

Problems for Class 2

TRUE or FALSE problems

State whether you believe the given statement is TRUE or FALSE and provide a brief argument for your answer.

1. In the throw of a fair six-sided die, we use the classical probability approach to calculate that the probability of a throw being less than 3 is equal to  $1/3$ .
2. When rolling two fair six-sided dice, the probability of the sum of the two rolls being 8 is higher than the probability of a 7.
3. A hat contains two blue, two red, two yellow, and two green marbles that cannot be distinguished by touching them. Without looking you draw marbles repeatedly and then replace them back into the hat. The probability that you draw two consecutive red marbles is less than the probability of drawing first a blue marble and then a green marble.
4. Consider drawing two cards without replacement from a deck of 52 cards. The probability that you draw two aces is 1 in 221.
5. There is a random draw of one card from a 52 card deck. You are told that the card is red. The probability that it is a King is  $1/13$ .
6. There are 271 numbers between 0 and 999 that have at least one 7 in them.
7. If two events are mutually exclusive and none of them is the empty set, then they cannot be stochastically independent.

Exercises

Exercises 1-10: NCT 4.9, 4.13, 4.17, 4.31, 4.35, 4.36, 4.42, 4.44, 4.52, 4.93(a)-(d).

11. Emma and Josh have just gotten engaged. What is the probability that they have different blood types? Assume that blood types for both men and women are distributed in the general population according to the following proportions:

Blood type	Proportion
A	40%
B	10%
AB	5%
O	45%

12. In a certain third world nation, statistics show that only eight out of ten children born in the early 1980s reached the age of twenty-one. If the same mortality rate is operative over the next generation, how many children does a women need to bear if she wants to have at least 75% probability that at least one of her offspring survives to age twenty-one?