Win 2022 ELEE 5810 Prescribed PDFs

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You must show **all** work to receive full credit. All work is to be your own. Due April 11

Upload to BlackBoard a single correctly running .m file 20% penalty for noncompliance

1. The purpose of this assignment is to get familiar with the acceptance-rejection method for generating a random variable with a prescribed pdf.

2. Let $\eta = \int_{\mathbb{R}} f(x)\,dx$ be the normalizing constant for

$$f(x) = \begin{cases} 1 - x^2 & \text{if } -1 \le x \le 1 \\ 3 & \text{if } 1 < x \le 1.003 \\ 0 & \text{otherwise} \end{cases}$$

And let the *prescribed* pdf be given by $p(x) = \frac{1}{\eta} f(x)$. Use MATLAB to "sample" from the prescribed pdf, with $N = 50000$ total samples (rejected and accepted), and $\Delta x = \frac{1}{1000}$, that is the support of the prescribed pdf is x=[-1:1/1000:1.003]; 80 points

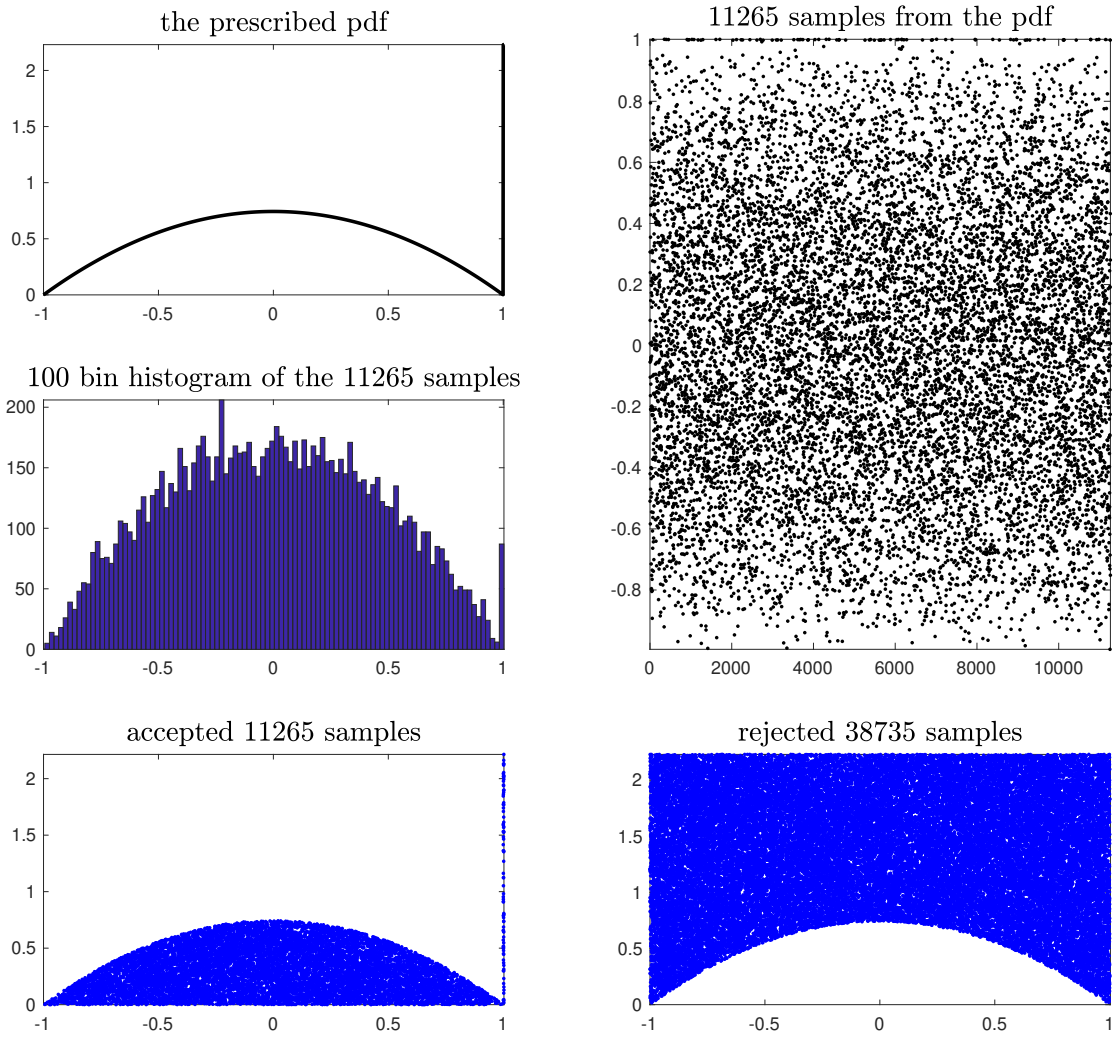

Figure 1: Results of Accept-Reject method for the pdf $p(x) = \frac{1}{\eta} f(x)$.