

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

■ Bookmarks

- Unit 0: Overview
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Unit overview

Lec. 5: Probability mass functions and expectations

Exercises 5 due Mar 02, 2016 at 23:59 UTC

Unit 4: Discrete random variables > Problem Set 4 > Problem 4 Vertical: Joint PMF

**■** Bookmark

## 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.

2. Find  $p_X(1)$ .

$$p_X(1) = \boxed{1/2}$$

Lec. 6: Variance; Conditioning on an event; Multiple r.v.'s

Exercises 6 due Mar 02, 2016 at 23:59 UTC

Lec. 7: Conditioning on a random variable;
Independence of r.v.'s
Exercises 7 due Mar 02, 2016 at

Solved problems

Additional theoretical material

## **Problem Set 4**

23:59 UTC

Problem Set 4 due Mar 02, 2016 at 23:59 UTC

**Unit summary** 

- Exam 1
- Unit 5: Continuous random variables
- Unit 6: Further topics on random variables
- ▶ Unit 7: Bayesian

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

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

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



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

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

You have used 3 of 3 submissions

## **DISCUSSION**

Click "Show Discussion" below to see discussions on this problem.

010		Problem 4 Vertical. Joint Pivir   Problem Set 4   6.041x Courseware   edx
	inference	
•	Exam 2	
	Unit 8: Limit theorems and classical statistics	
	Unit 9: Bernoulli and Poisson processes	
	Unit 10: Markov chains	
•	Exit Survey	
•	Final Exam	

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