Geometry in Real Life

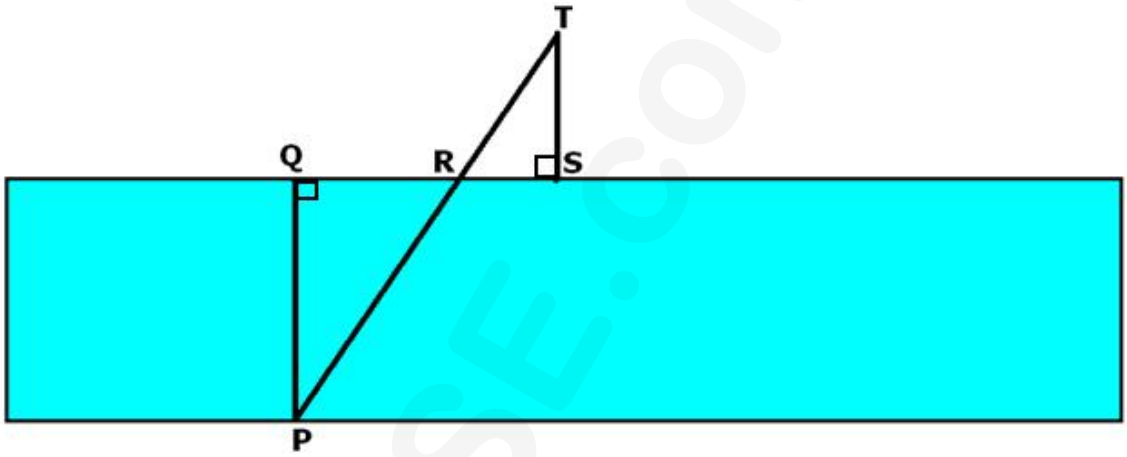
Objective

To become familiar with the fact that geometry (similar triangles) can be used in real life to find height of certain things and width of many others.

Description

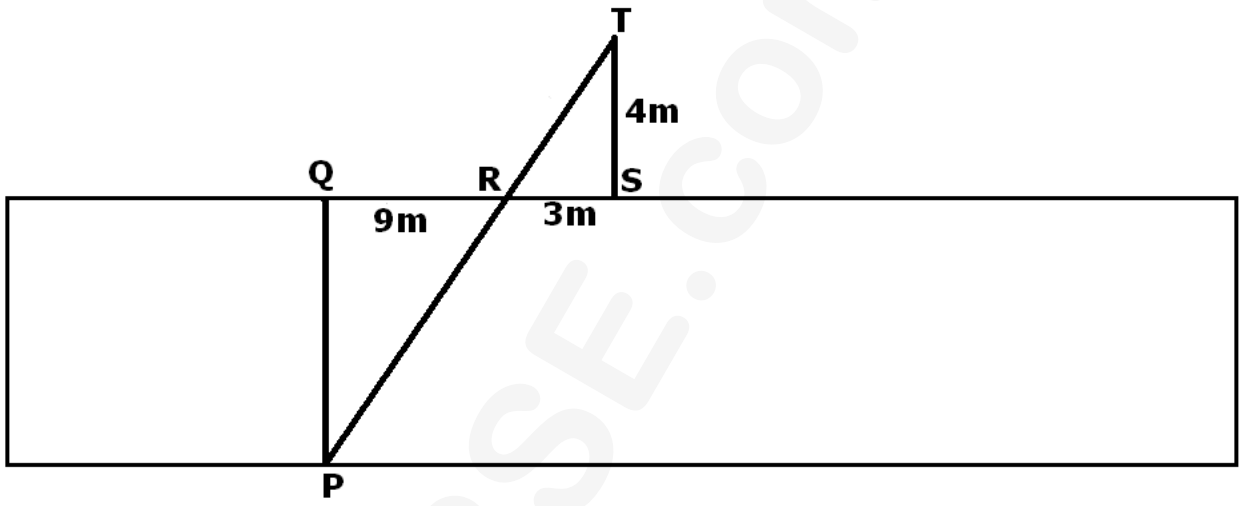
In this project I tried to find situations in daily life where geometrical notions can be effectively used, I selected the following examples:

1. To find the width of a river
2. To find height of a tower


T
Q
R
S
P

To find the width of a river

Fixed a pole at Q directly opposite to a tree P on the other side of the river. Walked along the river, fixed another pole at R at a distance of 9 metres. Walked another 3 metres to S, from here walked at right angles to the river till the point T is reached such that T is directly in line with R and P. Measured the distance ST. Using the property of similarity of triangles the width of the river was determined.


