Question

The two filters h1 and h2 should be convolved so as to produce the filter h3.

h1 is defined as:

$$\begin{matrix} 1 & 2 & 1 \\ 2 & 4 & 2 \\ 1 & 2 & 1 \end{matrix}$$

h2 has the Fourier transform (sampling distance=1):

$$4 + 2\cos(u) + 2\cos(v)$$

(where u and v are the spatial frequencies in the horizontal and vertical directions)

Determine the coefficients of filter h3 and present it as an an operator similar to h1