

Project 1: Goblet Design

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Preparation

Be sure to read the *Project Report Guidelines* before beginning your project. Remember, you are to turn in a neat and complete project report typed in Microsoft Word (or a similar software). Any figures should have a title and a legend and be properly referenced in the report. A complete project report should include all necessary equations and information.

Instructions

You have been hired by a private company overseas to design the most visually appealing goblet that meets the following criteria:

- the goblet will be molded using a symmetric mold, that is, the goblet must be a solid of revolution;
- the goblet must hold between 177 cm^3 and 237 cm^3 (6-8 ounces) of liquid and use less than 200 cm^3 of glass;
- the height of the center of mass must be less than 3 times the radius of the foot so the goblet will be reasonably stable;
- thickness of the glass must be at least 0.25 cm at its thinnest point.

Your report is due at the beginning of the next lab meeting and should follow the guidelines set forth in the *Project Report Guidelines* document on our lab web page. In particular, your report should include the following:

- a detailed description of your design.
- a (2-D) plot of the region to be revolved and a (3-D) plot of the goblet
- detailed numerical results showing that the criteria are satisfied.
- use the scale that one unit on the x or y -axis is 1 cm

Acknowledgment

- This project is based on a project created in the Department of Mathematics at Kenyon College.
- The best design from each section and an over-all winner will be selected.