

TEST 4

Math 152 - Calculus II

Score: _____ out of 100

12/3/2013

Name: _____

Read all of the following information before starting the exam:

- You have 50 minutes to complete the exam.
- Show all work, clearly and in order, if you want to get full credit. Please make sure you read the directions for each problem. I reserve the right to take off points if I cannot see how you arrived at your answer (even if your final answer is correct).
- Please box/circle or otherwise indicate your final answers.
- Please keep your written answers brief; be clear and to the point. I will take points off for rambling and for incorrect or irrelevant statements.
- This test has 5 problems and is worth 100 points. It is your responsibility to make sure that you have all of the pages!
- Good luck!

1. Determine if the following series converge or diverge. Clearly state the test you are using to obtain your answer.

(a) $\sum_{n=0}^{\infty} \frac{n!}{7^n 9^{n+1}}.$

(b) $\sum_{n=1}^{\infty} \left(\frac{1}{2} + \frac{1}{\ln(5n)} \right)^n.$

(c) $\sum_{n=0}^{\infty} \frac{(-1)^n}{e^n + 1}.$

2. Determine if the following series is absolutely convergent, conditionally convergent, or divergent.

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

3. Using the formula, **set up a table** and find the first THREE nonzero terms of the Maclaurin series for

$$f(x) = \sin\left(x + \frac{\pi}{2}\right).$$

Be sure to write out the series!

4. Using the formula, **set up a table** and find the first THREE nonzero terms of the Taylor series about $x_0 = 1$ for

$$f(x) = e^{-3x}.$$

Be sure to write out the series!

5. Find the **radius of convergence** and **interval of convergence** for the power series

$$\sum_{n=1}^{\infty} \frac{(x-5)^n}{n^4}.$$

Interval of Convergence:

Radius of Convergence: