Math 262 Section 2.5

Section 2.5 Day

Section 2.5	Day 8
1. Suppose that during a meteor shower, ten visible meteors per hour are exp	pected.
(a) Let X be the number of visible meteors in one hour. What assumptio say that X has a Poisson distribution?	ns must we make in order to
(b) What is the probability that $5 \le X \le 15$?	
 Suppose that the number of phone calls an office receives has a Poisson d calls per hour. 	istribution with a mean of 5
(a) What is the probability that exactly 7 calls are received between 10:0	00 and 11:00?
(b) What is the probability that more than 7 calls are received between 1	10:00 and 11:00?
(c) What is the probability that exactly 10 calls are received between 10:	:00 and 12:00?

- 3. Suppose that a machine produces items, 2% of which are defective. Let X be the number of defective items among 500 randomly-selected items produced by the machine.
 - (a) What is the distribution of X?

(b) What are the mean and variance of X?

(c) What is P(X = 12)?

(d) What Poisson distribution approximates the distribution of X?

(e) Use your Poisson distribution to approximate P(X = 12).

4. Let $X \sim \text{Poisson}(\mu)$. Show that P(X = k) increases monotonically and then decreases monotonically as k increases, reaching its maximum when k is the largest integer less than or equal to μ .

Hint: Consider $\frac{P(X=k)}{P(X=k-1)}$.