

Math 216 Clicker Questions – Chapter 2

1. Your sister calls to say she's having twins. Which of the following is more likely? (Assume she's not having identical twins.)
 - A. Twin boys
 - B. Twin girls
 - C. One boy and one girl
 - D. All are equally likely.

2. Through accounting procedures, it is known that about 10% of the employees in a store are stealing. The managers would like to fire the thieves, but their only tool in distinguishing them from the honest employees is a lie detector test that is only 90% accurate. That is, if an employee is a thief (and lies about it), there's a 90% chance the test will discover the lie. And if an employee is not a thief (and tells the truth), there's a 10% chance the test will say the employee is lying. If the lie detector says an employee is lying, what's the probability that the employee is a thief?
 - A. 90%
 - B. 75%
 - C. $66\frac{2}{3}\%$
 - D. 50%

3. A fair coin is tossed six times and the results are recorded in the order that they appear, using H for heads and T for tails. Which of the following outcomes is MOST LIKELY to occur?
 - A. H H H T T T
 - B. T T H H T H
 - C. H T T H H H
 - D. Both 1 and 2 are equally likely.
 - E. All of these sequences are equally likely.

Bill is 34 years old. He is intelligent, but unimaginative, compulsive, and generally lifeless. In school, he was strong in mathematics but weak in social studies and English. Rank the following statements in order of decreasing likelihood.

- A. Bill is a physician who plays poker for a hobby.
- B. Bill is an architect.
- C. Bill is an accountant.
- D. Bill plays jazz for a hobby.
- E. Bill surfs for a hobby.
- F. Bill is a reporter.
- G. Bill is an accountant who plays jazz for a hobby.

- H. Bill climbs mountains for a hobby.
4. Which of the following is true for your ranking? (Here, $>$ means “is more likely than.”)
- A. $C > D > G$
 - B. $C > G > D$
 - C. $D > C > G$
 - D. $D > G > C$
 - E. $G > C > D$
 - F. $G > D > C$
5. In a certain semester, 500 students enrolled in both Astronomy I and Biology I. Of these students, 82 got an A in astronomy, 73 got an A in biology, and 42 got an A in both courses. Which of the following probabilities is the smallest? The probability that a randomly chosen student...
- A. Got an A in at least one of the two courses.
 - B. Got less than an A in at least one of the two courses.
 - C. Got an A in both of the two courses.
 - D. Got an A in astronomy but not in biology.
 - E. Got an A in biology but not astronomy.
6. Which of the following might not always be a true statement about events A and B in a sample space S?
- A. $(A \cup B)^c = A^c \cap B^c$
 - B. $(A \cap B)^c = A^c \cup B^c$
 - C. $S = (A \cap B^c) \cup (B \cap A^c)$
 - D. $S = (A \cup B) \cup (A^c \cap B^c)$
7. Consider tossing a fair coin twice. Let A be the event that the first toss is heads. Let B be the event the second toss is tails. Let C be the event that the two tosses are the same. And let D be the event that the two tosses are both heads. Which of the following pairs of events is not independent? [MULTIPLE MARK]
- A. A and B
 - B. A and C
 - C. A and D
 - D. B and C
 - E. B and D
 - F. C and D
8. Three cards are placed in a hat—one card is blue on both sides, one is red on both sides, and one has a blue side and a red side. A card is drawn at random from the hat and you see that one side is blue. What’s the probability that the other side is blue?
- A. $1/3$
 - B. $1/2$

- C. $2/3$
- D. $3/4$

9. Monty Hall offers you a choice of three doors. Behind two are goats, and behind the other door is a brand new car. After you make your choice, Monty opens one of the doors you didn't choose to reveal a goat, and offers you the chance to switch your choice to the one remaining. What should you do? (Assume Monty knows where the car is and always opens a door with a goat after the contestant chooses.)

- A. Switch
- B. Stay
- C. It doesn't matter.

10. Suppose you're running an ice cream stand. Let A be the event that it is a hot day and let B be the event that you sell more ice cream than usual. TRUE OR FALSE: "Events A and B are independent."

- A. True
- B. False

11. Suppose your instructor asks you a multiple-choice question with **three** answer choices in class. You are to submit your answer and also rate your confidence (low, medium, or high) with which you believe in that answer. You will be scored based on the chart below. If you have no idea what the answer is, and you have to guess randomly among the **three** available answer choices, what confidence level should you choose in order to maximize your points?

- A. Low
- B. Medium
- C. High
- D. It doesn't matter.

Confidence	Correct Answer	Incorrect Answer
Low	3	2
Medium	4	1
High	5	0

12. Suppose your instructor asks you a multiple-choice question with **two** answer choices in class. You are to submit your answer and also rate your confidence (low, medium, or high) with which you believe in that answer. You will be scored based on the chart below. If you have no idea what the answer is, and you have to guess randomly among the **two** available answer choices, what confidence level should you choose in order to maximize your points?

- A. Low
- B. Medium
- C. High

D. It doesn't matter.

Confidence	Correct Answer	Incorrect Answer
Low	3	2
Medium	4	1
High	5	0

Answers

1. C
2. D
3. E
4. A (assuming it's more likely that Bill is an accountant than someone who plays jazz)
5. E
6. C
7. C, E, F
8. C
9. A
10. B
11. A
12. D (at least as far as expected values go)