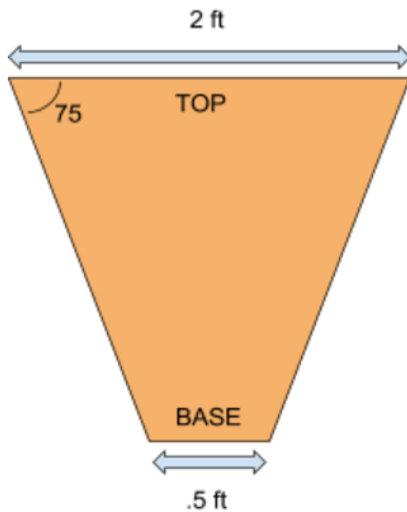


Arch Calculations Worksheet

- Given the shape of the block below, which is needed to construct a semicircular arch, how many blocks would you need to finish the arch? What would the inner radius of the arch be? What about the outer radius?
 - Note: Since the block shape being used is a trapezoid and does not have rounded edges, use the radii based on the center of the base and the top of the trapezoids for the calculations of inner and outer radius, respectively.
 - Remember that in order for the arch to be a perfect semicircle, the base and tops of the blocks coming into contact with the ground need to be perpendicular to the ground
 - Hint: Add a cut from the middle of the top to the middle of the base so that when it rests on its cut edge, the top and base are perpendicular to the ground.
 - Final thought: Calculating the dimensions of the arch is not supposed to be easy. Make sure you are extending edges and connecting them as well to form other shapes that will give you the information necessary to find the dimensions of the arch.



2. The blocks you will be working with for this next problem are perfect squares (cubes) rather than trapezoidal blocks. A block dimension is $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$ -inches. Do the same process as above, but for these square blocks, so that you can design a support bridge for your arches such as the one shown below, use 7 blocks since you will not be cutting the base blocks of the arch in half as you did when solving problem #1. Note that because you will not be cutting the blocks in half, the height of your support structure will be slightly larger than its base, meaning it will not be a perfect semicircle.

