Graph Theory: Lecture No. 36

L. Sunil Chandran

Computer Science and Automation,
Indian Institute of Science, Bangalore
Email: sunil@csa.iisc.ernet.in

For every integer $k \geq 3$, the Ramsey number of k satisfies: $R(k) > 2^{k/2}$

The Mean or Expected Value of a random variable X is the number $E(X) = \sum_{G \in \mathcal{G}(n,p)} P(G).X(G)$.

Markov's Inequality: Let $X \geq 0$**, be a random variable on** $\mathcal{G}(n,p)$ **and** $a > 0$**. Then**

$P[X \geq a] \leq \frac{E(X)}{a}$

The expected number of k-cycles in $G \in \mathcal{G}(n,p)$, is $E(X) = \frac{(n)_k}{2k} p^k$.

Let $k > 0$ **be an integer, and let** $p = p(n)$ **be a function of** n **such that** $p \geq (6k \ln n)/n$ **for large** n**. Then** $lim_{n \to \infty} P(\alpha \geq \frac{n}{2k}) = 0$

For every integer k, there exists a graph H with girth $g(H) > k$ and chromatic number $\chi(H) > k$.