

CALC LAB 1: PARAMETRIC CURVES AND ARC LENGTH

DOUG HUNDLEY

Due Date: With the rest of Lab 1- at the beginning of class on 9/23 or 9/24 (See the schedule)

The purpose of this lab is to continue getting you familiar with LaTeX, and start working on some mathematics. Note that the full “Lab 1” will be the homework from last week, this sheet, plus some extra stuff next week. For this week, write your solution using the template on our class webpage (`template.tex`).

1. THE QUESTION

A certain curve is defined parametrically, $(x(t), y(t))$ as:

$$(1) \quad x(t) = \int_1^t \frac{\cos(u)}{u} du \quad y(t) = \int_1^t \frac{\sin(u)}{u} du$$

Find the length of the arc of the curve from the origin to the nearest point where there is a vertical tangent line using Equation 1. You may use a Calculus text (for example, [1]) to help you, but be sure to write out a full solution.

2. GROUP WORK

We’ll be working in groups- You might try to divide up the workload; for example, have someone look up the appropriate mathematics, and have someone else start the LaTeX write up, etc. This sentence shows you how to reference a previous section, like Section 1.

3. GUIDELINES FOR GRADING:

These are the things I will be looking for when I am grading this part of your Lab:

- (1) The problem and final answer are clearly stated.
- (2) The mathematics are nicely typeset, including the use of whitespace (for example, `\quad`, `\qquad`, `\,` where necessary)
- (3) LaTeX issues I will focus on:
 - Use a title and section headings.
 - Be able to use sizable parentheses.
 - Be able to label and number an equation and refer to it in the text (not manually, but by using LaTeX commands).
- (4) Use the Hints Sheet, Page 1 (see the class website)

REFERENCES

- [1] Stewart, J. 2003, *Calculus*, 5th edition, Brooks-Cole.