1. Suppose that $X$ is a discrete r.v. with p.f. given by $f(0) = 1/4$, $f(1) = 1/2$, $f(6) = 1/4$. Find:
   
   (a) $F(3)$, where $F$ is the d.f. of $X$.
   
   (b) $EX$, $Var(X)$, $E(4X + 3)$ and $Var(4X + 3)$.
   
   (c) The moment generating function of $X$.
   
   (d) All medians of $X$.

2. Companies $A$ and $B$ make lightbulbs which follow exponential distributions with means 1 and 2 years, respectively. You buy a batch of bulbs, 40% of which come from $A$, the rest from $B$. A bulb is drawn at random from the complete bulbpool and put in the socket. Let $X$ be its time at burnout.

   (a) Find the p.d.f. and the mean of $X$.

   (b) If the bulb burns out after 1.2 years, what is the probability that it came from $A$?

3. Problem 8, p.209. Find also $E(X^2)$.


5. Problem 12, p.209.

6. Problem 7, p.213, but change $x + \frac{1}{2}$ to $\frac{1}{2}x + \frac{3}{4}$. Also, how is the value of the minimizing M.S.E. related to the mean and variance of $X$?
Recommended Problems: A few from §4.3, and

§4.4: 7,9,11.

§4.5: 3,4,5,6,9,10.