Secondary 2H **Name**_____ **Desk** _____

Unit 7 **HW: Conditional Probability**

Score _____

SHOW ALL WORK. If you need to show your work on a separate piece of paper, please do!

Timothy rolls a pair of number cues. Use this information to complete problems 1 and 2.

1. What is the probability that both numbers are odd if their sum is 7? What is the probability that the sum of the numbers is 7 if both numbers are odd?

2. What is the probability that the sum is even if the product is even? What is the probability that the product is even if the sum is even?

For problems 3 and 4, list the sample space for the given events using a tree diagram and explain what your symbols represent. Use conditional probability to determine if events A and B are independent; show your work.

3. DeShawn rolls a number cube 3 times.

Event A: The second roll is odd.

Event B: Exactly 2 consecutive rolls are odd.

4. The Millers have 3 children.

Event A: The second oldest is a girl.

Event B: At least 2 are girls.

Use the information to complete problems 5 and 6.

A surveyor gathered data from 161 students regarding their interests and favorite entertainment activities. When asked to choose either "music and drama" or "athletics" as their greater overall interest, 80 students chose music and drama, while 81 students chose athletics. Students were then asked to choose among several entertainment activities, including watching movies and singing karaoke.

- 40 students chose movies; of those students, 19 had chosen music and drama, while 21 had chosen athletics.
- 40 students chose karaoke; of those students 31 had chosen music and drama, while 9 had chosen athletics.

5. Consider the following events.

MD: A student chooses music and drama.

M: A student chooses movies.

Are MD and M independent? Compare $P(MD|M)$ and $P(M|MD)$. Interpret what your answers mean.

6. Consider the following events.

A: A student chooses athletics.

K: A student chooses karaoke.

Are A and K independent? Compare $P(A|K)$ and $P(K|A)$. Interpret what your answers mean.

7. The buses at the Zoomy Express Bus Company depart as scheduled 80% of the time. The buses depart and arrive as scheduled 68% of the time. What is the probability that a Zoomy Express bus arrives as scheduled if it departs as scheduled?

8. A hotel restaurant has a 75% customer approval rating for its service. The restaurant has a 60% customer approval rating for its service and its food. What is the probability that a restaurant customer approves of the food if he or she approves of the service?

9. Benicio rolls a pair of number cubes. What is the probability that the sum is 6 if the numbers are different? What is the probability that the numbers are different if the sum is 6?

10. Shanequa tosses a coin 3 times. What is the probability that she gets all heads if the first toss is heads? What is the probability that the first toss is heads if she gets all heads?

11. Amy has 1 sibling. Find the probability that Amy's sibling is a boy if given the following parameters.
    Parameter 1: Nothing is known about the age of Amy or her sibling.
    Parameter 2: It is known that Amy is older than her sibling.