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## 8. Exercise: Total probability theorem II

Exercise: Total probability theorem II

2/2 points (graded)

On any given day, mail gets delivered by either Alice or Bob. If Alice delivers it, which happens with probability 1/4, she does so at a time that is uniformly distributed between 9 and 11. If Bob delivers it, which happens with probability 3/4, he does so at a time that is uniformly distributed between 10 and 12. The PDF of the time X that mail gets delivered satisfies

## **Solution:**

The PDF is 1/4 times a uniform on [9,11] (of height 1/2) plus 3/4 times a uniform on [10,12] (again of height 1/2).

- a) At time 9.5, only the first uniform is nonzero, yielding  $f_X(9.5)=(1/4)\cdot(1/2)=1/8$ .
- b) At time 10.5 both uniforms are nonzero, yielding  $f_X(10.5)=(1/4)\cdot(1/2)+(3/4)\cdot(1/2)=1/2.$

提交

You have used 2 of 3 attempts

• Answers are displayed within the problem

讨论

Topic: Unit 5 / Lec. 9 / 8. Exercise: Total probability theorem II

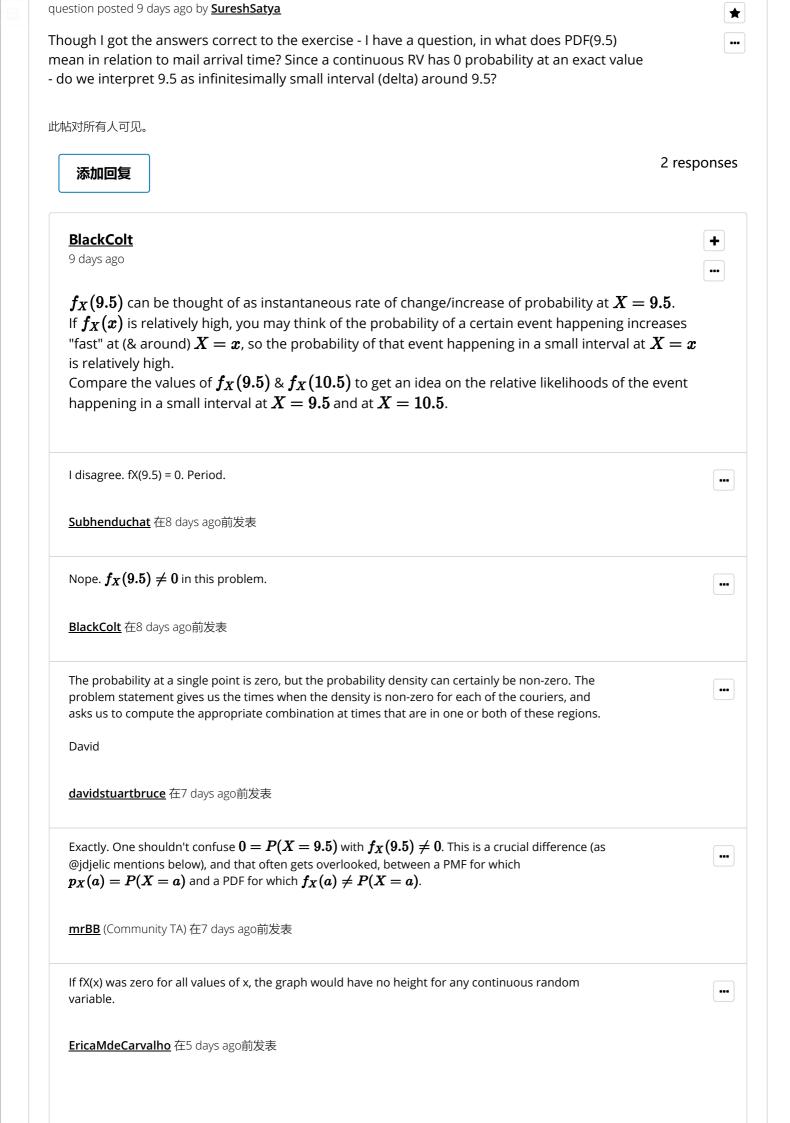
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PDF(9.5)



<mark>QiaominXie</mark> (Staff) 在5 days ago前发	<b>支表</b>	
	point. That if the pdf was zero for all specific values X = x. Then it lently, it wouldn't be a pdf. I think people are mistaking density for	•••
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	e as PMF. Whereas PMF gives the probability of a point, it is not true can even be > 1 at certain points! For continuous r.vs, probability is y integration on those.	
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