

Name: \_\_\_\_\_ Score (Out of 8 points):

1. (4 points) Let  $(X, d)$  be a metric space, and  $A \subseteq X$  a subset. Prove that  $\overline{X \setminus A} = X \setminus \overset{\circ}{A}$ .

2. (4 points) Consider the the real numbers  $\mathbb{R}$  with the Euclidean metric. For each of the following subsets  $A \subseteq \mathbb{R}$ , state the interior  $\overset{\circ}{A}$  and the closure  $\overline{A}$ . No justification necessary.

$$A = [-1, 1) \quad \overset{\circ}{A} = \underline{\hspace{2cm}} \quad \overline{A} = \underline{\hspace{2cm}}$$

$$A = \mathbb{N} = \{1, 2, 3, \dots\} \quad \overset{\circ}{A} = \underline{\hspace{2cm}} \quad \overline{A} = \underline{\hspace{2cm}}$$

$$A = \left\{ \frac{1}{2^n} \mid n \in \mathbb{N} \right\} \quad \overset{\circ}{A} = \underline{\hspace{2cm}} \quad \overline{A} = \underline{\hspace{2cm}}$$

$$A = \emptyset \quad \overset{\circ}{A} = \underline{\hspace{2cm}} \quad \overline{A} = \underline{\hspace{2cm}}$$

