

Arboreal Trees, Inc.
10 Walnut St.
Forest City, NC 28043

Math 112 Students
Suite 020, Manchester Hall
Wake Forest University
Winston-Salem, NC 27109

01 September 2009

Dear Math 112 Students:

My company specializes in growing the highest quality trees to plant in public parks. We are writing you because we need to measure the area of a leaf. We have a new product, and we're trying to decide whether to introduce it first for oak trees or for magnolia trees. I won't bore you with all of our details, but it basically comes down to this: magnolia leaves are bigger than oak leaves in area, but by how much?

A little background – we have recently devised a new, 100% organic leaf-growing solution that helps our trees stay naturally healthy and resilient to all major tree diseases; we're going to make a fortune. However, we only want to roll this out for one type of tree first.

That's why we need your help. My two top biochemists, Rob Pinedale and John Spruce, cannot agree on whether our new product is better for oak trees or magnolias. After their latest confrontation turned ugly (let's just say Rob & John have lost their chainsaw privileges for awhile), they agreed to calculate some figures. We determined that if the average magnolia leaf is twice as big (in area) as the average oak leaf, then we'd focus on magnolia trees; otherwise it's oak trees.

Unfortunately, my two pugnacious botanists rarely agree. Rob says magnolia leaves are much, much bigger than oak leaves; John reasons that oak leaves are almost as long, and should be almost as big, as magnolia leaves. Neither one knows how to measure the area of a leaf.

Looking for help, I turned to your enterprising though somewhat frazzled professor for suggestions. He assured me that you were right for the job. We have enclosed photocopy of a sample leaf from each type of tree. Can you approximate the area of each leaf? On which tree should we focus our marketing? We would like to be able to do this calculation ourselves for other trees, so please include a detailed step-by-step description of your methods.

We are also looking for ideas, so we would like you to find a third leaf, from neither a magnolia or an oak, and measure its area. Please enclose a copy of the leaf and the leaf itself. It would be helpful if you could tell us what type of tree it's from; if not, I'm sure Rob or John will be able to figure it out.

We have a company meeting scheduled for September 11th, so I need this information by September 10th at noon.

Yours sincerely,
Mr. George Cherry
CEO Arboreal Trees

Re: Written Requirements for Project

To: Math 112 students

From: Jason Parsley

Date: 01 September 2009

Mr. Cherry of Arboreal Trees, Inc. has sent you a letter detailing your most recent consulting project. He has asked me to communicate the requirements that his company demands of all written reports.

In addition, I have the actual leaves he sent in my office for your inspection. I believe you will find the photocopies of the leaves to be more useful.

Requirements for Written Report

You will work in groups of 2-3 students, as given on the last page. Your findings should be detailed in a typed technical report of 3-6 pages (not including figures). Cherry will accept computer-generated graphics (possibly from Maple) or (neatly) hand-drawn calculations and figures. Your report should answer Cherry's question about which tree they should use. You should also estimate the area of each leaf, find a third leaf, and measure its area. Please submit both the actual leaf and a photocopy of it.

The report should be written in a clear, concise manner using proper grammar. You are free to use any references you like. You should cite any references that you utilize, except for the course lecture and book. I encourage you to work within your group and to work very little with other groups; please cite any group which has helped you with your project.

The report is due at the start of class on **Thursday, September 10th**.

Grade Determination

Your compensation ('grade', if you prefer such language) will be calculated in five categories as given below. The first four concern the correctness of your mathematical presentation and explanation. The fifth measures your composition style.

<i>Category</i>	<i>Worth</i>
Mathematical Description of the Problem	20 pts
Correct Solution	15 pts
Finding your own leaf and its area	15 pts
Explanation of Reasoning for Solution	30 pts
Style and Grammar	15 pts
<i>Total</i>	<i>100 pts</i>

Suggestions

You might want to provide a variety of estimates of the area. What do you get using left-hand sums? right-hand sums? Can you find an overestimate? An underestimate?

Otherwise, the approach is up to you. You may find graph paper and a good ruler valuable. In case you would like more copies of the leaves, this project will be posted on Sakai.

I also suggest getting started as soon as possible. We will have homework due on the 9th, and Webwork that week. If you do this report at the last minute, it probably won't turn out well.

Project Groups

Group 1: Seth Bernstein, Kaitlin Bilby, Molly Binder

Group 2: Katy Burke, Ronan Carr, Katie Crabtree

Group 3: John Dicken, Erica Donaldson, Wes Farrell

Group 4: Sam Ferraro, Winston Fleishman, Drew Fozzard

Group 5: Abbey Gensch, Ryan Himmelsbach, Megan Hitchcock

Group 6: Chris Iskander, Shannon Kelley, Min Suk Kim

Group 7: Justin Johnson, Logan Kolakowski, Mallory Krause

Group 8: Lauren Lukacsko, Will Myers, Joseph Napier

Group 9: Gabe Feldman, Deven Patel, James Rex

Group 10: Brian Sherman, Alex Smolko, Emily Spurlin

Group 11: Olivia Taldone, Stephen Turner, Trent West