

Chaining Across Obstacles

Plane Surveying
Laboratory

Lab. No. (3)

Al-Karkh University of Science
Remote Sensing Department
Stage 2nd

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Chaining Across Obstacles

Objective:

To **measure distance** between **two points** by chaining across different types of **Obstacles** encountered by **indirect method**.

Chaining Across Obstacles

OBSTACLES TO CHAINING ARE OF TWO KINDS

1. Obstacles to **chaining** but **not ranging** .

a) Pond

b) River



2. Obstacles to both **chaining**
and **ranging** .

• Ex:- Building



Chaining Across Obstacles

1- Obstacles to chaining but not ranging:

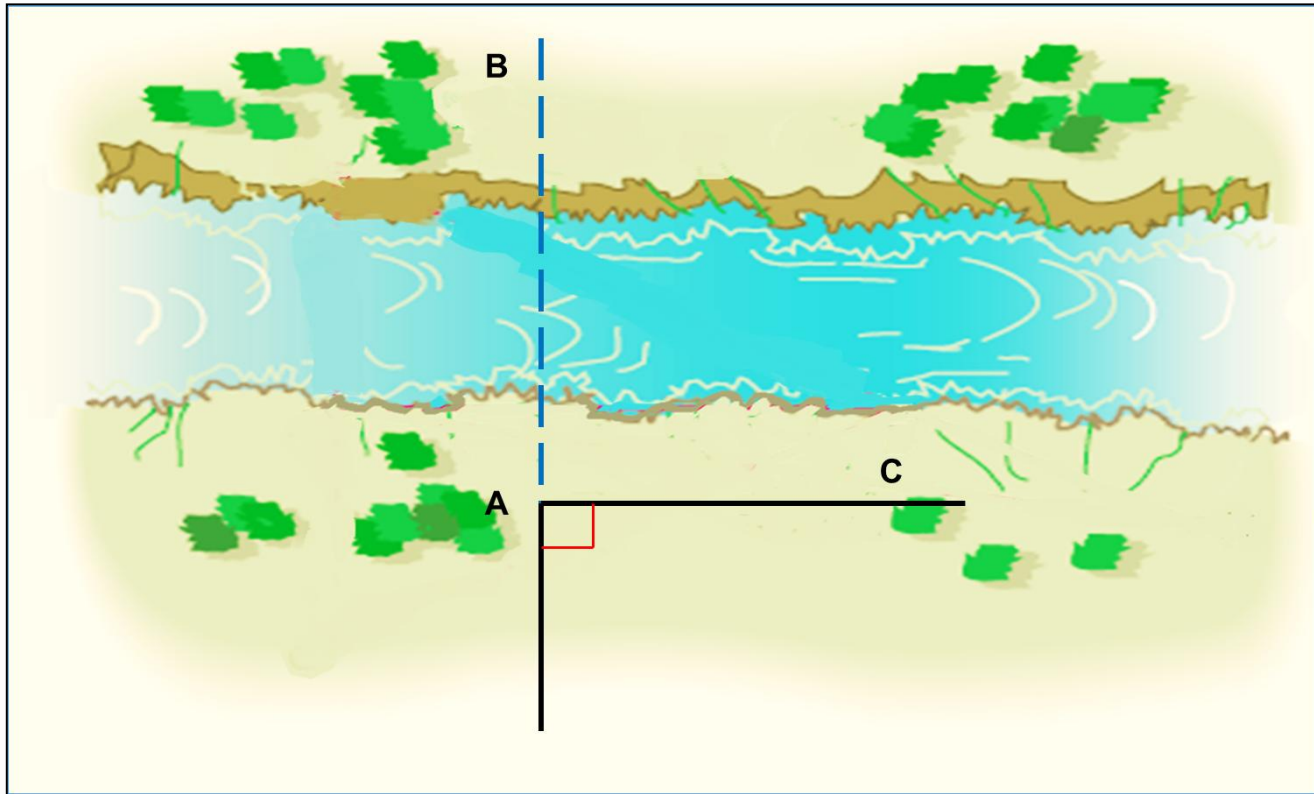
b. River: it is possible to chain round the obstacle



Method To Determine Obstructed Length

- Method (a);-

1. Let **AB** be the obstructed length across the river .

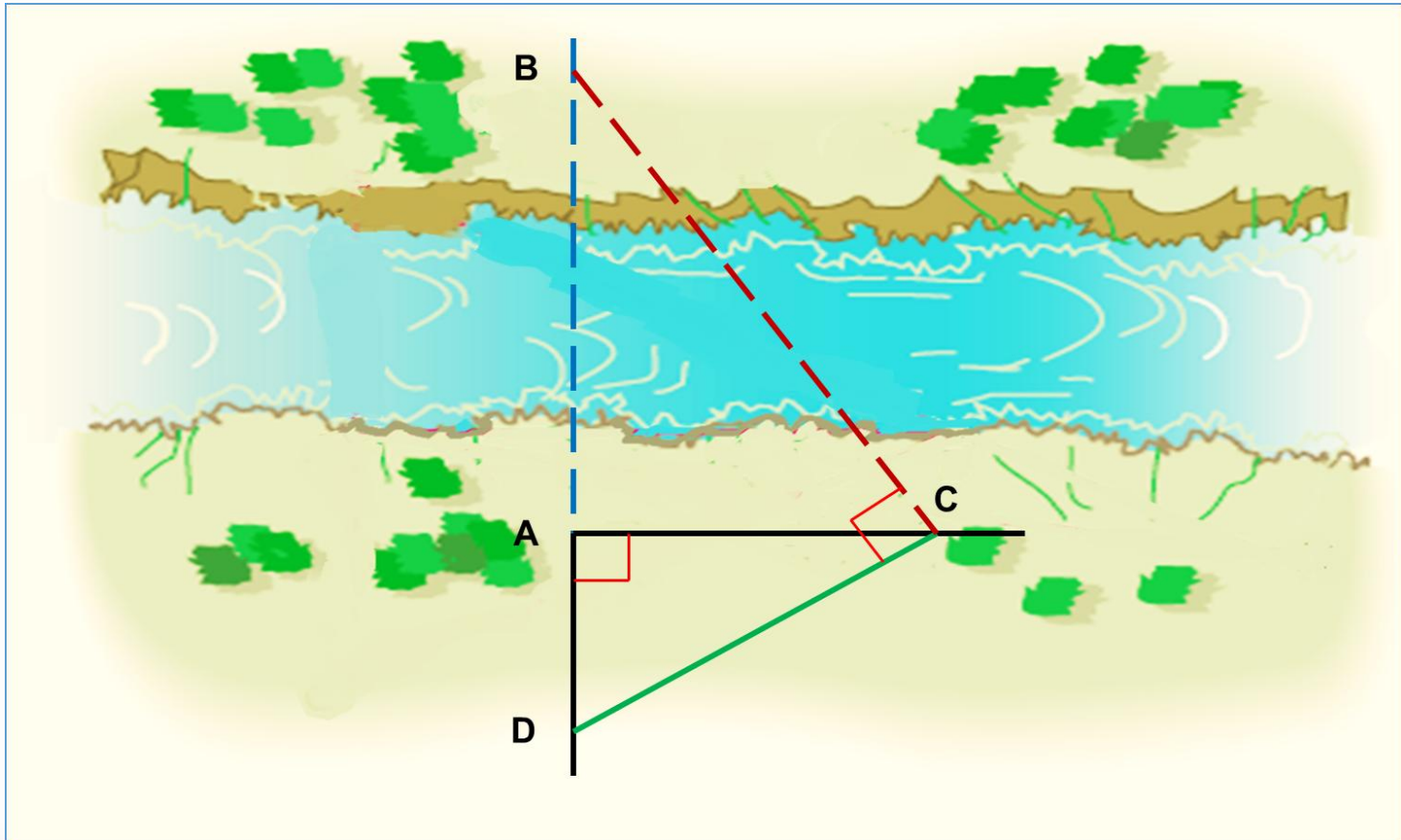


2. Set out **AC** perpendicular to the required distance **AB**.

Method To Determine Obstructed Length (River)

