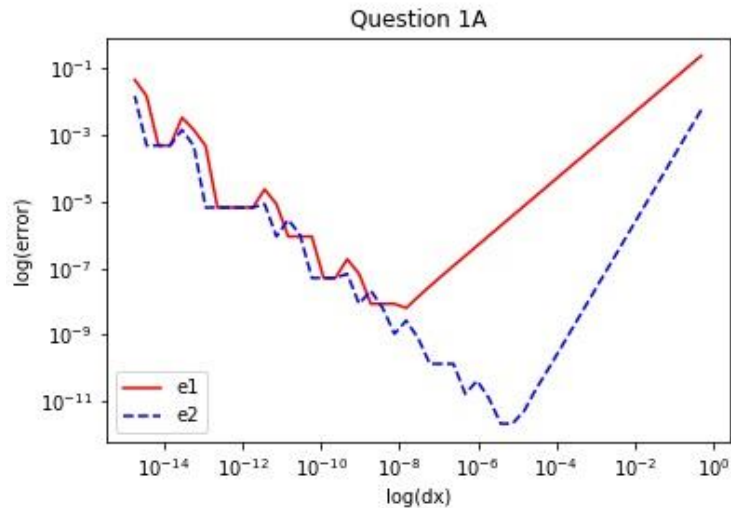


Name: Christopher Morris HW1 Phys 305

Question 1):

1A)



1B)

p1: 0.023494283459872763 p2: 1.6532335417270845e-06 p3: -0.1411200337763976

True derivative at $dx = 0$: -0.1411200080598672

Extrapolated derivative from polynomial fitting: -0.1411200337763976 with an error of: 2.5716530377417612e-08

The error of the $dx = .025$: 1.4699541470569732e-05

The error of using $dx = 0$ instead of $dx = .025$ with within 3 orders of magnitude better.

1C)

p1: -0.00022042382249622494 p2: 0.023532857628819914 p3: -2.7547490426023543e-07 p4: -0.14112000622341977

True derivative at $dx = 0$: -0.1411200080598672

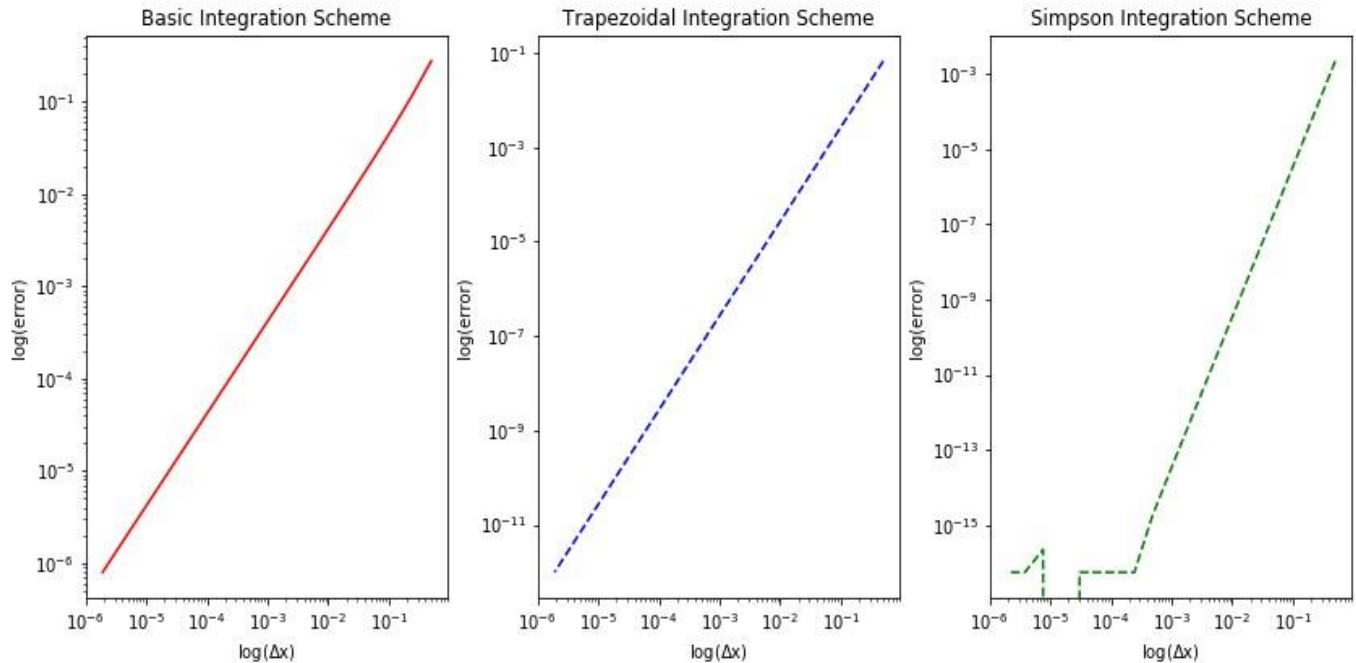
Extrapolated derivative from polynomial fitting: -0.14112000622341977 with an error of: 1.8364474385634821e-09

The error of using $dx = 0$ instead of $dx = .025$ with within 4 orders of magnitude better.

Question 2):

2A):

Question 2A



2B)

p1: -0.00800091966070037 p2: -0.26721638680999354 p3: -0.000251867463712889 p4: 0.4024564217758112

True integral: 0.40244801710422107

Extrapolated integral from polynomial fitting: 0.4024564217758112 with an error of: 8.40467159013425e-06

The error with $dx = 1/16$: 0.004213961601492566

The error of using the extrapolated $dx = 0$ instead of $dx = 1/16$ is within 3 orders of magnitude better

Question 3)

3A)

root 1: 0.314143624943681
root 2: 1.7029530502855779
integral = 6.286959421352375

3B)

root 1: 0.2928932189336046
root 2: 1.7071067817509176
computed integral = 6.283185348420567
Actual integral: 6.283185307179586