Sveučilište u Dubrovniku
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Logika, skupovi i diskretna matematika

Exercise 6

The assignments are due to 09.01.2006.

Tutorial 6.1

1. Calculate the coefficient of
   (a) x^6 in $(1+x)^{12}$,
   (b) a^3b^7 in $(a+b)^{10}$,
   (c) a^4b^6 in $(a^2+b)^8$.
2. In some lottery game, a person was required to choose six numbers (in any order) among 44 numbers. In how many ways can this be done? In how many ways can it be done when choosing six numbers among 48 numbers?
3. Suppose we have a shipment of 50 microprocessors of which four are defective.
   (a) In how many ways can we select a set of four microprocessors?
   (b) In how many ways can we select a set of four nondefective microprocessors?
   (c) In how many ways can we select a set of four microprocessors containing exactly two defective microprocessors?
   (d) In how many ways can we select a set of four microprocessors containing at least one defective microprocessor?

Homework assignment 6.1 — 3 points

1. Calculate the coefficient of
   (a) x^5 in $(1+x)^{11}$,
   (b) a^6b^6 in $(a^2+b^3)^5$,
   (c) x^3 in $(3+4x)^6$.
2. In a class of 67 computer science students, 47 can read French, 35 can read German and 23 can read both languages. How many can read neither language. If, furthermore, 20 can read Russian, of whom 12 also read French, 11 read German also and 5 read all three languages, how many can read any of the three languages?

Homework assignment 6.2 — 14 points

Get familiar with discrete probability theory by reading the material handed out in the lectures (pages 247–260). Solve the following exercises:

1. Exercises 18, 22, 48, 49, and 50 on Pages 249–250.
2. Exercises 10, 11, 12, 13, 20, and 51 on Pages 259–260.