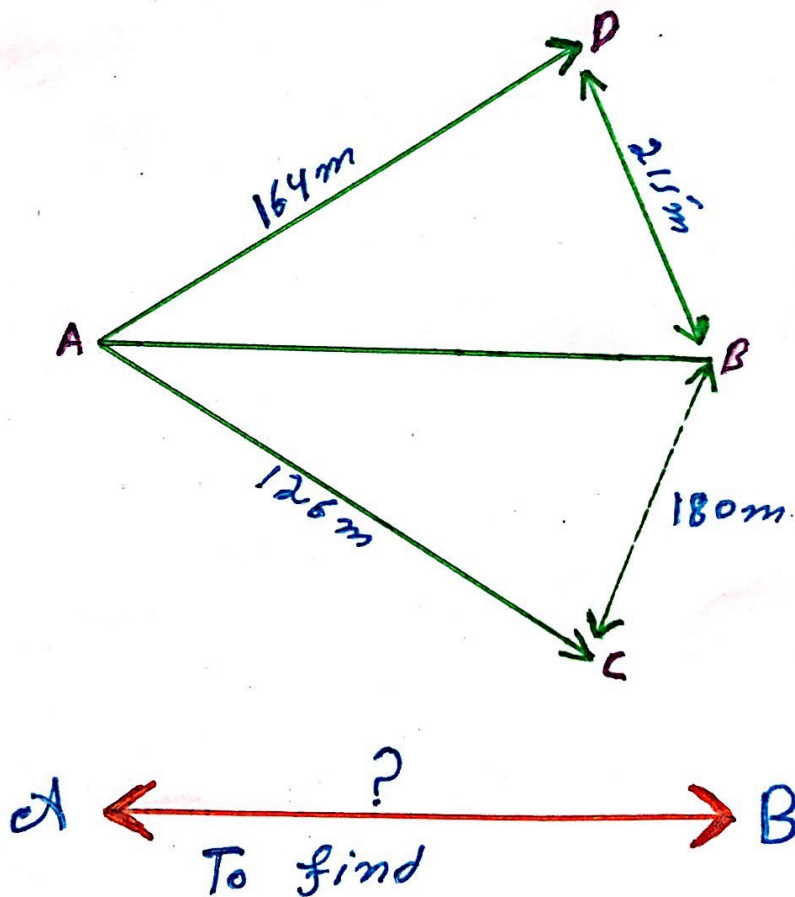


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Assignment : Quiz
Semester : B-Tech 8th semester

Page: 1

Q1s: While chaining across a pond two points A and B were taken on opposite side of the pond. A line CB 180m long was laid on left of AB and another line BD was laid down on the right of line AB is 215m, such that points C, A and D becomes in line with each other. CA & AD were then measured and found to be 126 and 164m respectively. Find the length AB.

Solution:



Page : 2

Given data:

$$AC = 126m, AD = 164m$$
$$BD = 215m, CB = 180m$$

*To find distance
of line AB = ?

