

## Volumes: Integrating Cross-sections- HW Problems

1. Find the volume of the solid whose base is the disk in the  $x$ - $y$  plane bounded by  $x^2 + y^2 = 9$  and whose cross sections when sliced by a plane perpendicular to the  $x$ -axis are
  - a. squares
  - b. semicircles
  - c. equilateral triangles.
  
2. find the volume of the solid whose base is the region in the  $x$ - $y$  plane bounded by  $y = 4 - x^2$  and the  $x$ -axis and whose cross sections when sliced by a plane perpendicular to the  $y$ -axis are
  - a. squares
  - b. isosceles right triangles with the hypotenuse in the base.

Find the volume of the solid obtained by rotating the region bounded by the curves below about the given line.

3.  $y = 1 - x$ ,  $x = 0$ ,  $y = 0$ , about the  $x$ -axis
4.  $y = x^2$ ,  $y = 4$ ,  $x = 0$ , about the  $x$ -axis
5.  $y = x^2$ ,  $y = 0$ ,  $x = 2$ , about the  $y$ -axis
6.  $y = e^x$ ,  $x = 0$ ,  $x = 1$ ,  $y = 0$ , about the  $x$ -axis
7.  $y = x^2$ ,  $y = \sqrt{x}$ , about the line  $y = -2$
8.  $y = x^2$ ,  $y = \sqrt{x}$ , about the line  $x = -1$

9.  $y = \cos(x)$ ,  $y = \sin(x)$ ,  $x = 0$ , about the line  $y = 0$
10.  $y = \cos(x)$ ,  $y = \sin(x)$ ,  $x = 0$ , about the line  $y = 2$ .