

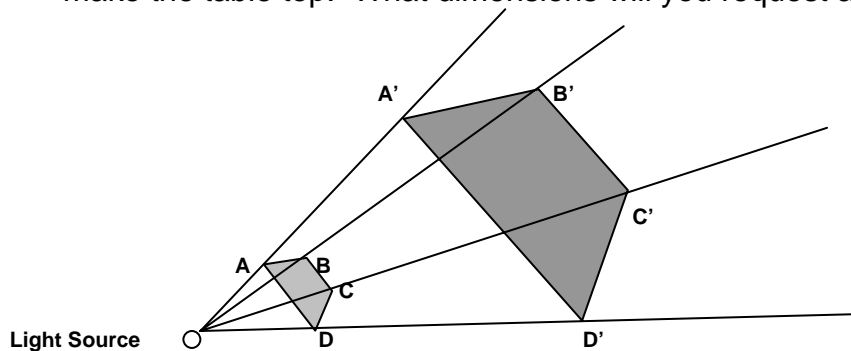
Shadows on the Wall



You may recall making “shadows on the wall” by holding your hand in front of a flashlight or other light source in a dark or dimly lit room as a child. These hand shadows were larger than one’s actual hand and the size of the shadow varied according to the distance from the light source. It was fun to make these shadows on the wall that had the same shape as the object held in front of the light source.

Now you have decided to use this same idea to make a design for a table top by holding a smaller image (template of the design) in front of a light source. You vary the distance from the light source until the shadow on the wall appears to be the right size. Since you have no way of tracing the shadow on the wall, you record measurements as shown in the diagram below.

1. Using the information given in the diagram, explain how to find the actual dimensions of the table top.
2. Suppose you go to your local home improvement store and ask the clerk in the lumber department to cut you a rectangular piece of furniture grade plywood with dimensions that require only two cuts to make the table top. What dimensions will you request and why?



This diagram is not drawn to scale.

The actual table top is represented by trapezoid A'B'C'D' in the drawing above.

The template for the table top design is represented by trapezoid ABCD.

Trapezoid ABCD is isosceles with $AB = 4$ inches.

$AA' = 7.5$ feet

$BC = \frac{3}{4} AB$

$OA = 18$ inches

$BC : AD = 1 : 2$