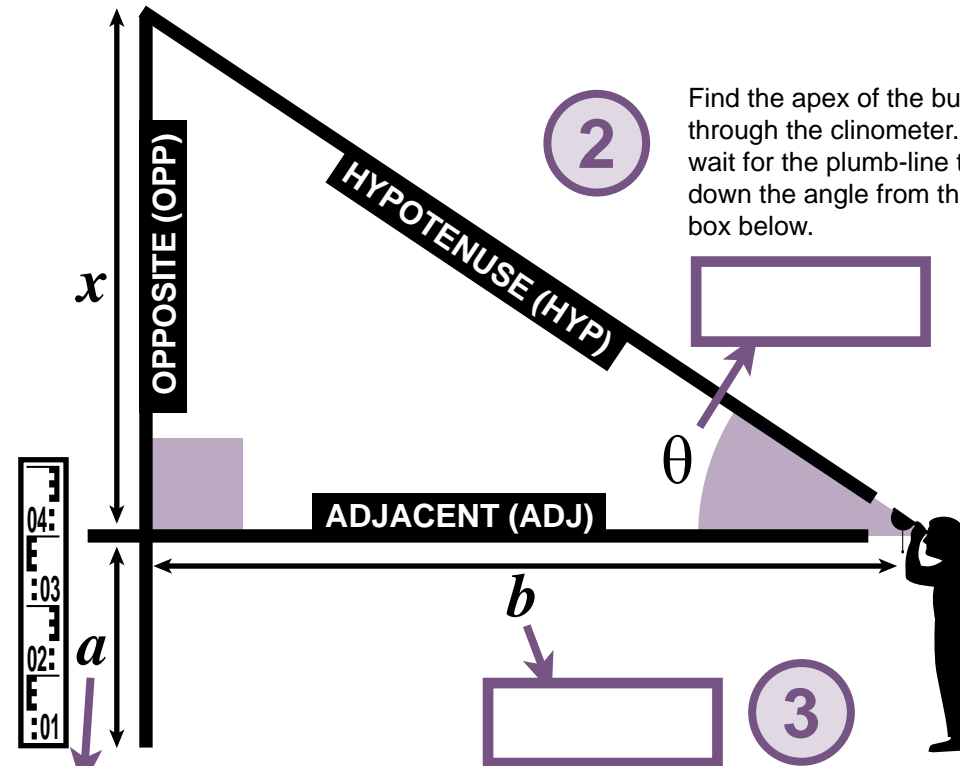


Calculating the height of a building

<http://www.virtualmaths.org/activities/shapes/theod2>

We're going to use a clinometer to find the total height of a building.
First assemble the attached clinometer and continue with this activity.



2

Find the apex of the building by looking through the clinometer. Once you've found it, wait for the plumb-line to settle and note down the angle from the clinometer in the box below.

3

Find an area on the ground directly beneath the plumb-line and mark it with an object, like a coin.
Now measure the distance between the marker and the building, and write the measurement in the box above.

1

Stand as far back as you need to, so you can clearly see the apex of the building.
Look through the clinometer at the levelling staff or measuring tape, **making sure the the angle on the clinometer reads 0**. Now take the reading and write it in the box above.

We know that...

$$\text{Tan } \theta = \frac{\text{OPP}}{\text{ADJ}}$$

We want to work out the height of **OPP**, so we need to make **OPP** the subject of the above equation.

We can do that by multiplying both sides by **ADJ**, which will cancel out the **ADJ** on the right side of the equation.

$$\text{ADJ} \times \text{Tan } \theta = \cancel{\text{ADJ}} \left(\frac{\text{OPP}}{\cancel{\text{ADJ}}} \right)$$

Now we have...

$$\text{OPP} = \text{ADJ} \times \text{Tan } \theta$$

So...

$$x = \text{ADJ} \times \text{Tan } \theta$$

What is **x** ?

.....

To find the height of the building, add **x** to height **a** that you found earlier

height =

Calculating the height of a building

DIY CLINOMETER



Things you'll need

- Some string
- A coin or similar weight
- Scissors
- Glue
- Adhesive Tape



1 Cut along the dashed line and separate the clinometer shape from this template sheet.



2 Carefully punch a hole at the center point of the protractor. Make sure the hole is just large enough to pass your piece of string through - the larger the hole, the less accurate the readings!



3 Now fold along the line that attaches the rectangle shape to the protractor, creating a hinge.



4 Apply some glue to the gray marked area and roll the rectangle to form your scope.



5 Apply some adhesive tape to the scope hinge to add strength



6 Cut off about a foot length of string and thread it through the hole you created earlier. Now take the length you passed through and tie some knots in it so its held in place and cant pass back through the hole



7 Take a coin or another weighted object and stick it with adhesive tape, to the other side of the string creating a plumb-line.

