

Exercise (H)

Problem 16

Try to give a "direct" proof of Harris-Kleitman inequality without using FKG inequality.

Problem 17

Suppose $0 < a_k < 1$ and $n \in \mathbb{N}$.

Show that

$$\prod_{k=1}^n (1 - a_k) \geq 1 - \sum_{k=1}^n a_k.$$

Exercise (I)

Problem 18 Show that $\binom{x}{\lfloor \frac{x}{2} \rfloor} \leq \frac{2^x}{4}$

for integer $x \geq 9$.