1.a

1.b

[]

2.

From the equation of convolution, the output signal *y*[n] will be

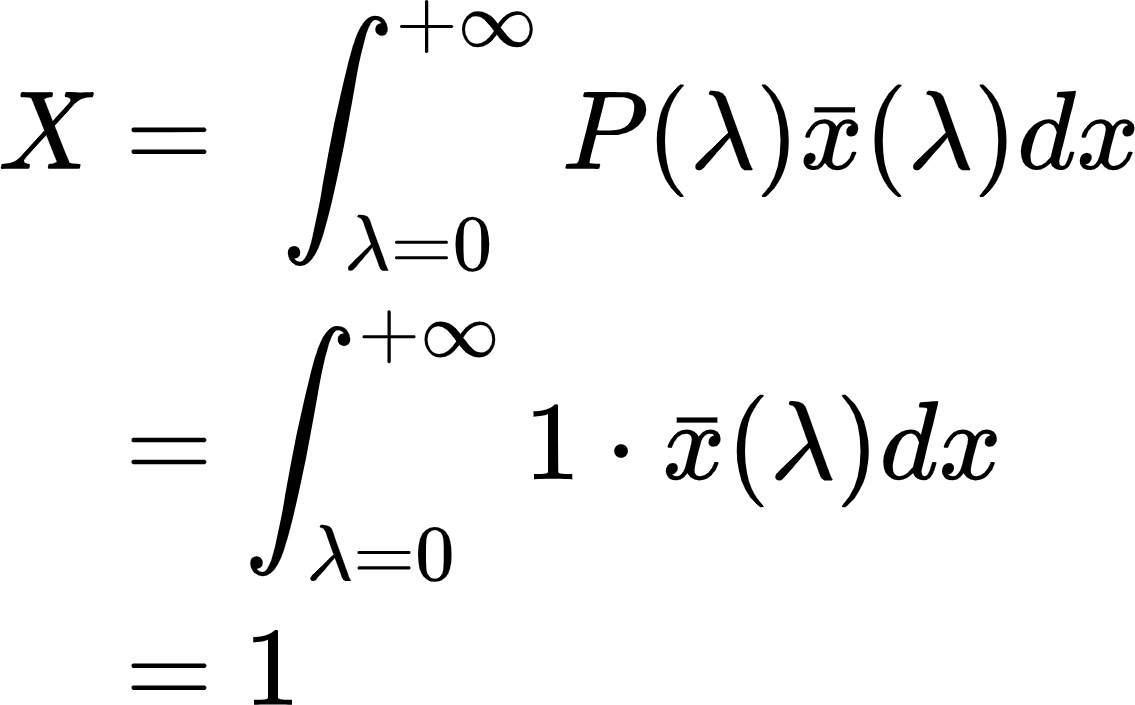
Let's compute the values of , , , ….

