

Probability Examples - Independent and Dependent Events

1. A bin contains 100 balls, 35 are white, 25 are red, and 40 are black. If you draw three balls one at a time from the bin without replacement, what is the probability that
 - (a) you get a black, red, and black ball in that order?
 - (b) you get three white balls?
2. Three radar sets, operating independently, are set to detect any aircraft flying through a certain area. Each set has a probability of 0.02 of failing to detect a plane in its area.
 - (a) If an aircraft enters the area, what is the probability that it goes undetected?
 - (b) If an aircraft enters the area, what is the probability that it is detected by all three radar sets?
3. A communications network has a built-in safeguard system against failures. In this system, if line I fails, it is bypassed and line II is used. If line II also fails, it is bypassed and line III is used. The probability of failure of any one of these three lines is 0.01, and the failure of these lines are independent events. What is the probability that this system of three lines does not completely fail?
4. A new secretary has been given n computer passwords, only one of which will permit access to a computer file. Because the secretary has no idea which password is correct, he chooses one of the passwords at random and tries it. If the password is incorrect, he discards it and randomly selects another password from among those remaining, proceeding in this manner until he finds the correct password.
 - (a) What is the probability that he obtains the correct password on the first try?
 - (b) What is the probability that he obtains the correct password on the second try? The third try?
5. Articles coming through an inspection line are visually inspected by two successive inspectors. When a defective article comes through the inspection line, the probability that it gets by the first inspector is 0.1. The second inspector will "miss" five out of ten of the defective items that get past the first inspector. What is the probability that a defective items gets by both inspectors?