Exercises for Sections 1.1 and 1.2.

1. Find the size of the sample space if the experiment consists of tossing four coins in a row.

2. Find the size of the sample space if the experiment consists of tossing four dice in a row.

3. Let the experiment be the toss of seven coins in a row. Let X be the number of coins that turn out heads in the experiment. Then, X is a random variable. What are the possible values of X?

4. If we toss four dice in a row, then each die will show a number. Let X be the sum of the numbers. Then, X is a random variable. What are the possible values of the random variable X?

5. Let the experiment be the toss of two dice in a row. Let X be the number shown by the first die, and let Y be the number shown by the second die. Let A be the event that $X + Y \geq 8$, and let B be the event that $X \geq Y + 2$.

   (a) Find the size of A.

   (b) Find the size of B.

   (c) Find the size of $A \cup B$.

(d) Find the size of $A \cap B$.

(e) Find the size of A'.

(f) Find the size of B'.

(g) Find the size of $A \backslash B$.

6. Let the experiment be the toss of one die. Then the sample space is

$$S = \{1, 2, 3, 4, 5, 6\}.$$

Let $A = \{1, 2, 3\}$, $B = \{4, 5\}$, $C = \{6\}$. Do the events A, B, C form a partition of S?

7. Let the experiment be the toss of one die. Then the sample space is

$$S = \{1, 2, 3, 4, 5, 6\}.$$

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8. Let the experiment be the toss of one die. Then the sample space is

$$S = \{1, 2, 3, 4, 5, 6\}.$$

Let $A = \{1, 2\}$, $B = \{3, 4\}$, $C = \{6\}$. Do the events A, B, C form a partition of S?