Cover Page Homework #7
Due at the beginning of class on Tuesday, October 25th

1. Problem 12.4
   (a) Answer: [ ]
   (b) Answer: [ ]

2. Problem 12.5
   (c) Draw the Venn Diagram for part (c).

3. Problem 12.6
   (a) Answer: [ ]

4. Problem 12.12
   (a) Answer: [ ]
   (b) Answer: [ ]
   (c) Independent? [ ]

5. Problem 12.54
   (a) Answer: [ ]
6. Problem 12.56

(a) Answer:  
(b) Answer:  

Read Example 10.9 on page 276  
Problems: 10.10, 10.13, 10.18, 10.51

7. (a) Answer:  
Answer:  

(b) True or False?  
Answer:  

8. Identify the source of the bias. If possible, specify the direction of the bias (that is, whether the sample result will be systematically above or below the true population result).

(a) Type of Bias? (Explain in your attached homework.)  
Answer:  

Systematically above or below? (Explain in your attached homework.)  
Answer:  

(b) Type of Bias? (Explain in your attached homework.)  
Answer:  

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Homework #7
Due at the beginning of class on Tuesday, October 25th

1. Do the following problems from Moore’s text:
   Problems: 12.1, 12.4, 12.5, 12.6, 12.7, 12.9, 12.12, 12.27, 12.39, 12.53, 12.54, 12.55, 12.56, 12.57

   Read Example 10.9 on page 276
   Problems: 10.10, 10.13, 10.18, 10.51

2. Of families with 4 children, what proportion have more girls than boys? You may assume that the sex of a child is determined with the same chances of tossing heads when flipping a coin.

3. In the U.S. in 1990, 20,273 people were murdered, compared to 16,848 in 1970.
   (a) Is the difference in the number of murders significant?

   (b) “These figures show that the U.S. became a more violent society over the period 1970-1990.” True or false, and explain briefly.

4. A general must plan a campaign to fight by either:

   (i) one major battle -OR- (ii) three small battles.

   He believes he has a 60% chance of winning a big battle, and an 80% chance of winning a small battle. Suppose that the victories or defeats of any battle are approximately independent. To win the campaign, the general must either win the (i) large battle or in the case of (ii) all three small battles. Which strategy should he choose?

5. In the game of craps, somebody rolls a pair of dice, and that person plus a bunch of people standing around watching bet on the sum of the faces pointing up when the dice come to rest. Each die has six faces, which (when the dice are thrown fairly) come up equally often. Two outcomes of particular interest are rolling a three (that is one way to lose, or “crap out”) and rolling a seven, which at some points in the game is one way to win. What is the chance of getting a three on any single roll of the dice? How about a seven?
In recent years, the influence of race on the imposition of the death penalty for murder has been much studied and contested in U.S. courts. The first table at right gives data from a 1981 paper in the *American Sociological Review* on 326 cases in murder (for example, in 19 of the 326 cases the defendant was white and the death penalty was imposed).

6. (a) Use the first table to compute the following probabilities for a defendant randomly chosen from among these 326 people: \( P(\text{death penalty}) \), \( P(\text{death penalty given white}) \), and \( P(\text{death penalty given black}) \). This shows that overall the rate of imposition of the death penalty was higher for white defendants than for black ones.

(b) But now compute the same three probabilities using the data in the middle table in which the victim was white, and repeat on the bottom table in which the victim was black.

If you have worked the probabilities out correctly, when you are done you will have shown something quite strange: separately for cases in which the victim was white and in which the victim was black, the rate of imposition of the death penalty was higher for black defendants than for white ones, and yet overall the reverse is true. Explain what happened in this case to make the paradoxical result occur.