Development Office
Ida Magin University
April 20, 2011

Math 111 Students
Kenyon College
Gambier, OH 43022

Dear Calculus Students:

After months of diligent work, I finally earned a promotion to Vice President for Development here at Ida Magin University. I'm very proud of my fund-raising accomplishments, but sometimes the gifts come with very strict limitations on how they can be used. We just received such a donation, and when I went looking for help, your enterprising and resourceful professor naturally referred me to you.

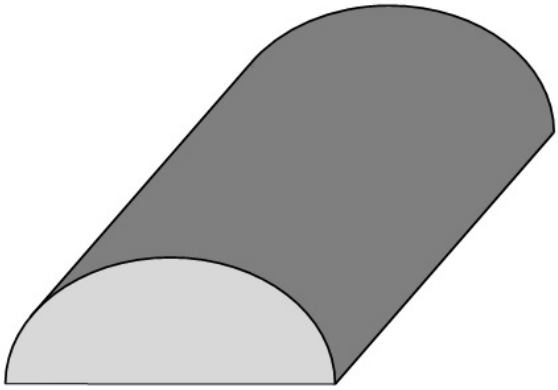
We have a somewhat eccentric alum who has made a major contribution in memory of his favorite Chia Pet Airplane that recently passed away in a bizarre gardening accident (it's best we not discuss the details). As a fitting tribute to the dearly departed, the donor has designated that the funds be used to build a dorm in the shape of an airplane hangar, as shown below. There is an additional stipulation on the gift: the volume of the dorm must be *exactly* 225,000 cubic feet, which is one cubic foot for each sprout on the Chia plane.

We're in the planning stages with the architects now, and we would obviously like to minimize the cost of the building. This is where I need your help. Currently, the construction costs for the foundation are \$30 per square foot, the sides cost \$20 per square foot to construct, and the roofing costs \$15 per square. I need your expert advice on what the dimensions of the building should be to minimize the total cost.

While the cost of the flooring and siding has been fairly stable, a further complicating factor is that the cost of the roofing material has been fluctuating dramatically for as long as I can remember (at least two months). In addition to your recommendation for the price of \$15 per square foot, I also need a recommendation on the dimensions of the dorm if the roofing costs $\$R$ per square foot. We are meeting with the architects to discuss plans before the start of summer, so I would appreciate your report by Friday, April 29th.

Your pal,

Fran Tick



Project 2 Expectations

Work in groups of two or three people. Each group should turn in one typed report containing the following. The paper should be a single **narrative** that includes all relevant information. All equations and figures should be labeled and explained. Functions and equations should be given as part of an English sentence (i.e. there should be no stand-alone math).

- Introduction – State the problem and motivation for your work.
- Set up – Describe the problem in mathematical language.
- Results – Give the results of your analysis. Your answers **must be justified**. i.e. you must show that any value you find is actually the appropriate extremum. All statements made in your conclusions section should be made here first.
- Conclusion – Summarize your general, important, and/or surprising findings. Discuss how your work could be improved upon and/or what questions remain to be investigated.
- Bibliography – Cite all sources (textbook, Maple, friends,...?).

This project is adapted from a project in *Writing Projects for Mathematics Courses* by Crannell, LaRose, Ratliff, and Rykken.