

Question 1:

An experiment involves tossing a pair of dice, 1 *green* and 1 *red*, an recording the numbers that come up. If x equals the outcome on the green die and y the outcome on the red die, describe the sample space S

1. by listing the elements (x, y) ;
2. by using the rule method.

Question 2:

If $S = \{x|0 < x < 12\}$, $M = \{x|1 < x < 9\}$, and $N = \{x|0 < x < 5\}$, where x is an integer, find

1. $M \cup N$;
2. $M \cap N$;
3. $M' \cap N'$;

Question 3:

Nine people are going on a skiing trip in 3 cars that hold 2, 4, and 5 passengers, respectively. In how many ways is it possible to transport 9 people to the ski lodge, using all cars?

Question 4:

A pair of fair dice is tossed. Find the probability of getting

1. a total of 8;
2. at most a total of 5.

Question 5:

The probability that a person visiting his dentists will have an X-ray is 0.6; the probability that a person who has an X-ray will also have cavity filled is 0.3; and the probability that a person who has had an X-ray and a cavity filled will also have a tooth extracted is 0.1. What is the probability that person visiting his dentist will have X-ray, a cavity filled, and a tooth extracted?

Question 6:

A real estate agent has 8 master keys to open several new homes. Only 1 master key will open any given house. If 40% of these homes are usually left unlocked, what is the probability that the real estate agent can get into a specific home if the agent selects 3 master keys at random before leaving the office?

Question 7:

A certain federal agency employs three consulting firms (A , B , and C) with probabilities 0.40, 0.35, and 0.25, respectively. From past experience it is known that the probability of cost overruns for the firms are 0.05, 0.03, and 0.15, respectively. Suppose a cost overrun is experienced by the agency.

1. What is the probability that the consulting firms involved is company C ?
2. What is the probability that is company A ?

Question 8:

A truth serum has the property that 90% of the guilty suspects are properly judged while, of course, 10% of guilty suspects are improperly found innocent. On the other hand, innocent suspects are misjudged 1% of the time. If the suspect was elected from a group of suspects of which only 5% have ever committed a crime, and the serum indicates that he is guilty, what is the probability that he is innocent?