

UNIVERSITY OF OSLO
DEPARTMENT OF ECONOMICS

Assignment in: **ECON4130 – Statistics 2**

Handed out: Monday, September 03, 2007

To be delivered by: Monday, September 10, 2007

Place of delivery: Department office, 12th floor

Further instructions:

- This assignment is part of the **portfolio assessment**. Candidates who have passed the portfolio assessment in a previous semester, do not have the right to hand in the assignments again. This is so, even if the candidate did not pass the exam.
- **Note:** The students can feel free to discuss with each other how to solve the problems, but each student is supposed to formulate her/his own answers. Only single-authored papers are accepted, and papers that for all practical purposes are identical will not be approved.
- If one of the assignments is not accepted, you will be given a new attempt. In order to sit in for the exam, all three assignments must be approved. If no, you will be withdrawn from the exam, so that this will not be an attempt.
- If a student believes that she or he has a good cause not to meet the deadline (e.g. illness) she or he should discuss the matter with the course teacher and seek a formal extension. Normally extension will only be granted when there is a good reason backed by supporting evidence (e.g. medical certificate).

ECON 4130 Statistics 2

Autumn 2007

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Assignment 1

Exercise 1-4

Rice (3rd edition) Chapter 2. Exercise 17, 28, 31, 46.

Exercise 5

Let U be a random variable that follows uniform distribution over the interval $[-1, 1]$.

- a. Write down the density function and cdf of U .
- b. Find the density function of $Y = U^2$.

Exercise 6

Let X be a Normal random variable with $\mu = 0$ and $\sigma^2 = 1$. Let $\phi(x)$ and $\Phi(x)$ denote the density function and distribution function of X respectively.

- a. Write down the expression of $\phi(x)$ and show that $\phi(x)$ is symmetric around 0. [Hint: to show symmetry, you have to show $\phi(x) = \phi(-x)$]
- b. Show that $\Phi(x) = 1 - \Phi(-x)$.
- c. Let $Y \sim Normal(\mu = 4, \sigma^2 = 36)$. Find $P(Y > 8)$ and $P(-10 < Y < 12)$.

[Write these probabilities in terms of the $\Phi(\cdot)$ function, where Φ denotes the distribution function of $Normal(\mu = 0, \sigma^2 = 1)$]