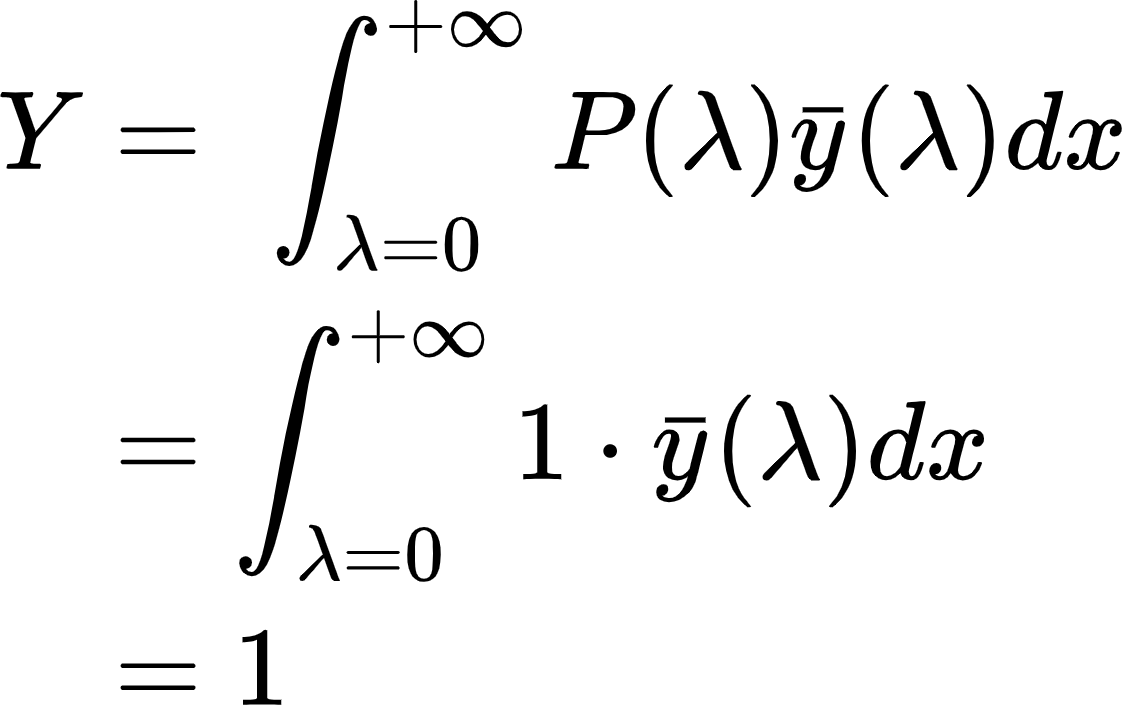
3.a

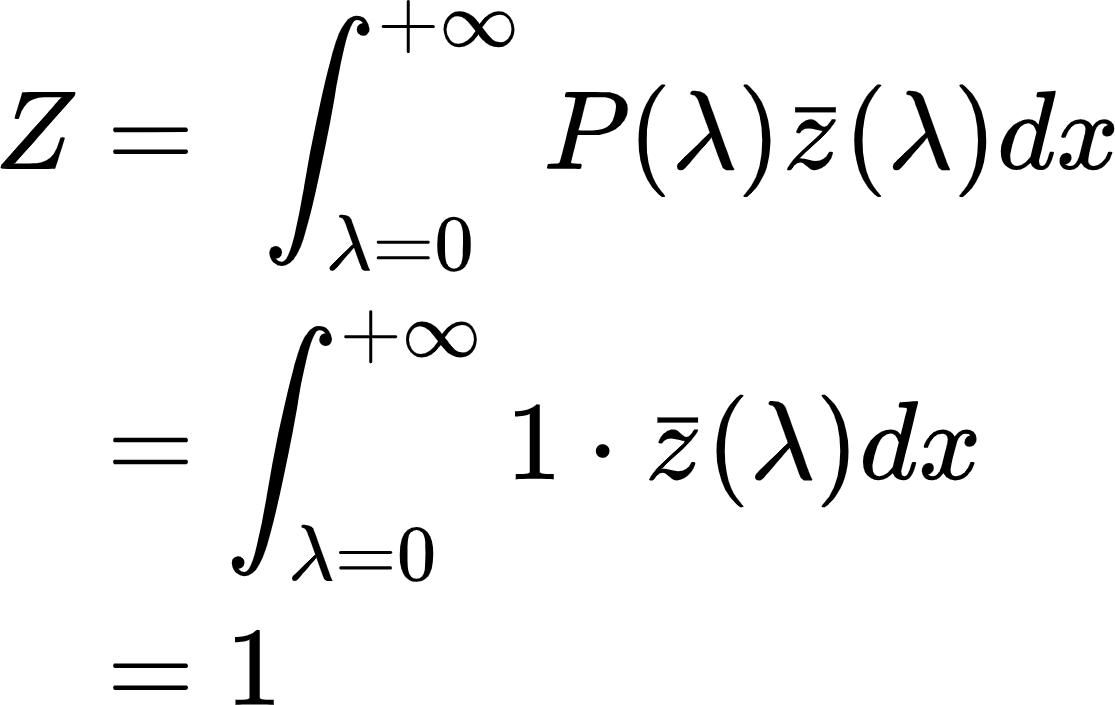
The correct answer is **option (B)**, since in this plot of spectral output *(y-axis)* against wavelength *(x-axis)*, the value of spectral output is non-zero for a single wavelength – corresponding to the wavelength of the monochromatic light – and zero for all other wavelengths.

