Name:

Math 116 Exam 3

March 30, 2023

Directions:

1. WRITE YOUR NAME ON THIS TEST!
2. 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.
3. Unless otherwise indicated, decimal approximations for a numerical answer accurate to 4 decimal places are acceptable.
4. If you have a question, raise your hand or come up and ask me.

1) Suppose you have a power series whose center is $c = 1/2$ and whose radius of convergence is $R = 1$.

a) Find three numbers, other than the center, for which the power series definitely converges.

b) Find three numbers for which the power series definitely diverges.

c) Find the only two numbers for which you can't tell whether the series converges or diverges.

2) Consider the power series $\sum_{n=2}^{\infty} \frac{(3x-18)^n}{\sqrt{2n+1}}$.

a) What is the center of this series?

b) Find the radius of convergence of this series.

3) Determine whether the following series are geometric or not. If it is, find the sum or show the series diverges.

a) $\displaystyle\sum_{n=3}^{\infty} \frac{7^{n-4}}{2^{3n-7}}$

b) $\displaystyle\sum_{n=0}^{\infty} 10^{-n^2}$

4) Determine whether the following sequence converges or diverges. If it converges, find the limit.

$$a_n = \left(\frac{n}{n+7}\right)^{6n}$$

Answers without work will count for nothing.