

Homework # 16 (due Monday, April 6)

Do the following problems:

1. In homework #15 you guessed $\bigcup_{n=1}^{\infty} A_n$ and $\bigcap_{n=1}^{\infty} A_n$, where A_n 's are defined below. Now prove your answers.

(a) $A_n = \{x \in \mathbb{R} \mid x \leq n\};$

(b) $A_n = \{x \in \mathbb{R} \mid -\frac{1}{n} \leq x \leq n\}.$

2. Find the sets $A_1, A_2, \dots, A_n, \dots$ so that each set A_i has an infinite number of elements, $A_i \cap A_j = \emptyset$ for all $i \neq j$, and

$$\bigcup_{n=1}^{\infty} A_n = \mathbb{N}$$