
Probability Theory: Activity 1

Name: _____

Consider rolling two dice (each a standard 6 sided die) as an experiment, and then you sum them.

1. What are all the possible outcomes, the sample space S ?
2. What are the elements of the set for the event that the sum is strictly less than 8? Assign this to be set A .
3. What are the elements of the set for the event that the sum is strictly more than 3 but only one digit? Assign this to be set B .
4. What are the elements for the event that the sum is even? Assign this set to be C .

Find the following:

1. $A \cup B$
2. $A \cap B$
3. A^c
4. $(A \cup B)^c$
5. $A^c \cap B^c$
6. Consider the answers to the previous two questions. Can you find $A^c \cap C^c$ without finding A^c and C^c first?
7. $C \cup C^c$
8. $(A \cap C) \cup (A \cap C^c)$
9. $(A \cap B) \cup (A \cap B^c)$
10. For any other set D , what do you think $(A \cap D) \cup (A \cap D^c)$ is?
11. Consider three sets D_1, D_2, D_3 such that they are all disjoint and $D_1 \cup D_2 \cup D_3 = S$. What do you think $(A \cap D_1) \cup (A \cap D_2) \cup (A \cap D_3)$ is? Explain why.