Seminar 2
Statistical and temporal averages
DEDP

1. Compute the average value, the average squared value, and the variance for a stationary random process with the distribution of a sample:

   a. $w_1(x) = \mathcal{U}[a, b]$ for some $a, b \in \mathbb{R}$

   b. $w_1(x) = \begin{cases} \frac{1}{2} - \frac{1}{8}x, & x \in [0, 4] \\ 0, & elsewhere \end{cases}$

   For this one, also plot the function and check that its integral really is 1

2. Compute the temporal average value, the temporal average squared value, the temporal variance, and the temporal autocorrelation function for the following realization of a finite-length random process:

$$f = [-1, 2, -1, 2, -1, 2, -1, 2, -1, 2]$$

3. Compute the temporal average value, the temporal average squared value, the temporal variance, and the temporal autocorrelation function for the following deterministic signal:

$$s(t) = cos(2\pi f t)$$

   (Hint: Consider $s(t)$ to be a realization of a random process, and proceed as usual).