Exercises, lecture 1

8. februar 2010

Exercise 1 Problem 21.1.2 in the book.

Exercise 2 Problem 21.1.6 in the book.

Exercise 3 Problem 21.1.5 in the book.

Exercise 4 Consider the following game: First a coin is flipped. If it turns up heads, two dice are thrown, otherwise only one die is thrown. Let X denote the resulting number of pips (eyes) facing up. If $X < 6$ the player loses 6 kr otherwise (s)he wins X kr.

1. What is the probability of losing 6 kr in one game?
2. What is the probability of winning 6 kr in one game?
3. What is the mean profit/deficit in the game?

Exercise 5 Show that $E(XY) = E(X)E(Y)$ if X and Y are independent.

Exercise 6 Problem 21.1.8 in the book.

Exercise 7 Let c be a constant. Show that $\mathrm{Var}(cX) = c^2\mathrm{Var}(X)$.

Exercise 8 Let $X_1, X_2, \ldots, X_n$ be independent variables with mean $E(X_i) = \mu$ and variance $\mathrm{Var}(X_i) = \sigma^2$. Show that the average $\bar{X} = (X_1 + X_2 + \cdots + X_n)/n$ has mean $E(\bar{X}) = \mu$ and variance $\mathrm{Var}(\bar{X}) = \sigma^2/n$.