

MATH ANALYSIS II HONORS

PROBABILITY 16.1 – 16.3

For questions # 1 – 6, use the following list of events.

A card is chosen from a standard deck of 52 cards.

Event A – “a king is chosen”

Event B – “a red card is chosen”

Event C – “a diamond is chosen”

Event D – “a queen is chosen”

Event E – “a spade is chosen”

1. Choose two events that are independent. Explain why they are.
2. Choose two events that are not independent. Explain why they are not.
3. Choose two events that are mutually exclusive. Explain why they are.
4. Is $P(C | B) = P(C)$? Explain what this means.
5. Is $P(\text{choosing either a king or a red card}) = P(A) + P(B)$? Explain why or why not?
6. What is $P(C)$? What is $P(E)$? Explain why these cannot be the only two possible outcomes, based on probability. (i.e. without assuming any knowledge about a deck of cards.)
7. A 6-sided die is rolled and a coin is tossed. What is the probability of rolling a number “above 2” and getting “tails”?
8. Two 10-sided dice are rolled (Each numbered 1 – 10). What is the probability of getting a sum that is **greater than 15**?
9. Four cards are chosen from a standard deck (without replacement.) What the probability of getting 4 aces?
10. Four cards are chosen from a standard deck (without replacement.) What the probability of getting at least 1 ace?

11. A coin is flipped 6 times. What is the probability of getting "tails" exactly 2 times?

12. The percentage of women in a large population is 55%. If three people are picked at random, what is the probability that exactly 2 women will be chosen?

13. The following data shows the number of students who play sports and are on the honor roll.

	Not on Honor Roll	Honor Roll
Sports	125	50
Not on Sports	175	75

A = "student is on the honor roll"

B = "student plays sports"

Find:

P(A)

P(B)

P(A | B)

P(B | A)