

Textbook problems from Stewart *Calculus*, 7th edition.

- §5.2: 2, 3, 7, 14
- §5.3: 5, 8, 15, 16
- §10.1: 5, 7, 11, 15
- §10.2: 4, 34, 42, 62, 66

Supplementary problems:

1. Consider the region bounded by $y = \frac{1}{x^2 - 4}$, the x -axis, the y -axis, and the line $x = 1$. Find the volume of the solid obtained by revolving this region around the line $x = 1$.
2. Consider the region bounded by $y = \ln x$, the x -axis, and $x = 2$.
 - (a) Find the volume obtained by revolving this region around the x -axis.
 - (b) Find the volume obtained by revolving this region around the line $x = 2$.
3. Consider the region bounded by $y = \sin x$ and the x -axis, between $x = 0$ and $x = \pi$. Find the volume of the solid obtained by revolving this region around the x -axis.
4. Consider the region bounded by $y = e^{-x^2}$, $x = -1$, $x = 1$, and the x -axis.
 - (a) Write an integral to express the volume of the solid obtained by revolving this region around the x -axis (you do not need to evaluate the integral).
 - (b) Express the value of this integral as the sum of a series.
 - (c) Using the alternating series estimation theorem (ASET), estimate the volume of this solid to within 0.001.