An approximation of a Dirac delta-function is:

\[ \delta_n(x) = \frac{\sin(nx)}{(\pi x)} = \frac{1}{2\pi} \int_{-n}^{+n} e^{ixt} \, dt \]  \hspace{1cm} (1)

(This is a good representation so long as there is no relevant physics or information on scales smaller than 1/n.)

Figure 1: This is a plot with \( n=250 \).

\[...\]

assignment 9 exercise 2