Homework One

Calculus I

College of the Atlantic

Due Friday, September 16, 2022

There are two parts to this assignment.

Part 1: WeBWorK. Do Homework 00 and 01 which you will find the WeBWorK page here: `https://webwork.runestone.academy/webwork2/coa-feldman-es1024i-fall-2022/`. I recommend doing the WeBWorK part of the homework first. This will enable you to benefit WeBWorK's instant feedback before you do part two.

Part 2: Non-WeBWorK problems. Here are some instructions for how to submit this part of the assignment.

- Do the problems by hand using pencil (or pen) and paper. There is no need to type this assignment.

- If you like working on a tablet, go for it.

- Make a pdf scan of your work using genius scan or some similar scanning app. Please make the homework into a single pdf, not multiple pdfs.

- Submit the assignment on google classroom. Please don't email it to me. (Between my two classes I will be receiving around 60 assignments a week. Keeping track of them all in email is challenging.)

- If you want, you can do the non-WeBWorK problems in pairs and submit only one assignment for the two of you.

Here are some non-WeBWorK problems.

1. Determine an equation for the linear function that generates the values in the table below.

x	$f(x)$
5.2	27.8
5.3	29.2
5.4	30.6
5.5	32.0
5.6	33.4

2. The graph of Fahrenheit temperature, F, as a function of Celsius temperature, C, is a line. We know that 212 F and 100 C are the same; this is the temperature at which water boils (under standard pressure). And we also know that 32 F and 0 C are the same; this is the temperature at which water freezes.

   (a) What is the slope of the graph?

   (b) What is the equation of the line? (I.e., F as a function of C.)

   (c) Use the equation to find what Fahrenheit temperature corresponds to 20 C.

   (d) What temperature is the same number of degrees in both C and F?

3. The cost of planting a crop is usually a function of the number of acres sown. The cost of the equipment is a *fixed cost*, because it must be paid regardless of the number of acres planted. The cost of supplies and labor varies with the number of acres planted and is called the *variable cost*. Supposed the fixed costs of $10,000 and the variable costs are $200 per acre. Let C represent the total cost of planting x acres of a crop.

   (a) Find a formula for C as a function of x.

   (b) Graph the function.

   (c) Which feature on the graph (slope or y-intercept) represents the fixed cost? Which represents the variable cost?