Math 242 Exam 3, Spring 2023

Name:

Section: 7   8

Question	Points	Score
1	1	
2	7	
3	8	
4	8	
5	12	
Total:	36	

- 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	
Exam 2	
Exam 3	
Total	

1. (1 point) Don't forget to write your name and circle your section!

2. Short answer. You do not have to show your work, but partial credit is available for work shown.

   (a) Each of the following series converges, find their sum.

   i. (2 points) $\displaystyle\sum_{n=0}^{\infty} \frac{2^{n+1}}{3^n}$

   ii. (2 points) $\displaystyle\sum_{n=0}^{\infty} (\arctan(n) - \arctan(n+1))$

   (b) Determine whether each of the following series converges absolutely, converges conditionally, or diverges. Circle your answer.

   i. (1 point) $\displaystyle\sum_{n=1}^{\infty} (-1)^n n^2$

      A. absolutely convergent   B. conditionally convergent   C. divergent

   ii. (1 point) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{n}$

      A. absolutely convergent   B. conditionally convergent   C. divergent

   iii. (1 point) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{n^3}$

      A. absolutely convergent   B. conditionally convergent   C. divergent

3. Determine wherther the following series diverge or converge. Show your work and clearly state which test(s) you are using.

(a) (4 points) $\displaystyle\sum_{n=1}^{\infty} \frac{\cos(n)}{n^2 + 1}$

(b) (4 points) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{\sqrt[3]{n^2 + 2n + 1}}$

4. Determine wherther the following series diverge or converge. Show your work and clearly state which test(s)

(a) (4 points) $\displaystyle\sum_{n=2}^{\infty} \frac{1}{n(\ln n)^2}$

(b) (4 points) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt{n}+7}$

5. Determine wherther the following series diverge or converge. Show your work and clearly state which test(s) you are using. you are using.

(a) (4 points) $\displaystyle\sum_{n=1}^{\infty} (\sin(7/n))^n$

(b) (4 points) $\displaystyle\sum_{n=1}^{\infty} \frac{7^n}{n!}$

(c) (4 points) $\displaystyle\sum_{n=1}^{\infty} \left(1 - \frac{7}{n}\right)^n$