EXTREMAL AND PROBABILISTIC COMBINATORICS

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ABSTRACT. This is a study of the book made by Robert Morris

§1. PRELIMINARIES

Set S, being |S| the number of elements of S $\binom{s}{k}$ is the set whose elements are all k-element subsets of S.

$$\left| \binom{s}{k} \right| = \binom{n}{k} = \frac{n!}{k!(n-k)!}$$

= the number of subsets

lower and upper bounds:

$$\left(\frac{n}{k} \right)^k \leqslant \binom{n}{k} \leqslant \left(\frac{en}{k} \right)^k$$

valid for all k $\in \mathcal{N}$

§2. ASYMPTOTICS

Given sequences an, bn

$an = O(bn)$ if

an = o(bn) or an $\ll$ bn if an/bn $\to$ 0 as n $\to \infty$

§3. GRAPHS

A graph G is a pair (V,E) where V is a set of vertices and E $\subseteq \binom{V}{2}$ is a set of edges

|G| instead of |V|

e(G) instead of |E|

v e w are adjacent in G(v w)

Kn $\to$ complete graph

§4. PROBABILITY

A subset S $\subseteq$ V(G) of

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