

# Homework One

## Calculus I

### College of the Atlantic

Due Friday, September 20, 2024

There are two parts to this assignment.

**Part 1: WeBWorK.** Do Homework00 and Homework01 which you will find on the WeBWorK page here: <https://webwork-hosting.runestone.academy/webwork2/coa-feldman-es1024-fal>. I recommend doing the WeBWorK part of the homework first. This will enable you to benefit WeBWorK's instant, if somewhat terse, 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.
- Please show your work clearly. Thanks.
- 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.
- 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?