

Reading Assignment 10 (Due Friday 8/22 by 5PM)

Directions: Read the following sections of the book:

- Section 11.1.3 and all of Section 11.2. We covered the main ideas during class.
- (Optional) Section 11.4. I am going to skip this, but I recommend you skim it and read any part that is of interest to you.
- Section 11.3 up to and including the Preview Activity.
- Section 11.5.1.

and complete the following tasks along the way. If an Activity is not listed, you do not need to complete it (although you are welcome to read it). Turn your write up in via [gradescope](#). You do not need to write the questions down, as long as you clearly indicate the question number.

1. Preview Activity 11.3.1
2. Preview Activity 11.5.1
3. Activity 11.5.2

Basic learning objectives: These are the tasks you should be able to perform with reasonable fluency **when you arrive at our next class meeting**. Important new vocabulary words are indicated in italics.

1. Set up a basic *iterated integral* for the volume under a surface over a such as a triangle.
2. Evaluate an iterated integral where the limits of the inner integral are functions of the outer variable.
3. Define *polar coordinates* (r, θ) and explain their geometric relationship to rectangular coordinates (x, y) .
4. Plot points using polar coordinates and convert coordinates for a point between the rectangular and polar systems.
5. Sketch simple curves and regions described by polar equations, such as $r = a$, $\theta = c$, or $a \leq r \leq b$.

Advanced learning objectives: In addition to mastering the basic objectives, here are the tasks you should be able to perform **after class, with sufficient practice**:

1. Determine whether a region is *Type I* (bounded by two functions of x) or *Type II* (bounded by two functions of y). Describe it using inequalities.
2. Set up and evaluate iterated double integrals over Type I and Type II regions.
3. Given an iterated integral, determine and sketch the region of integration.
4. Reverse the order of integration for an iterated integral.
5. Choose the more efficient order of integration to evaluate a double integral over a general region.
6. Convert an iterated integral in rectangular coordinates to an equivalent iterated integral in polar coordinates.
7. Evaluate double integrals using polar coordinates.
8. Determine when it is advantageous to use polar coordinates to evaluate an iterated integral.