Unit 9 Lesson 3 Homework Set

1. A professor is in charge of a program to prepare students for a high school equivalency exam. Records show that the probability that a student in the program needs help in math is 0.7, the probability that a student needs help in English is 0.6, and the probability that a student needs help in both math and English is 0.55. What is the probability that a student needs help in math or English?

2. A single die is rolled. What is the probability of rolling an odd number or a number greater than 4?

3. What is the probability of selecting a jack or a club from a deck of playing cards?

4. A couple plans to have 5 children. What is the probability that all of their children will be boys? If their first 4 children are boys, what's the probability that their fifth will be a boy?

5. A sample of 40 people who recently hired a landscaping service responded to a survey about the service. Twenty-three of them would recommend the service. Seven would not recommend them, and 10 weren't sure. If 3 people were randomly selected among the 40 respondents, what is the probability that the first two would not recommend the service, and the third is not sure?

6. Some birth defects and syndromes are *polygenetic* in nature. Typically, the chance that an offspring will be born with such an affliction is small. However, once an offspring is born with the affliction, the probability that future offspring of the same parents will be born with the same affliction increases. Assume that the probability of a child being born with affliction *A* is 0.001. If a child is born with this affliction, the probability of a future child being born with the same affliction becomes 0.04. Are the events of the births of two children in the same family with affliction *A* independent? Explain. Also, what is the probability that the first will be born with the affliction and the second will not?

7. Suppose 36 out of every 1000 people in the $30,000-$70,000 income bracket are audited annually. Assuming that the tax returns to be audited are selected at random, and each year's selections are independent of the previous year's selections.

   a. What is the probability that a person in this income bracket will be audited this year?

   b. What is the probability that they will be audited this year but not next year?

8. Two playing cards are dealt to you from a well-shuffled standard deck of 52 cards. If either card is a diamond or both are diamonds, you win. Otherwise, you lose. Does the game favor you, is it fair, or does it favor the dealer? Justify your answer.

Problems taken from A Survey of Mathematics with Applications, Angel et. al., Pearson Ed, 2009.