Statistics 394, Problem Set 3

Wellner; 1/19/2000

Reading:	Kelly, Chapter 1, Section 1.4; Chapter 2, Sections 2.3 and 2.4.
Optional Web Reading:	Bernoulli Trials at http://www.math.uah.edu/stat/bernoulli/index.html ; The Poisson Process at http://www.math.uah.edu/stat/poisson/index.html .
Due:	Wednesday, January 26, 2000.
Mid-Term Exam:	Monday, February 7.

1. K 2.3, # 1
2. K 2.2, # 3
3. K 2.2, # 10
4. K 2.2, # 13
5. K 1.4, # 2
6. K 1.4, # 5
7. K 1.4, # 3
8. Bonus Problem: Look at the Negative Binomial Experiment at the Virtual Laboratories website:

   `http://www.math.uah.edu/stat/bernoulli/index.html` .

   (a) For $k = 2$ and $p = .4$, verify the probabilities you see plotted in blue for $P(Y = 2)$, $P(Y = 3)$ and $P(Y = 4)$. (The random variable Y in the Experiment is W_2, the waiting time until the 2nd success in Bernoulli trials with success probability $p = .4$, in my notation.)
   (b) Change the "Stop Freq 10" to "Stop Freq 100", and run the experiment. (This draws 100 samples from the Negative Binomial(2,.4) distribution. Record the sample mean "Data Mean" and standard deviation "SD Data" shown, call them $\overline{Y}_{100}$ and S_{100}, and compute $\overline{Y}_{100} \pm 1.96 S_{100}/\sqrt{100}$. Does this interval include the population mean $\mu_Y = E(Y) = 5.0$?