

MATH 559 - ASSIGNMENT 4

Please submit your solutions by 11.59 pm (EST) on Sunday 26th November by uploading a single pdf to myCourses.

The continuous univariate pdf

$$f(x) = cx^3 \exp\{-x/2 - 1/\sqrt{x}\} \quad x > 0$$

for constant $c > 0$ is a non-standard form.

Using Monte Carlo methods based on

(a) Rejection sampling 8 MARKS

(b) The Metropolis-Hastings Algorithm 8 MARKS

estimate

$$\mathbb{E}_f[X]$$

and compare the variances of your Monte Carlo estimators over replicated estimation runs. 4 MARKS

You may use modified code from lectures and knitr sheets, but you must explain step-by-step your approach.