

**Topic:** In the R application assignment you will use programming in the context of another subject, perhaps Calculus I or statistics. Consider Newton's Method as a topic: You can find links to a relevant textbook and video under Handouts and Links on our Blackboard site. Other possible topics are the Riemann sum, the Trapezoidal Rule, and convergence of infinite series. Please seek prior approval if you wish to pursue a topic other than these.

- 1) **Objective:** Write an introduction to the topic under consideration. For example, if you choose to write about Newton's Method your introduction will look very similar to Section 4.1 in APEX Calculus as posted, except that the target audience is a calculus student who can program in R. You will not need to show hand calculation.
- 2) **Academic honesty:** Write any R code INDEPENDENTLY, following our usual syllabus policy. Do not consult outside written, electronic, or human sources in general during the programming process. (See syllabus policy.) Of course, you can always see me.
- 3) **Source(s) for calculus** (or other non-programming subject matter): In your write-up, please indicate any sources that you are consulting for calculus or other non-programming subject matter. These could be APEX Calculus, the video on Newton's Method as posted, and / or your personal copy of a calculus text. You may wish to check out a calculus or other text from the library.
- 4) **Format:** Type your assignment, or write it by hand. Illustrate your work with figures, perhaps hand-drawn, as needed to clarify your explanations. All computer code that you use in your assignment should be uploaded to Blackboard as a .R file as usual. Include all the invocation statements from your assignment at the bottom of the module (file), so that I may test them. Refer to the file in your written portion.
- 5) **Length and Submission:** Write as much as you need to introduce the topic thoroughly. Use APEX Calculus, Section 4.1 as a general guide. Include at least two problems. These could be chosen from the explanation and problem sections in APEX Calculus. Your problems should go beyond the simplest introductory level. (Don't just use, say, Problem 1.) Explain *how* your problem goes beyond the simplest introductory level. The R file itself could be about the same size as in the five-function assignments, or maybe a little smaller, since you are pairing the programming with extensive written explanation.
- 6) **Philosophy:** I have in mind a modest assignment to give you a framework for applying programming, applying your communication skills in mathematics and computer science, locating/analyzing/synthesizing information, and pointing a reader to your subject-matter sources, such as a calculus text. Consider the assignment low stakes (50 points), tractable, and---yes---enjoyable and rewarding!