3.b

Given

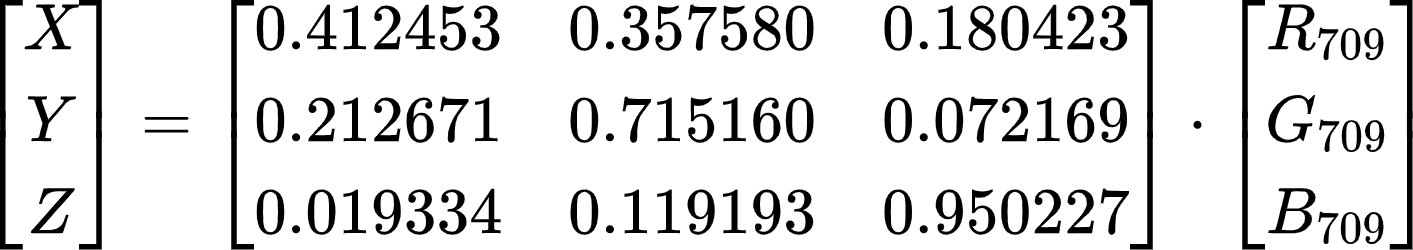


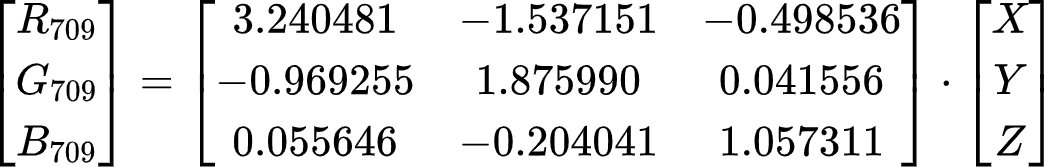


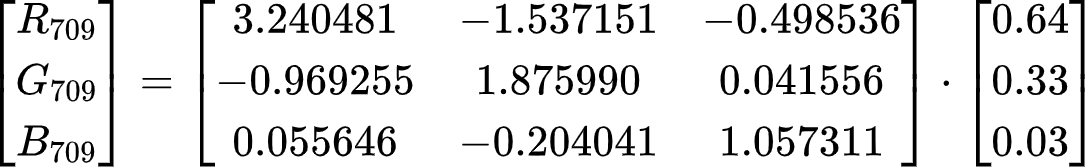


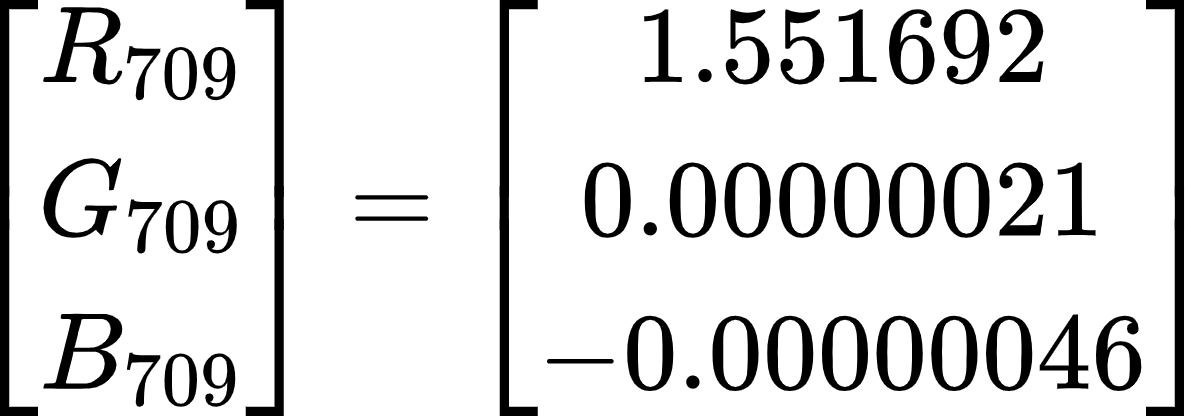
Now calculating from

3.c





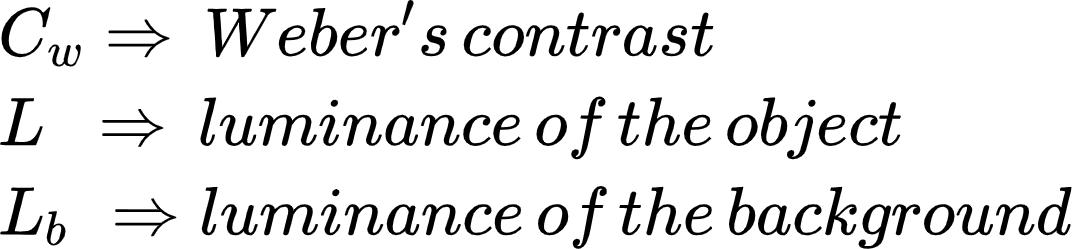




4.

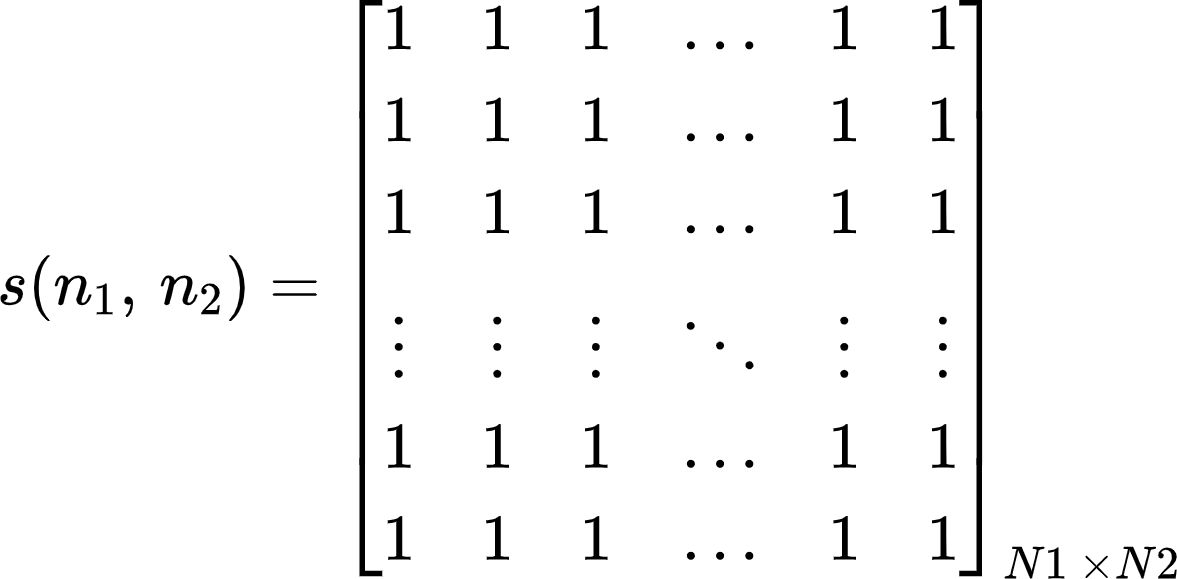
Color contrast in terms of luminance is the relationship between the luminance of a brighter area of interest and that of an adjacent darker area. *Luminance* is the intensity of light emitted from a unit area surface in a given direction. Mathematically, it can be formulated as:

