Poisson Distribution

Exercise 1.

In a rolling process occurs, in average, one fault every 10 metres. The sheets are cut into 5 metre pieces.

a) What is the probability that a piece will not have any faulty? *Answer: 0.6065*

b) What is the probability that a piece has more than 2 defects? *Answer: 0.0143*

Exercise 2.

A computer presents, in average, 2 interruptions per hour. Usually, the computer performs all its functions correctly when there are at most 7 interruptions in 3 hours of work. Calculate the probability of this happening. *Answer: 0.7439*

Exercise 3.

A printer company that works with magazines suppose that the average of spelling mistakes per page is 0.5. If we pick a magazine with 30 pages,

a) What is the probability to find more than 5 mistakes? *Answer: 0.9972*

b) What is the probability to find at most 10 mistakes? *Answer: 0.1185*

c) What is the probability to find 20 mistakes? *Answer: 0.0418*

d) How many mistakes do we expect to find in the selected magazine? *Answer: 15 mistakes*

Exercise 4.

A pizzeria receives, in average, 4 calls for delivery per hour. On Saturdays, the store works 5 hours. If we pick a random Saturday,

a) What is the probability that the pizzeria receives at least 10 calls for delivery? *Answer: 0.995*

b) What is the probability that the pizzeria receives more than 12 calls for delivery? *Answer: 0.9609*

c) What is the probability that the pizzeria receives at most 15 calls for delivery? *Answer: 0.1565*

Combined Exercises.

Exercise 1

The coils of rope in a port have an average of 2 knots per metre. If 10 coils of 5 metres each are inspected,

a) What is the probability to find 2 coils with more than 8 knots? *Answer: 0.0035*

b) What is the probability to find 5 coils with more than 8 knots? *Answer: 0.1434*

c) How many coils with more than 8 knots do we expect to find within these 10 that are inspected? *Answer: 6.6 coils.*

Exercise 2

In a wire control process, it is known that the number of faults every 10 metres follows a Poisson distribution with variance of 1. What is the probability that, inspecting 20 wires of 10 metres each, we find at least one fault in more than 10 of them? *Answer: 0.8349*