Practice Problem Set 2 - Multivariate Distributions

1. Murphy 2.4, 2.6, 2.12, 3.2, 3.4, 3.5, 3.6
2. Prove $E\left[E[X|Y]\right] = E[X]$. This is called the *iterated expectation* property. Note carefully with respect to which random variables the expectations are taken.
3. Random variables X and Y have joint pdf $f_{X,Y}(x, y) = 2$, for $0 \le y \le x \le 1$, and zero everywhere else. Find the conditional pdfs for $X|Y$ and $Y|X$. Consider $0 \le x \le 1$ and $0 \le y \le 1$.