Scavenger Hunt of Textbook

Goal is to practice reading a math textbook and understand concepts from that reading. I suggest reading page 885-887 alone, then complete the scavenger hunt below with groups.

1. Draw a picture of volume under a surface

    a. How is this different from area under a curve in single variable calculus?

2. List the steps to defining a double integral?

3. Draw a picture of the process you defined above.

4. Write the Riemann sum of the area under a surface.

5. What is the volume of one cube under the surface?

6. Describe the final step in defining the double integral.

7. Write the definition of the Double Integral over a Rectangle:

8. How do we partition x and y into regular subintervals?

9. Example 1 (pg. 888): Let $R = [1, 2.5] \times [1, 2]$. Calculate $S_{3,2}$ for the integral

   $\iint\limits_{R} xy \, dA$ of the graph of $z = xy$ using the following two choices of sample points:

   a. Lower-left vertex   b. Midpoint of rectangle

10. Example 2 (pg. 888): Use geometry to evaluate $\int\int_R (8 - 2y)dA$, where

   $R = [0, 3] \times [0, 4]$.

11. Theorem 1 states:

12. What are the two properties of double integrals:

   1.

   2.

It is a good practice to use other resources to help understand concepts after working with the textbook explanation. Some resources include:

- Youtube Video: Defining Double Integration with Riemann Sums | Volume under a Surface
  https://www.youtube.com/watch?v=JXh9AQkKmsw&list=PLHXZ9OQGMqxc_CvEy7xBKRQr6I214QJcd&index=25

- Pauls Online Notes: Double Integrals
  https://tutorial.math.lamar.edu/classes/calciii/DoubleIntegrals.aspx