

1. [3 points] **There is work to submit for this problem. Read it carefully.**

- You may use your one pre-written page of notes, on an 8.5" by 11" standard sheet of paper, with whatever you want handwritten (not typed) on both sides.
- You are not allowed to use any other resources, including calculators, other notes, or the book.
- You may not use any electronic device or the internet, except to access the Zoom meeting for the exam, to access the exam file itself, to submit your work, or to report technological problems via the Google forms we will provide to do so. The one exception is that you may use headphones (e.g. for white noise) if you prefer, though please note that you need to be able to hear when the end of the exam is called in the Zoom meeting.
- You may not use help from any other individuals (other students, tutors, online help forums, etc.), and may not communicate with any other person about the exam until **10am on Wednesday, March 31** (Ann Arbor time).
- The one exception to the above communication policy is that you may contact the proctors in your exam room via the chat in Zoom if needed.
- Violation of any of the policies above may result in a score of zero for the exam, and, depending on the violation, may result in a failing grade in the course.

As your submission for this problem, you must write "I agree," and write your initials and UMID number to signify that you understand and agree to this policy. By doing this you are attesting that you have not violated and will not violate this policy.

2. [12 points] A table of values for a differentiable, invertible function $g(x)$ and its derivative $g'(x)$ are shown below.

x	0	1	2	3	4	5
$g(x)$	0	0.5	1	2	5	6
$g'(x)$	1.9	1.5	2.8	2.5	2.6	3

- a. [2 points] Use the table provided to give the best possible estimate of $g''(3.5)$.

For parts **b.** and **c.** below, find the **exact** value. Write DNE if the value does not exist, and write NEI if the quantity exists but there is not enough information provided to compute its value.

Your answers should not include the letters g or h but you do not need to simplify. Show work.

- b. [3 points] Let $f(x) = g^{-1}(3x)$. Find $f'(2)$.

- c. [3 points] Let $k(x) = \frac{g(x) - 7}{\ln(x)}$. Find $k'(3)$.

Suppose now that $g(x)$ is the number of thousands of seagulls on a beach when there are x hundred tourists on the beach.

- d. [4 points] Complete the following sentence to give a practical interpretation of $(g^{-1})'(1.6) = 0.2$.

If the number of seagulls on the beach increases from 1600 to 1605 ...