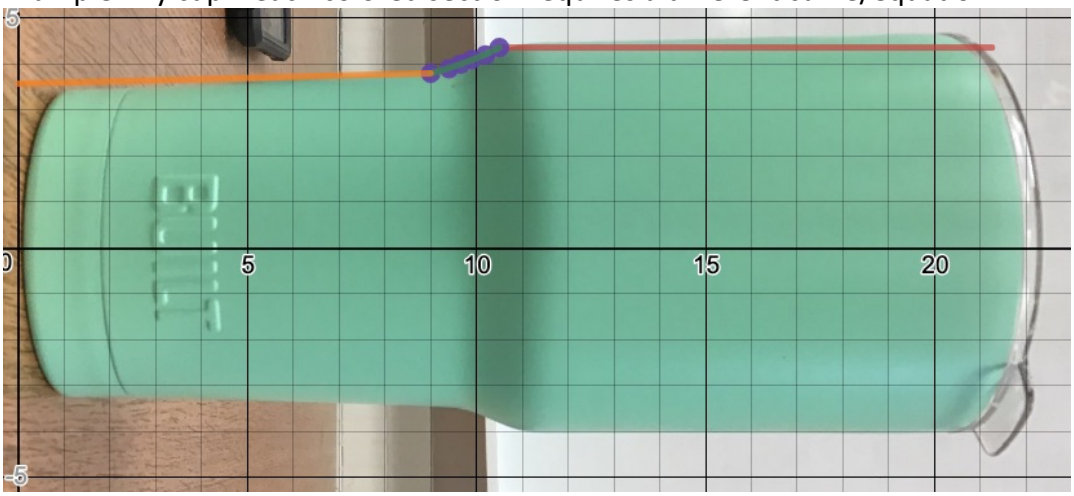
Calculus
Volume (Disc Method) Project

Your task is to use your newly acquired volume skills to find the volume of a real-life object.

Step 1: Find an object with a circular cross section.

- Your object's profile must require at least three different functions to model.
  Example: my cup – each colored section requires a different curve/equation.



- Your object's outline must include at least two functions that are not horizontal or vertical lines.
- All objects must be approved by Ms. McNabb (it can't be too easy).

Step 2: Modeling your object's outline.

- Photograph your object and measure its height/width **carefully**.
- Open the Desmos App (sign in), and insert your photo. Position it the way you think it would be easiest to find the volume, and size it so that the real-life dimensions match the scale on the axis.
- Write functions to match your object's outline. You may plot ordered pairs and use regression to get an accurate polynomial function to match (I will show you how).
- **Save** your work!

Step 3: Calculate the volume using calculus!

- Write down your integral, antiderivative, and result for each function.
- Include units on your answers.
- You may use Wolfram Alpha for the antiderivative and evaluating the integral.

Step 4: Summarize/explain.

- Make a document Keynote, Pages document, or video summarizing your work.
  It must include:
  - A photo of your object
  - A screenshot of your Desmos model (and a link to your graph)
  - The equation of your piecewise function

- Your integrals, clearly explained with work shown
- Your total volume -- if possible, compare your calculated volume to the actual volume. Identify and describe possible sources of error.