Homework 4

- 1. Complete the R exercise. All the code is provided; be sure to explain how each of thesteps worked for you.
- 2. Consider the probability distribution below:

x	p(x)
50	0.2
80	0.7
100	0.1

- (a) What is the sampling distribution for the sample mean based on a sample of size 2 for the above distribution?
- (b) Confirm that $E(X) = E(\bar{X})$ and $\sigma_{\bar{X}}^2 = \sigma_X^2/2$.
- 3. Answer the following questions using the example in 6.31. You may use Table II or **R**.
 - (a) 6.31a
 - (b) Find $P(\bar{X} > 28.5)$
 - (c) Find $P(28.2 \le \bar{X} \le 31)$
 - (d) Find x_0 so that $P(\bar{X} < x_0) = 0.75$
- 4. Answer the following questions using the example in 6.31, but assume n=10. You may use Table II or \mathbf{R} .
 - (a) 6.38a
 - (b) Find $P(\bar{X} > 3.66)$
 - (c) If the sample size increased from 10 to 40, how would your answers in (a) and (b) change?
- 5. Answer the following questions using the example in 6.42.
 - (a) 6.42a and b
 - (b) Find the probability that \overline{X} is between 1.75 and 2.2 ppm.
 - (c) Find \bar{x}_0 so that $P(\bar{X} > \bar{x}_0) = 0.65$
- 6. Answer the following questions related to the example in 6.57
 - (a) What is the mean and standard deviation of \hat{p} ?
 - (b) What is the probability that 45% or more of sampled adults do not work during summer vacation?
 - (c) Find p_0 so that $P(\hat{p} > p_0) = 0.01$.
- 7. *Grad students only.* 6.59, but study the probability that at least 30 incidents involve each of the three types of crops. This problem can be solved by treating the number of incidents for each crop separately as a binomial random variable.