

Seminar 1

DEDP

1. Let A be a continuous r.v. with distribution $\mathcal{U}[0, \pi]$, then
 - a. Draw the PDF of A
 - b. Compute the probability that $X > 1$
 - c. Compute the probability that $X \in (0, 2)$
 - d. Draw the CDF function and write its mathematical expression
 - e. What is the distribution of $B = A - 2$?
2. Let A be a r.v. with distribution $\mathcal{N}(\mu = 1, \sigma^2 = 2)$.
 - a. Compute the probability that $A \in [2, 4]$
 - b. What is the distribution of $B = A - 2$?
 - c. What is the maximum value of $w_A(x)$ and for what x is it reached?
3. Let A be a **discrete** random variable with uniform distribution $\mathcal{U}[0, 10]$
 - a. How many different realizations of A are possible?
 - b. Draw the PMF of A
 - c. Find the probability that A is an odd number
 - d. Find the probability that $A \in [3, 7]$
4. Compute the probability that three r.v. X, Y and Z i.i.d. $\mathcal{N}(-1, 1)$ are all positive simultaneously
5. Find the relation between the $erf()$ function

$$erf(x) = \frac{2}{\sqrt{\pi}} \int_0^x e^{-t^2} dt$$

and the Laplace function

$$F(x) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^x e^{-\frac{t^2}{2}} dt$$