Problem Set 8 (§4.6.1–5.1.1) Math 660

Due Monday, August 15, 2011 Jim Fowler

Different problems may be assigned!

This is probably not the final version! The problems assigned on this homework set are subject to change! The final version of Problem Set 8 will probably be ready by August 9, 2011.

Problem 1

Suppose $f(z)$ is analytic in the annulus $r_1 < |z| < r_2$ and continuous on the closed annulus. If $M(r)$ denotes the maximum of $|f(z)|$ for $|z| = r$, show that

$$M(r) \leq M(r_1)^{\alpha} M(r_2)^{1-\alpha},$$

where

$$\alpha = \frac{\log \frac{r_2}{r}}{\log \frac{r_2}{r_1}}.$$

Discuss cases of equality.

Problem 2

Page 166, problem 1 in Ahlfors' *Complex Analysis*.

Problem 3

Page 171, problem 4 in Ahlfors' *Complex Analysis*.

Problem 4

Page 171, problem 2 in Ahlfors' *Complex Analysis*.

Problem 5

Page 171, problem 7 in Ahlfors' *Complex Analysis*.

Problem 6

Page 171, problem 5 in Ahlfors' *Complex Analysis*.

Problem 7

Page 172, problem 8 in Ahlfors' *Complex Analysis*.

Problem 8

Page 174, problem 3 in Ahlfors' *Complex Analysis*.

Problem 9

Page 174, problem 5 in Ahlfors' *Complex Analysis*.

Problem 10

Page 174, problem 5 in Ahlfors' *Complex Analysis*.

Problem 11

Page 174, problem 4 in Ahlfors' *Complex Analysis*.

Problem 12

Page 179, problem 4 in Ahlfors' *Complex Analysis*.

Problem 13

Page 179, problem 5 in Ahlfors' *Complex Analysis*.

Problem 14

Page 178, problem 3 in Ahlfors' *Complex Analysis*.