Homework # 7
Due 3/19

1. Reading: Sections $3.2 - 3.3$, 6.7.

2. Show that if X and Y are independent rv's, then $V[X+Y] = V[X]+V[Y]$. Then show that if $X_1, X_2, \ldots, X_n$ are independent then
$$V[\sum_{i=1}^{n} X_i] = \sum_{i=1}^{n} V[X_i] \tag{1}$$
(This shows that the variance of a sum of independent r.v. is the sum of the variances, which as we have previously shown is not true in general.)

3. Prove Theorem 6.31. You may look at the proof in the book. I just want you to go through the proof of this important theorem yourself.

4. Exercise 6.36

5. Chapter 6, problems $4, 12$ (but skip part b), $14a$ (this problem is a particular example of an important fact: the linear combination of independent normals is normal), 20 (skip the last part about conditional probability).