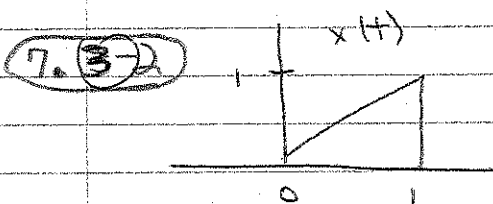
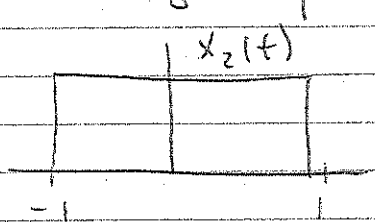


# HW 7 Solns

## ECE 366



$$X(\omega) = \frac{1}{\omega^2} (e^{j\omega} - j\omega e^{j\omega} - 1)$$



$$x_2(t) = x\left(\frac{t+1}{2}\right) + x\left(\frac{1-t}{2}\right)$$

$$x\left(t + \frac{1}{2}\right) \leftrightarrow X(\omega) e^{j\frac{\omega}{2}}$$

$$x\left(\frac{t+1}{2}\right) = x\left(\frac{t}{2} + \frac{1}{2}\right) \leftrightarrow 2X(2\omega) e^{j\omega}$$

$$x\left(\frac{1-t}{2}\right) \leftrightarrow 2X(-2\omega) e^{-j\omega}$$

$$x_2(t) \leftrightarrow 2[X(2\omega) e^{j\omega} + X(-2\omega) e^{-j\omega}]$$

$$x_3(t) = x\left(\frac{t+2}{4}\right) + x\left(\frac{2-t}{4}\right) + x\left(\frac{t}{2}\right) + x\left(\frac{-t}{2}\right)$$

$$x\left(\frac{t+2}{4}\right) \leftrightarrow 4X(4\omega) e^{j2\omega}$$

$$x\left(\frac{t}{2}\right) \leftrightarrow 2X(2\omega)$$

$$x\left(\frac{2-t}{4}\right) \leftrightarrow 4X(-4\omega) e^{-j2\omega}$$

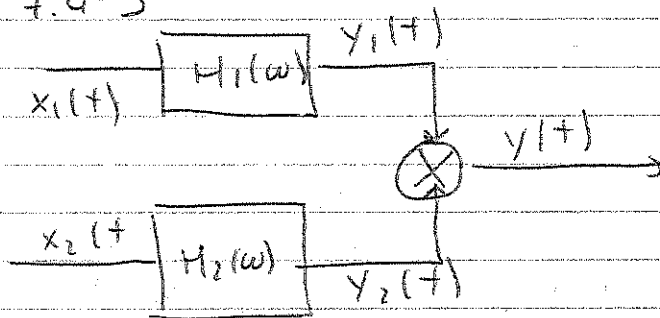
$$x\left(\frac{-t}{2}\right) \leftrightarrow 2X(-2\omega)$$

$$x_3(t) \leftrightarrow 4[X(4\omega) e^{j2\omega} + X(-4\omega) e^{-j2\omega}] + 2X(2\omega) + 2X(-2\omega)$$

$$x_5(t) = x(t+0.5) + x(0.5-t) + x(t+1.5) + x(1.5-t)$$

$$x_5(t) \leftrightarrow X(\omega) e^{j\omega/2} + X(-\omega) e^{-j\omega/2} + X(\omega) e^{j1.5\omega} + X(-\omega) e^{-j1.5\omega}$$

7.4-3



a)  $x_1(t) = 10^4 \text{rect}(10^4 t) \leftrightarrow X_1(\omega) = \text{sinc}\left(\frac{\omega}{2 \times 10^4}\right)$

