

Bent E. Sørensen

ECONOMICS 6331 – Probability and Statistics, Fall 2004

Homework 8. Wednesday November 17, 2004. Due Monday November 22.

1. Ramanathan, Exercise 5.22, page 121.
2. Show that if X is t-distributed with q degrees of freedom, then X^2 is $F(1, q)$ distributed.
3. Assume X_n converges in probability to a constant c and Y converges in probability to a constant d . Prove that the random variable $W_n = X_n + Y_n$ converges in probability to $c + d$.
4. Assume that X is an n -dimensional random variable with covariance matrix Σ and Y is an n -dimensional random variable, independent of X with covariance matrix Ω . Show that the covariance matrix for $X + Y$ is $\Sigma + \Omega$. (If you have problems with the general situation, we will give full point if you show it for 2-dimensional case.)