



COMPLEX VARIABLES  
FALL 2024

ASSIGNMENT 6.2  
DUE OCTOBER 9

**Exercise 1.** If  $n \in \mathbb{Z}$  and  $f : \mathbb{C} \rightarrow \mathbb{C}$  is defined by  $z^n$ , prove that  $f$  is analytic on  $\mathbb{C}$  (or  $\mathbb{C}^\times$  when  $n < 0$ ) and satisfies the power rule

$$f'(z) = \frac{d}{dz}(z^n) = nz^{n-1},$$

where we interpret  $0 \cdot z^{-1}$  as 0 for all  $z \in \mathbb{C}$ .

**Exercise 2.** Textbook exercise 1.5.1.

**Exercise 3.** Textbook exercise 1.R.15.