

VOLUMES WITH KNOWN CROSS SECTIONS

Your objective is to solve for volumes with known cross sections. You will create three models of volumes with known cross sections to better visualize the shapes of the solids we're analyzing.

What You'll Need

- Protractor
- Compass
- Pencil
- Three sheets of printer paper
- Three sheets of card stock
- Tape or glue

Information

Region R is the area bounded by the equation $y = \sqrt{x}$, line $x = 2$ and the x -axis. The bases of the cross sections are perpendicular to the y -axis.

Region S is the area bounded by the equation $y = x^2$ and the line $y = 9$. The bases of the cross sections are perpendicular to the y -axis.

Region T is the area bounded by the equation $y = x^2$, the x -axis, and the line $x = 4$. Bases of the cross sections are perpendicular to the x -axis.

Determine the volume of the solids formed by the bases given above and the indicated cross-sections in the table below.

Cross Section	Region R	Region S	Region T
Squares (Formula: $A = \quad$)			
Semicircles (Formula: $A = \quad$)			
Equilateral Triangles (Formula: $A = \quad$)			
Rectangle, $h = \frac{1}{2}b$ (Formula: $A = \quad$)			

Construct the Solids

1. Accurately sketch the regions R , S , and T on three separate sheets of copy paper.
2. Choose three out of the four cross sections from the table to use for your model.
3. Use your protractor and compass to cut out shapes from the card stock that represent at least 10 cross sections of varying size. Be sure to measure the height of the graph in order to accurately cut the shapes.
4. Tape or glue cross sections onto the regions that you sketched.