

Math 1700 Summer 2013

Exam 3

Thursday July 18 2013

No Work = No Credit

Name: _____ Student Number: _____

Signature: _____

Instructor: _____ Section: _____

Instructions: Answer all questions and show all of your work. The use of books, notes or calculators is not permitted.

Problem	Points	Student's Score
1	10	
2	10	
3	10	
4	10	
5	10	
6	10	
7	10	
8	10	
9	10	
10	10	
Total:	100	

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1. (10 points) Determine whether the series

$$\sum_{n=1}^{\infty} n^2 e^{-n^3}$$

is convergent or divergent.

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2. (10 points) Determine whether the series

$$\sum_{n=1}^{\infty} \frac{n^3}{n^6 + n^3 + 1}$$

is convergent or divergent.

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3. (10 points) Determine whether the series

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

is convergent or divergent.

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4. (10 points) Determine whether the series

$$\sum_{n=1}^{\infty} \frac{\sin(10n)}{10^n}$$

is absolutely convergent, conditionally convergent or divergent.

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5. (10 points) Determine whether the series

$$\sum_{n=1}^{\infty} \frac{(-10)^{n+1}}{n^{10}}$$

is absolutely convergent, conditionally convergent or divergent.

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6. (10 points) Find the radius of convergence and the interval of convergence of the power series

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

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7. (10 points) Find a power series representation for $f(x)$, and the associated radius of convergence, where

$$f(x) = \ln(10 - x).$$

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8. (10 points) Use the Maclaurin series for $\sin(x)$ to find the Maclaurin series for $x \sin(\frac{1}{2}x^2)$.

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9. (10 points) Find the sum of the series

$$\sum_{n=0}^{\infty} \frac{(-1)^n \pi^{2n+1}}{4^{2n+1} (2n+1)!}.$$

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10. (10 points) Use the definition of the Taylor series to find the Taylor series for $f(x) = \frac{1}{x}$ centered at $c = -3$.