1. Let’s redo problem 2 from homework 2, but now write the transmission of the mask below in terms of two $\text{rect}(t)$ and two $\delta$ functions.

![Mask Image]

2. Write an expression for the 2D Fourier transform of the transmission mask in the preceding problem and provide a 2D plot of the magnitude of the result with the ranges $\xi \rightarrow [-0.75, 0.75]$ and $\eta \rightarrow [-0.75, 0.75]$. Also show cross-sectional plots along the $\xi$ and $\eta$ axes.

3. Let’s redo problem 2 from homework 4, but now prove that $\text{rect}_1(x) \ast \text{rect}_2(x) = \text{tri}(x)$ using the properties of Fourier transforms and the table of common transforms in the notes.

4. A linear shift-invariant system has an impulse response $h(x) = 7\text{sinc}(7x)$. Find the output $g(x)$ for the input $f(x) = \cos(4\pi x)$. Use the Fourier domain approach to find the answer.

5. Find the 0th order Hankel transform of $f(r) = \text{cyl}(2r) \ast \ast \ast \text{cyl}(2r)$. 