Random Number Generation

1. Using the procedure that generates random numbers uniformly distributed in the range [0,1) of your chosen programming language, generate N = 10000 samples of the following distributions:
    a. An *Exponential distribution* of rate $\lambda = 0.25$
    b. A *Pareto distribution* with parameters $a = 2.5$, $m = 3$
    c. An Erlang distribution with $k = 8$, and $\lambda = 0.8$
    d. A Hypo-Exponential distribution with rates $\lambda_1 = 0.25$, $\lambda_2 = 0.4$
    e. A Hyper-Exponential distribution with rates $\lambda_1 = 1$, $\lambda_2 = 0.05$, $p_1 = 0.75$
2. For each distribution, compare a plot the *Empirical distribution* obtained from the samples, with the corresponding real distribution (using its formula). Please choose a range on the x-axis to make the evolution of the distribution clearly visible, and show only one distribution per figure.