Design a proposed Pepsi can (modeled by the right cylinder shown below) to hold **12 fluid ounces (21.65 in^3)**. Solve for and identify the can dimensions (in decimal inches) that minimize the use of aluminum for the sides and top/bottom of the can. Solve this problem graphically (using MS Excel) by plotting the can surface area as a function of the can radius. Use this graph to identify the radius which minimizes aluminum usage.

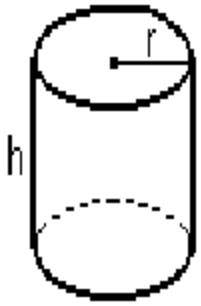
Important / relevant equations:

Volume: $\pi \cdot r^2 \cdot h$

Lateral surface area: $2 \cdot \pi \cdot r \cdot h$

Entire surface area: $2 \cdot \pi \cdot r^2 + 2 \cdot \pi \cdot r \cdot h$

From Google: $12 \cdot fl\_oz = 21.656 \cdot in^3$



Create a quality word processed document which:

Explains your design process.

1. Showns / explains all mathematical formulas and derivations.
2. Includes an MS Excel graph that shows how surface area changes as a function of can radius.
3. Identifies on the graph the optimal solution radius and/or height.
4. Explicitly states the optimal can height and radius and the number of square inches of aluminum each can will utilize with the optimal design. All dimensions to be stated in inches accurate to 2 decimal places .
5. Measures the present dimesions of existing 12 oz Pepsi cans.
6. Explains why knowing the optimal can design is so important.
7. Explains why PEPSI may have chosen not to manufacturer cans in the optimal designed dimensions (that typically DO NOT minimize aluminum usage).

Hand writing of any type is not permitted.

Label your MS Word document as follows: **CanLab-LastName.docx**
E-mail the file as an attachment to **mheinen_1@msn.com**

Due Date: Midnight, Monday, May 26th, 2014