

Calculus Project

Volumes of Solids with Known Cross Section

Make a physical model of a solid with a known cross section on a base with a standard function. The following guidelines apply:

- 1) The base function(s) can be any non-linear function except a parabola, square root, or absolute value. (If using 2 functions, the 2nd can be any of your choice).
- 2) The cross section can be any shape except a square. (If using multiple cross sections, the 2nd can be any cross section).
- 3) The materials can be no thicker than 0.25". Your model must be at least 6 inches long and have at least 24 laminations.

Your presentation must have the following information:

- 1) A description of the functions used.
- 2) An explanation of what the cross section looks like.
- 3) The computed volume for each slice using a Riemann Sum.
- 4) The total volume of the slices in your model.
- 5) The theoretical volume as defined by a definite integral. If your problem is not integrable, you may use the Numerical Integration feature of your calculator.

Scoring:

- 1) Difficulty of the function and cross section used – 20 points
- 2) Neatness and appeal of your model – 10 points
- 3) Presentation of the information and calculations – 20 points

Those projects showing extra effort and performance can earn extra-credit points.