EECS 361
Homework #6

1. Section 3.7 Participation Activities
- 3.7.1: Frequency response function and output from sinusoidal input.
- 3.7.2: Time-domain response and frequency response pairs
- 3.7.3: Is this system sinusoidal response LTI (Linear Time Invariant)?

2. Challenge activity
- 3.7.1: LTI sinusoidal response.

3. Given $H(\omega) = \frac{10}{1+j\omega/8}$ and input x(t) find the system output for the following cases.

a. x(t) = 1

b. $x(t) = \frac{1}{2\sqrt{2}}\cos(4t)$

c. $x(t) = \frac{1}{2\sqrt{2}}\cos(2t)$

d. $x(t) = \frac{1}{2\sqrt{2}}\cos(8t)$

4. Exercise 3.7.2

5. x(t) = 2+4cos(3t)+8cos(6t) is the input to a LTI system with h(t) =u(t)$3e^{-6t}$ find the output signal y(t).

6. A system has an impulse response of h(t)=10u(t)e^{-t}-32u(t)e^{-2t}+26u(t)e^{-3t}. Find the system output for an input of cos(2t).

7. Exercise 3.7.8

8. For h(t) = u(t)$e^{-\alpha t}$

a. Find H(ω).

b. Put H(ω) in the form of H(ω)=R(ω)+jI(ω) where R(ω) and I(ω) are real functions.

c. Put H(ω) in the form of H(ω)=A(ω)$e^{j\theta(\omega)}$ where A(ω) and θ(ω) are real functions.

d. For α=0.25 plot |H(ω)|, $|H(\omega)|^2$, 20Log(|H(ω)|) and θ(ω).