Method A

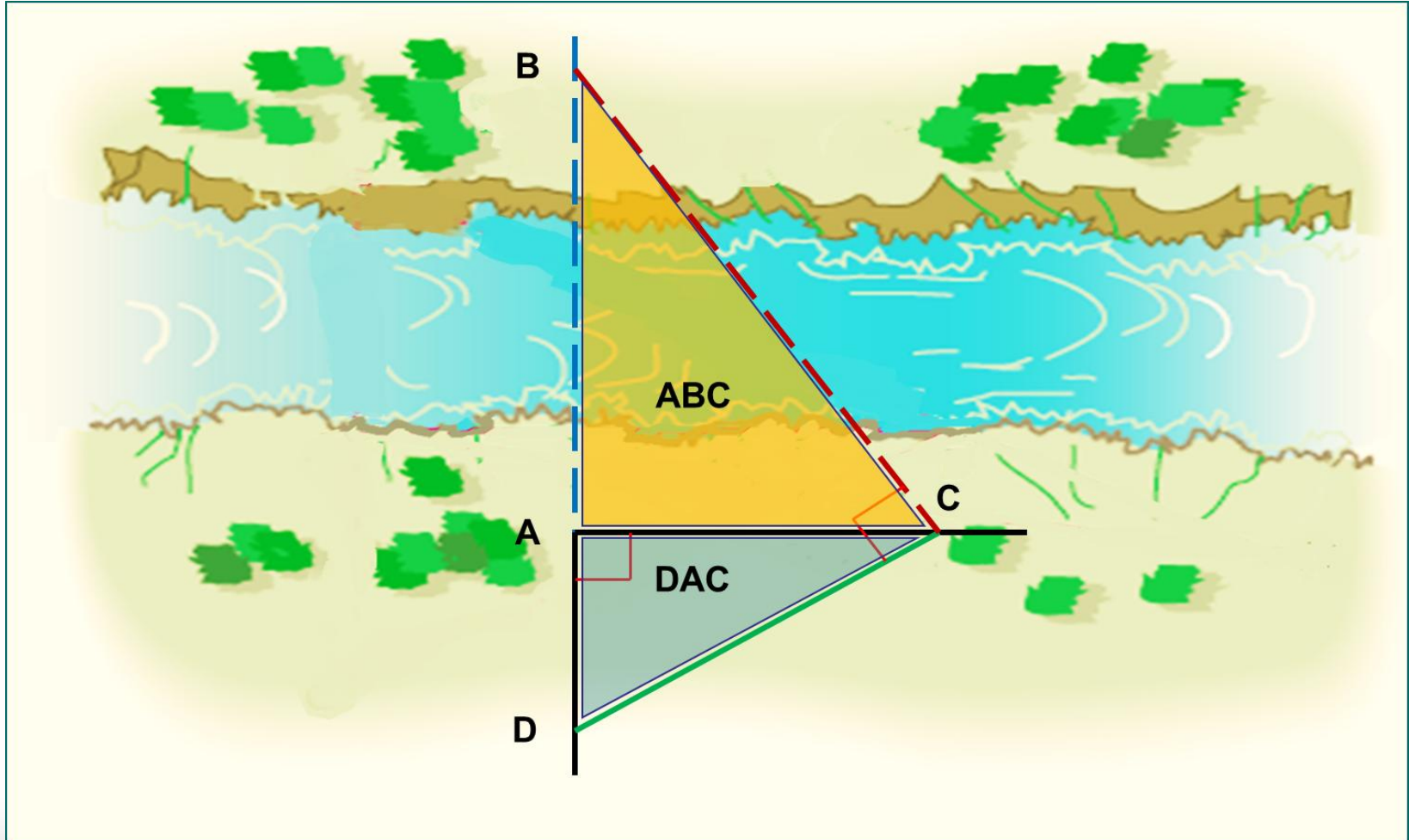
3. perpendicular is laid off from **C** such that it meets the **extended line** of **AB** at **D**.



Method To Determine Obstructed Length (River)

Method A

4. Triangles **ABC** and **DAC** are similar triangles.

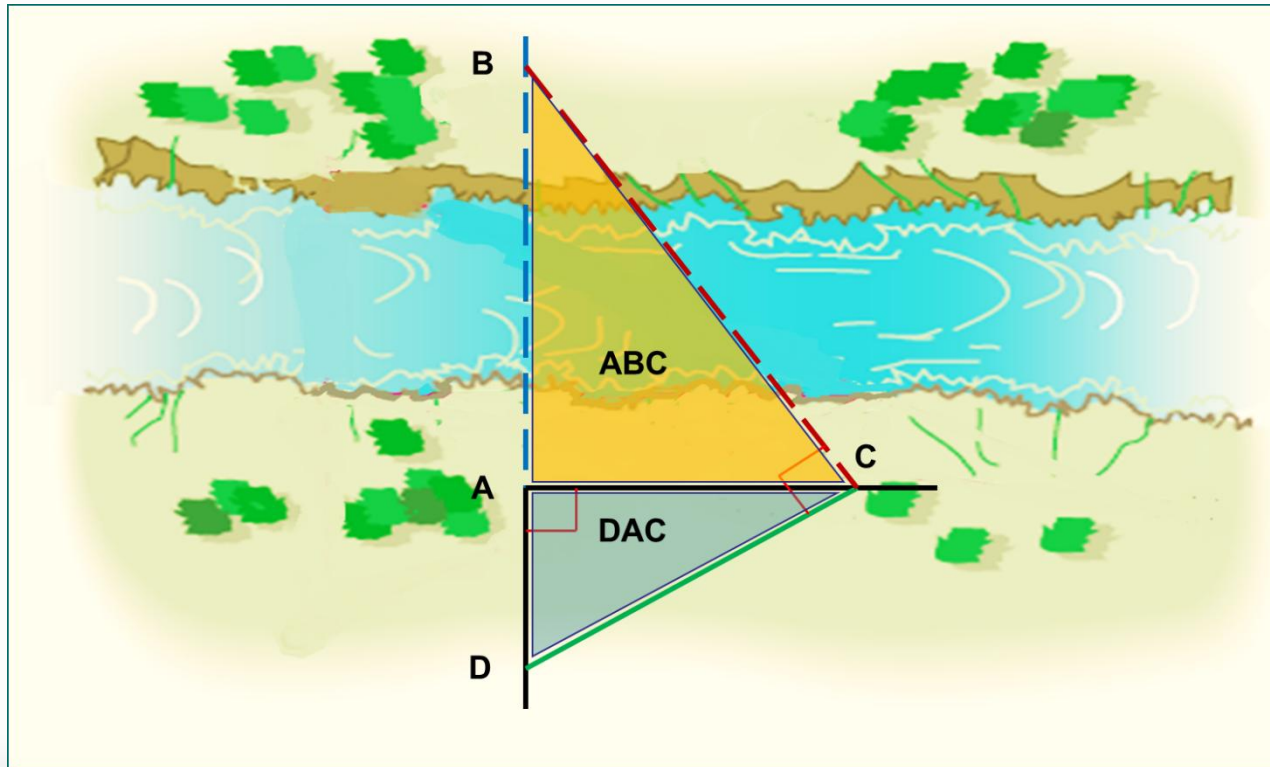


Method To Determine Obstructed Length (River)

