1. Find the Fourier transform of $\exp(-ax^2)$, where $a > 0$.
2. Find the Fourier transform of the function
$$f(x) = \begin{cases} 0; x < -nL \\ \sin\dfrac{2\pi x}{L}; -nL < x < nL \\ 0; x > nL \end{cases}$$
3. Find the Fourier transform of the one-sided exponential function
$$f(t) = \begin{cases} 0, t < 0 \\ e^{-\alpha t}, t > 0 \end{cases}$$
    where α is a positive constant.
4. Find the Fourier transform of the two-sided exponential function
$$f(t) = \begin{cases} e^{\alpha t}, t < 0 \\ e^{-\alpha t}, t > 0 \end{cases}$$
    where α is a positive constant.
5. Find the Fourier transform of $\exp(-ax^2)$, where a is a positive constant.
6. Find the Fourier transform of $\exp(-a|x|)$.