

Volumes of Solids of Revolutions
A Mathematica-Based Calculus Lab
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For questions 1 to 5, do the following.

- (a) Sketch the region enclosed by the given curves *and* the solid generated by rotating this region about the specified line.
- (b) Run the corresponding section of `volumes.nb` to check your sketches.
- (c) Find the volume of the solid generated.
 1. $y = \sqrt{x-1}$, $x = 2$, $x = 5$, and $y = 0$; about the x -axis
 2. $y = \sec x$, $y = 0$, $x = -1$, $x = 1$; about the x -axis
 3. $y = \frac{1}{x^2}$, $y = 0$, $x = 1$, $x = 3$; about $y = -1$
 4. $y = x$, $y = \sqrt{x}$; about $x = 2$
 5. $2x + 3y = 6$, $(y - 1)^2 = 4 - x$; about $x = -5$
(Don't evaluate the integral by hand. Instead, set up the correct integral, open <http://mss.math.vanderbilt.edu/~pscrooke/toolkit.html>, and use the Definite Integrals tool.)
 6. Find the volume of a frustrum of a right circular cone with height h , lower base radius R , and top radius r .
(Try this on your own first. If you get stuck, run the Question 6 section of `volumes.nb`.)