MAT 132 **Name (Print):** _____
Summer II 2019
Quiz 4
08/08/19
Time Limit: 50 minutes ID number _____

Instructions

- This exam contains 10 pages (including this cover page) and 8 problems. Check to see if any pages are missing. Enter all requested information on the top of this page, and put your initials on the top of every page, in case the pages become separated.
- You may *not* use your books, notes, or any device that is capable of accessing the internet on this exam (e.g., smartphones, smartwatches, tablets). You may not use a calculator.
- **Organize your work**, in a reasonably neat and coherent way, in the space provided. Work scattered all over the page without a clear ordering will receive very little credit.
- **Mysterious or unsupported answers will not receive full credit**.

Problem	Points	Score
1	2	
2	4	
3	2	
4	2	
5	2	
6	2	
7	3	
8	3	
Total:	20	

1. (2 points) Determine whether the sequence

$$a_n = \frac{n \sin(n)}{n^2 + 1}$$

converges or diverges. If it converges, finds its limit.

2. Determine the value of the following series:

   (a) (2 points)

$$\sum_{n=1}^{\infty} \frac{3^n}{4^{n+2}}$$

(b) (2 points)

$$\sum_{n=1}^{\infty} \frac{1}{n^2 + 7n + 10}$$

3. (2 points) Use the Integral Test to determine whether the following series converges

$$\sum_{n=1}^{\infty} \frac{1}{n^2+1}$$

4. (2 points) Use the Comparison Test to determine whether the following series converges

$$\sum_{n=1}^{\infty} \frac{1+\sin(n)}{3^n}$$

5. (2 points) Use the Limit Comparison Test to determine whether the following series converges

$$\sum_{n=1}^{\infty} \frac{n^2 - 1}{3n^4 + 1}$$

6. (2 points) Use the Alternating Series Test to determine whether the following series converges

$$\sum_{n=1}^{\infty} \frac{(-1)^n(2n+1)}{3n-1}$$

7. (3 points) Find the radius and interval of convergence of the following series

$$\sum_{n=1}^{\infty} \frac{n(x+1)^n}{4^n}$$

8. (3 points) Find a power series representation of the following function

$$f(x) = \frac{x}{9 + x^2}.$$