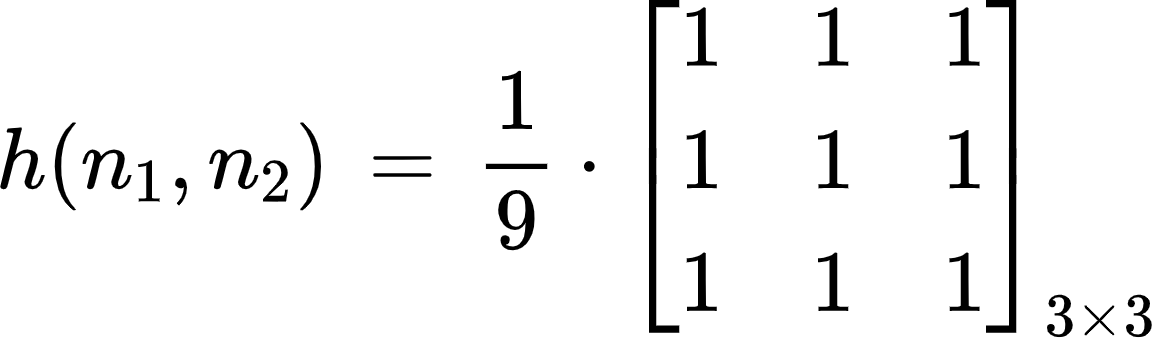
where,



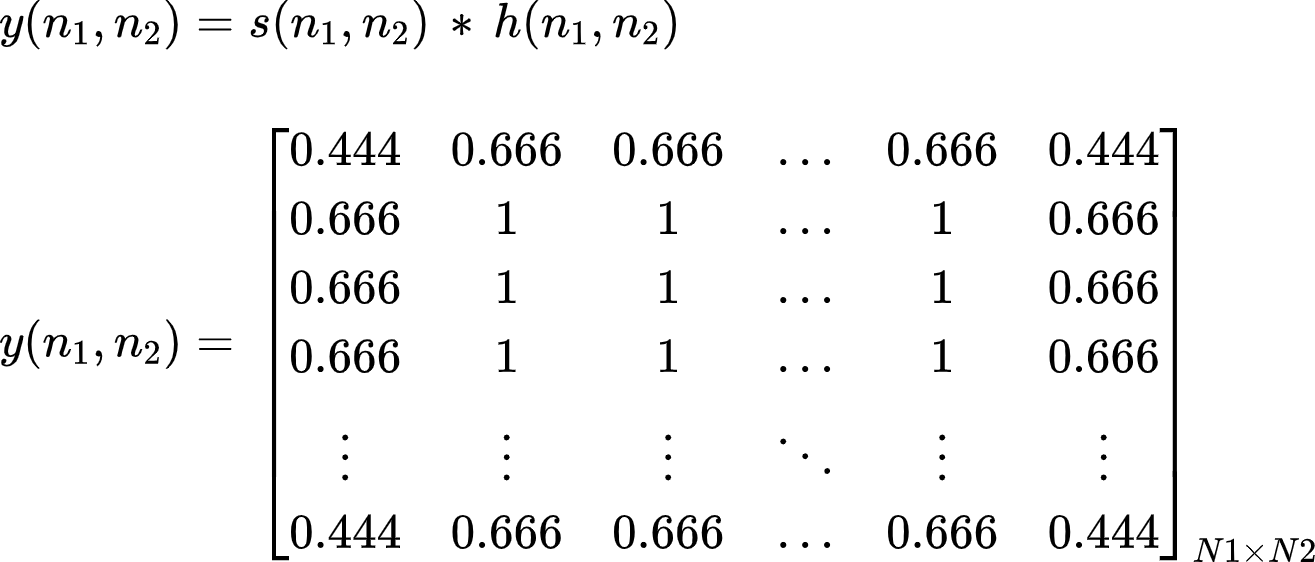
This definition is also called **Weber Contrast**, and is the most commonly useful one in the context of lighting.

5.

