Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Problem Set 7.2***

**1. Give an example of two dependent events:**

a) that have a large effect on each other

b) that have a small effect on each other

**2. Give a one sentence argument for each pair of events as to whether or not you think they are independent or dependent.**

a) first letter of your first name and the last letter of your math teacher’s last name

b) eye color and hair color

c) country you live in and the number of syllables in your name

d) birthdate and annual salary

e) gender and cancer

f) a bag contains eight red marbles and four blue marbles. You randomly pick a marble and then pick a second marble without replacing the first marble. The first marble is red and the second marble is blue.

g) A box of chocolates contains five milk chocolates, five dark chocolates, and five white chocolates. You randomly select and eat 3 chocolates. The first piece is milk chocolate, the second is dark chocolate, and the third is white chocolates.

h) You flip a coin and then roll a fair six-sided die. The coin lands on tails and then the di shows a one.

i) A cooler contains ten bottles of sports drink: 4 lemon-lime, 3 orange, and 3 fruit punch. Three times, you randomly grab a bottle, return the bottle to the cooler, and then mix up the bottles. The first time you get a lemon lime. The second and third times you get a fruit punch.

3. Let’s take another look at the Titanic data from the last problem set and see how it relates to the ideas of conditional relative frequency and independent events.

a) Look back at the questions you answered about this table in PS 7.1. Did any of those questions involve a condition? If so, which ones? How did you include the condition when solving the problem?

b) What is the difference between the statements? Which of the statements is correct and why?

 “Most second-class passengers did not survive”

 “ Most of the people who didn’t survive were second class passengers.”

c) Are the events “passenger survived” and “passenger was in first class” independent events? Support your answer.

4. If two events are dependent, does that mean that one CAUSES the other? Why or why not? Recall our conversations from Chapter 2 about causation and use examples to help you explain your answer.

**5. Find the probability of the following events.**

a) You flip a coin and then roll a fair six-sided die. The coin lands on heads and the die shows an even number.

b) You roll a fair six-sided die twice. The first roll shows a five and the second roll shows a six.

c) There are eight shirts in your closet, four blue and four green. You randomly select one to wear on Monday and toss it in the laundry basket to wash when you are done. Then you wear a different one on Tuesday. You wear a blue shirt both days.

d) A basket contains five apples and seven peaches. You randomly select one piece of fruit and eat it. Then you randomly select another piece of fruit. The first piece of fruit is an apple and the second piece of fruit is a peach.

e) You draw a card from a standard deck of 52 cards. Then you draw a second card without replacing the first. The first card is a club and the second card is a 7.

f) You draw a card from a standard deck of 52 cards. What is the probability that you draw a face card or a 3?