

Math 1710 Tutorial 3. Volumes

In Problem 1, *suggested* method is the Washer method, and in Problem 2, *suggested* method is the Shell method. However, you may choose both methods to solve these problems if possible.

Problem 1. Find the volume of the solid obtained by rotating the region bounded by the given curves about the specified line.

- (a) $y = 2 - |x|$, $y = 0$; about the x -axis.
- (b) $y = \frac{2}{x}$, $y = 0$, $x = 1$, $x = 4$; about $y = -1$.
- (c) $y = x^{2/5}$, $x = 1$, $y = 0$; about the y -axis.
- (d) $y = \ln x$, $y = (x - 1) \ln 2$; about $x = -1$ (verify that the x -coordinates of the points of intersection of the two curves are $x = 1$ and $x = 2$).
- (e) $y = \sqrt{\sin x}$, $y = \frac{1}{\sqrt{2}}$, $0 \leq x \leq \pi$; about the x -axis.

Problem 2. Find the volume of the solid obtained by rotating the region bounded by the given curves about the specified line.

- (a) $y = \sqrt[3]{x}$, $x = 8$, $x = 0$; about the x -axis.
- (b) $x = (y - 2)^2$, $y = x$; about $y = -1$.
- (c) $x + y = 4$, $y = 2\sqrt{x - 1}$, $y = 0$; about the x -axis.
- (d) $xy = 9$, $x + y = 10$, $x = 3$ (larger region); about $x = -2$.