

HOME ASSIGNMENT 3 (18.05, SPRING 2007)

Read: *Dekking et al.* Chapters 9, 10; + p. 183 (Chebyshev inequality)

Solve: Problems 9.3, 9.7, 9.12, 9.14, 9.16, 10.3, 10.4, 10.8, 10.11, 10.13, 13.5.
(10 points each)

1. (10 points) Let X be a d.r.v. with *Geo*(.1) distribution. Compute $P(X \geq a)$ and estimate this probability using Markov and Chebyshev inequality, for

$$a = 20, 30, 40.$$

2. (20 points) Let X be a c.r.v. with $f_X(x) = cx^3$ when $x \in [0, 2]$ and $f_X(x) = 0$ otherwise. Find c . Compute $E[X]$, $Var(X)$. Compute $P(X < a)$ and use Chebyshev inequality to estimate this probability for $a = 0.5$. Same for $a = 0.2$.

3. (15 points) Let X, Y be uniform and independent on $[0, 1]$. Compute: $P(X + Y < 1.2)$, $P(X^2 + Y^2 < 1)$, $P(X < Y < 0.8)$, $P(X \cdot Y > 0.5)$.

This Homework is due Friday March 7 at 4 pm. in 2-108 (UMO)