

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

Bookmarks

Unit 0: Overview

- ▶ Entrance Survey
- ▶ Unit 1: Probability models and axioms
- ▶ Unit 2: Conditioning and independence
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Unit overview

Lec. 8: Probability density functions

Exercises 8 due Mar 16, 2016 at 23:59 UT (4)

Lec. 9: **Conditioning on** an event; Multiple r.v.'s

Exercises 9 due Mar 16, 2016 at 23:59 UT 🗗 Unit 5: Continuous random variables > Lec. 9: Conditioning on an event; Multiple r.v.'s > Lec 9 Conditioning on an event Multiple r v s vertical5

■ Bookmark

Exercise: From joint PDFs to probabilities (8/8 points)

a) The probability of the event that  $0 \leq Y \leq X \leq 1$  is of the form

$$\int_a^b \left(\int_c^d f_{X,Y}(x,y)\,dx
ight)\,dy.$$

Find the values of a, b, c, d. Each one of your answers should be one of the following: 0, x, y, or 1.



b) The probability of the event that 0 < Y < X < 1 is also of the form

$$\int_a^b \left(\int_c^d f_{X,Y}(x,y)\,dy
ight)\,dx.$$
 Note the different order of integration as

compared to part (a).

Find the values of a, b, c, d. Each one of your answers should be one of the following: 0, x, y, or 1.

$$a = \begin{bmatrix} 0 \\ b = \end{bmatrix}$$
 Answer: 0
 $b = \begin{bmatrix} 1 \\ c = \end{bmatrix}$  Answer: 1
 $c = \begin{bmatrix} 0 \\ d = \end{bmatrix}$  Answer: 0
 $c = \begin{bmatrix} 0 \\ d = \end{bmatrix}$  Answer: x

Answer:

a) For any given  $y \in [0,1]$  , x ranges from y to 1 , yielding

$$\int_0^1 \int_y^1 f_{X,Y}(x,y)\,dx\,dy.$$

Lec. 10: Conditioning on a random variable; Independence; Bayes' rule

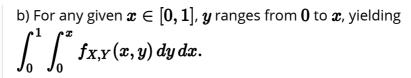
Exercises 10 due Mar 16, 2016 at 23:59 UT @

Standard normal table

Solved problems

**Problem Set 5** Problem Set 5 due Mar 16, 2016 at 23:59 UT 🗹

**Unit summary** 



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