

<u>Course</u> > <u>Unit 5:</u> ... > <u>Lec. 10:</u>... > 13. Exe...

13. Exercise: Stick-breaking

Exercises due Mar 13, 2020 05:29 IST Completed

Exercise: Stick-breaking

2/3 points (graded)

Consider the same stick-breaking problem as in the previous clip, and let $\ell=1$. Recall that $f_{X,Y}\left(x,y\right)=1/x$ when $0\leq y\leq x\leq 1$.

a) Conditioned on Y=2/3, the conditional PDF of X is nonzero when $a\leq x\leq b$. Find a and b.

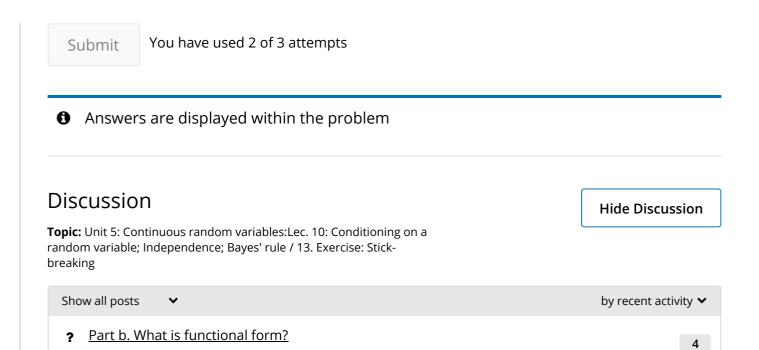
$$b = \boxed{1}$$
 Answer: 1

b) On the range found in part (a), the conditional PDF $f_{X|Y}\left(x\,|\,2/3\right)$ is of the form cx^d for some constants c and d. Find d.

$$d=oxed{f 0}$$
 X Answer: -1

Solution:

- a) Since the joint PDF is nonzero only for $0 \le y \le x \le 1$, it follows that given that Y=2/3 , X ranges on the interval [2/3,1].
- b) As a function of x, the conditional PDF has the same functional form (within a normalizing constant) as the joint PDF, and so it is of the form c/x, from which we conclude that d=-1.



As per the solution. What is functional form? And why is it the same as the joint PDF?

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