$$DC = DB + BC$$
$$= 215 + 180 = 395m$$

* ΔADC , Let $\angle ADC = \alpha$

$$AC^2 = AD^2 + DC^2 - 2(AD)(DC)\cos\alpha$$

$$\cos\alpha = \frac{(AD)^2 + (DC)^2 - (AC)^2}{2(AD)(DC)}$$

$$\cos\alpha = \frac{(164)^2 + (395)^2 - (126)^2}{2(164)(395)}$$

$$= 0.70$$

In ΔADC , $AB^2 = AD^2 + BC^2 - 2(AD)(DB)$

$$\times \cos\alpha$$

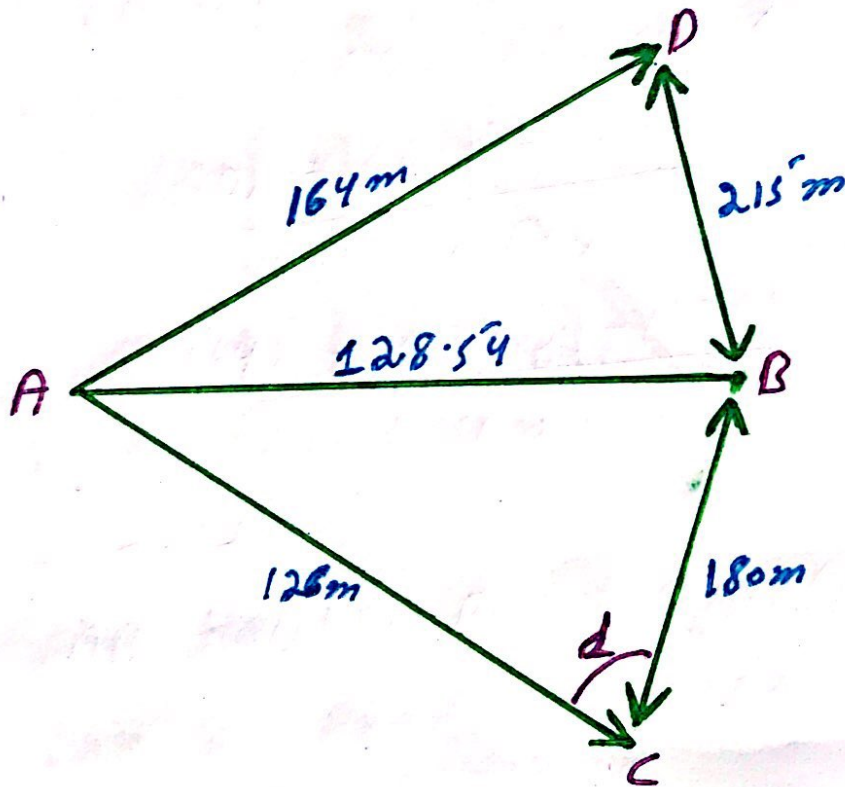
Page : 3

$$\sqrt{AB}^2 = \sqrt{(126)^2 + (180)^2 - 2(126)(180) \times 0.70}$$

$$AB = \sqrt{48276 - 317.52}$$

$$AB = \sqrt{16524}$$

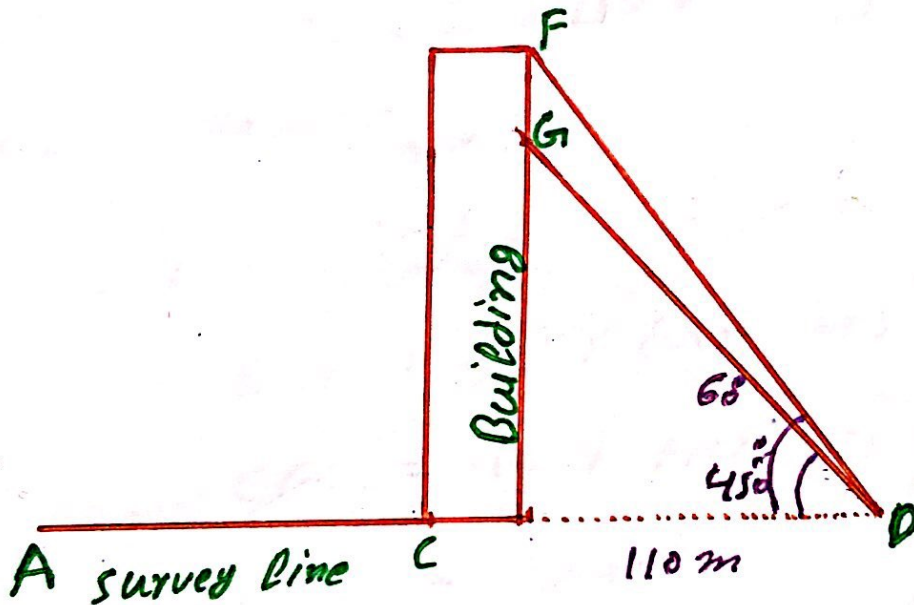
$$AB = 128.54 \text{ m} \text{ Ans.}$$



Page : 4

Q₂: A survey line AC intersect a building. To prolong the line behind the building Per CD 110m long drawn at C. From D Two lines DF and DG are drawn at angle 60° and 45° respectively. Determine the length DF and DG and also obstructed length CF. *

