# Präsenzaufgabe 6

**Exercise 1: Deutsche Bahn delays** Deutsche Bahn trains are known to often have delays. We consider the delay of Deutsche Bahn trains as a Zufallsvariabel $X$ in $\mathbb{R}$ (counted in minutes), with for example $X = 2.5$ when the train is delayed by 2 minutes and a half. We assume that the expected value of $X$ is $\mathbb{E}(X) = 10$ minutes.

1. Assuming that $X$ has an exponential distribution:

   a) what is the Intensity parameter (Intensitätsparameter) $\lambda$? (it may help to draw the "survival function" and the Lebesgue density for $X$).

   b) What is the probability to have less than 20 minutes delay?

2. Assuming that $X$ has a gaussian distribution:

   a) what is the value of $\mu$?

   b) Can you deduce the value of parameter $\sigma$ without more information?

   c) If the probability to have less than 20 minutes delay is 70%, what is the value of $\sigma$?

   d) What is then the probability for the train to arrive on time or earlier?