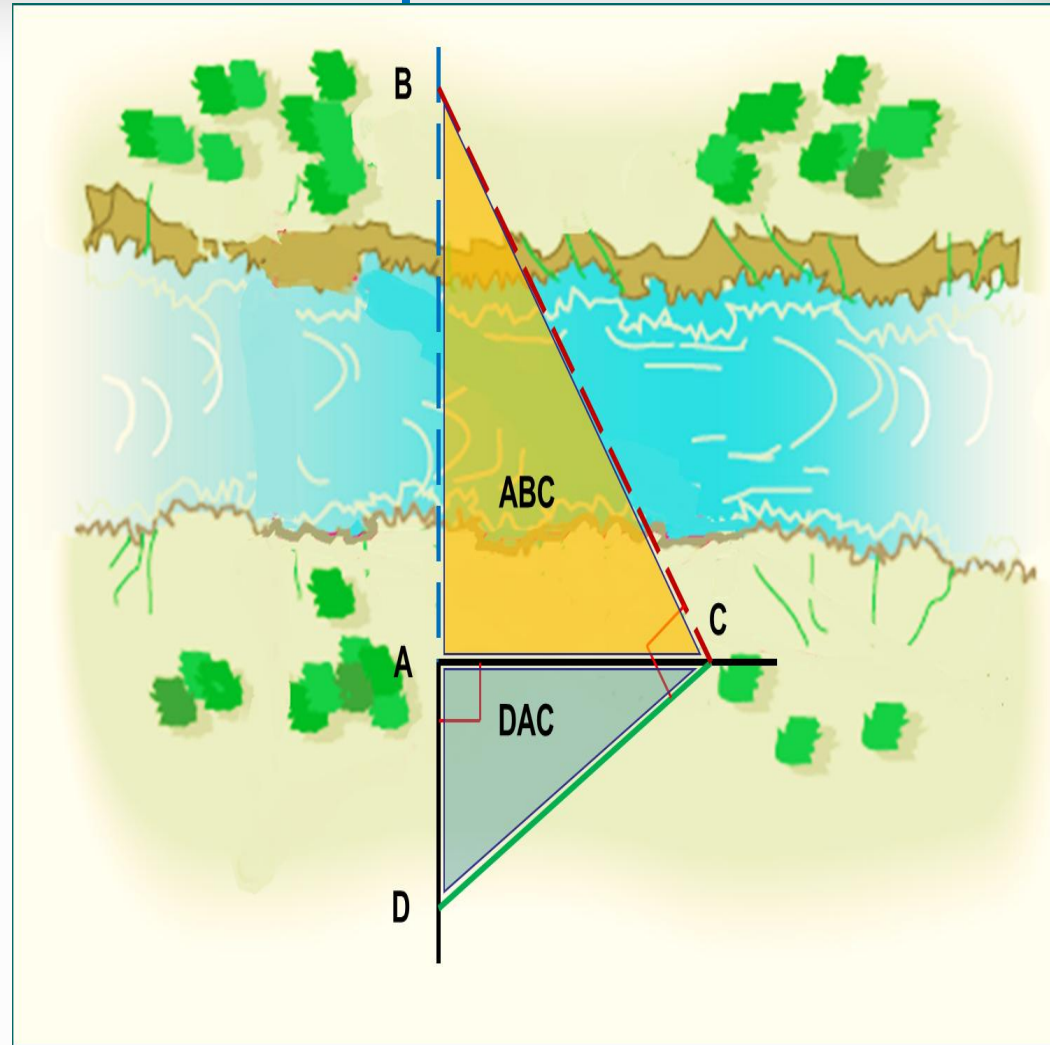
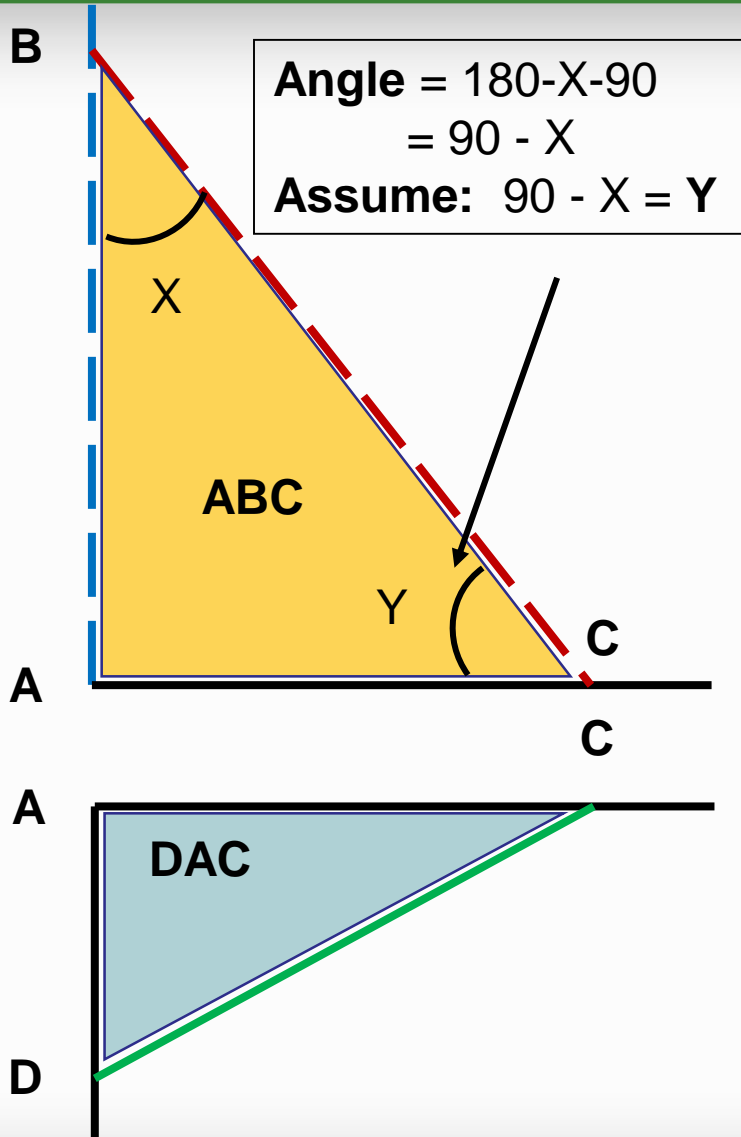
Method A

5. From the principle of similar triangles, $\frac{AB}{AC} = \frac{AC}{AD}$

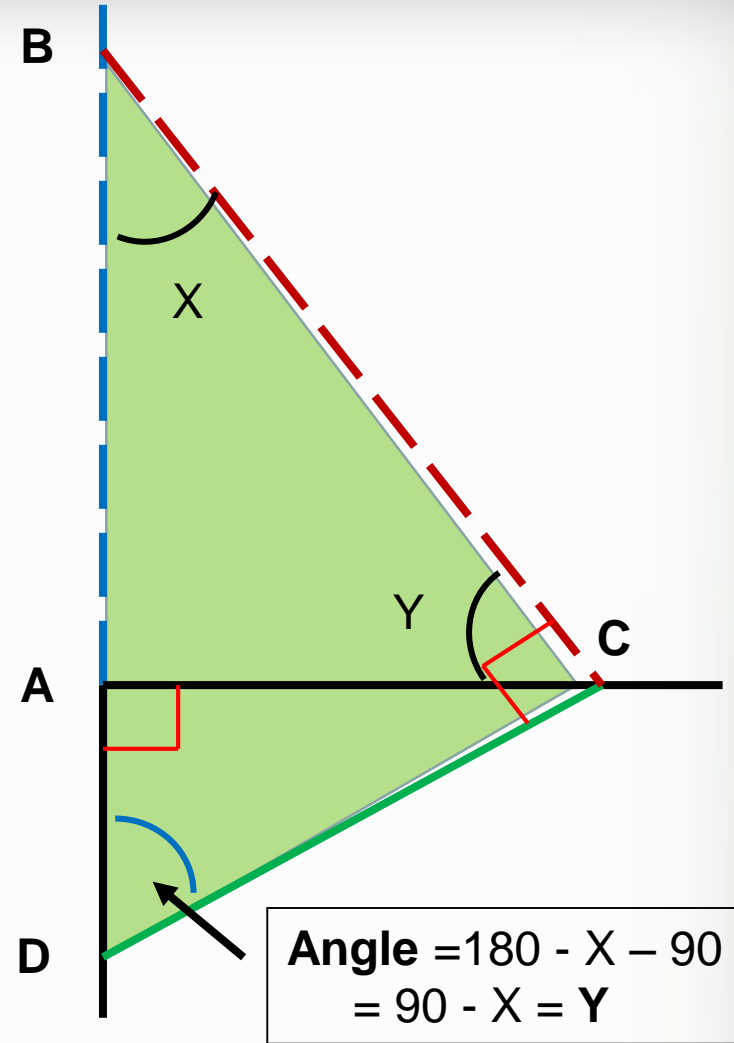
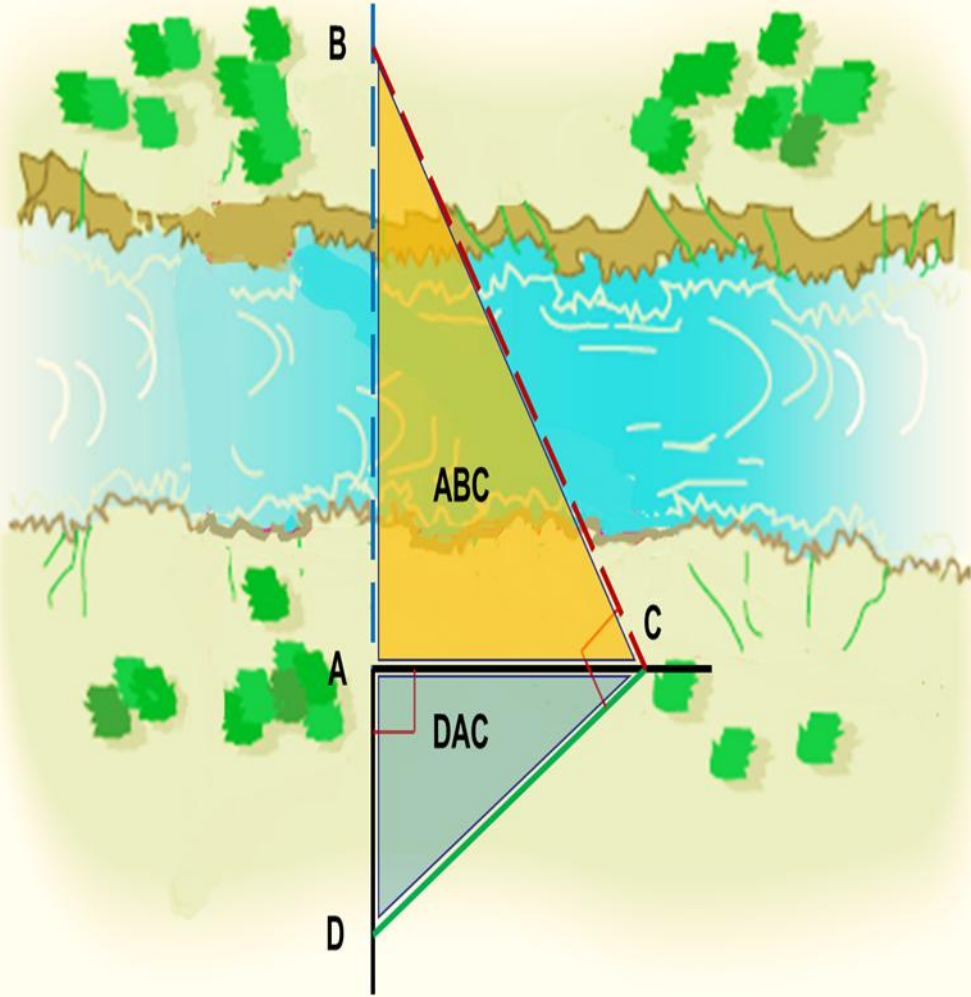
Therefore, **obstructed length AB** = $\frac{AC^2}{AD}$



