Some important points regarding Monte Carlo integration, Numerov algorithm and Mathematica

- Use the class lectures and a recommended text book to learn as much as possible about **random numbers in C++**.

- Use your knowledge on random numbers in C++ and the class lectures to integrate univariate and multivariate functions using **Monte Carlo integration**. If you're looking for definite integrals involving univariate functions, use Monte Carlo to do the same integration problems given in **Practice Q. 1**. For multivariate functions, consult ***Calculus* by H. Anton**.

- Consult the class lectures and the papers given here (total 3) on **Numerov algorithm** to learn the algorithm. To practice, solve $\frac{d^2u(t)}{dt^2} = -4\pi^2 u(t)$, where $u(0) = 1$ and $u'(0) = 0$ using Numerov algorithm (Actually, this problem was given in a lecture on Numerov algorithm). You should solve it first using RK4 algorithm to compare your results.

- Here's a list of some very basic calculus related problems to solve in **Mathematica**. If you need more, consult ***Calculus* by H. Anton**. If you can remember, on a particular lab class on **Maple**, you had to use the ***assume*** command for an integration problem, there's also a similar command called ***Assuming*** in **Mathematica**. Sometimes you may find this particular command very useful. Now, solve the same problem in Mathematica for your practice.

- The pdf named "phase" will help you to generate phase diagrams from the solutions of O.D.E.s (analytic/numerical) in Mathematica. You may find it helpful to solve O.D.E.s in **Mathematica**.

- Also, a list of special functions in **Maple** is included. Find out about the same functions in **Mathematica**. You'll need this to solve special functions related problems in **Mathematica**, given that you're allowed to use built-in Mathematica functions.