



COMPLEX VARIABLES  
SPRING 2011

ASSIGNMENT 8.1  
DUE OCTOBER 24

**Exercise 1.** Define  $f(z) = \sqrt{r}e^{i\theta/2}$  where  $z = re^{i\theta}$  with  $-\pi \leq \theta < \pi$ . Let  $R$  denote the rectangle with vertices  $i$ ,  $-i$ ,  $2-i$  and  $2+i$ . Use Lemma 2.3.4 to help you evaluate  $\int_R f(z) dz$ .

**Exercise 2.** Let  $G$  be the region of textbook Exercise 2.3.5. Use Cauchy's Theorem for a Rectangle to prove that if  $f$  is analytic on  $G$  and on its boundary  $\partial G$ , then  $\int_{\partial G} f(z) dz = 0$ .