Homework 7a

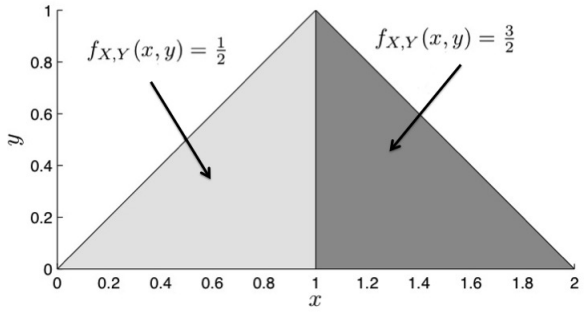
(Due at 11 AM Thursday, April 13)

In addition to your reading assignment, this week's homework has one problem (see next page). Taking the time to solve this problem will prepare you for Thusday's quiz.

Before the quiz, please look over problems 3.14, 3.16, from the notes. Also please take a look at the section titled "Conditioning One Random Variable on Another"on page 30, chapter 3 of the notes. We discussed these examples in class, and you may be given a question similar to one of these on the quiz.

Question 1. A joint PDF on a triangular region

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 $f_X(x)$.

   If $0 < x < 1$, $f_X(x) =$

   If $1 < x < 2$, $f_X(x) =$

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

   If $0 < y < 1/2$, $f_{Y|X}(y \mid 0.5) =$

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

   If $1/2 < x < 1$, $f_{X|Y}(x \mid 0.5) =$

   If $1 < x < 3/2$, $f_{X|Y}(x \mid 0.5) =$

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

   $\mathbf{E}[R \mid A] =$