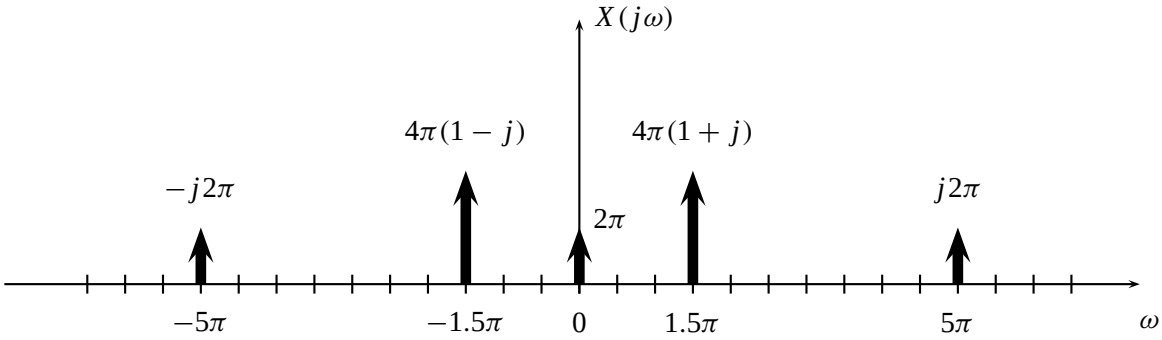
PROBLEM:

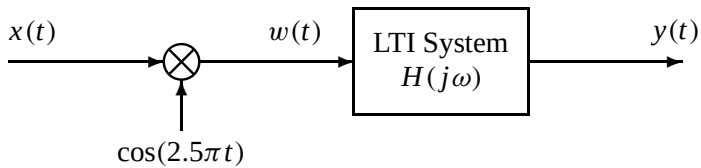
The Fourier transform of a signal $x(t)$ is shown in the following figure.



(a) Write an equation for $x(t)$ in terms of cosine functions.

(b) Suppose that $x(t)$ is modulated by a cosine of frequency $\omega_c = 2.5\pi$, and then lowpass filtered with a filter that has a frequency response

$$H(j\omega) = \begin{cases} 1 & |\omega| \leq 2\pi \\ 0 & \text{otherwise} \end{cases}$$



Make a plot of the Fourier transform of $y(t)$.

McClellan, Schafer and Yoder, *Signal Processing First*, ISBN 0-13-065562-7.
Prentice Hall, Upper Saddle River, NJ 07458.