EXERCISE 1 (10 POINTS)

Let $Z$ be a r.v. such that it follows a $b(0.45, 12)$ binomial distribution.

1. (2 points) Compute the probability $P(Z = 8)$.
2. (2 points) What is the characteristic function for this r.v.?
3. (2 points) Compute the probability $P(Z > 12)$.
4. (4 points) Compute the probability $P(3 \leq Z < 5)$.
EXERCISE 2 (10 POINTS)

The number of cars that arrive each hour at a given car washing facility follows a Poisson distribution with variance equal to 2.5. We assume independence between the different cars arriving at the car washing facility.

1. (2 points) What is the probability that, in a given hour, exactly 4 cars arrive at the car washing facility?

2. (2 points) What is (are) the most likely number(s) of clients that arrive, in a two-hour period, at the car washing facility?

3. (2 points) What is the probability that, in a two-hour period, more than 8 cars arrive at the car washing facility?

4. (4 points) What is the probability that, in a period of eight hours, at least 30 cars arrive at the car washing facility?