

## Mathematics 1110H – Calculus I: Limits, Derivatives, and Integrals

TRENT UNIVERSITY, Summer 2025 (S62)

### Assignment #5 – A Solid of Revolution

*Due on Friday, 25 July.\**

Consider the region between  $y = \sin(x)$  and  $y = -\sin(x)$ , where  $0 \leq x \leq 2\pi$ .

1. Sketch or plot this region. [1]
2. Find the area of this region. [2]

Consider the solid obtained by revolving the given region about the  $y$ -axis.

3. Sketch or plot this solid. [1]
4. Compute the volume of this solid using the cylindrical shell method. [4] em5. Compute the volume of this solid by hand without using calculus. [2]

HINT. See the end Section 9.3 of the textbook for an example of this method. There are also a number of examples among the work with solutions on the archive page.

5. Compute the volume of this solid by hand without using calculus. [2]

HINT. You are allowed to look things up ...

### Last Things First

Solutions to problems

are easy to find:

the problem's a great  
contribution.

What is truly an art

is to wring from your mind  
a problem to fit  
a solution.

*Another Grook by Piet Hein.*

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\* You should submit your solutions via Blackboard's Assignments module, preferably as a single pdf. If submission via Blackboard fails, please submit your work to your instructor by email or on paper. You may work together and look things up, so long as you write up your submission by yourself and give due credit to your collaborators and any sources you actually used.