Discussion Worksheet 1

MAT 17B

Due at 11:59 PM on Friday, January 13

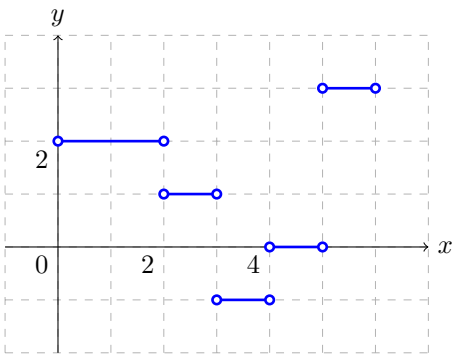
Instructions

- Be sure to read through the group work instructions on Canvas!
- This week, whoever's name comes first in the alphabet is the Scribe, whoever's name comes second is the Reporter, whoever's name comes third is the Clarifier, and whoever's name comes fourth is the Manager. (If your group has only three people, you won't have a Manager.)
- See the group work instructions on Canvas for an explanation of what each person's job will be.
- Work together to solve the problem, sharing ideas and asking questions.
- Write out any explanations **in complete sentences**. Any calculations in your solution should be contained in sentences. Look at how your textbook writes solutions to examples to see what that should look like.
- Your work will be graded on whether you followed directions. Your exact solution isn't as important as working together and showing the process you used to solve the problem.

Problems

1. Write down your groupmates' names and contact information. You don't need to turn these in, but you should make sure you're able to communicate with your groupmates outside of discussion section.

2. Below is the graph of $f'(x)$.



   (a) Suppose that $f(x)$ is continuous on $[0, 6]$ and $f(0) = -1$. Sketch the graph of $f(x)$.

   (b) Suppose that $f(0) = -1$ but $f(x)$ is NOT continuous. Sketch a possible graph of $f(x)$. How many possibilities are there?

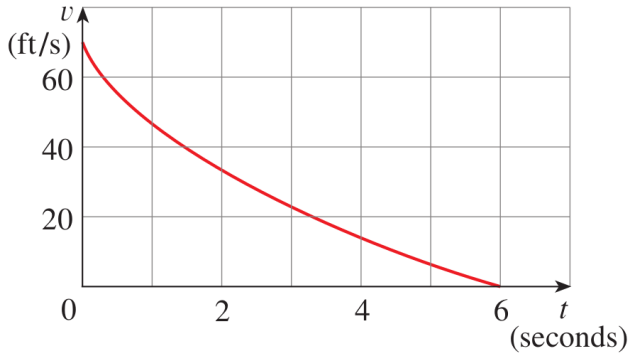
3. (a) Write the following definite integral as a limit:

$$\int_7^{12} 3\sin(4x)\,dx$$

(b) Write the following limit as a definite integral:

$$\lim_{n\to\infty} \frac{4}{n} \sum_{i=1}^{n} \left[\left(3 + \frac{2i}{n}\right)^2 - 3\left(3 + \frac{2i}{n}\right) + 4 \right]$$

4. The graph below shows the *velocity* of a car as a function of time.



(a) Approximate the area under the graph for $0 \le t \le 6$ using rectangles and right endpoints.

(b) What are the *units* of your answer above? What might the area under the graph tell us physically?

(c) Is your approximation in part (a) an *over*estimate or an *under*estimate of the actual area? Would your answer change if you used a different number of rectangles?

(d) Would your answer to part (c) change if you used left endpoints instead?