

Part I (due at the beginning of class Wednesday, September 2)

In OpenStax *Calculus Volume 2*, read the first part of [Section 2.2: Determining Volumes by Slicing](#), stopping when you get to the heading “Solids of Revolution.”

Remember that what you record for Part I should have 3 parts, as mentioned in the syllabus:

- (a) Your responses to the reading questions below.
- (b) Your own questions/comments on the reading.
- (c) The amount of time you spent on Part I (including the time spent reading).

Reading Questions

1. Choose an object from your living space. Sketch a picture of the object. Write down what the object is and then describe the shape of a cross section of that object (feel free to sketch it) if you sliced the object vertically and what a cross section would look like if you sliced the object horizontally.
2. How is the slicing method for finding the volume of a solid related to using Riemann sums for finding the area of a 2-dimensional region?
3. In the solution to Example 2.6 (Deriving the Formula for the Volume of a Pyramid), what fact about similar triangles is being used?

Part II: Exercises (prepare for class Wednesday, September 2)

Problem 2 parts (c) and (d) on the Inverse Hyperbolic Functions handout. A hint for (c): $9x^2 = (3x)^2$. A hint for (d): $x^2 - 4 = 4 \left(\frac{x^2}{4} - 1 \right)$.

Part III: Homework Problems (due Wednesday, September 2 at the beginning of class)

Review the guidelines in the syllabus for Part III questions and make sure to follow them when writing your solutions.

1. Following the same process we used to find the derivative of $\sinh^{-1} x$, find the derivative of the inverse trigonometric function $\arctan x$.
2. Find the following.

(a) $\frac{d}{dx} (\operatorname{csch}^{-1}(e^x))^4$

(b) $\int \cosh(2x)(\sinh(2x))^2 dx$

(c) $\int e^{-x} \sinh x dx$ (Hint: remember the definition of $\sinh x$.)

Recall that on Wednesday, you should be turning in Part III problems from Daily Works 1, 2, and 3.

Colloquium Reminder

Math and Science Colloquium is on (most) Tuesdays from 11:30–12:20 in the South End Dining Hall. On Tuesday, September 1, Professor Eli Knapp and I will give a brief recap of our sabbaticals in Spring 2026 and answer questions about our sabbaticals and sabbaticals in general. You are welcome to come, and if you do come and write a paragraph about what you learned and what was surprising to you, you can earn an extra token.