TEST 4

Math 152 - Calculus II **Score:** _____ out of 100

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 6 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) $\sum_{n=0}^{\infty} \frac{3^n}{n!}$.

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

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

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

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

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

$$f(x) = \frac{1}{1+3x} = (1+3x)^{-1}.$$

4. Using the formula, set up a table and find the first THREE terms of the Taylor series about $x_0 = 2$ for

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

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

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

6. Use known Maclaurin series to write the first THREE terms of the Maclaurin series for the following.

   (a) $\dfrac{1}{1+3x^2}$.

   (b) $\displaystyle\int e^{x^3}\,dx$.