

Math 132 - Quiz 6

April 23, 2020

Name _____

Score _____

Show all work to receive full credit. Supply explanations when necessary. You must work individually on this quiz. This quiz is due no later than April 28.

1. (4 points) Find the radius and interval of convergence of the power series $\sum_{n=1}^{\infty} \frac{x^n}{n^2}$.
(Be sure to also check for convergence at the interval endpoints.)

2. (2 points) Find the interval of convergence of the power series $\sum_{n=0}^{\infty} \left(\frac{x}{4}\right)^n$.
(Be sure to also check for convergence at the interval endpoints.)

3. (4 points) Consider the power series $\sum_{n=0}^{\infty} \frac{x^n}{n!}$.

(a) Show that the radius of convergence is ∞ .

(b) Since the power series converges for all x , it converges to some function $f(x)$ that is defined for all real numbers. Use term-by-term differentiation to find a power series for $f'(x)$.

(c) Use term-by-term integration to find a power series for $\int f(x)dx$.

(d) Based on your results, can you determine a more familiar expression for $f(x)$?