Homework assignment #9

Math 317

Due Friday, April 15

1. Read section 61.

2. Solve the following problems from the textbook: P. 188 ex. 1,3,10,11,12; P 198 ex. 1,3,4,9; P 214 ex 8, P 219 ex 3, 8.

3. The Riemann zeta function is defined by

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

where as usual $n^s = \exp(s \log n)$ (since n is a real number we use the usual log on the real numbers).

Show that this series converges absolutely and uniformly in the region $\operatorname{re} s \geq \sigma$ for any $\sigma > 1$.

Deduce using Morera's theorem that ζ is analytic for $\operatorname{re} s > 1$.