Overview

This laboratory provides an exercise in the solution to an ODE by a numerical method.

Tasks

Simple Calculations Try and do the following calculations.

1. Add two integers
2. Multiply and 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 Save your work as a mathematica notebook: `3016_Lastname_Lab01.nb`.

Report

This homework will not be graded, but you should turn it in anyway so we can iron out any glitches. Your report on the work above should be ordered as it is above. Your report should include comments that would help one of your classmates understand what your work demonstrates. Send your report as a saved Mathematica notebook with name `3016_Lastname_Lab01.nb` to 3016-labreports@pruffle.mit.edu. As the subject use "3.016 Lab 01 LASTNAME".