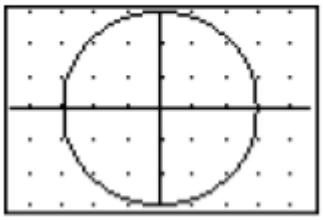
Calc AB NAME_____

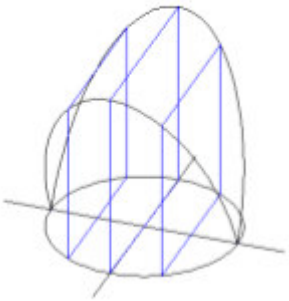
Notes Cross Sections (Section 7.2)

Volume of a solid by known Cross-Sections:

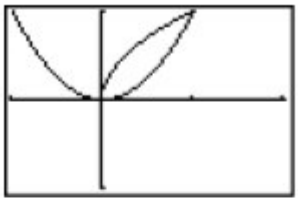
Using disks, washers and shells, volume is found by using a circular cross section on a solid of revolution. Not all solids, however, are generated by rotation. The volumes of these non-rotated solids can be found using known cross sections, like triangles, squares, ellipses, etc. Any geometric plane figure can be used as a cross section. The volume of these solids is found by integrating the area of the particular cross-section.

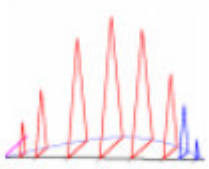
Ex1: Find the volume of the solid that has square cross sections perpendicular to the x axis whose base is bounded by the graph of $x^2 + y^2 = 9$.

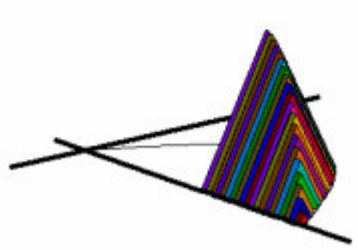




Ex2: Find the volume of the solid that has equilateral triangle cross sections perpendicular to the x axis whose base is bounded by the graph of $y = \sqrt{x}$ and $y = x^2$.







Ex3: *A* mathematician has a paperweight made so that its base is the shape of the region between the x axis and one arch of the curve $y = 2\sin x$. Each cross section cut perpendicular to the x axis is a semicircle whose diameter runs from the x axis to the curve. Find the volume of the paperweight.