Volumes of Known Cross Sections

Region A is the area bounded by $y = x^2$, and the line y = 9. Bases of cross-sections are perpendicular to the y-axis.

Region B is the area bounded by $y = \sqrt{x}$, the x-axis, and the line x = 9. Bases of cross-sections are perpendicular to the x-axis.

Region C is the area bounded by $y = x^2$, the x-axis, and the line x = 3. Bases of cross-sections are perpendicular to the x-axis.

Cross-Section	Region A	Region B	Region C
Squares			
Semicircles			
Rectangle w/ $h = \frac{1}{2}b$			
Isosceles right triangle w/ h = b			

Directions for making cross-section models

Sketch bounded area on graph paper. Bigger scale is NOT better. Foam sections stand up best if they are not tall. I used 1:1 scale. Cut out graph paper and glue it (standard Elmer's) to small rectangles of mat board (scraps from the art teacher.)

Use graph paper blocks to measure sides of cross-sections on craft foam sheets. Squares, rectangles and isosceles right triangles are fairly easy to cut out free-hand with edges measured and marked with a pencil. Semi-circles should be drawn on foam first. Use light colored foam so you can see the pencil marks. Use a stiff, standard pointed compass to draw the circles on the foam. Safety compasses do not work well – the foam is not stiff enough for them. Measure the radius for the compass on the graph paper and then draw the semi-circle on the foam. Cut out about 10 sections of each shape. I cut one for each square and an extra small one at 0.5.

Glue foam sections to graph paper with a hot glue gun. Apply glue to the bottom edge of the foam. Place on the lines of the graph paper base. Use tweezers for the small sections. Start with the smallest and work towards the largest. Place a paper plate under the glue gun to catch drips and protect the desk.