

Section 3.4

#1.

$$\frac{(3/4)(0.4)}{(3/4)(0.4) + (1/3)(0.6)} = \frac{3}{5}.$$

#6.

$$\frac{(0.92)(1/5000)}{(0.92)(1/5000) + (1/500)(4999/5000)} = 0.084.$$

#10.

$$\frac{1 \left(\frac{1}{6}\right)}{\sum_{i=0}^5 \left[\binom{100-i}{100} / \binom{1000}{100} \right] \left(\frac{1}{6}\right)}$$

Solution of Section 3.5

4. $(3/4)^2(5/8)^2 = 0.00503$

#6. $(0.725)^2 = 0.526$; $(1-0.725)^2 = 0.076$.

#9. $(1 - 0.0001)^{64} = 0.9936$

#12. Since $A = AA$, thus $P(A) = P(AA) = P(A)P(A) = [P(A)]^2$.

This gives that $P(A) = 0$ or 1 .

#15. $1 - (0.3)(0.2)(0.1) = 0.994$.

#17 $1 - (0.94)^{15} - 15 \times (0.94)^{14}(0.06) = 0.226$.

#27 Let E_i be the event that the switch located at i is closed. The desired probability is:

$$\begin{aligned} & P(E_1E_2E_4E_6 \cup E_1E_3E_5E_6) \\ &= P(E_1E_2E_4E_6) + P(E_1E_3E_5E_6) - P(E_1E_2E_4E_3E_5E_6) \\ &= 2p^4 - p^6. \end{aligned}$$