Problems #1, 2 and 3
The following problems come from Haykin’s Book.
Problems 2.22, 2.28 and 2.31

Problem #4
Write the equation for an SSB-FM signal, which only contains frequencies below the carrier frequency, $f_0$. Assume that the baseband phase modulating signal is $\phi(t)$, as in class.
Problem #5
Suppose we have an FM signal where the modulating signal, s(t), is made up of two frequencies

\[ s(t) = A_1 \cos 2\pi W_1 t + A_2 \cos 2\pi W_2 t \]

a. Write down the equation for the FM signal in terms of \( \beta_1 = \Delta f_1/W_1 \) and \( \beta_2 = \Delta f_2/W_2 \) where \( \Delta f_1 = hA_1 \) and \( \Delta f_2 = hA_2 \).

b. Now represent the FM signals, as a double series, using the Bessel Functions \( J\nu(\beta_1) \) and \( J\nu(\beta_2) \).

c. What is the maximum frequency deviation in terms of \( \beta_1, \beta_2, W_1, W_2, \Delta f_2 \) and/or \( \Delta f_1 \)?

d. What would be Carson’s bandwidth in terms of \( \beta_1, \beta_2, W_1, W_2, \Delta f_2 \) and/or \( \Delta f_1 \)?

THIS STARTS TO BE INTERESTING!!