

The Chinese University of Hong Kong
PHYS 3061, 2019-2020
Homework 3 (optional)

In this optional homework, you will be asked to write a simple Monte Carlo program to calculate the definite integral of a given function. By choosing your own weight function, you are going to investigate the basic idea of importance sampling.

(a) Given $f(x) = e^{-x^2} \sin^2 \frac{\pi x}{2}$, design your own weight function $p(x)$, and write a 2

Monte Carlo program to estimate the following integral:

$$F_N = \int_{-10}^{10} f(x) dx$$

(b) Calculate the variance σ and compare it with uniform sampling, i.e. $p(x) = 1$.

- This is a optional homework. There is no deadline and you don't need to submit it
- But if you want to do this HW, you should try to get the variance table for different sample number