- 3.14 (d) check whether $\sum_{y=1}^{5} p(y) = 1$
- 3.37 $P(X = k) = p(k) = 1/6$, where $k = 1, 2, ..., 6$. Calculate $E(1/X)$. If it's bigger than (1/3.5), gamble; otherwise, accept the guaranteed amount.
- 3.48 Let X = number of drivers who will come to a complete stop among 20 randomly chosen drivers, then $X \sim Bin(20, 0.25)$

  (a) $P(X <= 6)$;

  (b) $P(X = 6)$;

  (c) $P(X >= 6)$;

  (d) $E(X)$
- 3.52 Let X = number of students who received special accommodation among the randomly chosen 25 students. X has a binomial distribution $Bin(25, 0.02)$.

  (a) $P(X = 1)$;

  (b) $P(X >= 1) = 1 - P(X = 0)$;

  (c) $1 - P(X <= 1)$

  (d) $P(|X - \mu| \leq 2\sigma) = P(X \leq \mu + 2\sigma) - P(X < \mu - 2\sigma)$, where μ denotes the mean and σ denotes the standard deviation.

  (e) $E(3 + 1.5X/n)$, where $n = 25$.
- 3.55 (a) $P(X <= 15$ when $p = 0.8)$;

  (b) $P(X > 15$ when $p = 0.7)$;

  (c) increases the error probability of (a) and decreases the error probability of (b)
- 3.71 (a) Geometric distribution for $X = x$ with $p = 0.5$;

  (b) $P(X = 3)$;

  (d) $E(X), E(X + 1)$
- 3.99 Let Y denote the number of individuals having the disease among the n individuals. Y has binomial distribution. Let X denote the number of tests using this procedure.

  $$X = \begin{cases} 1, & \text{with prob } P(Y = 0) \\ (n+1), & \text{with prob } P(Y > 0) \end{cases}$$

  Calculate $E(X)$.
- 3.100 X is distributed as binomial(n,p) with $p = 1 - p_1 + p_1 p_2$.