Assignment 4

1 Monte Carlo Integration

- (*50 Points*) We learned in class about Monte Carlo Integration and in particular computed a similar integral to this one

$$I = \int_{-1}^{1} e^{-x^2} dx \approx 1.49365 \tag{1.1}$$

  - *(5 Points)* Plot the function in that interval and using the Monte Carlo method described in class, compute that integral for $N = 10000$. What value do you get?
  - *(30 Points)* What is the error of this method? How do you compute it?
  - *(15 Points)* Compare the error found with other approaches, like the midpoint , trapezoidal, quadratures, Simpson, etc. Is this method better or worst? If the integral were in eight dimensions, which method would be better? Prove it.