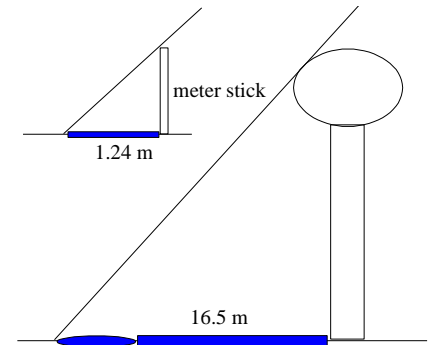


## (A) Heights Using Shadows

This technique creates two similar triangles because the angle of the sun is the same for both measurements.

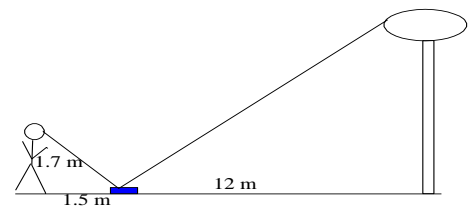
So in this case our ratio are:  $x \text{ m} : 1 \text{ m} = 16.5 \text{ m} : 1.24 \text{ m}$



## (B) Heights Using Mirror on the Ground

Again we create two similar triangles due to the reflection of light => angle in = angle out.

So our ratios are  $1.7 \text{ m} : 1.5 \text{ m} = x \text{ m} : 12 \text{ m}$

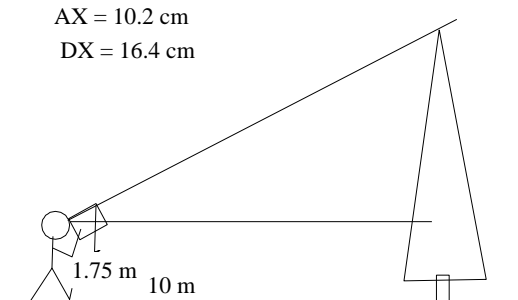


## (C) Heights Using a Hypsometer

We create a hypsometer using paper, string, weight & straw. Draw a diagonal and then sight the tops of objects. We mark the intersection point of the string and the diagonal thereby creating one of our triangles.

So now our ratio becomes

$$10.2 \text{ cm} : 16.4 \text{ cm} = x \text{ m} : 10 \text{ m}$$



## (D) Inaccessible Distances

We will line up a given point (C in the diagram) using 2 lines of sight → one is along line ABC and the other line of sight is along DEC. Since we cannot cross the obstacle (covered by triangle BEC), the only measurement that we can get is side BE. So additionally we measure AB and AD we can now create our ratios and proportions to solve for BC and

So our ratio is  $6 + x \text{ m} : x \text{ m} = 12 \text{ m} : 4 \text{ m}$

