MATH 302 WORKSHEET V SPRING 2009 NAME:______________________________
(PLEASE PRINT LEGIBLY)

1. Let X, Y be jointly distributed such that the joint probability density function, $f_{xy}((x, y))$ is defined as:

$$f_{xy}((x, y)) = \begin{cases} 12xy(1-y) & 0 < x < 1 \quad 0 < y < 1 \\ 0 & \text{else} \end{cases}$$

A. Find the conditional p. d. f. of X given Y = ½
B. Find the conditional p. d. f. of X given Y = ¼
C. Find the conditional p. d. f. of X given Y = ¾

2. Let X, Y be jointly distributed such that the joint probability density function, $g_{xy}((x, y))$ is defined as:

$$g_{xy}((x, y)) = \begin{cases} e^{-x-y} & 0 < x \quad 0 < y \\ 0 & \text{else} \end{cases}$$

A. Find the marginal p. d. f.s
B. Find ρ_{XY}
C. Are X and Y statistically independent? Why or why not.

3. Let X, Y be jointly distributed such that the joint probability density function, $h_{xy}((x, y))$ is defined as:

$$h_{xy}((x, y)) = \begin{cases} 24y(1-x-y) & 0 < x \quad 0 < y, \quad x + y < 1 \\ 0 & \text{else} \end{cases}$$

A. Find the marginal p. d. f.s
B. Find ρ_{XY}
C. Are X and Y statistically independent? Why or why not.

4. Let X, Y be jointly distributed such that the joint probability mass function, $k_{xy}((x, y))$ is defined as:

$$k_{xy}((x, y)) = \begin{cases} \dfrac{x+y}{21} & x \in \mathbb{N}_3 \quad y \in \mathbb{N}_2 \\ 0 & \text{else} \end{cases}$$

A. Find the marginal p. d. f.s
B. Find ρ_{XY}
C. Are X and Y statistically independent? Why or why not.

5. Let X, Y be jointly distributed such that the joint probability mass function, $j_{xy}((x, y))$ is defined as:

$$j_{xy}((x, y)) = \begin{cases} \dfrac{xy^2}{30} & x \in \mathbb{N}_3 \quad y \in \mathbb{N}_2 \\ 0 & \text{else} \end{cases}$$

A. Find the marginal p. d. f.s
B. Find ρ_{XY}
C. Are X and Y statistically independent? Why or why not.