. Then if point B coincide with point
G the problem is solved; if not it must fall on
C G or C G produced. Suppose it fall on C G produced.
Make C G B' = to A B & through B', B' D' ∥ to G D
and produce C D so that it cuts the line B'.... produced
any length in D'. Then the Δ C B' D' is in all
respects similar to the Δ C G B. ∴ the side B' C : B' D'
:: 3 : 4 To bisect B' D', Then any quarter of B' D'
bisects C' B'. But C' B' was made equal to A B
∴ Therefore A B is bisected. The construction
is precisely similar if B. fall within C. G.
If the required to be divided the line it must be applied

& CD & the same method used.
of the series of whole number ~~Δs~~ squares
i.e. better series of right-angled Δs in which the
sum of the chequers on the squares of the two sides just
make up the square on the hypotenuse the next
makes it possible & divide the given
line into 7 or 13 equal parts & so on.