1. Evaluate integral $\int_0^1 \sin^2(1/x) \, dx$ by both a deterministic (for example, the composite Trapezoidal) method and a Monte Carlo method. Comment on relative advantages and disadvantages.

2. Implement a Metropolis algorithm to sample from a Poisson distribution $\text{Poi}(\lambda)$. Test it for $\lambda = 3, 5$ and 10. Choose a suitable transition distribution $T$ and the acceptance probability $A$. 