

MATH 5/6680 Spring 2009 Quiz #1
Instructor: Erkan Nane

Name:
PID:

(20pts)**Problem 1.** Suppose that the joint pdf of (X, Y) is given by

$$f(x, y) = \begin{cases} kxy, & 0 \leq x \leq y \leq 1 \\ 0, & \text{otherwise.} \end{cases}$$

(a) What is the value of k .

(b) Find the marginal probability densities of X and Y .

(c) Are X and Y independent? Why?

(d) Compute $P(X/Y > 1/2)$.

(e) Find $P(X + Y \leq 1)$.

(10pts)**Problem 2.** Two of the integers $\{1, 2, 3, 4\}$ are chosen at random without replacement. Let X be the first selected integer and Y be the second selected integer.

(6pts)**a.** Find the joint distribution of (X, Y) by completing the following table

| $X Y$ | Y=1 | Y=2 | Y=3 | Y=4 | $P(X = x)$ |
|------------|-----|-----|-----|-----|------------|
| X=1 | | | | | |
| X=2 | | | | | |
| X=3 | | | | | |
| X=4 | | | | | |
| $P(Y = y)$ | | | | | |

(4pts)**b.** Are X, Y independent.