

Name:

Math 116 Exam 2

November 11, 2010

Directions: WRITE YOUR NAME ON THIS Exam! Except where indicated, merely finding the answer to a problem is not enough to receive full credit; you must show how you arrived at that answer. DO NOT convert irrational numbers such as $\sqrt{3}$ or π into decimal approximations; just leave them as they are.

1) Find the sum of the series or show that it diverges.

a) (10 points) $\sum_{n=2}^{\infty} \frac{11^{n+1}}{5^{2n}}$

b) (10 points) $\sum_{n=1}^{\infty} \ln \left(\frac{n+3}{n+4} \right)$ (*Hint:* partial sums.)

2) Consider the power series $\sum_{n=3}^{\infty} \frac{(5x - 15)^n}{\sqrt{n - 2}}$.

a) (3 points) What is the center of the series?

b) (12 points) Find the radius of convergence of the series.

3) The following series converge. Find a number of terms needed to estimate the value of the sum to within .0001.

a) $\sum_{n=2}^{\infty} \frac{7}{n^3}$

b) $\sum_{n=1}^{\infty} \frac{(-1)^n n^4}{e^n}$

4) Determine whether the following series converge or diverge. CLEARLY STATE WHICH TEST YOU ARE USING!

a) (6 points) $\sum_{n=0}^{\infty} \frac{7n+1}{n+1}$

b) (10 points) $\sum_{n=6}^{\infty} \frac{(-32)^n}{n!}$

c) (12 points) $\sum_{n=2}^{\infty} \frac{\arctan(\sqrt{n})}{\sqrt{n}}$