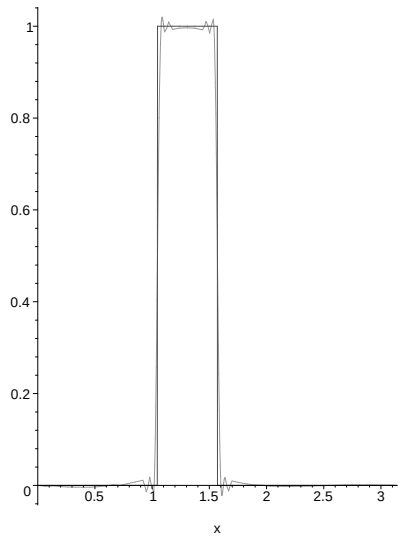
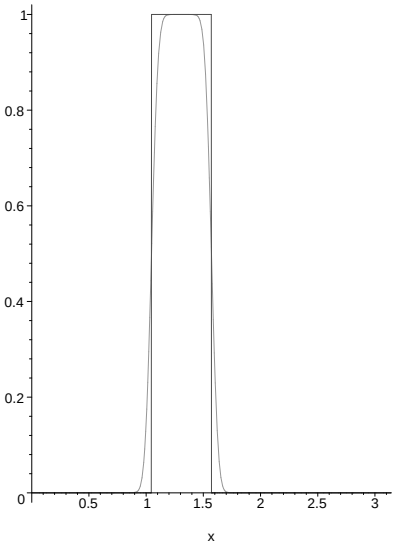
Heat flows ...

Suppose that $f(x)$, an initial temperature distribution, is defined by $f(x) = \begin{cases} 1 & \text{if } \frac{\pi}{3} < x < \frac{\pi}{2} \\ 0 & \text{elsewhere} \end{cases}$.

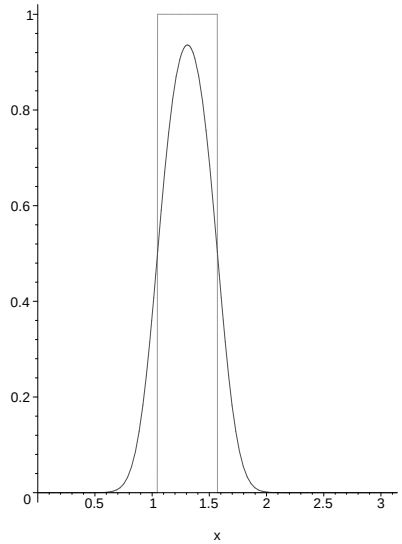
Then $f(x)$ has a Fourier sine series, obtained by taking an *odd extension* of $f(x)$ to $[-\pi, \pi]$. I computed the first 100 terms of this sine series, and then I used this partial sum to create a solution to the heat equation with ends kept at temperature 0. Here are some pictures:



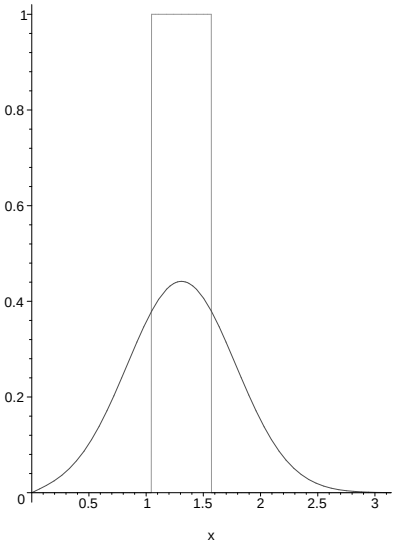
t=.0001



t=.001

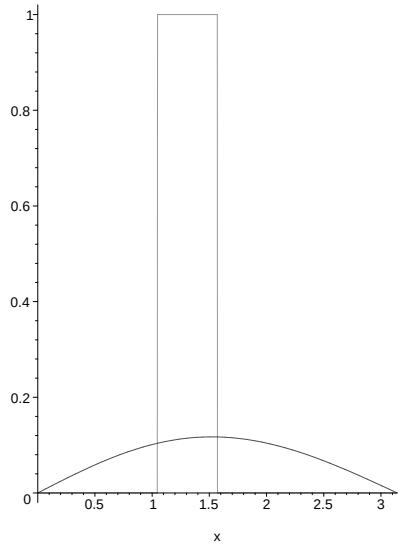


t=.01

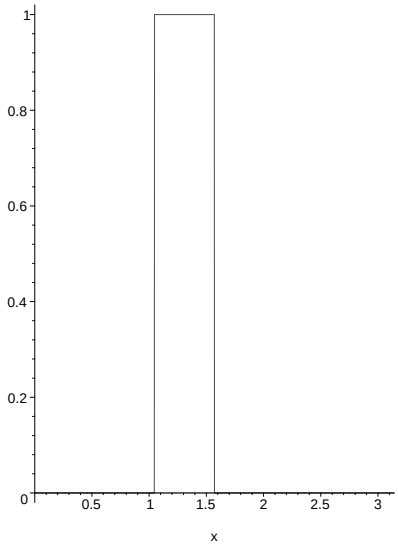


t=.1

OVER



t=1



t=10