

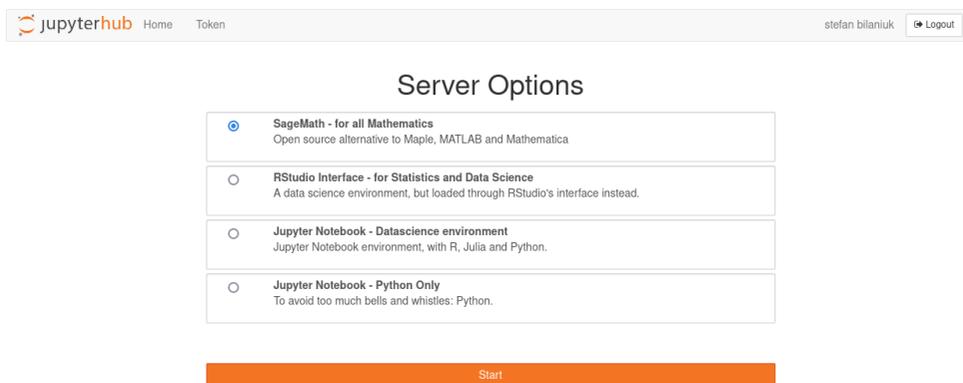
Mathematics 1110H – Calculus I: Limits, Derivatives, and Integrals

TRENT UNIVERSITY, Summer 2023 (S61)

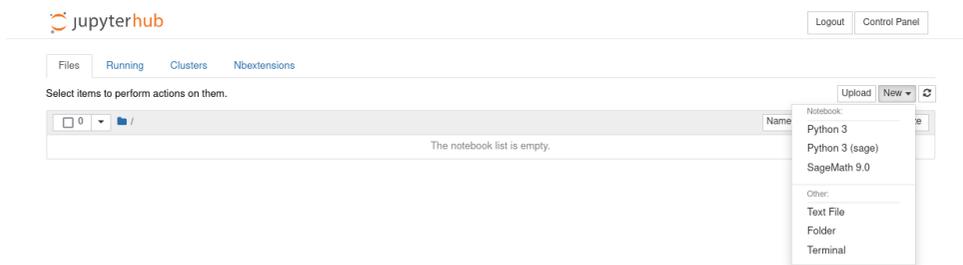
Getting Started with `sage.trentu.ca`

SageMath is a cross-platform program that rolls together the functionality of many pieces of open-source mathematics software to get something comparable to the general-purpose mathematics programs Mathematica or Maple. Unlike those two programs, SageMath is free to use. However, like those two programs, SageMath can be pretty resource-hungry and finicky to install, so at Trent we're running it on a server that you can access via your browser and do all your work online in a Jupyter notebook. Those of you who are interested in installing SageMath on your own computer should go to <https://www.sagemath.org> and take it from there. Most of the rest of this document is about getting started with Trent's SageMath server.

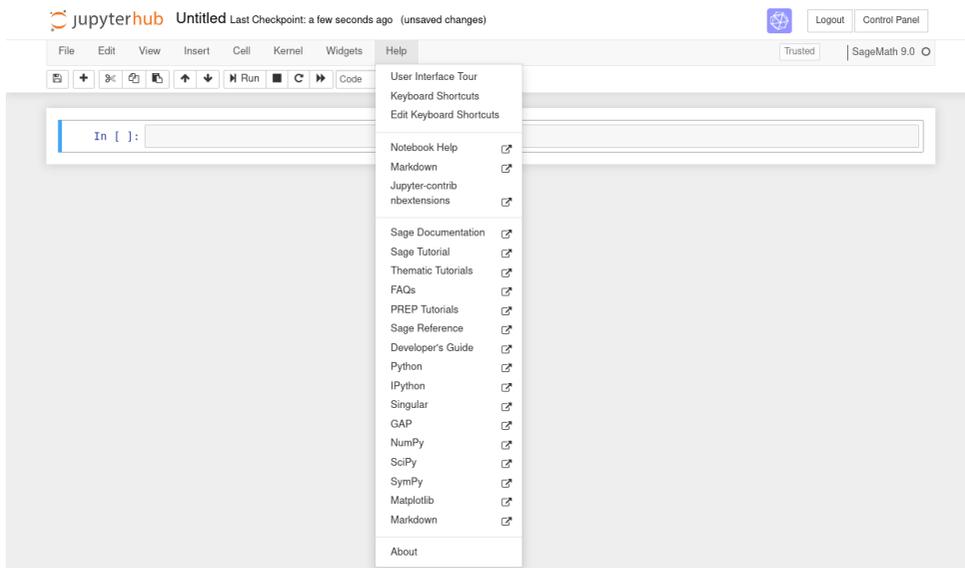
Point your browser to <https://sage.trentu.ca> and go there. (There is also a link in the SageMath folder in the Course Content section of the MATH 1110H Blackboard site.) You will be asked to login using your Trent email and password. Doing so should bring you to a page that looks like:



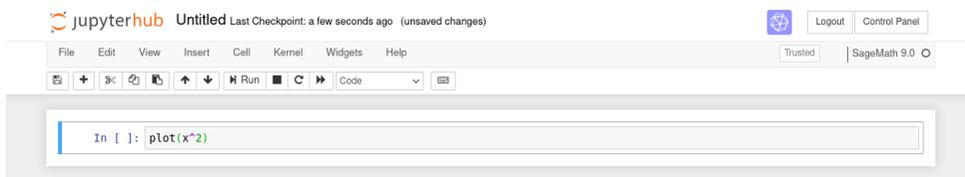
Make sure that SageMath is selected and click on the Next button. This should bring you to a page that looks like:



