

## CHAPTER 3

### Section 3-2

- 3-14
- a)  $P(X=1.5) = 1/3$
  - b)  $P(0.5 < X < 2.7) = P(X=1.5) + P(X=2) = 1/6 + 1/3 = 1/2$
  - c)  $P(X > 3) = 0$
  - d)  $P(0 \leq X < 2) = P(X=0) + P(X=1.5) = 1/3 + 1/3 = 2/3$
  - e)  $P(X=0 \text{ or } X=2) = 1/3 + 1/6 = 1/2$
- 3-16
- All probabilities are greater than or equal to zero and sum to one.
- a)  $P(X \leq 2) = P(X=1) + P(X=2) = 0.8571$
  - b)  $P(X > 1) = 1 - P(X=1) = 1 - 0.5714 = 0.4286$
  - c)  $P(2 < X < 6) = P(X=3) = 0.1429$
  - d)  $P(X \leq 1 \text{ or } X > 1) = P(X=1) + P(X=2) + P(X=3) = 1$
- 3-21.
- $P(X = 0) = 0.02^3 = 8 \times 10^{-6}$
  - $P(X = 1) = 3[0.98(0.02)(0.02)] = 0.0012$
  - $P(X = 2) = 3[0.98(0.98)(0.02)] = 0.0576$
  - $P(X = 3) = 0.98^3 = 0.9412$

Section 3-3

3-27.

$$F(x) = \left\{ \begin{array}{ll} 0, & x < -2 \\ 1/8 & -2 \leq x < -1 \\ 3/8 & -1 \leq x < 0 \\ 5/8 & 0 \leq x < 1 \\ 7/8 & 1 \leq x < 2 \\ 1 & 2 \leq x \end{array} \right\} \text{ where } \begin{array}{l} f_x(-2) = 1/8 \\ f_x(-1) = 2/8 \\ f_x(0) = 2/8 \\ f_x(1) = 2/8 \\ f_x(2) = 1/8 \end{array}$$

- a)  $P(X \leq 1.25) = 7/8$
- b)  $P(X \leq 2.2) = 1$
- c)  $P(-1.1 < X \leq 1) = 7/8 - 1/8 = 3/4$
- d)  $P(X > 0) = 1 - P(X \leq 0) = 1 - 5/8 = 3/8$

$$3-28 \quad F(x) = \left\{ \begin{array}{ll} 0, & x < 0 \\ 1/25 & 0 \leq x < 1 \\ 4/25 & 1 \leq x < 2 \\ 9/25 & 2 \leq x < 3 \\ 16/25 & 3 \leq x < 4 \\ 1 & 4 \leq x \end{array} \right\} \text{ where } \begin{array}{l} f_x(0) = 1/25 \\ f_x(1) = 3/25 \\ f_x(2) = 5/25 \\ f_x(3) = 7/25 \\ f_x(4) = 9/25 \end{array}$$

- a)  $P(X < 1.5) = 4/25$
- b)  $P(X \leq 3) = 16/25$
- c)  $P(X > 2) = 1 - P(X \leq 2) = 1 - 9/25 = 16/25$
- d)  $P(1 < X \leq 2) = P(X \leq 2) - P(X \leq 1) = 9/25 - 4/25 = 5/25 = 1/5$

3-33.

- a)  $P(X \leq 3) = 1$
- b)  $P(X \leq 2) = 0.5$
- c)  $P(1 \leq X \leq 2) = P(X=1) = 0.5$
- d)  $P(X > 2) = 1 - P(X \leq 2) = 0.5$