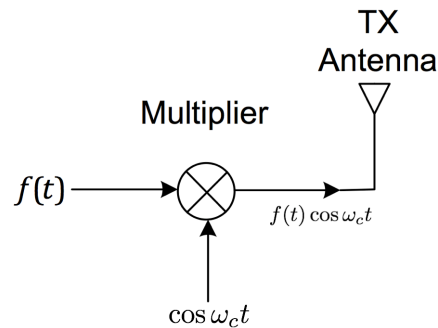


1. The following figure shows an AM modulator, where $f(t)$ is a message signal, ω_c denotes a carrier frequency, and TX Antenna represents a transmitting antenna.



Assume that $f(t)$ has a form of Figure 1 and carrier wave is shown as in Figure 2. Draw the resulting AM modulated signal, $f(t) \cos \omega_c t$.

Hint: It is enough to roughly draw the plot.

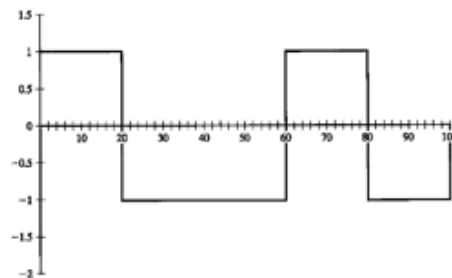


Figure 1: Sinusoidal message signal.

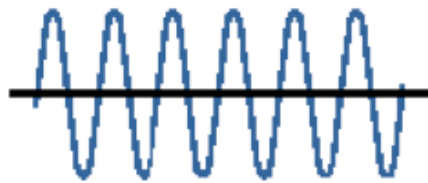


Figure 2: AM carrier signal.

2. Assume that $f(t)$ is bandlimited (i.e., the range of its frequency components is in $[-B, B]$), and its frequency components are shown in Figure 3: Roughly draw the resulting frequency

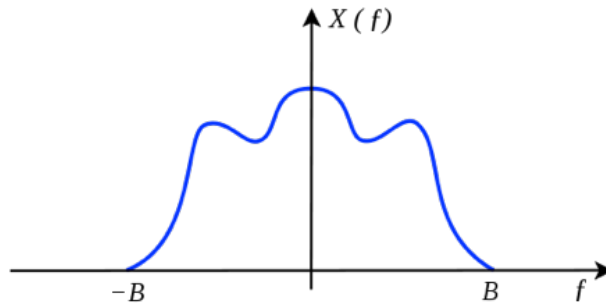


Figure 3: Bandlimited signal.

components of AM modulated signal, $f(t) \cos \omega_c t$. You may assume that $\omega_c \gg B$ and try to use the modulation property of the Fourier transform.

Hint: It is enough to roughly draw plots.

3. Review and study the Fourier transform and its Modulation property.