Project 02

APSC 607 Fall 2017

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1   Introduction

This project explored methods for calculating the integral roots of functions. Each functions was examined in the range between zero and two, using the Composite Trapezoidal Rule, Composite Midpoint Rule, Composite Simpson's Rule, as well as an adaptive implementation of the Composite Simpson's Rule. The behavior and characteristics of these methods are reviewed by examining the effectiveness of the resulting value for the integral given a range of values for N.

All computations were performed using MATLAB using the code (Table 1) accompanying this report (in a zip file). The following Methods section will present the methods used in MATLAB to explore functions, as well as the outputs and results. The Results section of this report contains the outputs for each function and range along with related observations and discussion. All figures and tables found in this report are available in the output subdirectory of the accompanying zip file. Additionally, all code and figures found in the zip file can be accessed via GitHub[1].

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[1] https://github.com/sgoodm/apsc607/tree/master/project_02

Item	Quantity
Widgets	42
Gadgets	13

Table 1: An example table.

2 Test

LaTeX is great at typesetting mathematics. Let $X_1, X_2, \ldots, X_n$ be a sequence of independent and identically distributed random variables with $\mathrm{E}[X_i] = \mu$ and $\mathrm{Var}[X_i] = \sigma^2 < \infty$, and let

$$S_n = \frac{X_1 + X_2 + \cdots + X_n}{n} = \frac{1}{n} \sum_i^n X_i \tag{1}$$

denote their mean. Then as n approaches infinity, the random variables $\sqrt{n}(S_n - \mu)$ converge in distribution to a normal $\mathcal{N}(0, \sigma^2)$.

Use the table and tabular commands for basic tables — see Table 1, for example.

You can make lists with automatic numbering . . .

1. Like this,

2. and like this.

. . . or bullet points . . .

- Like this,

- and like this.

. . . or with words and descriptions . . .

Word Definition

Concept Explanation

Idea Text

Some text[1].

$$f(x) = e^{2x} * sin(3x) \tag{2}$$

$$f(x) = \frac{1}{x + 4} \tag{3}$$

here is ref to 3
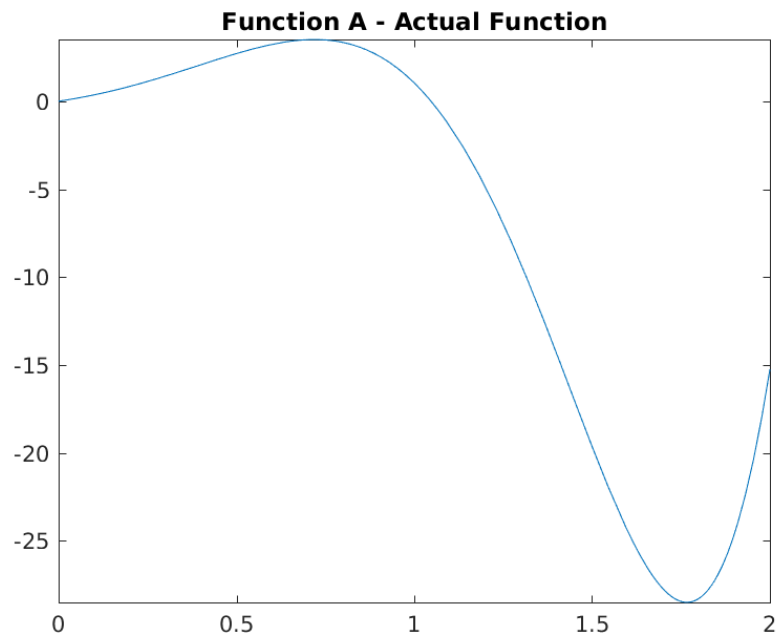before figure 1a

Function A - Actual Function

Figure 1: caption text a

after figure 1a
Figure 1

cool $B = 0$ stuff
sdsadas[2]

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[2]See following link on MATLAB precision limitions (general limitations of floating point representations apply) https://www.mathworks.com/help/fixedpoint/ug/limitations-on-precision.html

3 Methods

3.1 Trapezoidal

TEXT

3.2 Midpoint

TEXT?

3.3 Simpson's

TEXT

3.4 Adaptive Simpson's

TEST

4 Results

4.1 Tables

stuff

References

[1] Burden, R., Faires, J., Numerical Analysis 9th Edition. 2010