Sol:



=> Building Height

$\tan \alpha = \text{Per/Base}$

Page 35

$$\Rightarrow \tan \alpha = \frac{CF}{CD}$$

$$CF = CD \times \tan \alpha$$

$$CF = 110 \times \tan 60^\circ = 190\text{m}$$

$$CF = \text{Building height} = 190\text{m}$$

$$\Rightarrow CD = 110\text{m}$$

$$\tan \alpha = \text{Perp/Base}$$

$$\tan (45^\circ) = CG/CD$$

$$CG = CD \times \tan 45^\circ$$

$$CG = 110 \times \tan 45^\circ = 110 \times 1$$

$$CG = 110\text{m}$$

$$\Rightarrow \cos \alpha = \text{Base/Hyp}$$

$$\cos \alpha = CD/DG$$

$$DG = \frac{CD}{\cos \alpha}$$

Page : 6

$$DG = 110 / \cos 45^\circ = \frac{110}{0.708}$$

$$DG = 155.36 \text{ m}$$

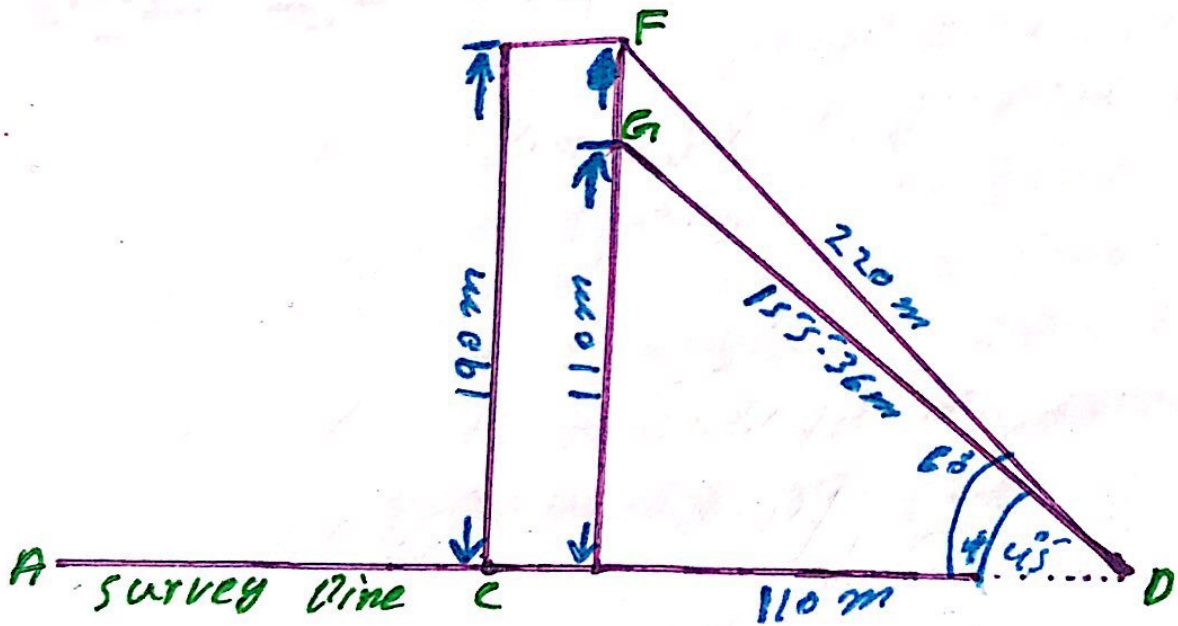
$$\Rightarrow \cos 2 = \text{Base} / \text{Hyp}$$

$$\Rightarrow \cos 2 = CD / DF$$

$$DF = CD / \cos 2$$

$$DF = \frac{110}{\cos 60^\circ} = 220 \text{ m}$$

$$DF = 220 \text{ m}$$



Page: 7

Q3: Explain the following terms.

