

## Conditional Probability.

1. You are given 5 random cards from the standard 52 card deck. You see that the first 4 cards are hearts. What is the probability that you will have flash (that is all 5 cards will be hearts).
2. A university football team plays two game this week. It beats the Jaguars in 80 % of the seasons, beats the Chickens in 40 % of the seasons and it beats both teams in 35 % of the seasons. After it won the first game (against the Jaguars) a friend of yours wants to bet \$ 1 that they will loose against the Chickens. Would you accept this bet?
3. A woman buys a toy truck for her boy in a toy store. Then she mentions to her friend that she has two kids. What is the probability that her first-born is a boy?
4. A box contains 6 red and 10 green balls. 5 balls are chosen at random without replacement. Given that 4 balls are red what is the probability that the third ball selected was green?
5. A box contains 7 green and 3 red balls. We get a ball at random from this box and then return it to the box with another box of the same color. When we select another ball at random. What is the probability that both balls will be green?
6. Two companies produce a certain equipment. The first company controls 80 % of the market, the second 20 % of the market. 10 % of the first company's products are defective and 5 % of the second company products are defective.
  - (a) What is the share of the defective products on the market?
  - (b) Given that a product is defective what is the probability that it was produced by the first company.
7. 1% of people has a certain disease. A test can reveal a disease with probability 95%, however it also gives false positive result it 2% of the cases. If a person is tested positive what is the probability that they have a disease?
8. (a) A certain algebra question is answered correctly by 90% of excellent students, by 70% of good students and by 50% of mediocre students. 50% of students in school I are excellent, 30 % are good and 20% are mediocre. Exellent and good students take honors algebra and mediocre students take regular algebra. What is a probability that a student will answer the question correctly if they are chosen at random from (i) honors algebra class (ii) regular algebra class (iii) the whole school?
  - (b) Answer the questions of part (a) for school II which has 20% of excellent students, 30 % of good students and 50% of mediocre students if excellent students are enrolled in honors algebra while good and mediocre ones are enrolled in regular algebra.