Daily Prep Assignment for March 9th

Overview

In previous sections we have learned about partial derivatives that measure the rate of change of a function as the input moves in the x or y direction. In this section we start by considering rates of change in other directions. This will lead us to investigating the *gradient* of a function, a tool that will show up again and again for the rest of the semester.

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*.

- Feel comfortable computing partial derivatives and interpreting them in context as rates of change in a certain direction.

Advanced learning objectives

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

- Compute directional derivatives.
- Understand the importance of unit vectors in the directional derivative.
- Compute the gradient of a function.
- Understand the meaning of the gradient magnitude and direction.
- Understand how the gradient relates to level curves of a function.

To prepare for class

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

- Preview activity 10.6.1

Reading:

- read section 10.6

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

1. Overview of extra 10.6: `https://youtu.be/WPa60m8VFzc`

During and after class

- Activity 10.6.2
- Activity 10.6.3
- Activity 10.6.4
- Activity 10.6.5
- Activity 10.6.6
- more to come...