Quiz Week 1

In the lectures, we showed an algorithm for computing a d-dimensional integral. Let this be the integral we need to approximately compute using the algorithm in the lectures:

$$I = \int_0^2 \int_0^2 \cdots \int_0^2 \exp\left(-\sum_{i=1}^{d} x_i\right) dx_1 dx_2 \cdots dx_d.$$

Derive the mean squared error (MSE) that your algorithm makes when n number of d-dimensional vectors are generated in this algorithm, and then upload the image of your derivations on Moodle. What is the MSE you get for $d = 49$ and $n = 100$? Upload this numerical value on Moodle up to and including the third decimal, i.e., upload this numerical value in the form $A.BCD$, where D is the third decimal.