

**Homework Set 7****EECS 401****Due: Monday, March 13, 2000,**  
in class before lecture begins.

Things to practice: working with joint pmf's, pdf's and cdf's, i.e. using their properties

1. 3.82, p. 182
2. 3.113, p. 185
3. 4.1, a,c,d,e p. 256
4. 4.5, p. 257
5. 4.6, p. 257, Just for pmf i. To make the required sketch, draw x-y axes, divide the x-y plane into regions, and label each region with the value of the cdf.
6. X and Y are independent random variables. X is discrete with pmf  $p_X(0) = p_X(1) = \frac{1}{2}$  and Y is uniformly distributed on the interval [0,1]. Find their joint cdf.
7. a. 4.10, p. 257  
b. Are X and Y independent? Justify your answer.
8. i. 4.12, p. 257  
ii. Find the marginal pdf's  
iii. Are X and Y independent?
9. 4.23 a, p. 259
10. 4.24 b,c, p. 259
11. It is found that from the time a husband and wife marry, the number of years that the husband lives can be modelled as random with an average of 50 and an exponential distribution. Similarly, from the time of marriage, the number of years that the wife lives can be modelled as random with an average of 60 and an exponential distribution. (The numbers of years need not be integers.) In addition, in this model, the time of death of one spouse has no influence on the time of death of the other. Find the probability that the husband outlives the wife.