Section 1.6 Daily Prep Assignment

Overview

We have spent approximately the first three weeks of the semester focusing on the first derivative: its definition, its meaning, and various interpretations in applied contexts. The first derivative, in essence, tells us *whether* a given function is increasing or decreasing at a certain point. Next, we are interested in learning *how* a function is increasing or decreasing at a given point, and the key tool to doing so is the *second derivative* of the function. Here, we consider what happens when we consider *the derivative of the derivative of a function.*

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*.

- Understand the formal definition of the terms *increasing* and *decreasing* and their connection to the derivative of a function.
- Begin to think about what we can learn by taking the derivative *of the derivative* of a function f.

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 the limit definition of the second derivative and, in practice, how we determine the second derivative of a function graphically.
- Know what it means to say that a function is concave up or concave down, and how the derivative(s) of a function determine whether a function is concave up, concave down, or neither.

To prepare for class

- Read the beginning of section 1.6 and do Preview activity 1.6.
- Read the the rest of Section 1.6.

Additionally but optionally

- Watch the overview video.

After class

- Finish any in-class activities you might not have finished during class.
- (Optionally) Do the problems on the WeBWorK assignment for this section.
- (Optionally) Complete the challenge problem for this section.