

Workbook



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Questions:

The following is a list of statements. Determine whether each statement is true or false, and explain your answer (an answer without an explanation will not be accepted).

- 1) Events A and B are in a sample space Ω . It is known that $P(A) = P(B) = 0.3$.
The probability of exactly one event occurring if the events are mutually exclusive is $2 \cdot 0.7 \cdot 0.3 = 0.42$.
- 2) In throwing a balanced die four times, the probability that at least two results are the same is $\frac{936}{1296}$.
- 3) Events A and B are independent events, and their probabilities are 0.5 and 0.3, respectively. The probability of at least one of them occurring is therefore 0.8.
- 4) A and B are events in a sample space Ω . It is known that $P(A) = P(B) = 0.2$.
If A and B are independent events, the probability of exactly one of them occurring is 0.4.
- 5) A dreidel has four faces. The probability of getting the same result each time if the dreidel is thrown three times is $\frac{1}{16}$.
- 6) If $E(X + Y) = E(X) + E(Y)$, then X and Y are independent random variables.
- 7) The number of different ways of putting three soldiers in order in a trio is 9.
- 8) Six different toys must be divided among four girls and two boys. The number of ways to divide the toys is 48.

Probability

- 9) An ATM code is composed of four digits taken from 0-9.
The probability that all four numbers are different is 0.504.
- 10) John and Mary go to the mall where there are a number of different activities.
We are given that:
- The probability that they go bowling is 0.3.
 - The probability that they go to a café is 0.5.
 - The probability that they go to at least one of bowling and a café is 0.7.
- Therefore, the probability that they go only bowling is 0.3.
- 11) There are three students in a class. The chances of a given student passing an exam are 0.8. All the students are independent of each other.
Therefore, the chances of at least one student passing an exam are 0.992.
- 12) A Guest House's dining room has the following items on its menu:
- 3 entrees
 - 4 main courses
 - 2 desserts
- The number of possible orders including one entrée, one main course, and one dessert is 9.
- 13) In a shooting competition, a competitor plays until he hits the target, but does not shoot more than four times. The probability of a competitor hitting the target is 0.6.
Therefore, the chances that a competitor will shoot at the target four times are 0.064.
- 14) The chances that a student will study on a given day are 0.7 if his mother asks him, and 0.4 if his mother does not ask him. The student's mom asks him to study on 60% of the days. Someone came to visit the student and found that he was studying, so the probability that his mother asked him to study on that day is 0.742.
- 15) The number of initials that can be created in an alphabet having 22 letters for a first and last name is 44.
- 16) The number of three-digit numbers in which the digits are all different from each other is 648.

Probability

17) There are two events. It is given that these two events are mutually exclusive. The chances of each of them occurring are 0.3, so the chances of at least one of them occurring are 0.6.

18) A , B , and C are three events in the sample space Ω .

It is known that $P(A) = P(B) = P(C) = 0.2$.

The probability of only event B occurring if the events are independent is 0.2.

19) In a certain population, the distribution of people according to their blood type is as follows:

Four people are randomly selected from this population. The probability that exactly one of them has blood type A is 0.4.

Blood Type	Percentage of the Population
A	40%
O	30%
B	20%
AB	10%

20) We define A as the result "4" - when throwing a die, and B as the result "heads", when tossing a coin. These two events are therefore mutually exclusive events.

Answer Key:

Question	Answer
1)	False
2)	True
3)	False
4)	False
5)	True
6)	False
7)	False
8)	False
9)	True
10)	False
11)	True
12)	False
13)	True
14)	True
15)	False
16)	True
17)	True
18)	False
19)	False
20)	False