

Name: _____

AP Calculus – Volume or Cross Sections Practice

1. Find the volume of the solid whose base is the region bound by the curves $y = x^2$ and $y = 8 - x^2$, and whose cross sections are perpendicular to the x -axis are

- (a) Squares (b) Semicircles

2. Let R be the region bound by the graphs of $y = \frac{1}{\sqrt{x}}$ and the $y = 0$ for $4 \leq x \leq 9$. Find the volume of the solid whose base is the region R and whose cross sections are perpendicular to the x -axis equilateral triangles.

3. Let f and g be the functions given by $f(x) = 2x(1 - x)$ and $g(x) = 3(x - 1)\sqrt{x}$ for $0 \leq x \leq 1$. Find the volume of the solid whose base is the region bounded by f and g and whose cross sections are perpendicular to the x -axis are quarter circles.

4. Let R be the region enclosed by the graphs of $y = e^x$, $y = x^3$, and the y -axis.

(a) Find the area of R .

(b) Find the volume of the solid with base on region R and cross sections perpendicular to the x -axis. The cross sections are triangles with height equal to three times the length of their base.

(c) Find the volume of the solid with base on region R and cross sections perpendicular to the y -axis. The cross sections are rectangles with height equal to six times the length of their base.

5. Consider the region bounded by the graph of $f(x) = \ln x$, and the lines $x = 5$ and $y = 0$.

(a) Find the area of this region.

(b) Find the volume of the solid with cross sections perpendicular to the x -axis if the cross sections are semicircles.

(c) Find the volume of the solid with cross sections perpendicular to the y -axis if the cross sections are equilateral triangles.