

Mathematics 260 Written Assignment #2 DUE: 2-2-18

1. For each $n \in \mathbb{N}$, let $A_n = \{x \in \mathbb{R} : -n \leq x \leq \frac{1}{n}\}$. Find each of the following sets. The universal set is \mathbb{R} . Give a brief justification for each answer.

$$\bigcup_{n=1}^{\infty} A_n \qquad \overline{\left(\bigcap_{n=1}^{20} A_n\right)} \qquad \bigcap_{n=1}^{\infty} \overline{A_n}$$

2. An important theorem from calculus is the Extreme Value Theorem, “If a function f is continuous on the closed interval $[a, b]$, then f attains a maximum value $f(c)$ at some number c in $[a, b]$.” Write at least five different, but logically equivalent, ways to express this theorem.