

Extra exercises

1. The average number of calls per minute received by a telephone switchboard is 120.

a) What's the probability of receiving less than 4 calls in 2 seconds?

b) What's the probability of receiving at least 3 calls in 3 seconds?

c) What's the probability that the first call is received after 3 seconds?

2. In a physiotherapy course there are 60% females and 40% males. If 6 random students have to go to a hospital for making practices, what's the probability of going more males than female?

3. Pick a number from 1 to 20.

a) What's the probability that the number picked is a multiple of 3.

b) Repeat your trial independently & identically and let X be the number of trial repeated until you get a multiple of 3.

What's the probability that you get a multiple of 3 at the 7th trial.

4. Suppose we flip an unfair coin and count the number of heads that appear. Knowing that there's 40% of getting a "Head", calculate

a) the probability of getting two "Head" if we flip the coin 10 times.

b) the probability of getting head for the first time at the 5th flip.

c) Suppose that we stop when we get 3 "head". What's the probability of stopping at the 10th flip?

5. Out of 100 students qualifying an exam, 10 were randomly chosen. If 35 out of those students are female, find the probability that 3 out of the chosen are females.

6. There's a test for allergy to cats, but this test is not always right:

- For people that really do have the allergy, the test says "Yes" 80% of the time
- For people that do not have the allergy, the test says "Yes" 10% of the time.

If 1% of the population have the allergy, and Hunter's test says "Yes", what are the chances that Hunter really has the allergy?

7. At the production of a certain item, two types of defects A and B can occur. We know that $P(A)=0,1$ and $P(B)=0,2$ and $P(A \cap B)=0,05$.

I. Compute the probability that a produced unit has

- a) at least one of the defects
- b) defect A but not B
- c) none of the defects
- d) precisely one of the defects.

II. are A and B independent? justify.