Daily Prep Assignment for Feb 18th

Overview

In section 10.1, we will study limits of functions of several variables, with a focus on limits of functions of two variables. We will begin to understand how the concept of limit for functions of two variables is similar to what we encountered for functions of a single variable. The limit will again be the fundamental idea in multivariable calculus, and we will use this notion of the limit of a function of several variables to define the important concept of differentiability later in this chapter.

In section 10.2 we begin to think about what a derivative of a function of several variables means. Thinking graphically again, we can try to measure how steep the graph of the function is in a particular direction. Alternatively, we may want to know how fast a function's output changes in response to a change in one of the inputs. This leads us to the idea of partial derivatives.

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*.

- Recall the concept of limits from single variable calculus.

- Understand the limit definition of the derivative of a single variable function and be able to draw a picture of it.

- Understand that a *partial derivative with respect to x* is asking for the rate of change of the value of a function as you change the x input.

Advanced learning objectives

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

- Understand how to check if a function of several variables has a limit at a point and when it does not.

- Understand what it means for a function of several variables to be continuous at a point.

- Compute partial derivatives of a function of several variables.

- Interpret partial derivatives and be able to draw a picture of them.

- Use a table or contour plot to estimate the partial derivatives of a function.

To prepare for class

Preview activities: Read the example preview activity solution on the course website then,

- Preview activity 10.1.1

- Preview activity 10.2.1

Reading:

- Read section 10.1

- Read section 10.2

Watching: Watch these additional resources if you need support reading the text.

1. Overview of 10.1: `https://youtu.be/ndU_RK2GYRA`

2. Overview of 10.2: `https://youtu.be/zx0IGg3SpAE`

During and after class

- Activity 10.1.2

- Activity 10.1.3

- Activity 10.2.2

- Activity 10.2.3

- Activity 10.2.4

- Activity 10.2.5

- Activity 10.2.6