2.7 – Optimizing Surface Area Using a Spreadsheet

A container is being designed with a **volume of 500 cm³.** What are the dimensions of the container with the <u>minimum</u> surface area? The container could be either a rectangular prism or a cylinder.

1. Copy the information from the table on P.115 into Sheet 1 **exactly** as it appears. Be **extremely** careful with the equations
   a. ^ can be inputted by hitting Shift and 6
   b. * can be inputted by hitting Shift and 8
2. **Fill Down** by grabbing the little black box at the bottom of cell A5 and fill to A23.
3. **Fill Down** for the other columns as well (to B23, C23, and D23).
4. Use the **Chart** feature to create a **Scatter Plot of length vs. surface area**. Use the 'Smooth Lines' feature, and be sure to include a title and labels for both axes.
5. Copy the information from the table on P.116 into Sheet 2 **exactly** as it appears. Be **extremely** careful with the equations.
6. Repeat steps 2-4 to create a Scatter Plot for the cylindrical information as well.

QUESTIONS: (NOTE: All questions are to be answered in Sheet 3 of your file)
FROM RECTANGULAR PRISM (Sheet 1)
1. What are the approximate dimensions of the rectangular prism with the minimum surface area?
2. What is the approximate surface area using the minimum dimensions?
3. Describe the shape of your graph.
4. How does the graph show which edge length will produce a rectangular prism with the least surface area?

FROM CYLINDER (Sheet 2)
1. What is the initial radius of the cylinder?
2. By what increment does the radius increase?
3. Describe the shape of your graph.
4. How does the graph show which radius will produce a cylinder with the least surface area?

****NAME YOUR FILE LIKE THIS: Chris Verberne Surface Area, using your name(s)****

Submit your file to the BlackBoard page for this class (follow instructions from me at the end of the period).

HOMEWORK: (Not submitted with file**)**

P. 118 # 11a-b, 12a (just rectangular prism and cylinder), b