CSE-103
DISCRETE MATHEMATICS

ASSIGNMENT NO : 06 (Out of the book Assignment #4)
ASSIGNED TO : PROF. DR. M. KAYKOBAD

DATE OF ASSIGNED : *30-11-2018*
DATE OF SUBMISSION : *07-12-2018*

SUBMITTED BY

AL ARAFAT TANIN

STD ID *: 1705070*
SECTION *: B*
LEVEL-1 TERM-2

(Out of the text assignment #3)

Problem Statement :

An old father told his son his son that he stored some gold in a forest. The son must find identical trees A and B, and a stone S. He then should walk from S to A and equal distance perpendicularly towards the other tree to find a point C. He should again come back to the stone S and do the same with respect to the other tree B to obtain a point D. Gold is just in the middle of the line joining C and D. The som could find trees but not the stone. How could he find the gold?

Answer

It is not important where is the stone, because wherever the stone is , the treasure is always in the same position. Here is my prove:

For the prove , let draw a square imaging that AB , here A and B is the point where the tree is located , is the diagonal of the square .

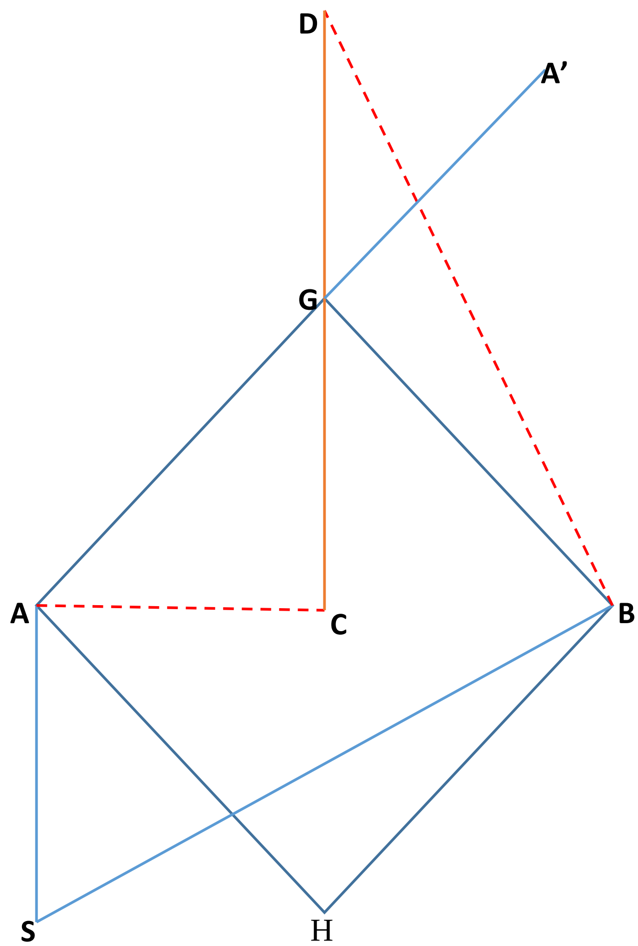
Suppose that the stone is at S . Now draw SA from S to A and AB from S to B and then AC from A to C and BD from B to D so that AC = SA and BD = SB

Now we will prove that G is midpoint of CD , that's all . And thus G point contains treasure.

<SAC = <GAH [both are 90 degrees]

Or <SAH = <CAG [subtracting <HAC>]

Now in triangle SAH and triangle CAG ,



SA = CA

HA = GA and <SAH = <CAG

So they are compatible hence

SH = CG

and <AHS = <AGC ………….. (1)

Again <SBD = <HBG So <SBH = <DBG …………………[subtracting <SBG]

Then in triangle SBH and triangle DBG

SB = DB

HB = GB and <SBH = <DBG

So they are compatible hence

HS = GD

and < SHB = <DGB ………… (2)

Also < SHB = <SHA + <AHB

Or <DGB = <AGC + 90 ………….. [from (1) and (2)]

Or <DGB - 90 = <AGC

Or <DGA' = <AGC ………….. [A' is in extention of AG, so <A'GB = 90]

So these two are vertical angles hence D, G, C are collinear and
as DG = GC ……………. [from (1) and (2)]
so G is the midpoint of CD. So G is the point where the treasure is located according to the question . So the sons had no need to find the stone , if they can find the trees they can find the gold . But there is a possibility that the gold is not at the position G but it is at the position of opposite of G and from figure this point is H (it can prove using the point S at the side of G is located).

This condition is same for any position of S **.** ***(Proved)***