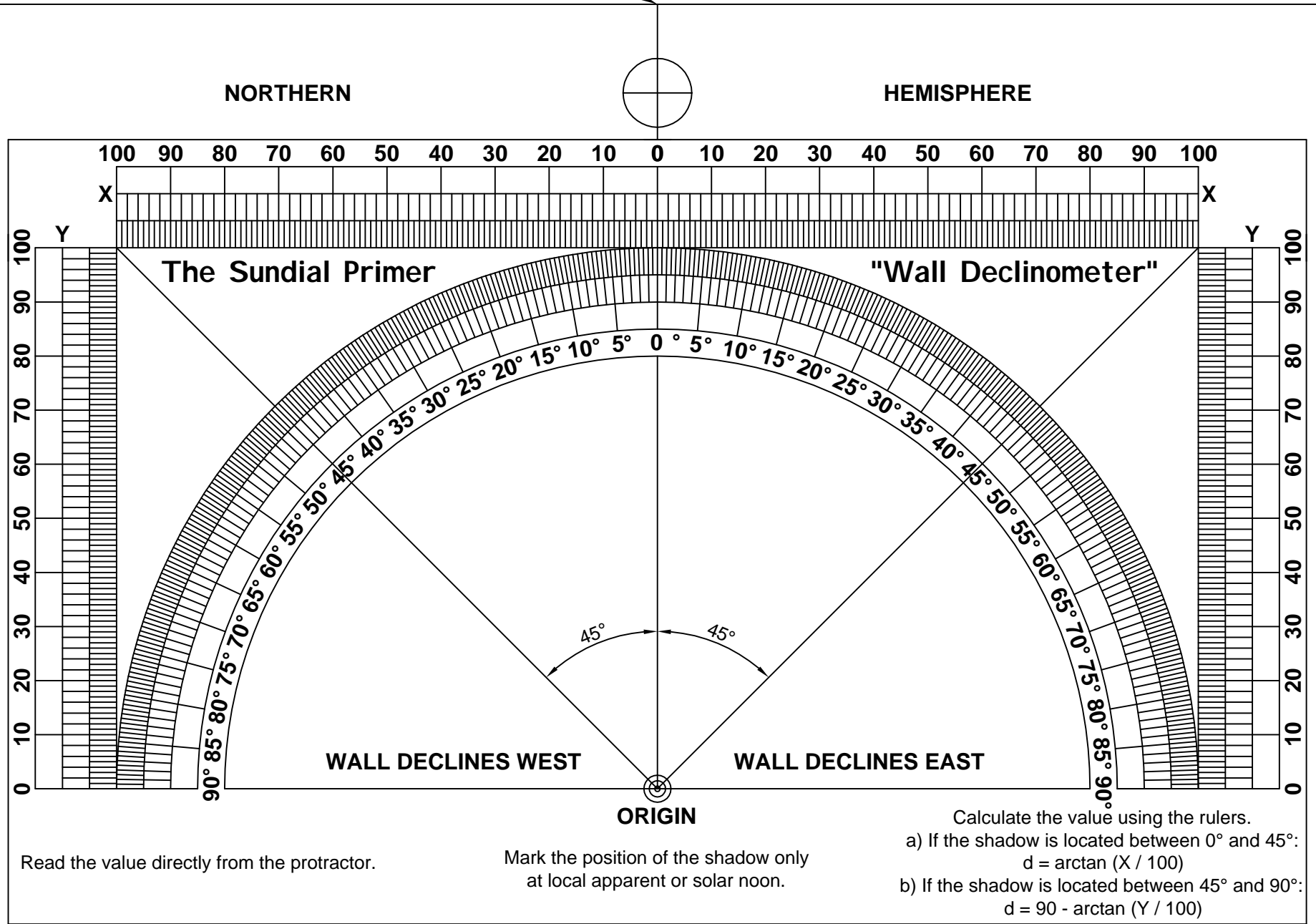


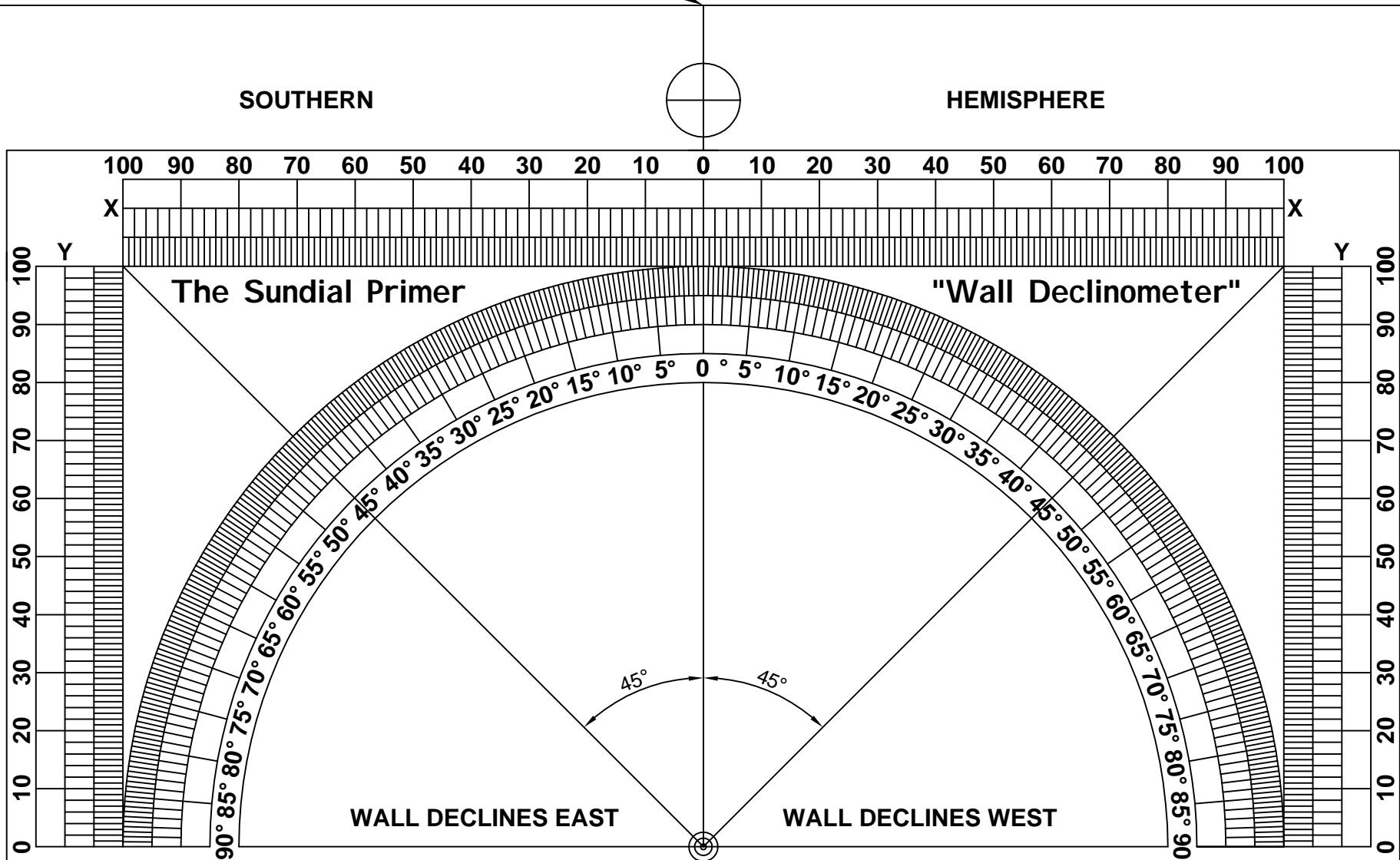
Cut the paper very carefully along this line.  
Place this edge on the factory cut edge of the styrofoam.

Attach velcro strip 5b to bottom side of styrofoam along this edge.  
Offset strip to allow for overhang due to suction cups.



Cut the paper very carefully along this line.  
Place this edge on the factory cut edge of the styrofoam.