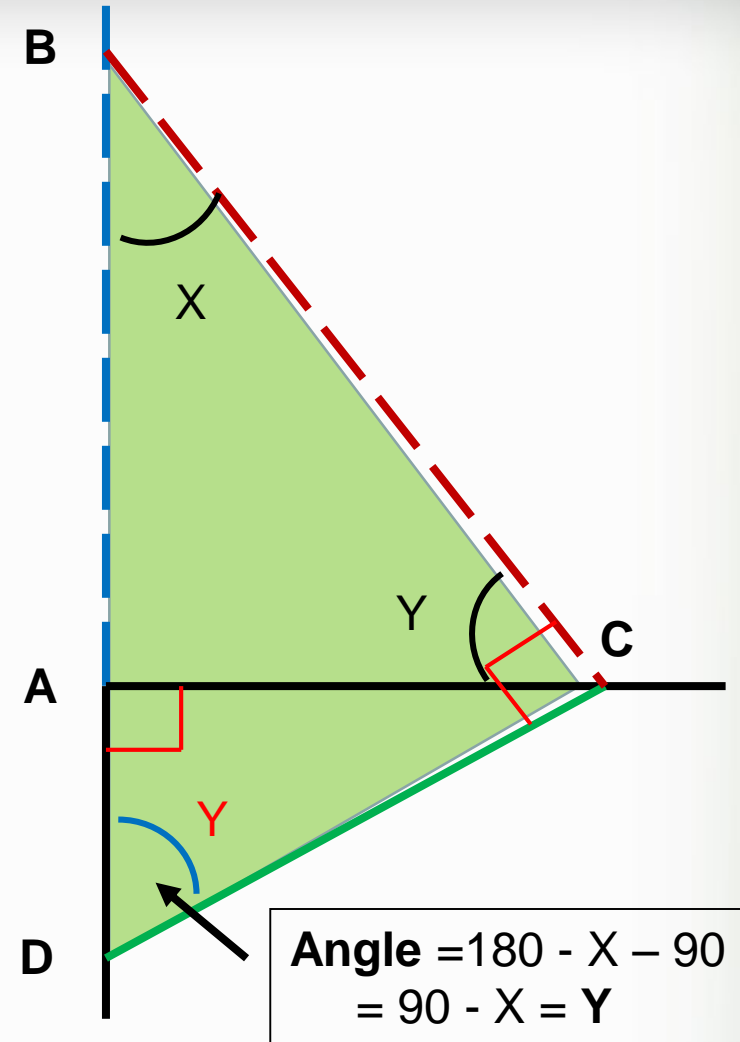
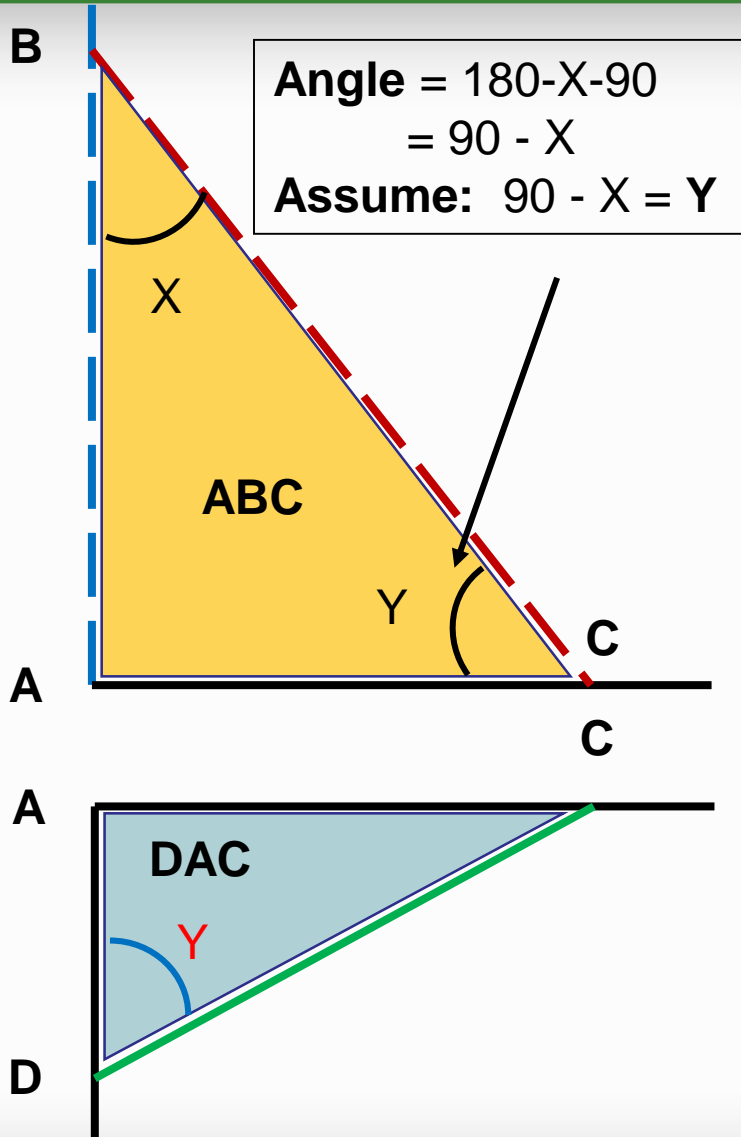
Theory of Formula



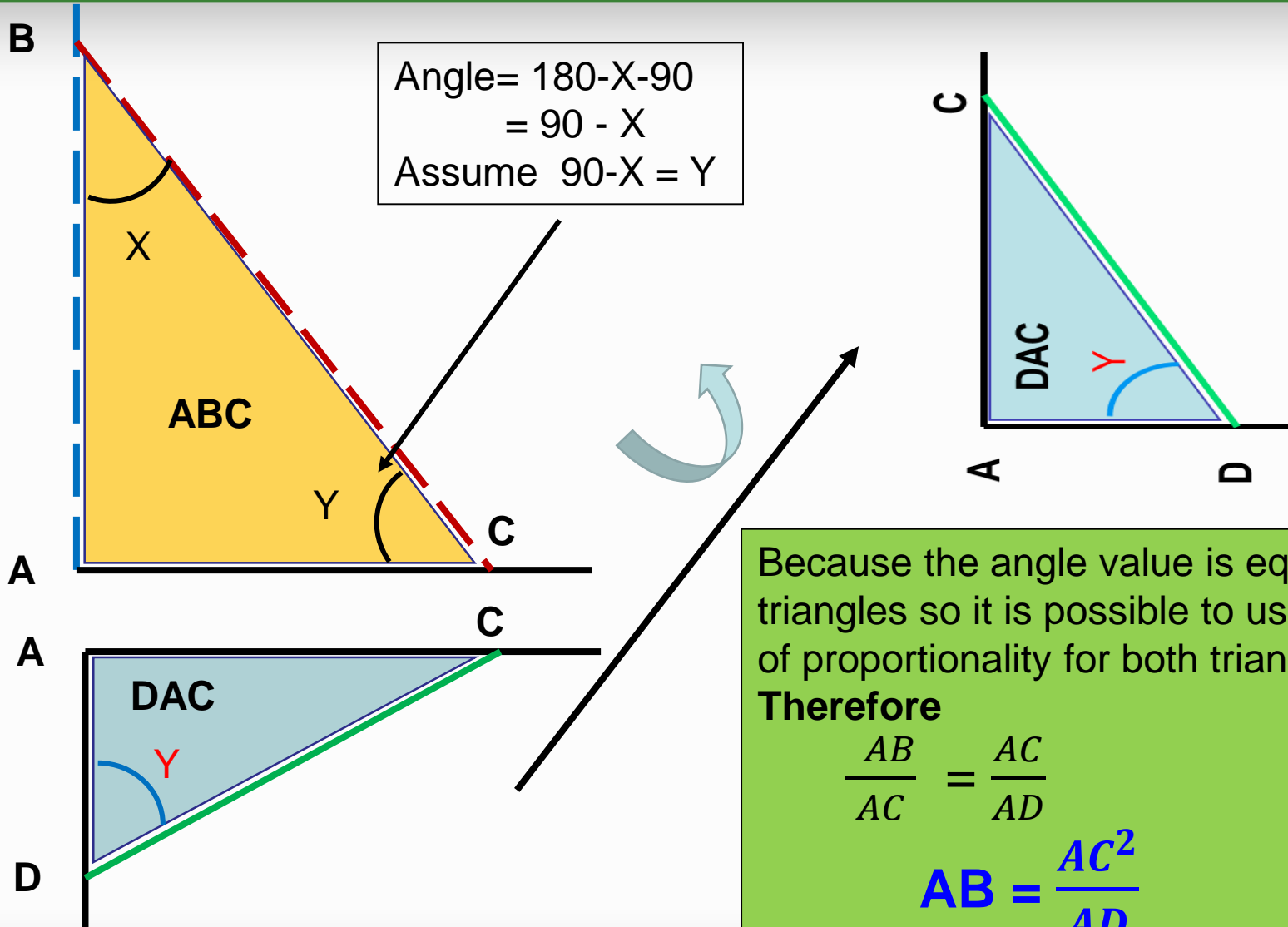
Theory of Formula



Theory of Formula



Theory of Formula



Because the angle value is equal for both triangles so it is possible to use the theory of proportionality for both triangles.

