
OVERVIEW

This is an introductory laboratory. By the end of this laboratory section, you should be able to start Mathematica on your own or on **the MIT server**. You should also be able to do a few calculations, use Mathematica's help browser, and save your work.

TASKS

Starting Up

- **On your own computer**
This year the student license is \$30, but I think you will find that you will use this in many of your other classes and would be a good investment. The process involves making an order, and then following instructions on the order-follow-up email; it may take a few days, so get a head-start if possible.
Once you have Mathematica installed, launch it as you would any other application of your particular flavor of operating system.
- **On the MIT server** On the MIT server machine, open a shell. Add the Mathematica locker by typing `add math` at the prompt. Start Mathematica by typing `math` at the prompt.

Simple Calculations Try and do the following calculations.

1. Add two integers
2. Multiply an integer and π
3. Calculate $4\pi - 4 \times 3.14159265$
4. Define a symbol *Energy* for the product $h\nu$. Investigate what happens to *Energy* if you also define h and then ν .
5. Find the derivative dR/dx where

$$R = \sqrt{\frac{1}{1 + \sqrt{\frac{1}{1 + \sqrt{\frac{1}{1+x}}}}}}$$

It may be easier to build up R in steps by using definitions.

6. Find the Mathematica Help Browser page that describes the function **Rationalize**. Find a rational approximation (i.e., of the form $\frac{\text{Integer}_N}{\text{Integer}_M}$ which differs from π by less than 10^{-12})

Save your work as a mathematica notebook: 3016 Lastname Lab01.nb.

REPORT

This homework will not be graded, but do send you saved mathematica file to **the instructor and the TA** at the end of the laboratory period.