T
4m
Q
R
S
9m
3m
P

In right triangle RQP and RST

Angle PQR = angle RST = 90°

Angle PRQ = angle TRS (vertically opposite angles)

Therefore triangle RQP ~ triangle RST by AA corollary

$$\frac{QP}{ST} = \frac{QR}{SR}$$

$$\frac{QP}{ST} = \frac{9}{3}$$

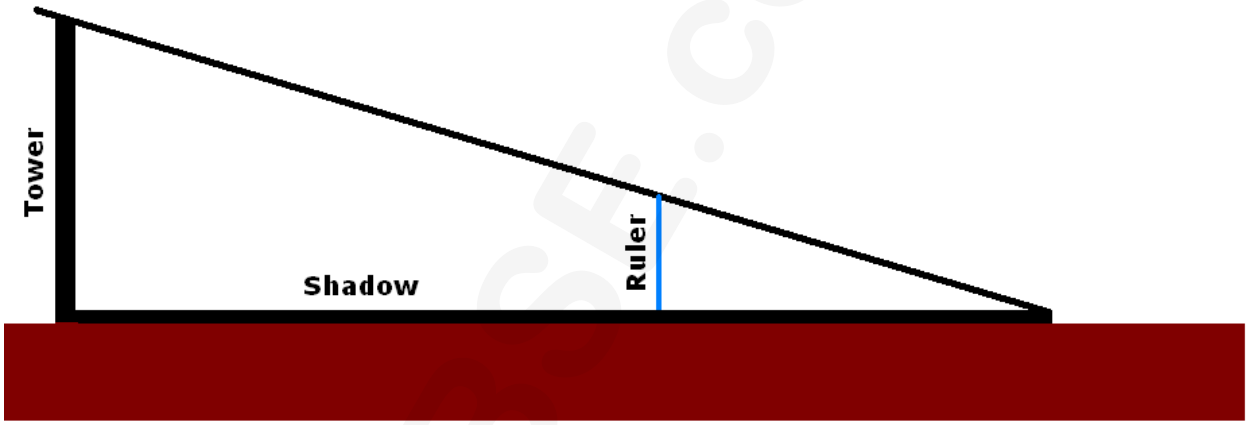
$$\frac{QP}{ST} = \frac{3}{1} \quad \text{------- (i)}$$

Now ST = 4m, substituting its value in (i)

$$\frac{QP}{4} = \frac{3}{1}$$

QP = 12m

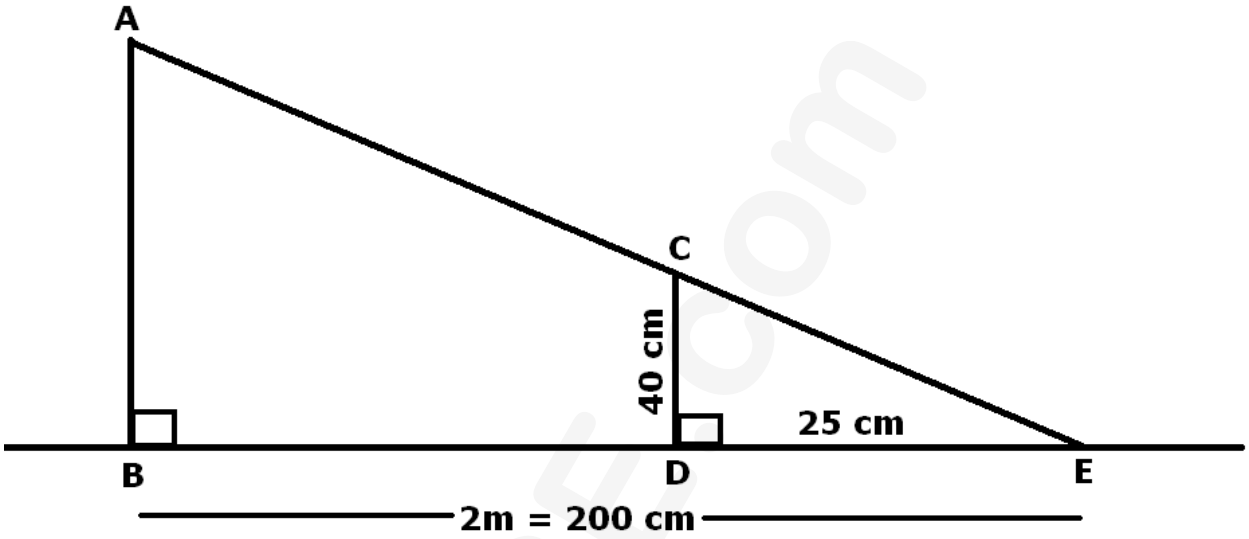
Therefore width of river = 12m


Tower
Shadow
Ruler

To find the height of a tower

Placed the ruler upright in the shadow of the tower, so that the ends of its shadow is at the same place as the ends of the shadow of the tower.

Knowing the relevant distance, the height of the tower can be estimated.


A
C
40 cm
25 cm
B
D
E
2m = 200 cm

Solution :

In ΔABE and ΔCDE

angle E = angle E (common)

angle B = angle D = 90°

∴ΔABE ~ ΔCDE

by AA corollary

$$\frac{AB}{CD} = \frac{BE}{DE}$$

(Corresponding parts of similar triangles)

$$\frac{AB}{CD} = \frac{200}{25} \quad \text{.....} \quad \text{(i)}$$

On measuring CD we get CD = 40cm

Substituting value of CD in (i)

$$\Rightarrow \frac{AB}{40} = \frac{200}{25}$$

$$\Rightarrow AB = \frac{200 \times 40}{25}$$

= 320cm

= 3.2m

∴ Height of tower = 3.2m

Conclusion

Thus we find that the geometry plays a very important role in our day to day life. Many examples involving different geometrical properties of triangles and circles could be examined. We can do lot of things which are impossible to measure for example:-

Measuring height of tree, height of building etc.

In particular, in the given project we discover situations in which properties of similar triangles learnt in the classroom are useful.