MAT 136: Calculus I
Weekly Homework 8

NAME:

Instructions

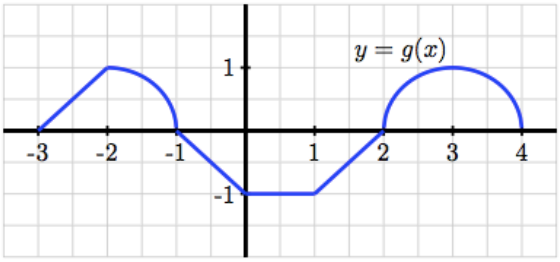
You are allowed and encouraged to work together on homework. Yet, each student is expected to turn in his or her own work.

Reviewing material from previous courses and looking up definitions and theorems you may have forgotten is fair game. However, when it comes to completing assignments for this course, you should *not* look to resources outside the context of this course for help. That is, you should not be consulting the web, other texts, other faculty, or students outside of our course in an attempt to find solutions to the problems you are assigned. This includes Chegg and Course Hero. On the other hand, you may use each other, Discord, me, and your own intuition. **If you feel you need additional resources, please come talk to me and we will come up with an appropriate plan of action.** Please read NAU's Academic Integrity Policy.

Complete each of the following exercises. Your solutions should be complete and neatly written. In particular, you should show all of your work. Write your solutions on your own paper or prepare them digitally. This assignment is due at beginning of class on **Thursday, November 23**.

Problems

1. Let g be the function given by the following graph. Assume that each piece of the function is part of a circle or part of a line. Compute each of the following integrals.



   (a) $\displaystyle\int_{-3}^{4} g(x)\,dx$ (b) $\displaystyle\int_{-3}^{4} |g(x)|\,dx$

2. Compute $\displaystyle\int_{0}^{1} 3x^2+1\,dx$ using a limit of Riemann sums with right endpoints.

3. Let f and g be functions such that $\displaystyle\int_{a}^{b} f(x)\,dx = \int_{a}^{b} g(x)\,dx$. Does this imply that $f(x) = g(x)$ for all $x \in [a,b]$? If the answer is yes, explain why. If the answer is no, provide a specific counterexample.

4. Suppose f is a bounded continuous function on the interval $[1,7]$ such that $2 \leq f(x) \leq 3$ for all $x \in [1,7]$. What are the minimum and maximum possible values of $\displaystyle\int_{1}^{7} f(x)\,dx$?