

Mathematics 1110H (Section A) – Calculus I: Limits, Derivatives, and Integrals  
TRENT UNIVERSITY, Fall 2024

Quiz #10  
Crank up the volume!  
Wednesday, 27 November.\*

No restrictions on the methods you are allowed to use to solve the following problems, but whichever you choose, please show all your work!

Consider the region between  $y = \sin(x)$  and  $y = -\sin(x)$ ,  $0 \leq x \leq \pi$ , and the solid obtained by revolving about the line  $y = -1$ .

1. Sketch the region. [0.5]
2. Find the area of the region. [1]
3. Sketch the solid. [0.5]
4. Find the volume of the solid. [3]

Sing me a song of the hydrogen light  
Three degrees Kelvin illumine the night  
Three degrees Kelvin, the infrared sky  
Colors too deep for the unaided eye  
Sing me a song of the hydrogen band  
Whispering low since the cosmos began  
Whispering low as the white light shifts red  
Wavefronts of hydrogen sweeping ahead  
Sing me a song of the hydrogen wall  
Vector me out to that light bounding all  
Vector me out in that glory to dwell  
End of the universe, cosmic eggshell.

By John M. Ford, from his novel *Princes of the Air*.

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\* Please submit your solutions, preferably as a single pdf, via Blackboard's Assignments module before midnight. If that fails, please submit them to the instructor on paper or via email to [sbilaniuk@trentu.ca](mailto:sbilaniuk@trentu.ca) as soon as you can.