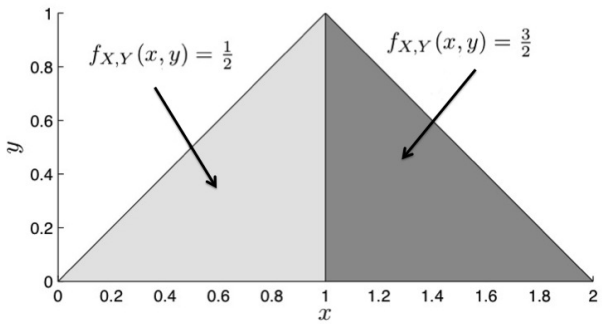
Problem 5: A joint PDF on a triangular region

(7/7 points)
This figure below describes the joint PDF of the random variables X and Y. These random variables take values in $[0,2]$ and $[0,1]$, respectively. At $x=1$, the value of the joint PDF is $1/2$.



1. Are X and Y independent?

- Yes
- No ✔

2. Find $f_X(x)$. Express your answers in terms of x using standard notation .

If $0<x<1$,

$f_X(x)=$ x/2 ✔

If $1<x<2$,

$f_X(x) =$ 3 - 3*x/2 ✔

3. Find $f_{Y|X}(y \mid 0.5)$.

If $0 < y < 1/2$,

$f_{Y|X}(y \mid 0.5) =$ 2 ✔

4. Find $f_{X|Y}(x \mid 0.5)$.

If $1/2 < x < 1$,

$f_{X|Y}(x \mid 0.5) =$ 1/2 ✔

If $1 < x < 3/2$,

$f_{X|Y}(x \mid 0.5) =$ 3/2 ✔

5. Let $R = XY$ and let A be the event $\{X < 0.5\}$. Evaluate $\mathbf{E}[R \mid A]$.

$\mathbf{E}[R \mid A] =$ 1/16 ✔

You have used 3 of 3 submissions

DISCUSSION

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