

Math 251 -- Test # 1 (Sec. 1.1-2.3)

Part B (30 minutes)

Due by 4:30 p.m. (Submitted by 4:45 p.m.)

2/13/23

Directions:

- 1) Must upload to Gradescope as a **single** PDF by the time it is due (**Be sure to allow enough time!!!** Remember you have a 15-minute grace period before any penalty, but after that there is a steep penalty!)
 - 2) Must **match** each problem to the page it is on.
 - 3) Make sure to follow all directions carefully by reading all directions carefully!
 - 4) Write clearly with sharp pencil or dark ink. Make sure all work is clear and legible!
 - 5) Make sure all pictures are clear and easy to read.
 - 6) You may use your study guide, but **NOTHING ELSE!**
 - 7) If you have any questions, **ask me and only me.**
 - 8) You may use a scientific calculator only--**Not** a graphing calculator.
 - 9) **You MUST show ALL your work for full credit! Box your final answer!**
 - 10) **Simplify** all answers and leave all answers in **Exact Form** (i.e. no decimals) unless otherwise noted.
 - 11) Good luck!
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5. Given the following function $f(x)$:

$$f(x) = \begin{cases} 2, & x < -4 \\ \frac{1}{2}x + 1, & -4 \leq x \leq 0 \\ e^x, & x > 0 \end{cases}$$

- a) Sketch the graph of $f(x)$
- b) Find $\lim_{x \rightarrow -4^-} f(x)$
- c) Find $f(-4)$
- d) Does $\lim_{x \rightarrow -4} f(x)$ exist? Explain why or why not.

6. For $f(x) = \frac{6}{x+2}$, construct and simplify the difference quotient $\frac{f(x+h) - f(x)}{h}$

7. Draw a graph of each of the following on an x-y axis system.

a) A graph for which y is not a function of x .

b) A graph for which y is a function of x , but y is not a one-to-one function of x .

c) A graph for which y is a one-to-one function of x .

8. Solve for x . You must show all of your work. Leave your answers in exact form (i.e. no decimal answers)

$$\ln(1 - x) = \ln(x + 16 - x^2)$$

Point Breakdown for Part B

#5 15 pts (7/2/2/4)

#6 10 pts

#7 12 pts (4/4/4)

#8 8 pts

Total possible points for Part B 45 pts

Total possible points on the Test $95+5=100$ pts (Note: includes the 5 pts for the study guide)