Therefore

$$\frac{AB}{AC} = \frac{AC}{AD}$$

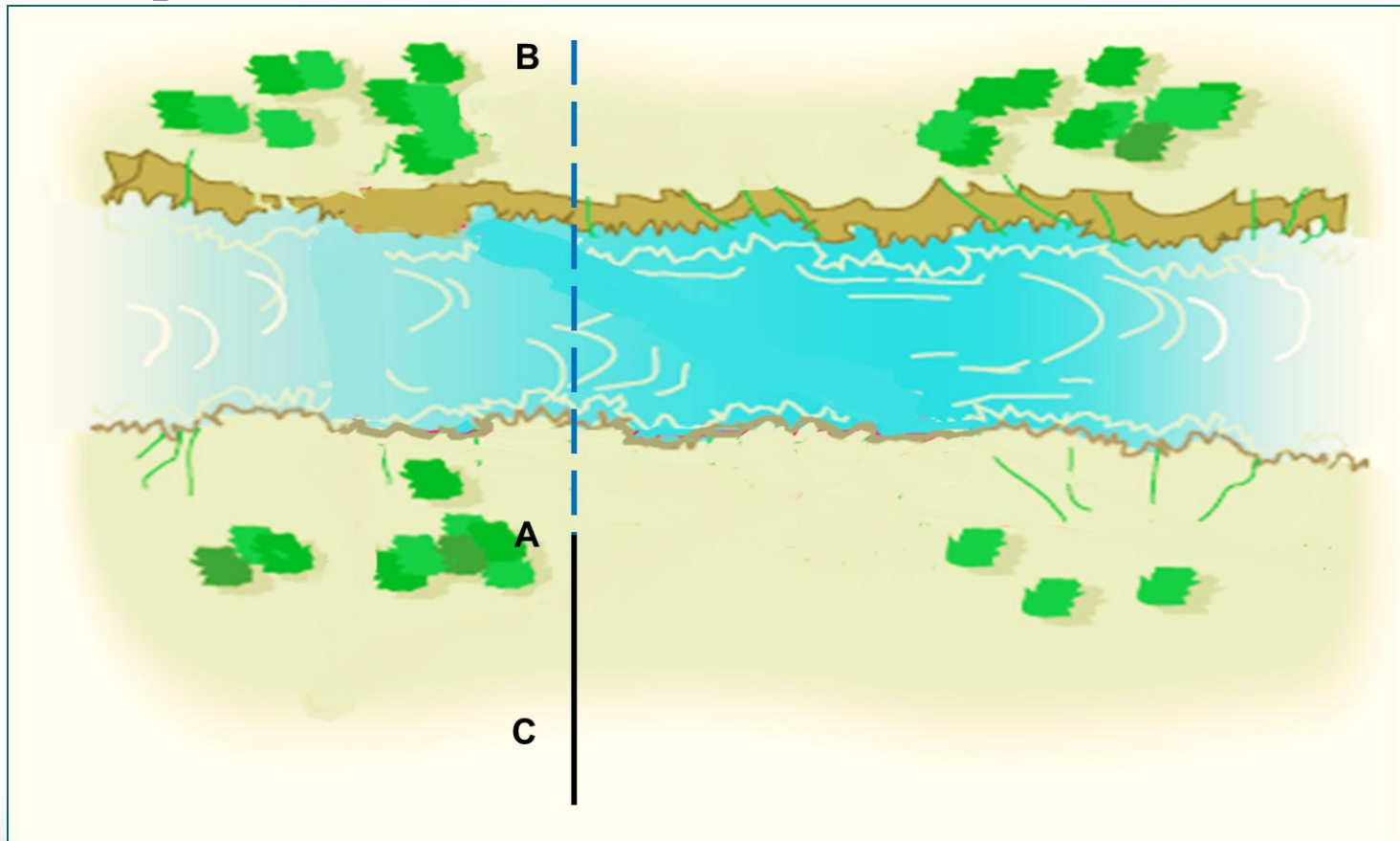
$$AB = \frac{AC^2}{AD}$$

Method To Determine Obstructed Length (River)

Method B

Method (b);-

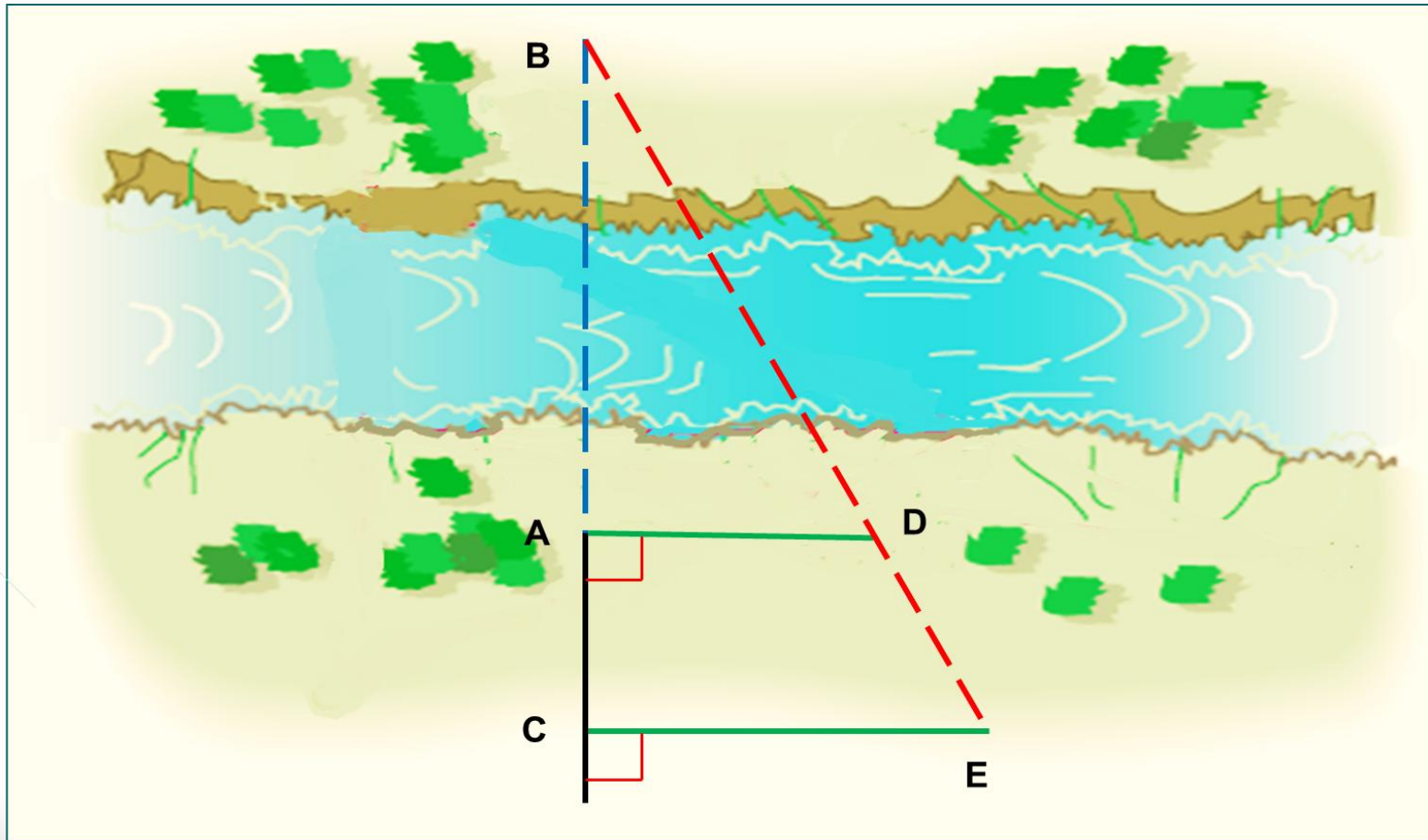
1. Select point B on one side and A, C on the other side.



