

Homework 08_7 (Due: 4/28)

1. For two random variables X and Y

$$f_{X,Y}(x, y) = 0.15\delta(x+1)\delta(y) + 0.1\delta(x)\delta(y) + 0.1\delta(x)\delta(y-2) \\ + 0.4\delta(x-1)\delta(y+2) + 0.2\delta(x-1)\delta(y-1) + 0.05\delta(x-1)\delta(y-3).$$

- (1) Find the correlation, covariance, and correlation coefficient of X and Y .
- (2) Are X and Y either uncorrelated or orthogonal?
2. Let X and Y be zero-mean, unit-variance independent Gaussian random variables.
- (1) Find the value of r for which the probability that (X, Y) falls inside a circle of radius r is $1/2$.
- (2) Find the conditional PDF of (X, Y) given that (X, Y) is not inside a circle of radius r .
3. Text 5.3.2 & 5.3.3.
4. Text 4.12.3.