

Calculus II Project 1:

3D Printed “Goblet” Project Requirements

1. Your Name
Your Section
Title for Your Project
Introduction explaining what you are doing.
2. > restart;
> with(plots):with(plottools):
3. Commands to make a 2D plot of a section thru your goblet.
Suppress all output except the final plot.
Include code documentation.
4. Commands to make a 3D plot of your goblet.
Suppress all output except the final plot.
Include code documentation.
5. Commands to export the plot as a .stl file for 3D printing. For example
> yourfile:=FileTools:-JoinPath([currentdir(), "Your_Name.stl"]);
> plottools[exportplot](yourfile,your3dplotname);
6. Compute volume of liquid held in your goblet.
Include an explanation of the math.
7. Compute volume of material to make your goblet.
Include an explanation of the math.
8. Compute 1st moment of your goblet.
Include an explanation of the math.
9. Compute the centroid of your goblet.
Include an explanation of the math.
10. Construction Requirements:
 - a. The goblet must hold between 4 in^3 and 6 in^3 of liquid
 - b. The material of the goblet must be at least $\frac{1}{8}$ in thick at all parts.
 - c. The height of the center of mass must be at most twice the radius of the base.
 - d. Assume 1 unit in maple is 1in.
11. Documentation Requirements:
 - a. Your code output should include displayed integrals followed by the value.
 - b. You must explain your computations in your own words.
12. Submission Requirements:
 - a. Email the Maple file and the .stl file to Dr. Yasskin.
 - b. Print the Maple file and turn in to Dr. Yasskin.
13. Grading: 40% Math, 40% Maple, 20% Documentation
14. Please make 2 copies of the 3D printed goblet, one for you and one for me.
This is a request not a requirement.

Acknowledgements:

This project is based on projects used at Kenyon College and the University of South Carolina.