

NAME _____

Rec. Instructor: _____

Signature _____

Rec. Time _____

CALCULUS II - EXAM 2

July 22, 2019

Required to show work or make statements for full credit. No books, notes or calculators are permitted. The point value of each problem is given in the left-hand margin. You have 75 minutes.

Problem	Points	Possible	Problem	Points	Possible
1		10	8		10
2		10	9		10
3		10	10		10
4		10	11		10
5		10			
6		10			
7		10			
			Total Score		110

(10)

- 1.** Evaluate the series $\sum_{n=2}^{\infty} \left(\frac{4}{5}\right)^n$

(10)

- 2.** Find the minimum M that guarantees that

$$\left| \sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{10n+2} - \sum_{n=1}^M \frac{(-1)^{n+1}}{10n+2} \right| < .001.$$

(10)

- 3.** Determine the radius of convergence and interval convergence, but don't check the end points

$$\sum_{n=1}^{\infty} \frac{2^n}{n} (4x - 8)^n.$$

(10)

4. Show whether the series converges absolutely or conditionally or diverges. Name all tests used.

$$\sum_{n=6}^{\infty} (-1)^n \frac{4 + \sqrt{n}}{n^3 - 5n^2}$$

(10)

5. Find the Taylor series for $f(x) = e^{-x}$ about $x = -4$

(10)

6. Find the limit of the sequence or state that it diverges.

$$\lim_{n \rightarrow \infty} n^2 e^{-n}$$

Determine whether the following series converge conditionally, converge absolutely, or diverge. Name all tests used.

(10)

7.
$$\sum_{n=1}^{\infty} \frac{(-1)^n}{n^{5/3}}$$

(10)

8.
$$\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt{n}}.$$

(10)

- 9.** Find a power series representation for the following function and determine its interval of convergence

$$f(x) = \frac{x}{5-x}.$$

(10)

- 10.** Determine whether the following series converge conditionally, converge absolutely, or diverge. Name all tests used.

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

(10)

- 11.** Solve the differential equation for initial conditions $y(1) = 4$
(Not required to solve for y).

$$\frac{dy}{dx} = x^2y - 3x^2$$