Tutorial 7
October 27/28, 2011

1. Suppose X is uniformly distributed between 0 and 1. Find the density function for random variable Y where:

    (a) $Y = X^2$.

    (b) $Y = e^X$.

2. Let X be a discrete random variable with PMF p_X and let Y be a continuous random variable, independent from X, with PDF f_Y. Derive a formula for the PDF of the random variable $X+Y$.

3. The random variables X and Y are described by a joint PDF which is constant within the unit area quadrilateral with vertices $(0,0)$, $(0,1)$, $(1,2)$, and $(1,1)$. Use the law of total variance to find the variance of $X + Y$.

4. (a) You roll a fair six-sided die, and then you flip a fair coin the number of times shown by the die. Find the expected value and the variance of the number of heads obtained.

    (b) Repeat part (a) for the case where you roll two dice, instead of one.