Lesson #59B Name_____ Group:_____

Volumes with Cross Sections

Problems 1-3 are noncalculator, Problem 4 is calculator. Show all work for noncalc questions including adding fractions.

1. The base of a solid is the region in the first quadrant bounded by the graph of $y = 3x^{\frac{1}{2}} - x^{\frac{3}{2}}$ and the x-axis. Cross sections perpendicular to the x-axis are isosceles right triangles, with one leg in the xy-plane. What is the volume of the solid?

2. The base of a solid is the circle centered at the origin with a radius of 3 inches. Find the volume of the solid if all cross sections perpendicular to the x-axis are equilateral triangles.

3. The base of a solid is the region bounded by the graphs of $x^2 = 16y$ and $y = 2$. Cross sections perpendicular to the x-axis are rectangles whose height is twice that of the side in the xy-plane. Find the volume of the solid.

3. 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 perpendicular to the x-axis is a semicircle whose diameter runs from the x-axis to the curve. Find the volume of the paperweight.