HW-Poisson

1. Suppose $X$ has a Poisson distribution with a mean of 4. Determine the following probabilities:
   (a) $P(X = 0)$
   (b) $P(X \leq 2)$
   (c) $P(X = 4)$
   (d) $P(X = 8)$

2. Suppose $X$ has a Poisson distribution with a mean of 0.4. Determine the following probabilities:
   (a) $P(X = 0)$
   (b) $P(X \leq 2)$
   (c) $P(X = 4)$
   (d) $P(X = 8)$

3. Suppose that the number of customers that enter a bank in an hour is a Poisson random variable, and suppose that $P(X = 0) = 0.05$. Determine the mean and variance of $X$.

4. The number of telephone calls that arrive at a phone exchange is often modeled as a Poisson random variable. Assume that on the average there are 10 calls per hour.
   (a) What is the probability that there are exactly 5 calls in one hour?
   (b) What is the probability that there are 3 or less calls in one hour?
   (c) What is the probability that there are exactly 15 calls in two hours?
   (d) What is the probability that there are exactly 5 calls in 30 minutes?

5. When a computer disk manufacturer tests a disk, it writes to the disk and then tests it using a certifier. The certifier counts the number of missing pulses or errors. The number of errors on a test area on a disk has a Poisson distribution with $\lambda = 0.2$.
   (a) What is the expected number of errors per test area?
   (b) What percentage of test areas have two or fewer errors?