- 3.78 $X \sim Poisson(.2)$

  a. $P(X = 1) = 0.1637$

  b. $P(X \geq 2) = 1 - P(X = 0) - P(X = 1) = 0.0175$

  c. $P(X = 0)^2 = 0.6703$

- 3.80 Binomial r.v. X can be approximated by Poisson with $\lambda = 10$

  a. Expectation = 10; standard deviation = $\sqrt{10}$

  b. $1 - F(10; \lambda = 10) = 0.417$, where $F(10; \lambda)$ is the cdf for Poisson distribution. Find its value by using Poisson table on page 739

  c. $P(X = 0) = 4.54 \times 10^{-5}$

- 3.81

  a. $X \sim Poisson(8)$. Calculate $P(X = 6)$;

  $P(X \geq 6) = 1 - F(5; \lambda = 8); P(X \geq 10) = 1 - F(9; \lambda = 8)$.

  b. $X \sim Poisson(12)$. Find its expectation and standard deviation.

  c. $X \sim Poisson(20)$. $P(X \geq 20) = 1 - F(19; \lambda = 20); P(X \leq 10)$.

- 3.85

  a. $2/0.5 = 4$.

  b. $X \sim Poisson(4)$. $P(X > 5) = 1 - F(5; \lambda = 4)$

  c. $X \sim Poisson(2t)$, where the unit for t is "years". Solve inequality $P(X = 0) = e^{-2t} \leq 0.1$ to obtain t.

- 3.105

  a. $X \sim Poisson(2)$. $P(X = 0)$

  b.
  $$\binom{5}{4} P(X = 0)^4 [1 - P(X = 0)]$$

  c.
  $$\sum_{k=0}^{\infty} [P(X = k)]^5$$