Homework #6: Chapter 3 (due Oct. 9, 2015)

Preliminary

- Textbook reading Ch. 3.0 - 3.5 (pp. 177 - 211)
- As a reminder, the required format for homework can be found at
  http://www.ece.nmsu.edu/~pdeleon/Teaching/EE312/Homework/HomeworkFormat.pdf
- Please direct all email to pdeleon@nmsu.edu (do not send email via Canvas). All requests for bonus points will receive a confirmation email within 48 hours.
- In order to receive full credit for homework problems, you must provide a detailed solution. Simply writing a few, summarized steps toward the answer will result in minimal credit.
- All problems are worth +10 points unless otherwise noted.

Textbook Problems

3.3

3.4

3.13

3.20

3.22 (a) only for Figures P3.22(a), P3.22(e)

Software Problems

Use MATLAB to solve the following problem. Attach the plot printout(s) to your solution(s).

1. Frequency responses are normally complex-valued, however, the frequency response in Problem 3.13 is real-valued. Use the following MATLAB code to plot the real-valued frequency response and use a $\times$ to denote the frequency response at the harmonic frequencies.

   Does the frequency response at the harmonic frequencies agree with your result in 3.13?

   ```
   omega = [-10:0.1:10]; % range of freqs
   H = sin(4*omega)./omega; % freq resp
   plot(omega,H);ylabel('H(j\omega)');xlabel('\omega (rads/s)');

   k = [-12:12];
   omega_0 = 2*pi/8; % fundamental
   k_omega_0 = k*omega_0; % harmonics
   H_k_omega_0 = sin(4*k_omega_0)./k_omega_0; % freq resp @ harmonics
   hold on;plot(k_omega_0,H_k_omega_0,'rX');hold off;grid
   ```

2. Use your plot to determine the frequency response, $H(j\omega)$ for the following frequencies: $\omega = 0, 1.9, 3.5, 4.3$ rads/s