

Find the indicated unions and intersections for the indexed families described below. Show plenty of work for help in studying and solving HW problems.

1. Let the index set $I = \mathbf{Z}^+ \cup \{0\}$ and $A_i = \{i, i - 1, i - 2, i - 3\}$.

(a) Find $\bigcap_{i=2}^4 A_i$ and $\bigcup_{i=2}^4 A_i$. Tell which is which.

(b) Find $\bigcap_1^\infty A_i$ and $\bigcup_1^\infty A_i$. Tell which is which.

2. Let the index set $I = \mathbf{Z}^+$ and define $A_i = [-i, \frac{1}{i}]$ for each $i \in I$.

(a) Find $\bigcap_{i=1}^3 A_i$ and $\bigcup_{i=1}^3 A_i$. Tell which is which.

(b) Find $\bigcap_{i=1}^{\infty} A_i$ and $\bigcup_{i=1}^{\infty} A_i$. Tell which is which.