

Sec. 1.2 #49 Presentation Guidelines

Your task is to complete Sec. 1.2, Problem #49, from page 20 of our textbook.

I'd like for you to submit this to electronically in pdf format to my email scott_randy@sccollege.edu If you don't think you have pdf capability (you probably do), then try to figure out how to do so, or submit the assignment on paper. DO NOT SEND ME A WORD DOCUMENT. Sorry for shouting.

Your solution is to be typed, with all mathematics typeset using an equation editor, and to with graphics produced with a CAS (Computer Algebra System) or with an internet-based application.

As we discussed in class, if you are using Microsoft Word, then you have access to a built-in equation editor. A little searching in the application's help section will get you started.

Also, since most of you do not have access to a CAS, you can use WolframAlpha to generate the graphs that are asked for.

Here are some tips for using WolframAlpha

1. For this project, do NOT activate their CDF feature; if it is activated ("CDF IS ON") click and turn it off. (CDF is a cool document format, but I haven't had the time to figure out how to use it ...yet!)

With CDF turned off, you'll be able to save any graph or expression images by hovering your cursor in the lower left corner of the pane.

2. In part (b), you are asked to generate the first positive zero of $J_0(x)$. On WolframAlpha, you can find this by asking in plain language: "What is the first zero of the Bessel J function of order 0?" and then reading what comes back ... you'll find it.

3. For part (d), your system DOES have built-in Bessel functions: ask WA to

Plot $J_0(x)$ from $x=0$ to $x=10$

I'll let you figure out how to plot the various partial sums $J(0, x, m)$ to find the smallest value of m that gives an accurate approximation to the first three positive zeros of the BesselJ function.

If you're curious about these functions, take a quick look at the Wikipedia page. It lists a number of applications. When I read through the Wikipedia page, I couldn't help but reflect on just how much I don't know.