Method To Determine Obstructed Length (River)

Method B

- Set Out **AD** and **CE** as perpendicular to **AB** ,
and **range B, D and E** in one line.

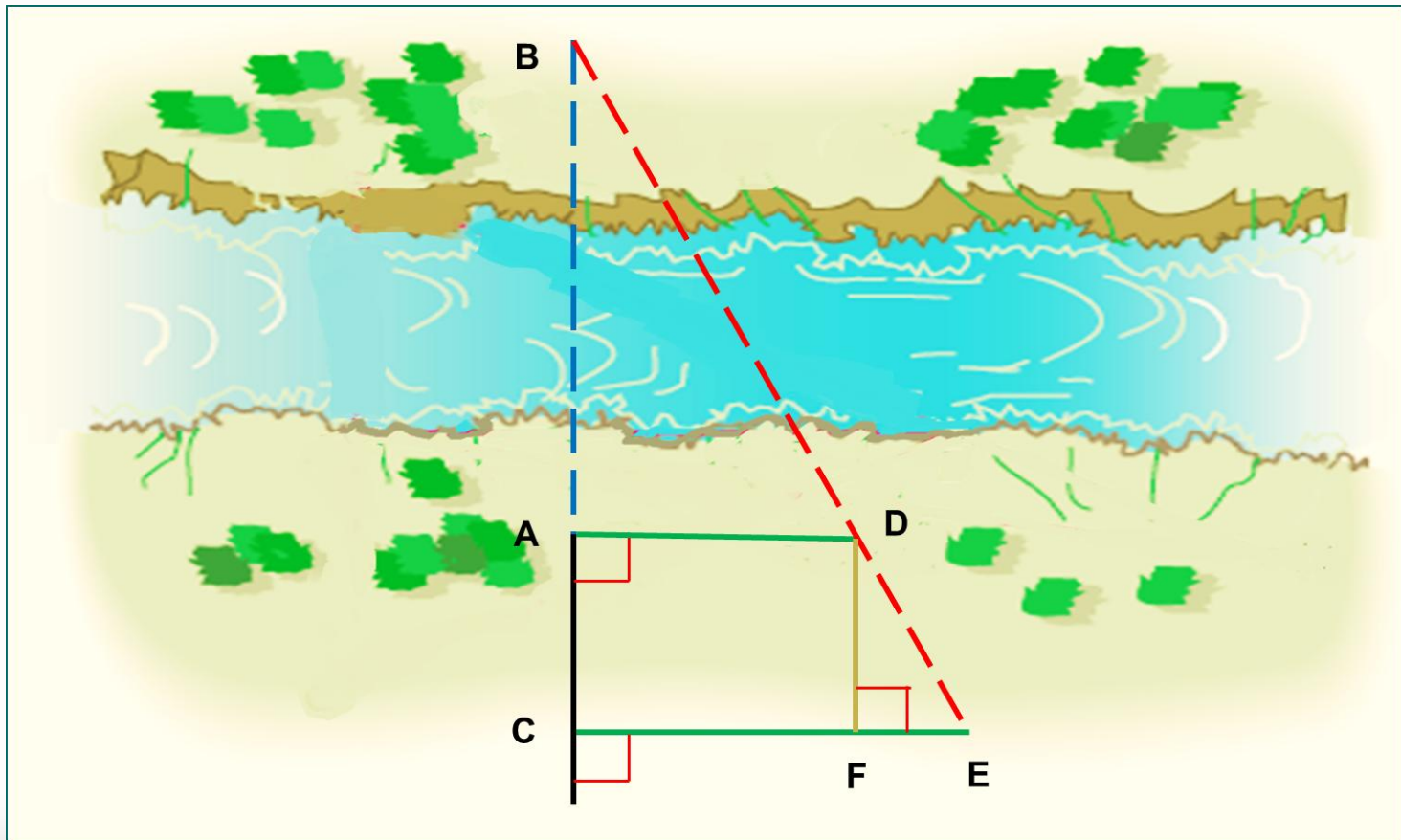


Method To Determine Obstructed Length (River)

Method B

3. Measure **AC**, **AD** and **CE**.

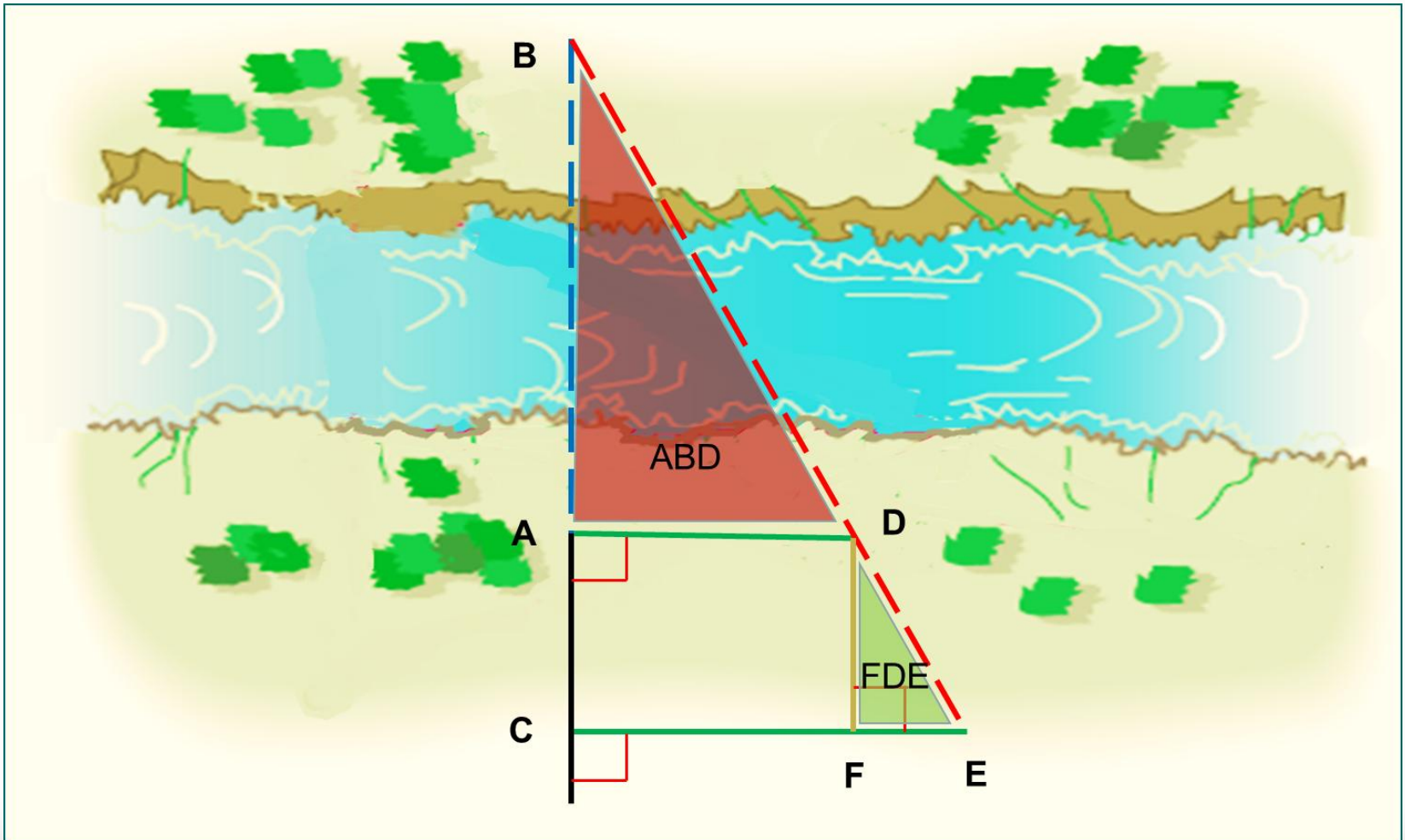
4. a line **DF** is drawn **parallel** to **AB** cutting **CE** in **F** perpendicularly



Method To Determine Obstructed Length (River)

Method B

5. the triangle **ABD** and **FDE** will be **similar**.



