

ECE 360
HOMEWORK #8
Due November 13, 2002

- Read 9.3 and 9.4 from Ambardar.
 - Office Hours: M,T 10:00-11:30 am, F 12:00-1:30 pm.
1. A linear time-invariant continuous-time system has the frequency response $H(\omega)$. It is known that the input $x(t) = 1 + 4\cos(2\pi t) + 8\sin(3\pi t - 90^\circ)$ produces the steady-state response $y(t) = 2 - 2\sin(2\pi t)$.
 - a) For what values of ω is it possible to determine $H(\omega)$?
 - b) Compute $H(\omega)$ for each of the values of ω determined in part (a).
 2. 9.44 a. (Find $y(t)$ and $Y(f)$.)
 3. 9.50 a, b, c, f. Draw the magnitude and phase response for $H(f)$.
 4. 9.55
 5. An ideal linear-phase bandpass filter has frequency response

$$H(f) = \begin{cases} 10e^{-j4\pi f}, & -4 < f < 2, \quad 2 < f < 4 \\ 0, & \text{all other } f \end{cases}$$

Compute the output response $y(t)$ of the filter when the input is $x(t) = \sin c(6t)$.