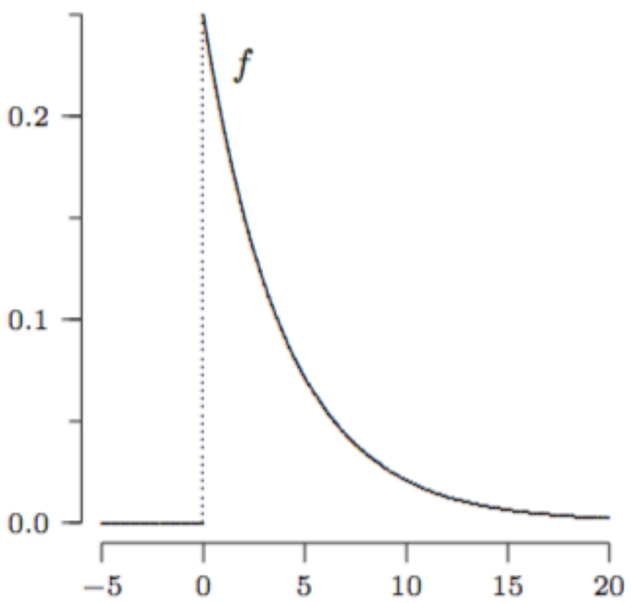
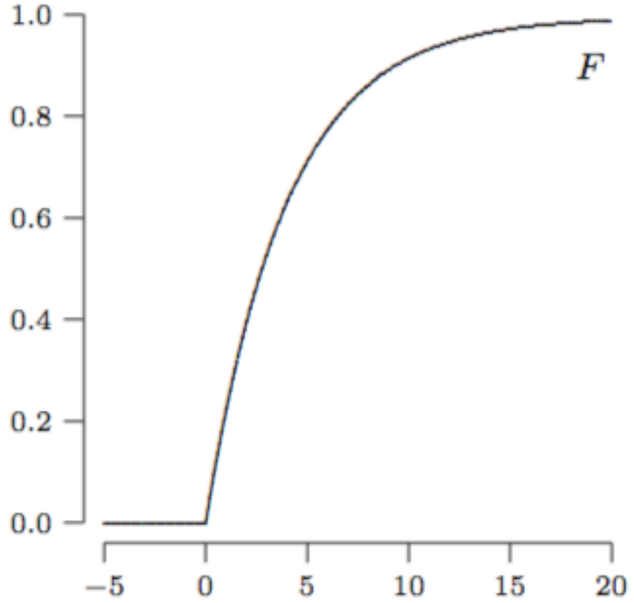
Recall: the exponential distribution

- **Definition**: a continuous random variable has an *exponential distribution* with parameter λ if its probability density function f is given by

$$f(x) = \lambda e^{-\lambda x} \quad \text{for} \quad x \geq 0$$

and $f(x) = 0 \quad \text{for} \quad x < 0$





Return of the Quantiles

- In exploratory data analysis, Q1, median (Q2), and Q3 were values that divided a set of values evenly: the bottom 1/4, the middle, and the top 1/4.
- 🤔🤔🤔… use the CDF to write down the p^{th} quantile of a CRV X.

$$p = \int_{-\infty}^{Q} f(x)dx \qquad \text{but the definition of the CDF is} \quad F(Q) = \int_{-\infty}^{Q} f(x)dx$$

so $p = F(Q)$

For example, the median is defined as: $0.5 = F(\tilde{x})$