Method To Determine Obstructed Length (River)

Method B

$$\frac{AB}{AD} = \frac{DF}{FE}$$

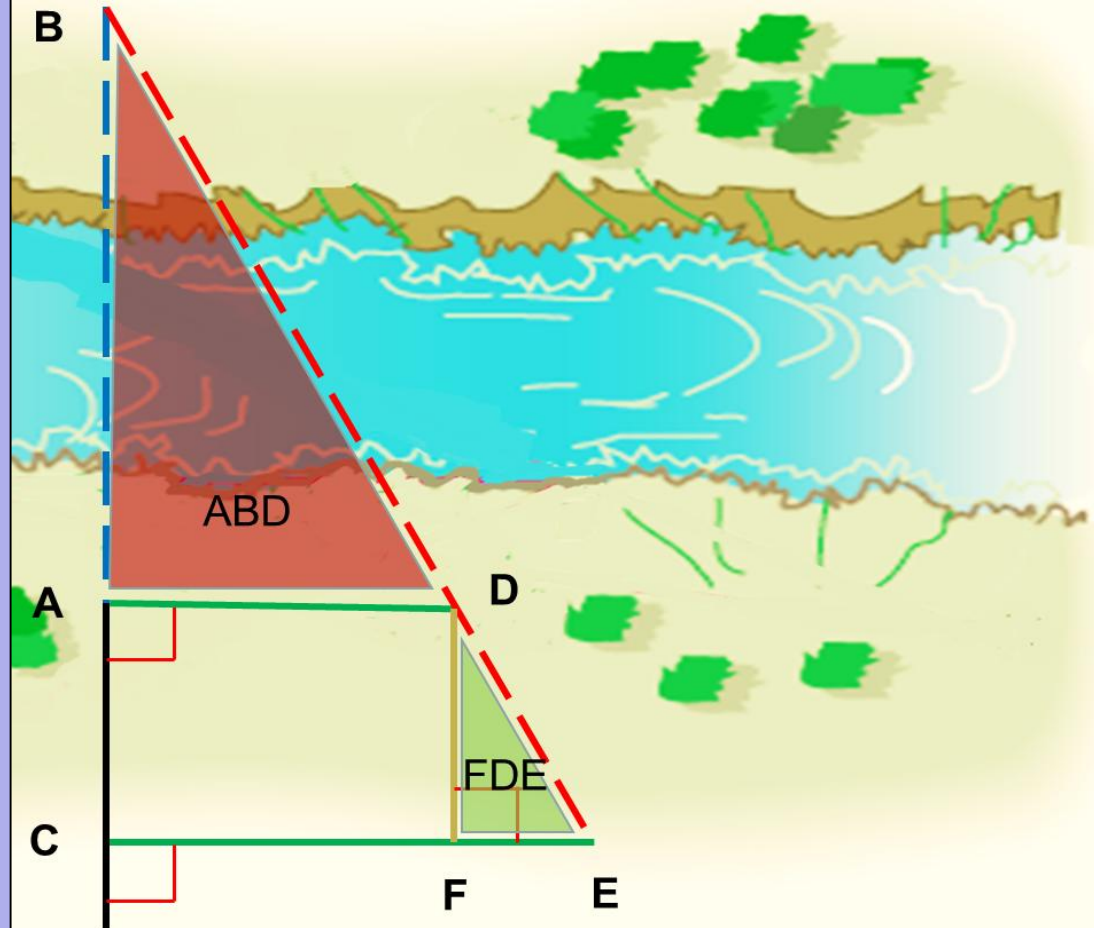
But $FE = CE - CF = CE - AD$,

And $DF = AC$.

$$\frac{AB}{AD} = \frac{AC}{CE - AD}$$

From which

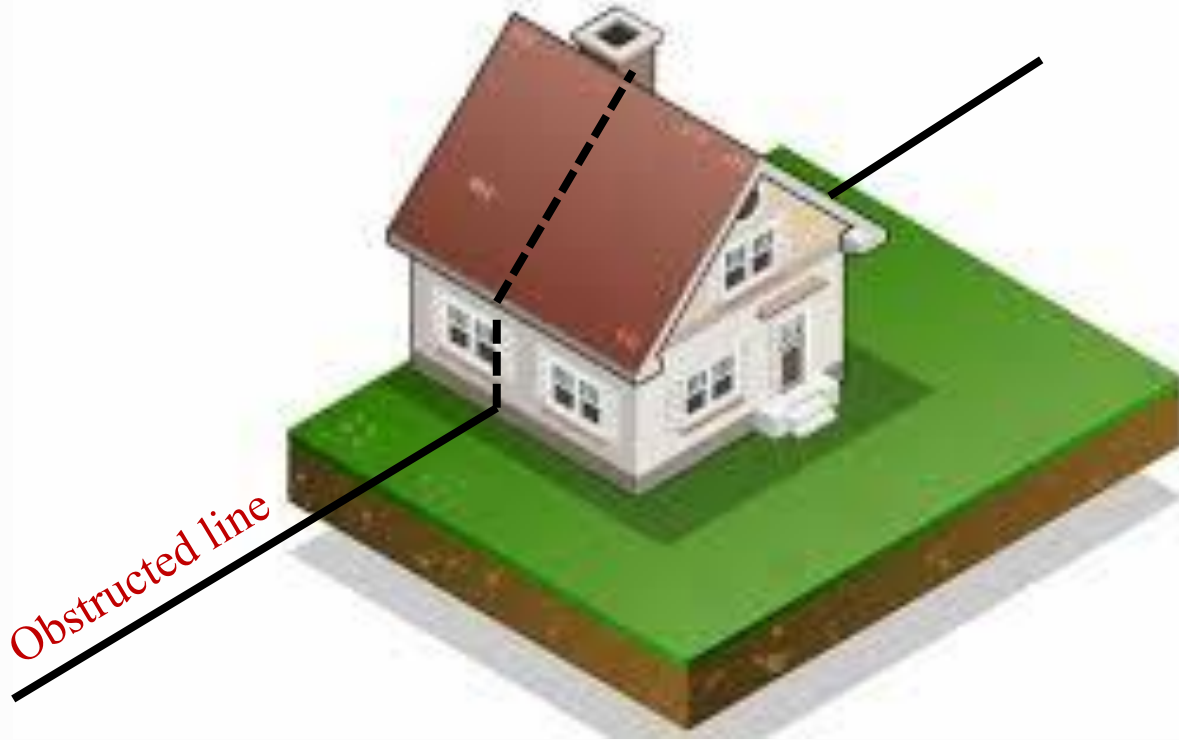
$$AB = \frac{AC * AD}{CE - AD}$$



Chaining Across Obstacles

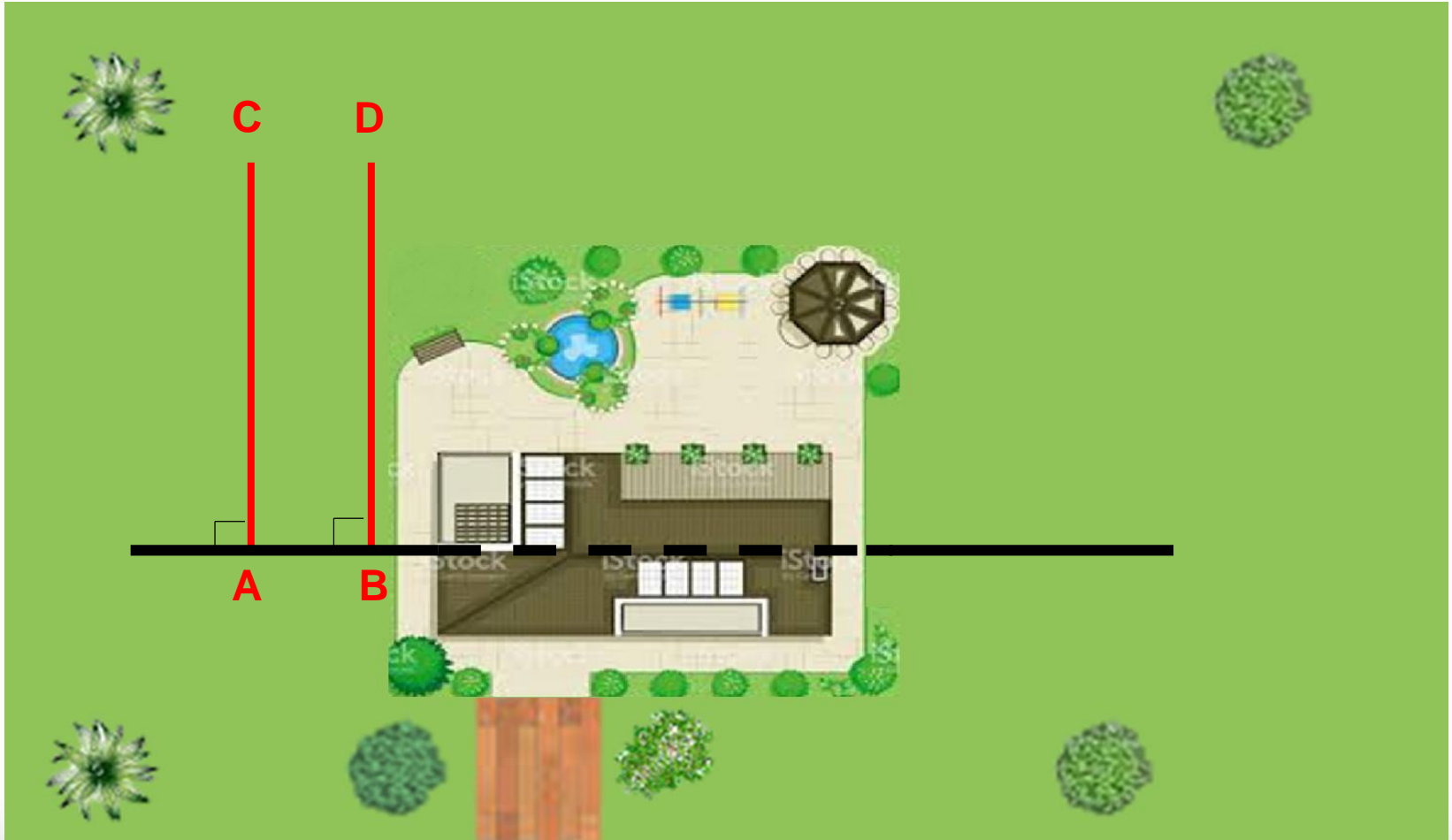
2. Obstacles to chaining but not ranging

