10.

Example: $A_n = \{x|0 \le x \le \frac{1}{n}\}$ n=1,2,⋯

Prove that $A_{n+1} \subset A_n$ for all *n* and $\bigcap_{n=1}^{\infty} A_n = 0$

Proof:

(1) Prove that $A_{n+1} \subset A_n$ for all *n*

Since $A_n = \{x|0 \le x \le \frac{1}{n}\}$ n=1,2,⋯,

We have $A_{n+1} = \{x|0 \le x \le \frac{1}{n+1}\}$, since $\frac{1}{n} > \frac{1}{n+1}$, so we have $A_{n+1} \subset A_n$ for all *n*

The statement has been proved.

(2) Prove that $\bigcap_{n=1}^{\infty} A_n = 0$

When $\mathrm{n} \to \infty$, $\frac{1}{n} \to 0$, $A_n = \left\{x \middle| 0 \le x \le \frac{1}{n}\right\} \to \{x|0 \le x \le 0\}$

Since there is only one real number 0 in A_n when $\mathrm{n} \to \infty$, according to the definition of intersection, $\bigcap_{n=1}^{\infty} A_n = 0$. The statement has been proved.