

Let  $n$  and  $k$  be fixed positive integers, and let  $a$  be an arbitrary non-negative integer. Choose a random  $k$ -element subset  $X$  of  $\{1, 2, \dots, k+a\}$  uniformly (i.e., all  $k$ -element subsets are chosen with the same probability) and, independently of  $X$ , choose a random  $n$ -element subset  $Y$  of  $\{1, \dots, k+n+a\}$  uniformly. Prove that the probability

$$\mathbb{P}\left(\min(Y) > \max(X)\right)$$

does not depend on  $a$ .