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Marginal Distributions: Continuous Example - Quiz

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Question 1

1/1 point (graded)

Let's return to the continuous example that we used earlier in this lecture,

$$f_{XY}(x,y) = \begin{cases} \frac{xy}{9}, 0 < y < 2 \; and \; 0 < x < 3 \\ 0, otherwise \end{cases}$$

Which of the following represents the marginal PDF of X?

- $f_x x = \int_0^2 \frac{xy}{9} dy$ ✔
- $f_x x = \int_0^3 \frac{xy}{9} dy$
- $f_x x = \int_0^2 \frac{xy}{9} dx$

$f_x x = \int_0^3 \frac{xy}{9} dx$

Explanation
The marginal PDF of X is given by integrating over the joint PDF over the support of Y. A gives the correct integral, where the joint PDF is integrated with respect to Y over the support of Y, where Y is between 0 and 1, or $f_x x = \int_0^2 \frac{xy}{9} dy$

Submit You have used 1 of 2 attempts

✔ Correct (1/1 point)

Question 2

1/1 point (graded)
Using the same example as above, what is the value of the marginal PDF for $X = 1$?

Please round your answer to two decimal places (e.g. if your answer is 0.181, you would to 0.18 and if it is 0.186, you would round to 0.19) .

0.22 ✔ **Answer:** 0.22

0.22

Explanation

To calculate the value of the marginal PDF for $X = 1$, solve the integral that we set up in the previous question.

$$f_X(x) = \int_0^2 \frac{xy}{9} dy$$

$$f_X(1) = \frac{y^2}{18}\Big| \begin{matrix} y = 2 \\ y = 0 \end{matrix}$$

$$f_X(1) = \frac{2^2}{18} - \frac{0^2}{18} = \frac{2}{9} = 0.22$$

Submit You have used 1 of 2 attempts

✔ Correct (1/1 point)

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