Due Friday October 3

Do the following problems from Abbott’s *Understanding Analysis*.

- Exercise 3.2.3
- Exercise 3.2.9
- Exercise 3.2.12

1) If $A \subseteq \mathbb{R}$, then $x \in A$ is an *interior point* of $A$ if $V_{\epsilon}(a) \subseteq A$ for some $\epsilon > 0$. Let $A^\circ$ be the set of interior points of $A$. We call $A^\circ$ the *interior* of $A$.
   a) Prove that $A^\circ$ is open.
   b) Suppose $O$ is open and $O \subseteq A$. Prove that $O \subseteq A^\circ$. Thus $A^\circ$ is the largest open subset $A$.
   c) Prove that
      $$(A^\circ)^c = \overline{A^\circ}.$$  
[Recall: $B^c$ is the complement of $B$, that is $B^c = \{a \in \mathbb{R} : a \not\in B\}$.]