Community College of Philadelphia | **Spring 2011**
Math 172-Calculus II | **Dr. Yun Yoo**

Attendance Quiz 24

Name: ____Date : ____________

You have to study ALL Attendance Quizzes (#17- #21) and HW problems. We recall topics:

Section 11.1 Sequences
Section 11.2 Series
Section 11.3 The Integral Test
Section 11.4 The Comparison Test
Section 11.5 Alternating Series
Section 11.6 Absolute Convergence and the Ratio and Root Tests
Section 11.7 Strategy for Testing Series
Section 11.8 Representations of Functions as Power Series

1. Find a formula for the general term a_n of the sequence, assuming that the pattern of the first few terms continues: $\{\frac{3}{2}, -\frac{9}{4}, \frac{27}{8}, -\frac{81}{16}, \ldots\}$. Ans: $a_n = (-1)^{n+1}(\frac{3}{2})^n$

2. Determine whether the sequence converges or diverges. If it converges, find the limit.

(a) $a_n = \frac{4n-3}{3n+4}$ (b) $a_n = \frac{\pi^n}{3^n}$

Ans: (a) $\frac{4}{3}$ (b) 0

3. Determine whether the series is convergent or divergent. If it is converges, find its sum. (Hint for (c), (d): these are the telescoping series).

(a) $\sum_{n=1}^{\infty} \frac{1}{e^{2n}}$ (b) $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{3^{2n}}{2^{3n+1}}$ (c) $\sum_{n=1}^{\infty} \frac{3n^2+4n}{2n^3-3^{10}}$

(d) $\sum_{n=1}^{\infty} \frac{1}{(3n-2)(3n+1)}$ (e) $\sum_{n=1}^{\infty} [\sin(\frac{1}{n}) - \sin(\frac{1}{n+1})]$

Ans: (a) $\frac{1}{e^2-1}$ (b) Divergent (c) Divergent

(d) $\frac{1}{3}$ (e) $\sin(1)$

4. To use the integral test, determine whether the series is convergent or divergent.

(a) $\sum_{n=1}^{\infty} \frac{\arctan n}{1+n^2}$ (b) $\sum_{n=1}^{\infty} ne^{-n^2}$

Ans: (a) Convergent (b) Convergent

5. Determine whether the series is convergent or divergent.

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

Ans: (a) Convergent (b) Divergent

6. Determine whether the series is convergent or divergent.

(a) $\sum_{n=2}^{\infty} \frac{(-1)^{n-1}}{n \ln n}$ (b) $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{2n^2}{4n^2+1}$

Ans: (a) Convergent (b) Divergent

7. Determine whether the series is absolutely convergent, conditionally convergent, or divergent.

(a) $\sum_{n=0}^{\infty} \frac{(-3)^n}{n!}$ (b) $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{2n+1}$ (c) $\sum_{n=1}^{\infty} (-1)^n \frac{2n}{3n-4}$

Ans: (a) AC (b) CC (c) Divergent

8. Determine whether the series is convergent or divergent.

(a) $\sum_{n=0}^{\infty} \frac{10^n}{n!}$ (b) $\sum_{n=1}^{\infty} \left(\frac{n^2+1}{2n^2+1} \right)^n$

Ans: (a) Convergent (b) Convergent

9. Find the radius of convergence and interval of convergence of the series.

(a) $\sum_{n=0}^{\infty} \frac{3^n x^n}{(n+1)^2}$ (b) $\sum_{n=1}^{\infty} \frac{(-1)^n x^{2n-1}}{(2n-1)!}$

Ans: (a) $R = \frac{1}{3}, -\frac{1}{3} \le x \le \frac{1}{3}$ (b) $R = \infty, (-\infty, \infty)$