MITx: 6.041x Introduction to Probability - The Science of Uncertainty

Problem 4: Joint PMF

(5/5 points)

The joint PMF, $p_{X,Y}(x,y)$, of the random variables X and Y is given by the following table:

$y=1$	$4c$	0	$2c$	$8c$
$y=0$	$3c$	$2c$	0	$2c$
$y=-1$	$2c$	0	c	$4c$
	$x=-2$	$x=-1$	$x=0$	$x=1$

1. Find the value of the constant c.

$c=$ 1/28

2. Find $p_X(1)$.

$p_X(1)=$ 1/2

3. Consider the random variable $Z=X^2Y^3$. Find $\mathbf{E}[Z \mid Y=-1]$.

$\mathbf{E}[Z \mid Y=-1]=$ -12/7

4. Conditioned on the event that $Y \neq 0$, are X and Y independent?

Yes

5. Find the conditional variance of Y given that $X=0$.

$\text{var}(Y \mid X=0)=$ 8/9

You have used 3 of 3 submissions

DISCUSSION

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