53. For 3.18: This is $Pr(B \cup C) = Pr(B) + Pr(C) - Pr(B \cap C) = .099$

For 3.19: This is $Pr(A \cup B \cup C) = .0143$.

For 3.20: This is $Pr(A \cap \overline{B} \cap \overline{C}) + Pr(\overline{A} \cap B \cap \overline{C}) + Pr(\overline{A} \cap \overline{B} \cap C) = .1368$

For 3.21: This is Pr(affected person is female) = .677.

For 3.22: This is Pr(both affecteds are female) = .263.

For 3.23: This is Pr(both < 80) = .160.

54. For 3.85: Use Baye's theorem to find $Pr(Y_1|(X_1 \cap X_6 \cap X_4)) = .009$.

For 3.87: You are computing $Pr(X_7|Y_2) = .7$.

For 3.88: Youi are computing $Pr(\overline{X}_7|\overline{Y}_2) = .605$.

55. For 3.104: .938.

For 3.105: .988.

56. For 4.37: Use the binomial distribution to find that the answer is .172.

57. For 4.44: The probability of the 82 year old dying in the next year is $p_1 = (l_{82} - l_{83})/l_{82} = .104$. Similar probabilities, $\{p_j\}_{2 \le j \le 11}$ can be obtained for the others. The sum, $\sum_{1 \le j \le 11} p_j = .176$, is the answer.

58. For 4.69: Use the binomial expansion with $n = 5$, $p = .4$ to find $Pr(X = 3) = .230$.

For 4.70: $Pr(X \ge 3) = .317$ using binomial table (Table 1) in Chapter 4.

59. For 4.78: Use the Poisson distribution with $\mu = 15.6$ to find the answer $\cong 7.651 \times 10^{-13}$.

60. For 5.31: This is given by $\Phi(-1.667) = 1 - \Phi(1.667) \cong .048$.

For 5.32: This is given by $\Phi(-3) = 1 - \Phi(3) \cong .0013$.

61. For 5.61: This is $84!/(29! \times 55!)\,(.24)^{29}\,(.76)^{55} \cong .009$

For 5.62: Use the fact that $Pr(X \ge 29) \cong Pr(Y \ge 28.5)$ where Y is normally distributed with mean = np = 20.16 and variance = npq = 15.32. Thus, $Pr(Y \ge 28.5) \cong .017$.

62. For 5.64: $Pr(X \ge 90) = 1 - \Phi(2.307) = .0105$.

For 5.65: Approximate the binomial distribution with a normal one of mean np = 21.1 and variance npq = 20.8. Then, $Pr(X \ge 25) \cong 1 - \Phi(.0755) = .225$.