Finding Volume

Write your name somewhere on the cardboard. Don’t write it too large; I plan to use these each year! ☺

Lightly tape the flat shape on graph paper. Create your own axes and be strategic where you place the solid to make life easier. Trace the outline of the shape (the tissue paper outline, not the cardboard.)

Divide the graph into sections that would best represent individual functions. You must have at least 3 different functions, but most of you will need MANY more than 3. After you have divided it into sections, get Miss Daniels’ initials. \_\_\_\_\_\_\_\_\_\_\_

For each different section, you will follow the set of steps below:

(For your calculator to do this properly, you need to go to the catalog and find “DiagnosticsOn”, presss ENTER. “DiagnosticsOn” will then appear on your main screen; press ENTER again.)

Pick specific points on your graph that fall on the line. You must have at least 10 points per section.

In your calculator, put all the x values of your points in List 1. Put all your y values in List 2. Keep them in order!

Next, we need to find what function is best represented by the points. On your calculator, press the STAT button and then move over one to the right for the CALC menu. #4 should say LinReg(ax + b). Press Enter, then press 2nd 1, next comma, next 2nd 2, then ENTER. This puts both of your lists into the regression. You will then have the variables that make up an equation. Check the “r” value to see how strong of a fit this is. The closer r is to 1 or -1, the better.

You need to also do a regression with this set of points for a QuadReg, CubicReg, QuartReg and SinReg. You may use some of the other options too if you think they may work better (LinReg (a + bx), LnReg, ExpReg, PwrReg, etc.) These are found in STAT🡪 Calc 🡪 #4-0 and letters A-C. Fill in the chart with your findings, and choose the function that has the highest correlation with regards to the “r.”

After determining the best function, set up a proper volume integral (shell, disk, washer) for each section. Fill in the chart with the volume of each section, then add together to get total volume.

Then, you need to think of a way to present your findings and final volume to the class. This should be in a mini presentation that last 3 – 5 minutes. You have a lot of freedom in this, but do something that makes Miss Daniels proud! ☺