1> Base Line

2> Check Line

3> Tie Line

4> Tie station

5> well-conditioned triangle

Ans: 1> Base Line: In surveying a baseline is a line between two points on the earth's surface and distance between them.

2> check line: A check line also termed as a proof-line is a line joining the apex of a triangle to some fixed points on any two sides of a triangle. A check line is measured to check the accuracy of the framework.

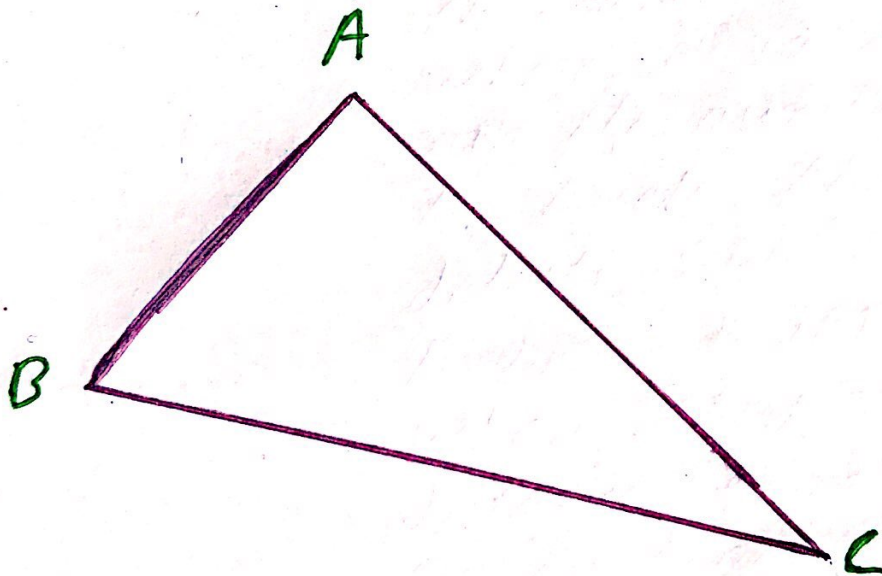
Page: 8

3 > Tie line: A line joining some fixed points as a Tie station on the main survey line is called as Tie line.

4 > Tie station: Any point selected on the main survey line where it is necessary to run the auxiliary lines to locate the interior details such as fences, hedges, buildings, etc, when they are at same distance from the main survey lines are known as Tie-stations.

Page: 9

→ Well-conditioned Triangle: A well-conditioned triangle is a triangle in which no angle is less than 30 degrees.



Page : 10

Q 45: What is meant by traverse surveying?
Distinguish between a close traverse and an open traverse.

Ans: Traverse surveying: Traverse is a method in the field of surveying to establish control networks. It is also used in geodesy. Traverse networks involve placing survey station along a line or path of travel and then using the previously surveyed points as a base for observing the next point.

⇒ Closed Traverse: A traverse which either originates from a station and closes at the same station or runs between two stations whose coordinates are known in terms of a common system of co-ordinate.

Page: 11

\Rightarrow Sum of internal angles = $(2n - 4) 90^\circ$

\Rightarrow Sum of External angles = $(2n + 4) 90^\circ$

\Rightarrow Open traverse: A traverse which neither returns to its starting station or ends on another station, is known as open traverse

\Rightarrow Closed traverse is better than open traverse for considering the degree of accuracy.