Quiz 2

Form A Name _____

Math 130B, 5 PM

Please justify all your answers April 6, 2022

Please also write your full name on the back

1. Consider two random variables X and Y with joint probability mass function given in the following table.

	$Y=0$	$Y=1$	$Y=2$
$X=0$	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{8}$
$X=1$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{6}$

   (a) Find $\Pr[X=0, Y\leq 1]$.

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

2. Let X and Y be two jointly continuous random variables with joint probability density function given by

$$f_{X,Y}(x,y)=\begin{cases} x+cy^2, & \text{if } 0\leq x\leq 1,\ 0\leq y\leq 1 \\ 0, & \text{otherwise} \end{cases}.$$

   (a) Find the constant c.

   (b) Find $\Pr[0\leq X\leq \frac{1}{2}, 0\leq Y\leq \frac{1}{2}]$.

Quiz 2

Form B Name _____

Math 130B, 6 PM

Please justify all your answers April 6, 2022

Please also write your full name on the back

1. Let X and Y be two jointly continuous random variables with joint probability density function given by

$$f_{X,Y}(x,y) = \begin{cases} cx + 2y^2, & \text{if } 0 \le x \le 1,\ 0 \le y \le 1 \\ 0, & \text{otherwise} \end{cases}.$$

   (a) Find the constant c.

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

2. Consider two random variables X and Y with joint probability mass function given in the following table.

	$Y=0$	$Y=1$	$Y=2$
$X=0$	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{1}{8}$
$X=1$	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{6}$

   (a) Find $\Pr[Y = 1 \mid X = 0]$.

   (b) Are X and Y independent?