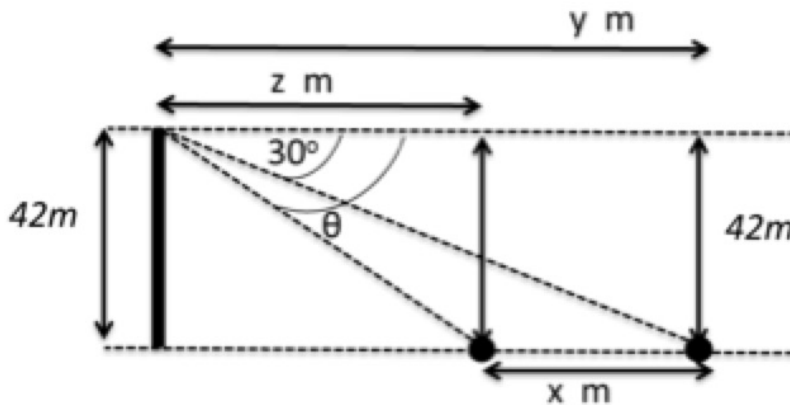


CLIFF RESCUE



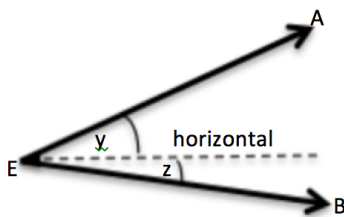
Two ships are heading towards a lighthouse, on the same path, one behind the other. From a height of 42 metre the closer ship can be observed at an angle of depression θ where $\tan \theta = \frac{4}{5}$ and the other ship at an angle of depression of 30 degrees. Draw a diagram.

How far are the two ships from each other?

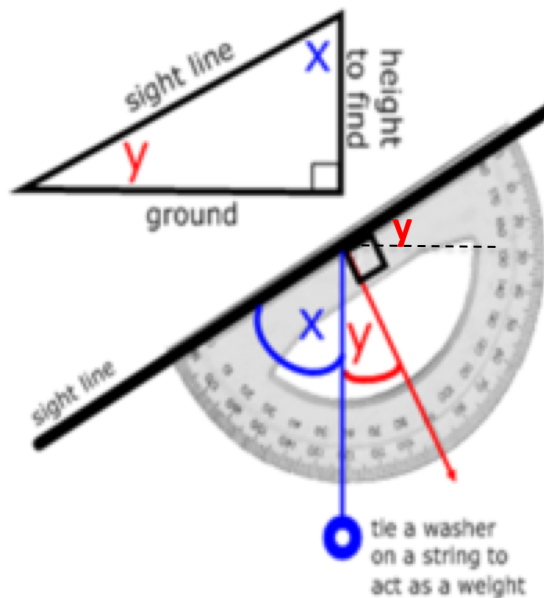
Help

You could make your own clinometers and do some projects.

Make your own clinometer to measure angles of elevation and depression



If an observer with her eye at E looks **up** to a point A, then the angle between the horizontal and EA, shown in the diagram as $\angle y$, is called the angle of elevation. Similarly if the observer looks **down** to a point B then the angle between the horizontal and EB, shown as $\angle z$, is called the angle of depression.



The diagram shows an instrument to measure these angles. It can be made simply and cheaply. To read the angles you need a protractor. To get an accurate vertical you need a weight (such as a heavy paperclip, a washer or a ball of plasticene) tied to a piece of string as the plumb line. To make the sight line use a drinking straw or stick.

If you hold the protractor with the 90° mark on the vertical the sight line is horizontal. You need two people to find the angle of elevation $\angle y$, one person holds the instrument to their eye looking at the object of interest through the straw along the line of sight. The other person reads the angle between the vertical plumb line and the 90° mark on the protractor. This is $\angle y$ equal to the angle of elevation.

Extension

Try the similar problem Cliff Rescue <https://aiminghigh.aimssec.ac.za/grades-10-and-11-cliff-rescue/>