

Lab 1

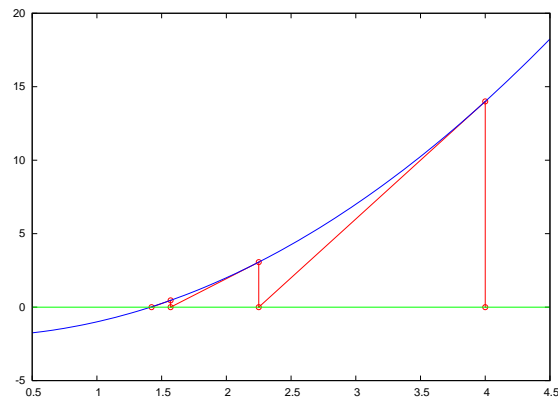
Perform each task and include both the answers and your code in a writeup.

1. Consider

$$S_N = \sum_{k=0}^N \frac{(-1)^k}{2k+1}$$

Compute S_1, S_2, \dots, S_{17} and plot these points on the real line.

2. Note that $\lim_{n \rightarrow \infty} S_N = \pi/4$. Write code that determines how large N must be so that $|S_N - \pi/4| < \epsilon$ for $\epsilon > 0$. How large must N be when $\epsilon = 10^{-6}$?
3. Repeat the previous task with $\sigma_N = \frac{1}{2}(S_N + S_{N+1})$ in place of S_N .
4. Generate the following image:



Start at $(x, y) = (4, 0)$. Move vertically until you hit the curve $y = x^2 - 2$ at $(4, 14)$, then follow the line tangent to $y = x^2 - 2$ at $(4, 14)$ until you hit the x -axis. Repeat this process to produce the jagged line.