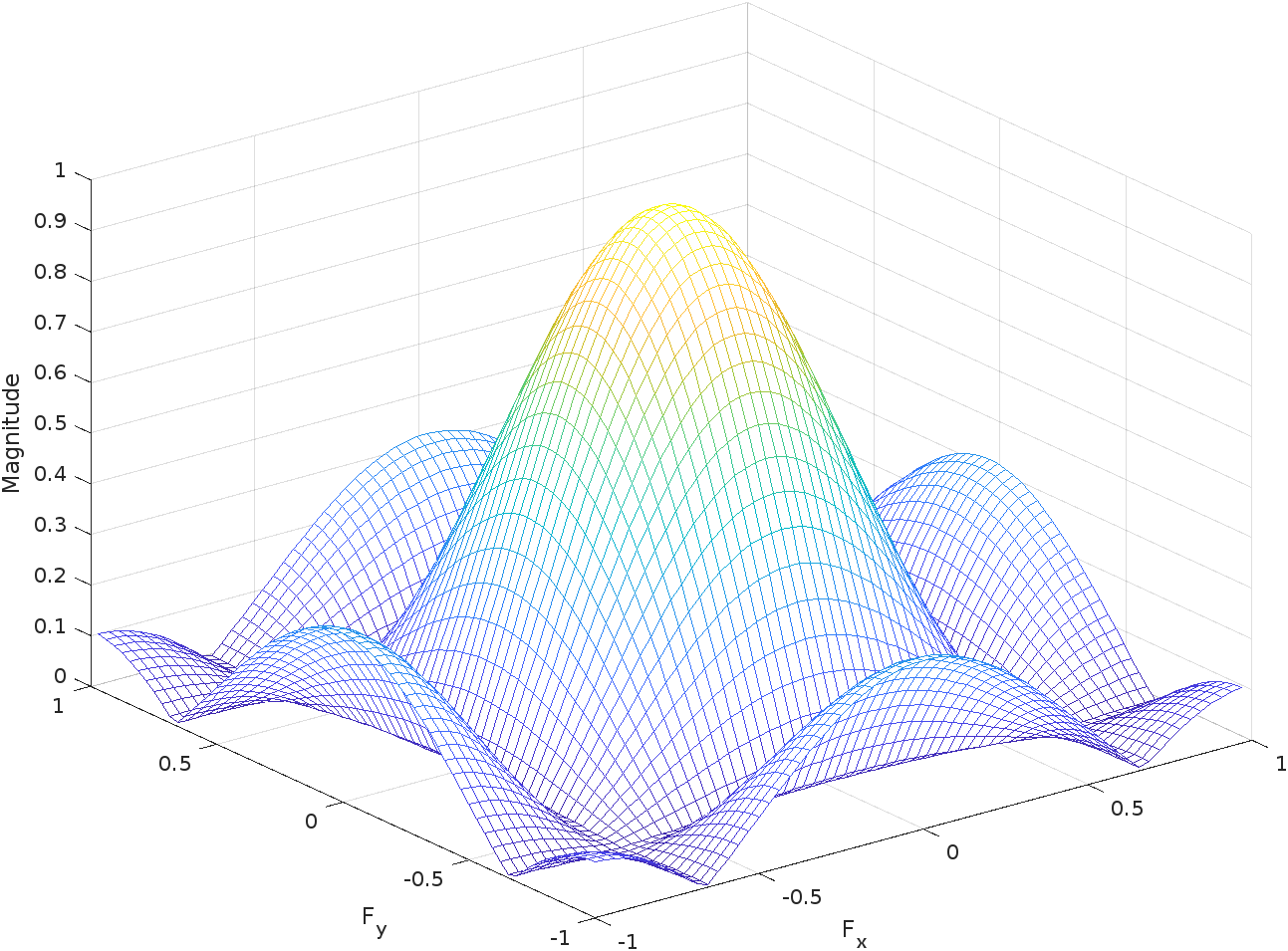




Convolving the filter / kernel over input gives us the following output:



Plotting the frequency response of filter using *freqz2*

**