1. Let \( s(t) \) be an DSB-LC (AM) signal. The unmodulated transmitted power is 3 KW. The message signal is \( m(t) = \cos(2\pi f_m t) \). The modulated transmitted power is 4 KW.
   a. Find the corresponding \( A_c \) and \( k_a \) in equation 3.2.
   b. What is the modulation factor?
   c. What is the power efficiency?

2. Given a baseband bandwidth of 90kHz for signals \( x_1(t), x_2(t), x_3(t), \ldots x_N(t) \). These signals are modulated using DSB-SC modulation. The modulated DSB-SC signals are frequency division multiplexed using a shared assigned RF spectrum of 20MHz.
   a. Assuming no guard band find N.
   b. Assuming a 20 KHz guard band find N.