ELEC 533 Homework 4

Due date: In class on Wednesday, October 3, 2001

Instructor: Dr. Rudolf Riedi

16. Suppose X and Y are joint r.v.'s with

$$f_{XY}(x, y) = \begin{cases} e^{-y} & x > 0, y > x \\ 0 & \text{otherwise} \end{cases}$$

   (a) Show that $\iint f_{XY}(x, y)\, dy\, dx = 1$.

   (b) Find f_X and f_Y.

   (c) Are X and Y independent? Show your reasoning.

17. Let the joint density of the pair of random variables (X, Y) be given by

$$f_{XY}(x, y) = \begin{cases} y \exp(-xy) & \text{if } x > 1 \text{ and } y > 0 \\ 0 & \text{else.} \end{cases}$$

   (a) Compute the marginal densities f_X and f_Y.

   (b) Are X and Y independent? Show your reasoning.

   (c) Compute $\mathbb{E}[X]$ and $\mathbb{E}[Y]$.