

QUIZ ON SECTIONS 11.1-5**MATH 151 – SPRING 2003 – KUNIYUKI
102 POINTS TOTAL, BUT 100 POINTS = 100%****Show all work, simplify as appropriate, and use “good form and procedure” (as in class).****Box in your final answers!****No notes, books, or calculators allowed.**

- 1) Find the limits. Write ∞ or $-\infty$ when appropriate. If a limit does not exist, and ∞ and $-\infty$ are inappropriate, write “DNE” (Does Not Exist). You do not have to show work. (9 points total; 3 points each)

a) $\lim_{n \rightarrow \infty} a_n$, where $a_n = \left(\frac{n+1}{n}\right)^n$

b) $\lim_{n \rightarrow \infty} a_n$, where $a_n = 6\left(-\frac{2}{5}\right)^n$

c) $\lim_{n \rightarrow \infty} a_n$, where $a_n = \frac{\sin^2 n}{\sqrt{n}}$

- 2) Find the sum of the series $\sum_{n=1}^{\infty} \frac{3^{n+1}}{4^n}$. (8 points)

3) The series $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{1}{n^3}$ is approximated by S_3 . According to our discussion in class, what is an upper bound on $|\text{error}|$ for this approximation? (4 points)

4) For each of the following series, box in “Absolutely Convergent,” “Conditionally Convergent,” or “Divergent,” as appropriate. You do not have to show work. (12 points total; 4 points each)

a) $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{1}{n^{1/3}}$

Absolutely Convergent Conditionally Convergent Divergent

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

Absolutely Convergent Conditionally Convergent Divergent

c) $\sum_{n=1}^{\infty} \left[\frac{1}{n} + (-1)^{n-1} \frac{1}{n} \right]$

Absolutely Convergent Conditionally Convergent Divergent

5) True or False: There exists a rearrangement of the terms of the series

$$\sum_{n=1}^{\infty} (-1)^{n-1} \frac{1}{n} \text{ so that the resulting series converges with sum } \pi.$$

Box in one: (3 points)

True

False

6) For each of the following series:

- Determine whether it converges (write “C”) or diverges (write “D”).
- State which test you are using (you may abbreviate as in class).
- Show work (as suggested in class).
- Whenever you use the Integral Test, state and verify the assumptions (hypotheses) for the test (as we have done in class). (66 points total)

a) $\sum_{n=2}^{\infty} \frac{n^{3/2}}{n^2 - 3}$

b) $\sum_{n=1}^{\infty} [1 + (-1)^n]$

$$\text{c) } \sum_{n=2}^{\infty} \frac{2n^4 + 3}{n^7 - 8}$$

$$\text{d) } \sum_{n=0}^{\infty} \frac{7^n}{n!}$$

$$\text{e) } \sum_{n=1}^{\infty} n \left(\frac{3}{4}\right)^n$$

$$\text{f) } \sum_{n=2}^{\infty} \frac{1}{n \ln n}$$