MATH 3283W HOMEWORK #5 DUE 4/6/10

SUMMATION NOTATION, SECTIONS 4.2, 4.3, CHAPTER 4

PART A

1. DETERMINE IF THE FOLLOWING SERIES CONVERGE OR DIVERGE. GIVE REASONS FOR YOUR ANSWERS

(a) $\sum_{n=1}^{\infty} \frac{5^{3n+2}}{4^{1+4n}}$

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

(c) $\sum_{m=0}^{\infty} \frac{1}{(m+1)(m+2)}$

d) $\sum_{n=1}^{\infty} n^{-5/6}$

2 (a) FIND A FORMULA FOR $\sum_{i=1}^{n} \sum_{j=1}^{n} ij$ IN TERMS OF n. SHOW YOUR WORK

(b) EVALUATE $\sum_{i=1}^{6} \sum_{j=1}^{6} ij$

3 FIND THE SUM OF THE FOLLOWING SERIES, FOR WHAT VALUES OF X DOES IT CONVERGE?

(a) $\sum_{n=2}^{\infty} x^{3n}$

(b) $\sum_{n=k}^{\infty} (-1)^n x^{2n}$, WHERE $k \in \mathbb{N}$

4 (a) WRITE THE FOLLOWING INIFINITE DECIMALS AS FRACTIONS

(i) $.\overline{357}$

(ii) 1232112321123321.....

(b) WHAT IS THE VALUE OF THE SUM

$.\overline{59} + .\overline{73}$?

PART B

5, SUPPOSE $\sum_{n=1}^{\infty} a_n$ IS A SERIES OF POSITIVE TERMS WHICH CONVERGES. DO THE FOLLOWING SERIES CONVERGE OR DIVERGE? PROVE YOUR ANSWERS

(a) $\sum_{n=1}^{\infty} \sin a_n$ (b) $\sum_{n=1}^{\infty} \cos a_n$

6 DETERMINE IF THE SERIES CONVERGE OR DIVERGE. GIVE CAREFUL REASONS FOR YOUR ANSWERS

(a) $1 + \frac{1}{2^2} + \frac{1}{3^3} + \frac{1}{4^2} + \frac{1}{5^3} + \cdots$ (b) $1 + \frac{1}{2^3} + \frac{1}{3} + \frac{1}{4^3} + \frac{1}{5} + \cdots$

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

7 FIND THE SHADED AREA, SHOW YOUR REASONING/CALCULATIONS