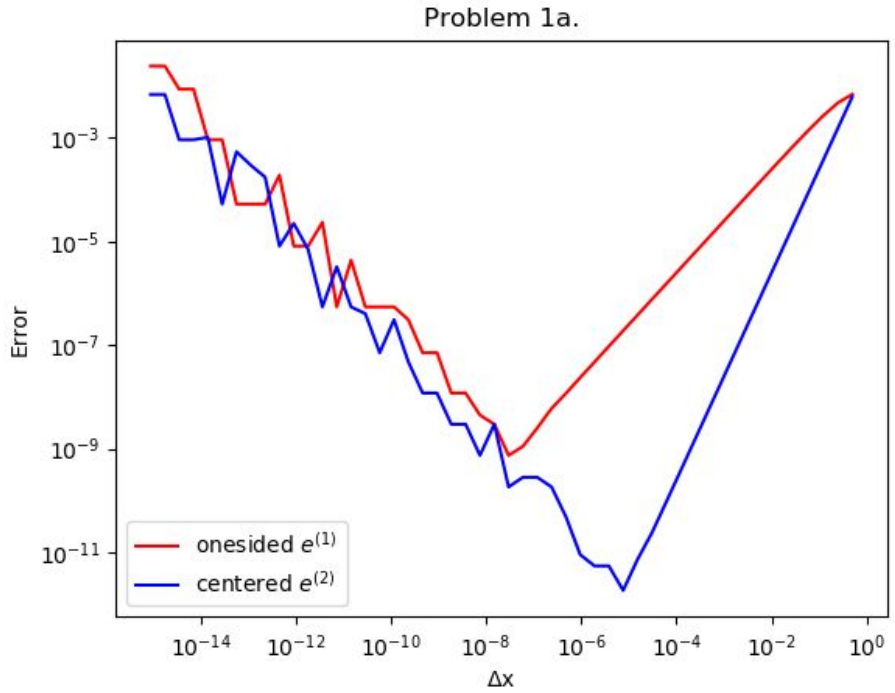
Rachel Buttry
PHYS 305
Homework #1

Problem 1

a) Plot:

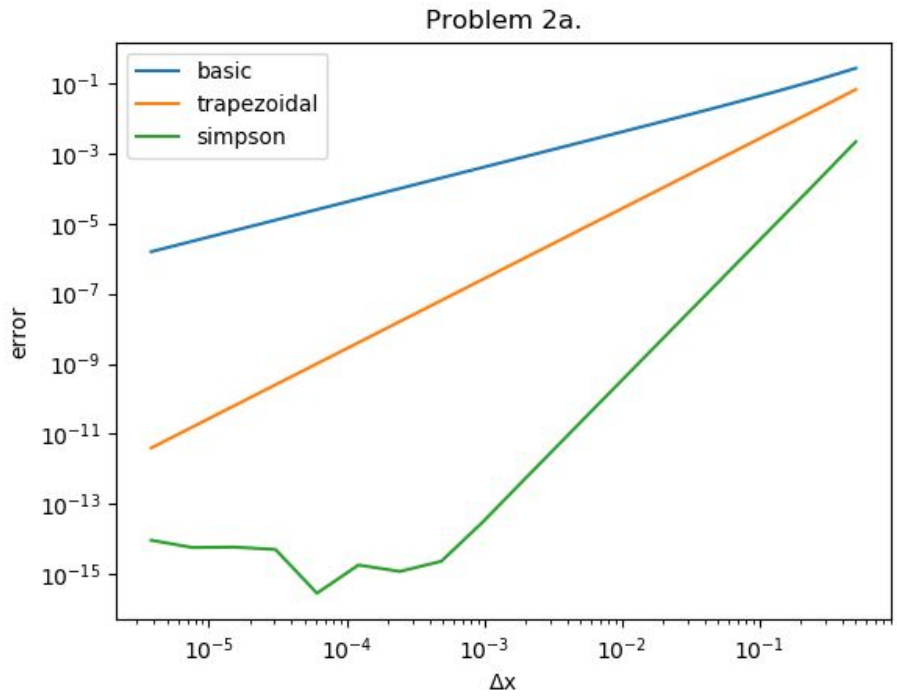


b) Quadratic fit
Derivative (as dx⟶0) = -0.149361196055
Error = 9.04884397968e-09

c) Cubic fit
Derivative (as dx⟶0) = -0.149361205749
Error = 6.4491842422e-10

Problem 2

a) Plot:



b)
Integral (as dx⟶0) = 0.402456421776
Error = 8.40467159058e-06

When dx = 1/16:
Integral = 0.401394912699
Error = 0.00105310440539

The error taken as dx⟶0 is ~10^3 times smaller than when dx = 1/16.

Problem 3
a)epsilon = 0.1
period = 23.9311513914

b)
epsilon = 0
period = 23.7668931795
Newtonian period = 6.28318530718
difference = 17.4837078723