



COMPLEX VARIABLES  
SPRING 2011

ASSIGNMENT 3.1  
DUE SEPTEMBER 19

**Exercise 1.** 1.4.13 and 1.4.14. I didn't define it in class, but a set is *closed* if and only if its complement in  $\mathbb{C}$  is open.

**Exercise 2.** 1.4.20.

**Exercise 3.** Let  $y_0 \in \mathbb{R}$  and let  $\arg z$  denote the branch of the argument taking values in  $[y_0, y_0 + 2\pi)$ . For what values of  $z_0 \in \mathbb{C}^\times$  does  $\lim_{z \rightarrow z_0} \arg z$  exist?