Algebra II Pre-AP -- Assignment 55

Probability 1

For this assignment, it would be helpful for you to familiarize yourself with a standard deck of 52 cards. If the probability is very small, answer using scientific notation with 3 significant digits.

A Problems (Required)	B Problems (For additional practice)
1. A bag contains 10 identical poker chips numbered 1 through 10. One chip is randomly selected from the bag. Let A be the event of getting an even number. Let B be the event of getting a number divisible by 3. Find: a) $P(A)$ b) $P(B)$ c) $P(A \cup B)$ d) $P(A \cap B)$ e) $P(\overline{B})$	1. A bag contains 12 identical poker chips numbered 1 through 12. One chip is randomly selected from the bag. Let A be the event of getting an even number. Let B be the event of getting a number divisible by 3. Find: a) $P(A)$ b) $P(B)$ c) $P(A \cup B)$ d) $P(A \cap B)$ e) $P(\overline{B})$
2. Two fair dice are rolled, one red and one green. Find each probability. a) the sum of the numbers showing on the dice is 10. b) The sum is at least 10. c) Exactly one die shows a 4. d) At least one die shows a 4. e) The sum is a multiple of 3	2. Two fair dice are rolled, one red and one green. Find each probability. a) the sum of the numbers showing on the dice is 6 b) The sum is a prime number. c) Exactly one die shows a 5. d) At least one die shows a 5. e) The number on the red die is greater than the number on the green die.
3. One card is randomly selected from a standard deck of 52 cards. Let A be the event of selecting a heart and let B be the event of selecting an ace. Find the following probabilities: a) $P(A)$ b) $P(B)$ c) $P(A \cap B)$ d) $P(A \cup B)$ e) Are A and B mutually exclusive? f) Are A and B independent?	3. One card is randomly selected from a standard deck of 52 cards. Let A be the event of selecting a black card and let B be the event of selecting a 2 or 3. Find the following probabilities: a) $P(A)$ b) $P(B)$ c) $P(A \cap B)$ d) $P(A \cup B)$ e) Are A and B mutually exclusive? f) Are A and B independent?
4. When Carlos shoots a basketball, the probability of a basket is 40%. When Brad shoots, the probability is 45%. If they each take one shot, calculate the following probabilities. a) Carlos makes but Brad misses b) both miss their shots c) both make their shots d) at least one basket is made	4. The probability of rain on a certain day is 65% in Yellow Falls and 40% in Copper Creek. Find the probability of each event. a) It will rain in Yellow Falls but not in Copper Creek. b) It will rain in both towns. c) It will rain in neither town. d) It will rain in at least one of the towns.
5. In a soccer shootout, Ken, Tom, Frank, and Bob each get one shot. Historically, Ken makes 80% of these shots, Tom makes 66%, Frank makes 75% and Bob makes 58%. Find the probability that a) At least one shot is made b) only Ken and Frank makes their shots c) exactly one shot goes in d) only Ken misses	5. The probability that project Alpha will succeed is 60%, the probability that project Beta will succeed is 45%, and the probability that project Gamma will succeed is 70%. Find each probability: a) at least one will succeed b) only Alpha and Beta succeed c) only one project succeeds d) only Alpha fails
6. A bag contains 2 red, 4 yellow, and 6 blue marbles. Two marbles are drawn at random. Find the probability of each event. a. Both are red. b. Both are yellow. c. Both are blue. d. One is red and one is yellow. e. Neither is red. f. Neither is blue.	6. A bag contains 3 red, 5 yellow, and 4 blue marbles. Two marbles are drawn at random. Find the probability of each event. a. Both are red. b. Both are yellow. c. Both are blue. d. One is red and one is yellow. e. Neither is red. f. Neither is blue.
7. Three balls are drawn at random from a bag containing 8 red balls and 7 black balls. Calculate the probability of drawing: a) 3 red balls b) 3 balls of the same color c) 2 red and one black ball d) more black than red balls e) at least one black ball	7. A town council consists of 8 Democrats, 7 Republicans, and 5 Independents. A committee of 3 is chosen by randomly pulling names from a hat. What is the probability that the committee has: a) 2 Democrats and 1 Republican? b) 3 Independents? c) no Independents? d) one from each party?
8. Seven cards are dealt from a well-shuffled standard deck of cards. Find the probability of getting: a) 5 clubs b) no clubs c) at least one club d) no aces e) at least one ace f) exactly 2 Jacks	8. Five cards are dealt from a well-shuffled standard deck of cards. Find the probability that: a) all 5 are spades. b) all 5 cards are of the same suit. c) there are no aces in the hand d) at least one card is an ace. e) three jacks f) three of a kind g) a pair of kings