

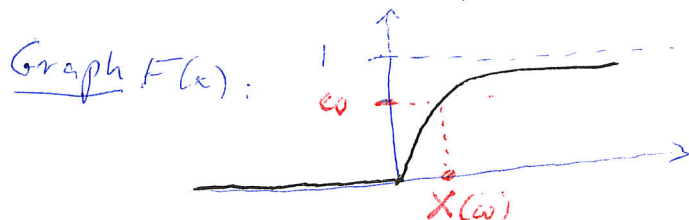
Jan 17
2020

Example for "construction"

Exponential distribution with parameter $\lambda=1$ has CDF

$$F(x) = \begin{cases} 1 - e^{-x} & x \geq 0 \\ 0 & x < 0 \end{cases}$$

Construction of r.v. $X(\omega)$ with this CDF on $(\Omega=(0,1), \mathcal{B}, \mathbb{P})$



So if $\omega \in (0,1)$ then $\{y; F(y) < \omega\} = (-\infty, X(\omega))$ where $X(\omega)$

Solves $F(X(\omega)) = \omega$ i.e. $1 - e^{-X(\omega)} = \omega$

$$e^{-X(\omega)} = 1 - \omega$$

$$-X(\omega) = \ln(1 - \omega)$$

$$\boxed{X(\omega) = \ln \frac{1}{1 - \omega}}$$

This is our answer