

**Math 131 - Problem Set 4**  
**Due Tuesday, Oct 2**

From Munkres: 23.2, 23.5, 23.9, 24.1, 24.2, 24.3, 26.2

1. Let  $X$  be a topological space and  $A \subset X$  any subset. Define an operation  $\Psi$  on subsets of  $X$  by

$$\Psi(A) = \overline{\text{int}(A)} \cap \overline{\text{int}(X \setminus A)}.$$

Show that for any subset  $A \subset X$ ,  $\Psi(\Psi(A)) = \emptyset$ .