

Math 242 Exam 1, Spring 2023

Name:

Section: 7 8

Question	Points	Score
1	1	
2	7	
3	8	
4	8	
5	4	
6	4	
Total:	32	

- You have 75 minutes to complete this exam.
- Please ask if anything seems confusing or ambiguous.
- You must show all your work unless the problem states otherwise. You will get almost no credit for solutions that are not fully justified.
- You may not use notes or calculators on this exam.
- You do not need to simplify your answers.
- Good luck!

Homework	
Worksheets	
Quizzes	
Exam 1	
Total	

1. (1 point) Make sure you write your name and circle your section on the cover page!
2. Short answer. Write your answer in the space provided. You do not have to justify your answer.

(a) (3 points) Let $f(x) = \cos(x) + x$. Then $f(0) = 1$. Find $(f^{-1})'(1)$.

(a) _____

(b) (1 point) Evaluate $\log_9(3)$.

(b) _____

(c) (1 point) Evaluate $\arccos(1)$.

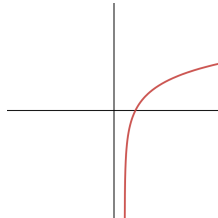
(c) _____

(d) (1 point) Find $\lim_{x \rightarrow -\infty} \arctan x$.

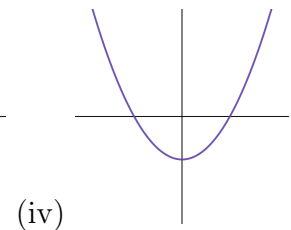
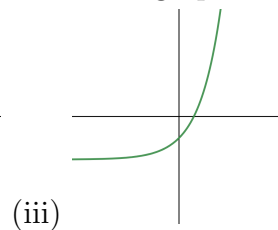
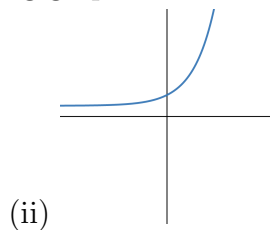
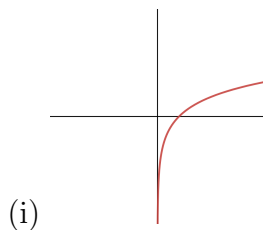
(d) _____

(e) (1 point) Consider the following graph,

(e) _____



Which of the following graphs is the inverse of the graph above?



3. Compute the derivatives of the following functions.

(a) (4 points) $y = 7^{\sqrt{x}} + \arctan(3x^2 + 1)$

(b) (4 points) $y = (\arcsin x)^x$

4. Compute the following limits. Clearly indicate usage of l'Hopital's rule.

(a) (4 points) $\lim_{x \rightarrow \infty} \frac{1 - e^x}{1 + e^{2x}}$

(b) (4 points) $\lim_{x \rightarrow \frac{\pi}{2}^-} (\sin x)^{\tan x}$

5. (4 points) Evaluate the integral $\int x \sin(3x) dx$

6. (4 points) A colony of bacteria under ideal conditions exhibits exponential growth. A colony starts with one bacterium and doubles every 30 minutes. How many bacteria are present after 1 day?