Conditional Probability Worksheet

1. Suppose you throw a pair of fair 6-sided dice. One is white and the other is black. Let T=total showing on both dice, and B = number showing on the black die.
a) Find $P(T = 5 \mid B = 2)$
b) Find $P(B = 2 \mid T = 5)$

2. Jar A has 4 red and 5 black candies. Jar B has 6 red and 2 black candies. A fair die is rolled and jar A is selected if a number divisible by 3 comes up, otherwise, Jar B is selected. One candy is drawn from the jar.
a) What is the probability you selected Jar A and got a red candy?
b) What is the probability you selected Jar B and got a red candy?
c) What is the probability you got a red candy?
d) Suppose a red candy is drawn, what is the probability it came from jar A?
e) What is the probability Jar B was selected if a black candy is drawn?

3. Box X contains 2 red and 3 white marbles. Box Y contains 1 red and 3 white marbles. A marble is randomly chosen from Box X and put into box Y. A marble is then randomly chosen from box Y.
a) What is the probability that the marble chosen from box Y is red?
b) If the marble from Y is red, what is the probability that the marble moved from X was white?

4. In a school 65% of students like pork chops. Two students from the school are picked at random. Given that at least one of them likes pork chops, what is the probability that both like pork chops?

5. The probability of winning a game is 0.8. You play the game 3 times.
a) What is the probability that you win all 3 games?
b) What is the probability that you win at least once?
c) If you win at least once, what is the probability that you have 3 wins?

6. Two boxes contain coins. One box has 1 silver and 3 gold coins, the other box has 2 silver coins and 1 gold. A box is randomly chosen, and a coin is randomly selected. The coin is silver. If a second coin is selected from the same box, what is the probability that it will be silver also?

7. Donald, the quarter back, has 2 wide receivers. He throws to Goofy three out of five plays and Goofy drops the ball 90% of the time. Donald throws to Pluto two out of five plays and Pluto is able to catch the ball 70% of the time.
a) Find the probability that the ball is dropped by either Goofy or Pluto.
b) If a ball is dropped, then the probability that it as Goofy who dropped it is_____
c) Given that the pass is caught, what is the probability that it was Goofy who caught it?

8. You have to travel from here to Grandma's house. Half the time you go by mule, 1/10 of the time you walk, and you fly 0.4 of the time. The mule has a 10% chance of completing the trip, while the plane has a 0.9 probability of completing the trip. You have a 1% chance of completing the trip by walking.
a) What is the probability you walk and do not complete the trip?
b) What is the probability that you make it to Grandma's house?
c) What is the probability that you took the mule given that you did not make it?

Answers:

1. a) $\frac{1}{6}$ b) $\frac{1}{4}$
2. a) 14.8% b) 50% c) 64.8% d) 22.9% e) 47.4%
3. a) $\frac{7}{25}$ b) $\frac{3}{7}$
4. 48.15%
5. a) 0.512 b) 0.992 c) 0.516
6. $\frac{4}{11}$
7. a) 0.66 b) 0.818 c) 0.176
8. a) 9.9% b) 41.1% c) 76.4%