MATH 128 Quiz # 2 (Practice Version)

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

[1] **1.** Select all the convergent series.

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

(b) $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n}}$

(c) $\sum_{n=1}^{\infty} \frac{1}{n^3}$

(d) $\sum_{n=1}^{\infty} \frac{1}{2^n}$

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

[1] **2.** Select all of the true statements.

(a) If $\lim_{n\to\infty} a_n = 0$, then $\sum_{n=1}^{\infty} a_n$ converges.

(b) If $\lim_{n\to\infty} a_n = 0$, then $\sum_{n=1}^{\infty} a_n$ diverges.

(c) If $\lim_{n\to\infty} a_n = 5$, then $\sum_{n=1}^{\infty} a_n = 5$

(d) If $\lim_{n\to\infty} a_n = 5$, then $\sum_{n=1}^{\infty} a_n$ diverges.

[1] **3.** Select all the geometric series.

(a) $\sum_{n=1}^{\infty} \frac{2}{n}$

(b) $\sum_{n=1}^{\infty} \frac{(-2)^n}{5^{2n}}$

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

(d) $\sum_{n=1}^{\infty} \frac{1}{3^n}$

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[1] **4.** Let $\{a_n\}$ be a sequence such that $\lim\limits_{n\to\infty} |a_n| = 0$. Select all of the true statements.

(a) $\lim\limits_{n\to\infty} a_n = 0$

(b) $\{a_n\}$ is an alternating sequence.

(c) $\{a_n\}$ is a convergent sequence.

(d) $\{a_n\}$ is a divergent sequence.

(e) There is not enough information to tell whether $\{a_n\}$ converges or diverges.

[1] **5.** Consider the sequence with general term $a_n = \tan\left(\frac{\pi}{4} + n\pi\right)\frac{n^2+2}{2^n}$.
Select all of the true statements.

(a) The sequence is alternating with $b_n = \dfrac{n^2+2}{2^n}$.

(b) The sequence is not alternating.

(c) The sequence converges to 0.

(d) The sequence diverges.

[1] **6.** Let $\{S_k\}$ be the sequence of partial sums of the series $\sum\limits_{n=1}^{\infty} a_n$. Select all of the true statements.

(a) If $\lim\limits_{k\to\infty} S_k = 1$, then the series $\sum\limits_{n=1}^{\infty} a_n$ diverges.

(b) If $\lim\limits_{k\to\infty} S_k = \infty$, then the series $\sum\limits_{n=1}^{\infty} a_n$ diverges.

(c) If $\lim\limits_{k\to\infty} S_k = 300$, then $\lim\limits_{n\to\infty} a_n = 0$.

(d) If $\lim\limits_{k\to\infty} S_k = 10$, then $\lim\limits_{n\to\infty} a_n = 10$.

7. Determine which of the following converge.

[2] (a) $\left\{ \dfrac{n+3}{e^n} \right\}$

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

[2] (c) $\displaystyle\sum_{n=0}^{\infty} \frac{5^n}{2^{3n}}.$

[2] **8.** Find the sum of the convergent series $\displaystyle\sum_{n=1}^{\infty} \frac{1-(-2)^n}{3^{2n+1}}$.

9. Let $f(x) = \displaystyle\sum_{n=1}^{\infty} \frac{5 \cdot (-1)^n}{2^n} x^n$. Determine the domain of f and what function the series converges to for values of x in its domain.

[2] **10.** Use the Integral Test to determine whether $\displaystyle\sum_{n=0}^{\infty} \frac{1}{1+n^2}$ converges or diverges.

[3] **11.** Use the Integral Test to determine whether $\displaystyle\sum_{n=2}^{\infty} \frac{1}{n\ln(n)}$ converges or diverges.