



## 17. Exercise: From joint PDFs to the marginals

Exercises due Mar 13, 2020 05:29 IST Completed

### Exercise: From joint PDFs to the marginals

5/5 points (graded)

For each one of the following formulas, identify those that are always true. All integrals are meant to be from  $-\infty$  to  $\infty$ .

$$f_{X,Z}(a, b) = \int f_{X,Y,Z}(a', b, c) da'$$

✓ Answer: No

$$f_{X,Z}(a, c) = \int f_{X,Y,Z}(a, b, c) db$$

✓ Answer: Yes

$$f_{X,Z}(a, b) = \int f_{X,Y,Z}(a, b, c) dc$$

✓ Answer: No

$$f_Y(a) = \int \int \int f_{U,V,X,Y}(a, b, c, s) db dc ds$$

✓ Answer: No

$$f_Y(a) = \int \int \int f_{U,V,X,Y}(s, c, b, a) db dc ds$$

✓ Answer: Yes



## Solution:

In each case, we need to "integrate out" the arguments associated with random variables that do not appear on the left-hand side. Thus, the correct formulas are:

$$f_{X,Z}(a, c) = \int f_{X,Y,Z}(a, b, c) db$$

and

$$f_Y(a) = \int \int \int f_{U,V,X,Y}(s, c, b, a) db dc ds.$$

Submit

You have used 1 of 1 attempt

**i** Answers are displayed within the problem

## Discussion

Hide Discussion

**Topic:** Unit 5: Continuous random variables:Lec. 9: Conditioning on an event; Multiple r.v.'s / 17. Exercise: From joint PDFs to the marginals

Show all posts



by recent activity



Tricky!

The difference between questions 4 and 5 is tricky! Reminds me of one of those "spot the difference" car...

1



Confused about explanation

I understand the rationale of wanting to "integrate out" the term(s) that we are not trying to find the mar...

11



What is the difference between the last two equations?

if the order of integration does not matter, the last two equations seem identical to me. Am I missing so...

3



Triple Integration

for the tripple integration question  $f_Y(a) = \int \int \int f_{U,V,X,Y}(s, c, b, a) db dc ds$  .. Does the order of integration matter ? how do we k...

3



Meaning a' ?

4



? Question on notation

4

I have a question regarding notation. In integral  $\int f(X,Y(i,j)) di$  is it assumed that first variable in function  $f, i, \dots$

? da,db,dc notations

2

© All Rights Reserved

