

Seminar 1

DEDP

1. If X is a r.v. with distribution $\mathcal{U}[0, \pi]$, then
 - a. compute the probability that $X > 1$
 - b. compute the probability density of a r.v. Y defined as

$$Y = X^2$$

- c. compute the probability density of a r.v. Z defined as

$$Z = \cos(X)$$

2. Let X be a r.v. with distribution $\mathcal{N}(3, 2)$. Compute the probability that $X \in [2, 4]$
3. Compute the probability that three r.v. X, Y and Z i.i.d. $\mathcal{N}(-1, 1)$ are all positive simultaneously
4. Find the relation between the $\text{erf}()$ function

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

and the Laplace function

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