

## ECON 770. Intro to Econometrics

### Recitation 3.

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1. Denote  $(x_1, \dots, x_n)$  a vector of solution for the equation  $x_1 + \dots + x_n = r$ , where  $x_i, r \in \mathbb{N}, x_i \geq 0, r > 0, i = \overline{1, n}$ . Denote  $K_n^r$  as the number of different solutions. Show that

$$K_n^r = C_{n+r-1}^r = \binom{n+r-1}{r}.$$

2. *The problem of Banach's match boxes.* A certain mathematician always carries one matchbox in his right pocket and one in his left. When he wants a match, he selects a pocket at random, the successive choices thus constituting Bernoulli trials with  $p = 1/2$ . Suppose that initially each box contained exactly  $N$  matches and consider the moment when, for the first time, our mathematician discovers that a box is empty. What is the probability that at this moment he has exactly  $r$  matches left?