MTH 201: Calculus

Daily Preparation, Module 10A: Determining distance traveled from velocity

Due by: 11:59pm ET, **TUESDAY**, November 10

Estimated time requirement: About 45-60 minutes for the whole assignment. *If you have worked on this assignment for 30 minutes and you're not at least halfway done, DON'T work any further* — instead, *stop and ask for help* on the `#dailyprep` channel on CampusWire.

Overview

With Module 10 we change gears to study the last big concept of this course. We're going to study the question of, **If we know how fast an object is moving, how far does it travel on a given time interval?** This is sort of the opposite of the question we started the course with in August — *Given the position of a moving object, how fast is it moving?* — and we'll answer it by building a new tool that is related to, but quite different from the derivative. We start that process here by going back to basic geometry.

What you will learn

Learning Targets addressed in this module:

- **INT.1:** I can calculate the area between curves, net change, and displacement using geometric formulas and Riemann sums.

BEFORE your class meeting, use the Resources for Learning (below) to learn how to do the following:

- Given the graph of a moving object's velocity, estimate the distance it traveled over a time interval using a rectangle sum.
- Define the term *antiderivative* and identify an antiderivative of a given function.

DURING AND AFTER your class meeting, you will learn how to do the following:

- Given the graph of a moving object's velocity (which varies over time), estimate the distance it traveled over a time interval using a rectangle sum.
- Use an antiderivative to compute the distance traveled by an object, given a formula for its velocity.

Resources for Learning

Text: In the *Active Calculus* text, read Section 4.1.

Video: Watch these at the GVSUMath YouTube playlist:

- Screencast 4.1.1 – Quick Review: Determining distance traveled from velocity (3:37) https://www.youtube.com/watch?v=bTJuR2f-FSs&list=PL9bljQJDwfGuXQHuS5Jkmum_CFILoCZX-&index=75
- Screencast 4.1.2 – Estimating distance traveled using a velocity graph (5:54) https://www.youtube.com/watch?v=xwS-v8MLli4&list=PL9bljQJDwfGuXQHuS5Jkmum_CFILoCZX-&index=76
- Screencast 4.1.4 – Finding distance traveled with antiderivatives (8:22) https://www.youtube.com/watch?v=mAul5vTAJSA&list=PL9bljQJDwfGuXQHuS5Jkmum_CFILoCZX-&index=78

You are free to search for and use other resources in addition to, or instead of the above, as long as you can work the exercises below.

Exercises

The exercises are on Desmos. Go to student.desmos.com and you should see the Daily Prep for Module 10A.

Submission, grading, and getting help

Submitting your work: Just work through the activities; your work is saved as you go.

How this is graded: Daily Prep assignments are graded on the basis of *completeness and effort*: If your submission has **all parts completed** (no blank entries, even if left blank accidentally) and **a good-faith effort to provide a correct solution or explanation is given** (no responses of "I don't know" or "I didn't understand") and **the work is submitted on time**, it gets a "check". Otherwise it gets an "x". If you are stuck on an item, you're expected to ask questions and give your best effort.

Getting help on this assignment: *You may work with others on this assignment, but you may not copy each others' answers.* Evidence of copying will be treated as academic dishonesty. You may also ask questions on the #dailyprep channel on CampusWire, but you may not ask simply to be given the answers; giving and receiving answers on CampusWire will be treated as academic dishonesty.