

APPLICATIONS OF TRIGONOMETRY

Activity – 9

1. What we have to do?

To measure the height of a tree using a clinometer .

2. What is required?

A clinometer, thread, measuring tape, geometry box, glue stick

3. Time required: 45 min

4. What do we need to know?

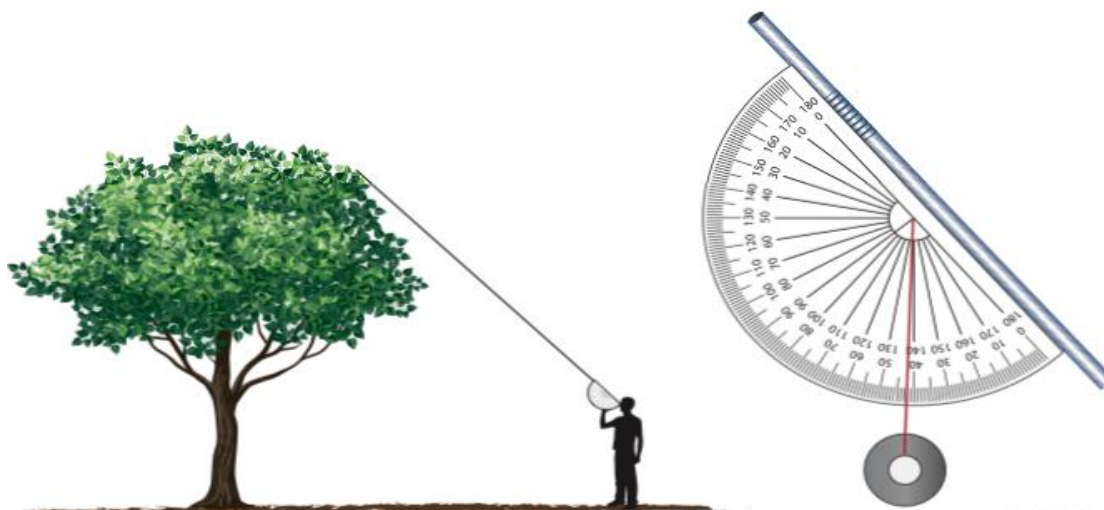
Properties of right angled triangle.

5. How will you proceed?

- 1) First measure the distance of the tree from you using a thread/ measuring tape. Let the distance be d.
- 2) Fix the Clinometer at the point of observation and look through the straw or pipe of the Clinometer at the top of the tree. Make sure you can clearly see the top of the tree.
- 3) Hold the clinometer steady and let your partner record the angle the string makes on the scale of the clinometer. Let this angle be θ .

$$\text{Using trigonometric ratio: } \tan \theta = \frac{\text{height}}{\text{distance}} = \frac{h}{d} \therefore h = d \tan \theta$$

- 4) Add the height at which the clinometer is kept to h obtained above to get the height of the tree.



6. What have you observed?

It is observed that on changing the distance of the object d (by either moving the object or by changing their position), angle of elevation θ will vary but the product $h = d \tan \theta$ will be _____ (within measurement error).

7. What have you learnt?

8. What would you be interested in doing?

Using clinometer measure the height of your school building.

Real Life Applications:

The above concept is used in various field such as Architecture, Surveying, Astronomy, Physics and Crime investigation.
