Our second midterm exam will be given on Thursday, December 1, from 6:30 pm to 8:00 pm. The exam will be a 90-minute exam. **Note that the room in which you take your exam is determined either by the first letter of your last name or, if your name begins with L, the first two letters of your last name. You MUST take the exam in the designated room.**

- If your last name begins with a letter between A and D, then go to SCI 109.
- If your last name begins with E through Lee, then go to CAS STO B50.
- If your last name begins with Li through Q or U or V, then go to CAS 522.
- If your last name begins with a letter between R and T or between W and Z, then go to Morse Auditorium.

We will start the exam as promptly as possible, so be on time and be sure to bring your BU ID card and at least three working pens or pencils. As you know, we scan your exams and upload the scans to gradescope. **Please make sure that what you write will produce readable scans.** If you use a pencil, please do your best to make your work appear as if it was written using a black pen. Also, write large enough so that we can read the scan but not so large that you repeatedly run out of space on the examination paper.

**Topics covered:** The exam will cover all of the material in Chapter 4 except for Section 4.4, Section 4.8, and the part of Section 4.6 that deals with differentials (bottom half of p. 297 and essentially all of p. 298). When we covered Section 4.9, we distributed a table of integrals


that you should know. **The table will NOT be provided to you during the exam.** There is an announcement that was posted on the MA123 A Section website on November 21 that contains a little more information about the table.

The exam will also cover most of Section 5.1 and parts of Section 5.2. In Section 5.1, you will not be responsible for calculations such as those done in Example 5 (bottom of p. 345 and all of p. 346). Although you should be familiar with sigma notation, you do not need to know the formulas that appear in Theorem 5.1.

The most important difference between Sections 5.1 and 5.2 is that the functions considered in 5.1 are assumed to be positive, and this restriction is removed in Section 5.2. In Section 5.2, the notion of a Riemann sum is generalized to functions whose values can be both positive and negative and the regular (equal width) partitions defined in Section 5.1 are replaced by general partitions (bottom half of page 355 and top half of page 356). In MA123, we will not focus on general partitions even though they are helpful when proving certain useful properties of the definite integral.

For this midterm exam, you are responsible for pages 353, 354, and the top half of page 355. The definition of the definite integral on page 356 and Theorem 5.2 is more general than we need and can be replaced by the following theorem.

**Theorem.** If the function $f$ is continuous on the interval $[a, b]$, then the limit

$$\lim_{n \to \infty} \left( \sum_{k=1}^{n} f(x_k^*) \Delta x \right)$$

exists and is independent of the choice of the “test” numbers $x_k^*$. This limit is the definite integral of the function $f$ over the interval $[a, b]$.

You should also be comfortable with Examples 3 and 4 on pages 357 and 358 as well as the relevant exercises in Homework #11 and the exercises in Worksheet #11.
The exam will not be cumulative in the sense that you will not be asked questions pertaining specifically to the material in Chapters 2 and 3, but of course, the skills covered in those chapters—particularly the rules and formulas for limits and derivatives—are needed to do the problems in Chapters 4 and 5.

**Rules regarding backpacks, mobile/smart phones, and smart watches:** All backpacks, papers, etc., must be placed in the front of the examination room before the start of the exam. All phones and smart watches must be turned OFF (silent mode is not permitted), and they must be stored in your backpack. If you do not have a backpack, see a proctor at the front of the examination room. We will hold your phone and/or watch for you during the exam.

**Additional rules and a suggestion:** More generally, the use of books, calculators, notes, entertainment devices, and other communication devices (other than pencils, pens, and erasers) is forbidden, and all of your work should be done on the exam itself—you will not be permitted to use your own paper, even if it is blank.

If you have a question during the exam, raise your hand and stay seated. A proctor will come to you. If you finish within the first 85 minutes of the exam, raise your hand and stay seated. A proctor will check your id and collect your exam.

In order to minimize unruly commotion at the end of the exam, you will not be permitted to hand in your paper during the last five minutes. If you finish five minutes before the end of the exam, then please sit quietly in your seat and check your work until somebody comes to pick up your paper.

As always, you are more likely to achieve the best possible score on the midterm if you read the directions of each question carefully, write legibly, show your reasoning, and pay attention to mathematical accuracy.