MATH 128 Quiz # 4 (Practice Version)

Bubble your answer(s) for each question 1 - 6 on the last page of the exam.

[1] **1.** If $-1 < x < 1$, then $\displaystyle\sum_{n=0}^{\infty} x^n =$

    (a) $\dfrac{1}{1-x}$

    (b) $\dfrac{x}{1-x}$

    (c) $\dfrac{1}{1+x}$

    (d) $\dfrac{x}{1+x}$

    (e) $1 + x$

[1] **2.** The radius of convergence of $\displaystyle\sum_{n=1}^{\infty} n! x^n$ is

    (a) $R = 0$.

    (b) $R = 1$.

    (c) $R = 2$.

    (d) $R = \infty$.

[1] **3.** If the radius of convergence of $\displaystyle f(x) = \sum_{n=1}^{\infty} c_n (x-a)^n$ is $R = 3$, then the radius of convergence of $\displaystyle g(x) = \sum_{n=1}^{\infty} c_n n (x-a)^{n-1}$ is

    (a) $R = 1$.

    (b) $R = 1 + a$.

    (c) $R = 3$.

    (d) $R = \infty$.

    (e) There isn't enough information to determine the radius of convergence.

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[1] **4.** Determine whether $\left\{ \dfrac{n^2 + 1}{3n^2 + 2} \right\}$ is convergent or divergent.

   (a) It is convergent.

   (b) It is divergent.

   (c) There is not enough information to determine whether it is convergent or divergent.

[1] **5.** Select all tests that we use to determine the radius of convergence of a power series.

   (a) The Geometric Series Test.

   (b) The P-Series Test.

   (c) The Limit Comparison Test.

   (d) The Alternating Series Test.

   (e) The Ratio Test.

[1] **6.** Let $\{S_k\}$ be the sequence of partial sums for a series $\displaystyle\sum_{n=0}^{\infty} a_n$. If $\displaystyle\lim_{k \to \infty} S_k = 8$, then

   (a) $\displaystyle\sum_{n=0}^{\infty} a_n$ diverges.

   (b) $\displaystyle\sum_{n=0}^{\infty} a_n$ converges, but we do not know the sum of the series.

   (c) $\displaystyle\sum_{n=0}^{\infty} a_n$ converges, and the sum of the series is 8.

7. Determine whether the series converges or diverges.

[2] (a) $\displaystyle\sum_{n=1}^{\infty} \frac{n^2 + 1}{3n^4 - 2}$.

[2] (b) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n n}{3^n}$.

[3] **8.** Find a power series of $f(x) = \dfrac{3x}{1 + 2x}$ centered at $a = 0$ and its radius of convergence. Your answer must be written in standard form.

[2] **9.** Find a power series for $\displaystyle\int \dfrac{1}{1 + x^3}\, dx$ centered at $a = 0$ and its radius of convergence.

[3] **10.** Find the Taylor series of $f(x) = xe^x$ centered at $a = 1$ and its radius of convergence.

[3] **11.** Determine the radius and interval of convergence of $\displaystyle\sum_{n=1}^{\infty} \frac{(-3)^n(x-2)^n}{\sqrt{n}}$.