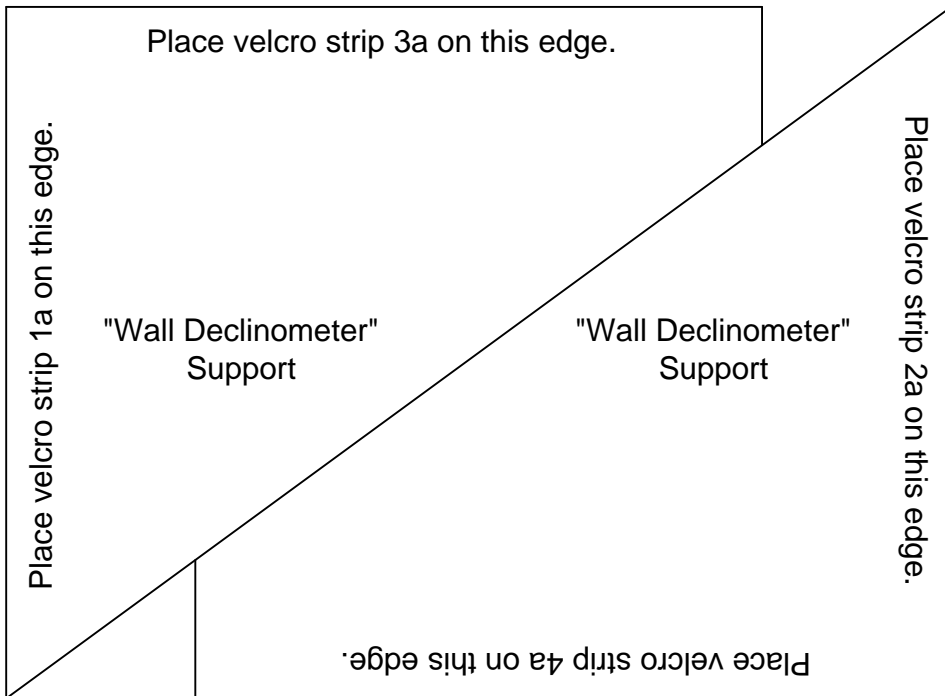
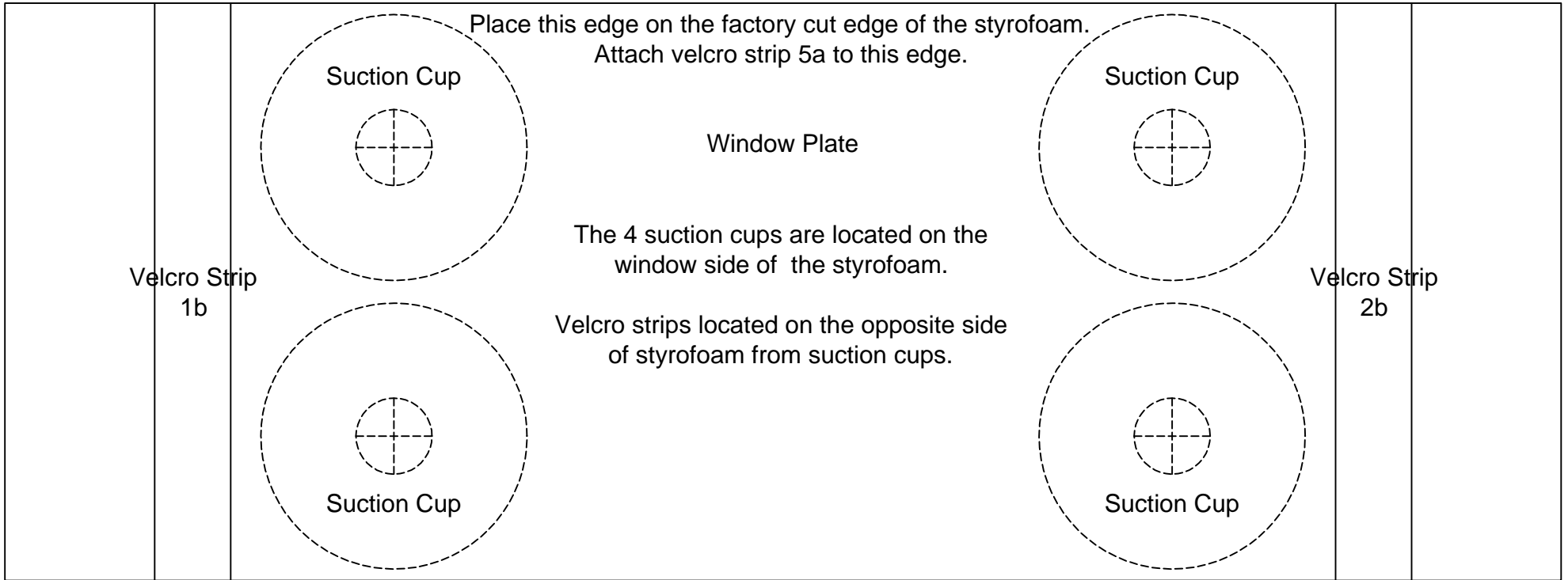
Attach velcro strip 4 to bottom side of styrofoam along this edge.  
Offset strip to allow for overhang due to suction cups.



