Homerwork Set 4

Due date: Sep 21, 2016

(1) Chapter 3, Problem 7
(2) Chapter 3, Problem 8
(3) Chapter 3, Problem 15
(4) Chapter 4, Problem 2
(5) Chapter 4, Problem 4
(6) Chapter 4, Problem 18

3.7. The king comes from a family of 2 children. What is the probability that the other child is his sister?

3.8. A couple has 2 children. What is the probability that both are girls if the older of the two is a girl?

3.9. Consider 3 urns. Urn A contains 2 white and 4 red balls, urn B contains 8 white and 4 red balls, and urn C contains 2 white and 6 red balls. A ball is selected at random from each urn. Compute the joint and the marginal distributions of the total number of red balls among the 3 selected balls.

4.2. Two fair dice are rolled. Let $X$ equal the product of the 2 dice. Compute $P(X = i)$ for $i = 1, \ldots, 36$.

3.15. An ectopic pregnancy is twice as likely to develop when the pregnant woman is a smoker as it is when she is a nonsmoker. If 32 percent of women of childbearing age are smokers, what percentage of women having ectopic pregnancies are smokers?

4.4. Five men and 5 women are ranked according to their scores on an examination. Assume that no two scores are alike and all 10! possible rankings are equally likely. Let $X$ denote the highest ranking achieved by a woman. (For instance, $X = 1$ if the top-ranked person is female.) Find $P(X = i)$, $i = 1, 2, 3, \ldots, 8, 9, 10$.

4.18. Four independent flips of a fair coin are made. Let $X$ denote the number of heads obtained. Plot the probability mass function of the random variable $X = 2$. 
