Math 3339 – Spring 2014 Name:

HW #7

Please, write clearly and justify all your steps, to get proper credit for your work.

(1)[9 Pts] Let X and Y have the following joint p.d.f. Compute μ_X, μ_Y, σ_X, σ_Y and ρ in each case:

(a)

	x	
y	1	2
1	0.5	0
2	0	0.5

(b)

	x	
y	1	2
1	0.25	0.25
2	0.25	0.25

(c)

	x	
y	1	2
1	0.1	0.4
2	0.4	0.1

(2)[6 Pts] Let X and Y have the following joint p.d.f.

	x		
y	1	2	3
1	0.05	0.15	0.15
2	0.10	0.10	0.10
3	0.15	0.15	0.05

(a) Calculate the marginal densities. Are X and Y are independent?

(b) Compute the means and variances.

(c) Computate the correlation coefficient. Are X and Y positively correlated? negatively correlated? uncorrelated?

(3)[4 Pts] Consider the random variables X and Y with joint p.d.f. given in Problem (2). Obtain the mean and variances of the following random variables:

(a) $Z = 2X + 3Y$;

(b) $W = 2X - 3Y$.

(4)[6 Pts] Consider the bivariate density function $f(x, y) = c(x + y)$, for $0 \leq x < 1$, $0 \leq y < 1$.

(a) Find the appropriate constant c so that f is a p.d.f.

(b) Compute the marginal densities for X and Y and calculate their means and variances.

(c) Obtain the covariance between X and Y and check whether the random variables are independent.