building: it is possible to chain round the obstacle



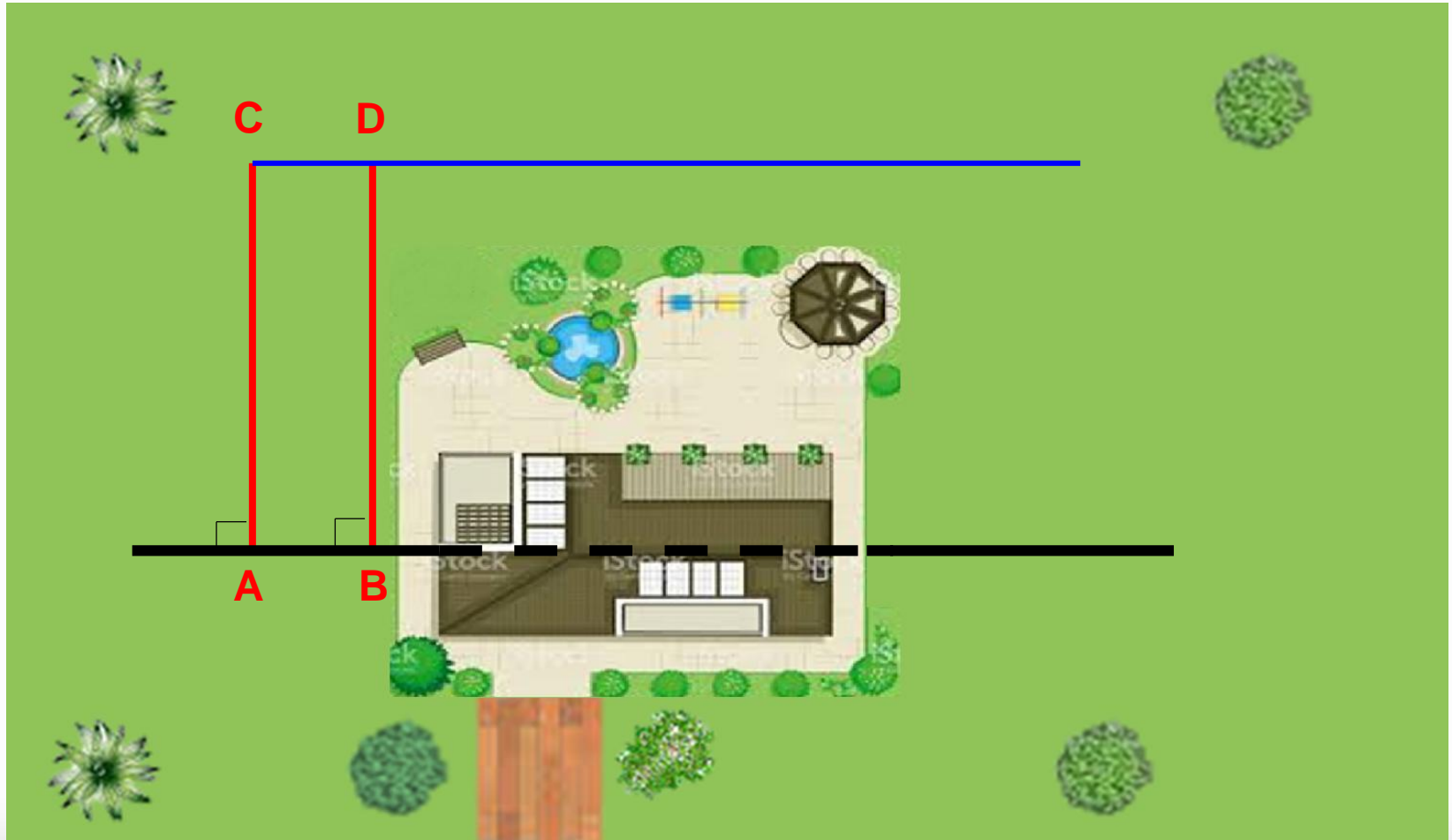
Method To Determine Obstructed Length (Building)

1. Choose two points **A** and **B** to one side and set out perpendiculars **AC** and **BD** of **equal length**.



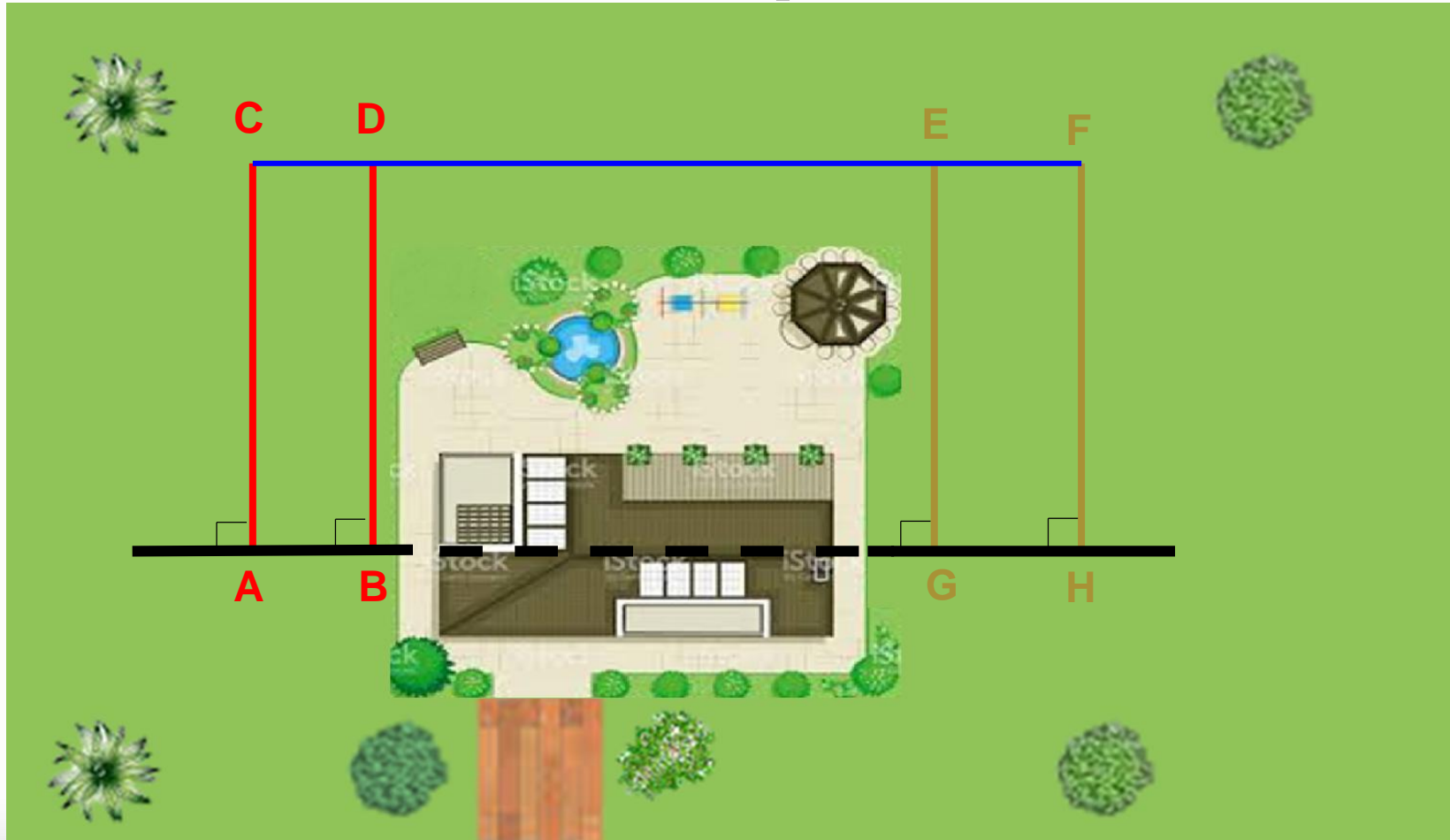
Method To Determine Obstructed Length (Building)

2. Join **CD** and prolong It **pass** the obstacles.



Method To Determine Obstructed Length (Building)

3. Choose two points **E** and **F** on **CD** and set out **perpendicular EG** and **FH** equal to **AC** or **BD**.



Method To Determine Obstructed Length (Building)

4. Join **GH** and prolong it. Measure **DE**.
5. **BG = DE**.