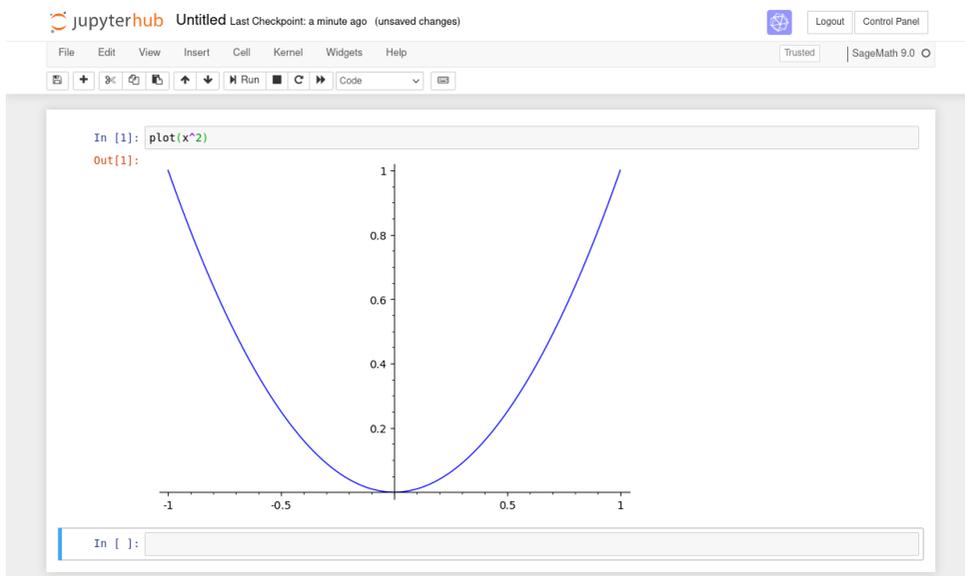
Selecting SageMath 9.0 from the New menu should bring you to a page that looks like



when you click on the Help menu. Unfortunately, the help menu items related to SageMath, as well as some others, are not active as of this document being written. However, you are in a position to type in SageMath commands, such as the command to draw a graph of $y = x^2$ below.

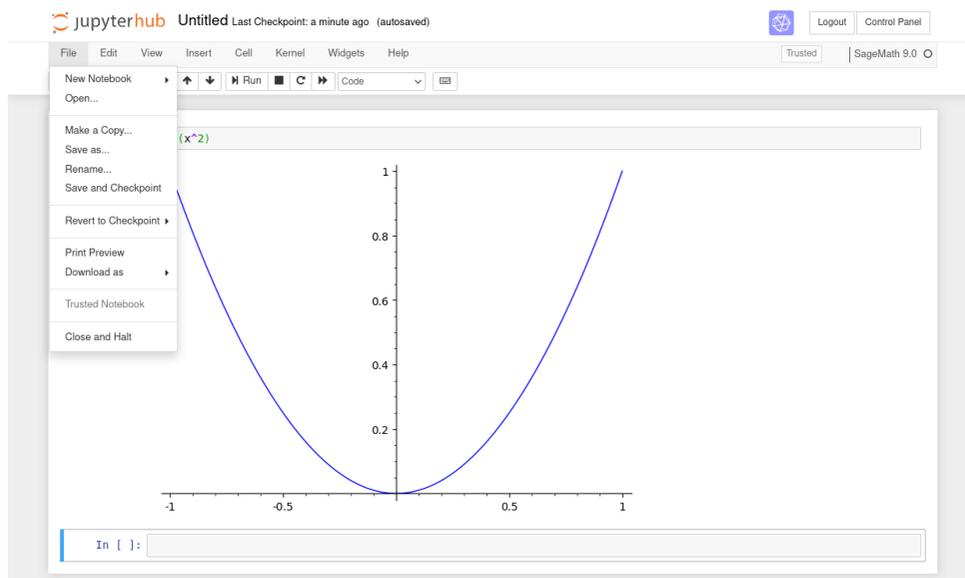


Clicking on the Run button or typing `<shift>-<enter>` should get you the following:



Typing the symbol # into one of the command boxes will turn the rest of the line into a comment, which can be useful for reminding yourself what you were trying to do when you look at it later, as well as letting whoever is marking your assignment know, so they can assign part marks more readily if something isn't entirely correct.

You can do the usual file operations, including saving what you have produced in some other format, using the File menu:



In particular, you can use the “Save as . . . ” item in the File menu to save your work in pdf format for submission as part or all of an assignment.

To actually learn about SageMath and what it can do, there are a few documents in the SageMath folder in the Course Content section of the MATH 1110H Blackboard site: two quick references for SageMath commands, one them optimized for calculus, and a book, *Sage for Undergraduates* by Gregory Bard. Most of what you'll need for MATH 1110H is in Chapter I, which is about 60 pages long, though for plotting implicitly defined curves, parametric plots, and plotting in polar coordinates, you will want to check out the relevant sections of Chapter 3.