1. [BC] 10.1, 10.2, 10.3. Give a brief explanation for each answer; one-word responses will not suffice.

2. Let $S$ be a subset of $\mathbb{C}$. Prove that every point of $S$ is an interior point of $S$ if and only if $S$ contains none of its boundary points. (This is asserted, but left unproved, in the text.)


4. Suppose that $S$ and $T$ are open subsets of $\mathbb{C}$. Show that $S \cup T$ is open, too.

5. Let $S$ and $T$ be domains. If $S \cap T$ necessarily a domain? Prove or give a counterexample.


7. Write each of the following functions in the form $w = u(x, y) + iv(x, y)$.
   
   (a) $f(z) = 3z^2 + 5z + i + 1$.
   (b) $g(z) = \exp(z) + \exp(-z)$.  

---

Professor Jeff Achter  
Colorado State University  

M419: Introduction to Complex Variables  
Fall 2007