Read the value directly from the protractor.

Mark the position of the shadow only  
at local apparent or solar noon.

Calculate the value using the rulers.  
a) If the shadow is located between 0° and 45°:  
 $d = \arctan (X / 100)$   
b) If the shadow is located between 45° and 90°:  
 $d = 90 - \arctan (Y / 100)$



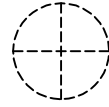
**"Wall Declinometer" Assembly Instructions:**

1. Print the "Wall Declinometer" on card stock and the remaining templates on regular paper.
2. Cut out all the templates taking care where noted.
3. Glue the "Wall Declinometer" template on to a piece of 1" inch styrofoam. Try to position the top edge on a factory cut. If this is not possible cut the styrofoam as squarely as possible. This is the edge that is positioned against the window.
4. Cut out the remaining styrofoam pieces using the templates. Try to position the top edge of the Window Plate on a factory edge. If this is not possible cut the styrofoam as squarely as possible. This is the edge that the "Wall Declinometer" Plate rests on.
5. Attach the suction cups to the window side of the Window Plate. Use a good adhesive to do this so the suction cups will not tear out easily.
6. Attach the velcro strips in the positions indicated. Remember to alternate the two halves of the strips. There are 5 sets of strips that will be attached to the various surfaces. One side of Velcros strips 6 and 7 will not be attached to anything but will be used to help hold the "Wall Declinometer" Plate to the Window Plate.
7. Drill a small hole at the origin through which the plumb line will pass. Do not drill at an angle. Make the hole the size of a small straw. To protect the hole line it with a piece of the straw.

Note: Test fit the pieces as the Velcro strips and suction cups are attached to make sure that they are positioned accurately and do not get in the way of each other during assembly. The Velcro does not need to be the full length shown but can be a number of shorter pieces.

Velcro Strip  
3b

Velcro strips shown here are located on the opposite side of styrofoam from the "Wall Declinometer" template.



Wood Dowel

"Wall Declinometer" Plate  
Bottom View

Velcro Strip  
4b

"Wall Declinometer" Assembly Instructions:

8. Insert and glue a 1/2 inch diameter wood dowel 1/2 inch long into the top surface of the "Wall Declinometer" Plate at the location shown. Drill a hole in the centre of the dowel large enough for a wire coat hanger to fit.

9. Cut a length of wire from a coat hanger, or other suitably stiff wire. Place a hook at one end and bend it towards the top so that when it is inserted in the dowel the hook will be roughly over the small hole drilled in the "Wall Declinometer" Plate. The total height of the wire should be about 12 inches.

10. Make up a plumb bob using a lead fishing weight and thin string such as dental floss. Other suitable materials can be used.

11. You are now ready to assemble the "Wall Declinometer" on a the outside of a window as shown below. Make sure to use a level. A string level will work.

12. Insert the wire into the dowel. Thread the string through the "Wall Declinometer" Plate. Attach one end of the string to the wire hook and the other to the weight. Adjust the wire so the plumb line passes through the origin.

13. You are now ready to use your "Wall Declinometer"!

