# Lab sheet - 8

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1. Calculate the integral $I = \int_0^1 x^2\, e^{x-1}\, dx$ using Trapezoidal rule and Simpson's $1/3^{rd}$ rule. Compare the results.

2. The density is given by $\rho(x) = A\, e^{-x^2}$, find the constant $A$ by normalizing the density. Take the $x$ range between $[-10, 10]$. Then, calculate the first two moments $< x >$ and $< x^2 >$.

3. Evaluate the integral $\int_0^1 \int_{(x-2)^2}^6 (y^2 - x)\, dx\, dy$ with a suitable method.