

Lab 1: Last part

Recall that we have had two previous assignments to do for the first lab. The first was a list of L^AT_EX commands to look up, a short paper about arc length with some specific L^AT_EX things to include, and today we will be solving some short problems using Maple.

Lab 1 is all three parts- Our previous two assignments, together with today's introduction to Maple questions. Here is what to turn in (BEFORE our next lab meeting):

For your group, one person will email me the following (email address: `hundredr@whitman.edu`, subject line: Math 235X (or Math 235Y), Lab 1):

- The latex file answering the questions for our first assignment (the .tex file ONLY).
- The latex file for the Arc Length question.
- The Maple file that answers the questions on the next page (not the introduction). Remove all the Maple output before mailing the worksheet file:

Edit⇒ Remove Output⇒ From Worksheet

Grading criteria: 5 pts per item below

- Lab 1a: Look things up in the L^AT_EX manual. I will be looking at your tex file to be sure the commands are correct.
- Lab 1b: The article we started last time (see that lab for grading criteria). Here, I am looking to see if the mathematics is correct, well typeset, and that the L^AT_EX specifications are included and correct.
- Maple Worksheet: Be sure that your Maple commands will work from scratch, and that they answer the four questions attached.

Today's Maple Lab (Lab 1, Part c)

Work through the Introduction to Maple before answering the following questions. Try using Maple's help features before asking your instructor for assistance.

On a new Maple worksheet (different than the one used for the Introduction), answer the following “typical” Calculus questions:

1. Use the Maple help system to find out how to enter a vector and compute the following cross product:

$$\langle 1, 1, 1 \rangle \times \langle 1, 2, 3 \rangle$$

Hint: Try looking under **Tools** -> **Tasks** -> **Browse...** Then see if you can find the cross product. The cross product is “vector algebra”, done in “vector calculus”.

2. Let $f(x) = e^{-(x-3)^2/6}$. Get a numerical approximation to the integral: $\int_{-10}^{10} f(x) dx$

Hints:

- What is the difference between **int** and **Int**?
- The exponential function is **exp(x)**, not **e^x**

3. Look up how to compute the Taylor approximation (include terms to t^6) then do it for:

$$f(t) = \int_1^t \frac{\cos(u)}{u} du$$

at $t = 1$. Plot the Taylor approximation (up to t^6 term) for $1/2 \leq t \leq 3/2$, then plot the error on the same interval.

4. Look up, then find the derivative of $f(x) = \frac{1}{x}$ by using Maple to step through the **definition** of the derivative, that is,

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

Once you have an answer for that function, copy and paste to do the same thing for $g(x) = \sqrt{x}$.