

Physics 609—Computational Physics
Homework 1—Due Thursday, January 28, 2016

1) Prepare a data file with one column of numbers δt . A range $0.01 \leq \delta t \leq 0.5$ would be particularly convenient, but it is not required. Explain how you prepared the file. You do not need to include the entire contents of your file in your printed homework, but you should include the location of the file on our classroom cluster, make sure that it is readable by me, and include enough of it in your printed homework that I can infer what the missing values are.

2) Prepare a second data file with two columns of numbers. This file should contain δt and $2.0\delta t^2$. Show the commands you used to create the second data file.

Parts 3–7 are easy to do using axis, but you need not use axis. Be sure to say what program you used and what commands you used to create each graph.

3) Graph your data with the x -axis properly labeled δt using a Greek symbol for δ . You may label the y -axis as error. Put a title on the graph that is your name (first and last).

4) Graph the same data, but this time make a log-log plot. (This is very easy to do using axis, but you don't have to use axis.)

5) Prepare a data file with two columns of numbers x and $\exp(-.5x)$, where x takes on values between 0 and 10 in increments of 0.1. Explain how you prepared the file.

6) Graph the data showing individual points plotted as diamonds.

7) Replot the same data as a semi-log plot with the y -axis logarithmic and the points connected by a solid line.

8) Using awk, prepare a temperature conversion command that will convert Fahrenheit to Celsius and Celsius to Fahrenheit. By now you should know that it is often easier to put awk commands in a file than to type them on the command line. I suggest you use this approach for this problem and show the contents of your awk file.

Suitable input would be:

25.2 C

45.1 F

Your output should look like:

25.2 C is xxxx F

45.1 F is yyyy C

where xxxx and yyyy are the correctly converted values.