

MATH 155 Assigning Probabilities to Events

Consider an experiment where pair of fair dice is rolled and the number of spots showing on the top face of each die is noted. We can suppose that one die is red and the other green. One representation of the sample space for this experiment is shown below. In each pair (g, r), the “g” is the number of spots showing on the green die and the “r” is the number of spots showing on the red die.

● 1,1	● 1,2	● 1,3	● 1,4	● 1,5	● 1,6
● 2,1	● 2,2	● 2,3	● 2,4	● 2,5	● 2,6
● 3,1	● 3,2	● 3,3	● 3,4	● 3,5	● 3,6
● 4,1	● 4,2	● 4,3	● 4,4	● 4,5	● 4,6
● 5,1	● 5,2	● 5,3	● 5,4	● 5,5	● 5,6
● 6,1	● 6,2	● 6,3	● 6,4	● 6,5	● 6,6

In the spaces adjacent to each sample point (outcome) assign a probability to each sample point.

Suppose we define events as follows:

- A: A five appears on each die.
- B: The sum of the numbers on the dice is seven.
- C: A six appears on at least one die.
- D: The sum of the numbers is at least six.
- E: A six appears on the green die.

Determine the following probabilities:

- a. $P(A) =$
- b. $P(B) =$
- c. $P(C) =$
- d. $P(D) =$
- e. $P(E) =$
- f. $P(B \cap C) =$
- g. $P(B \cup C) =$
- h. $P(E^c) =$
- i. $P(A \cap C) =$
- j. $P(E^c \cup E) =$
- k. The probability of B given that we can see that E has occurred.
- l. The probability of B given that we can see that E^c has occurred.