Figure 1: Continuous-time signals

EECS20n, Quiz 5, 4/25/03

Please print your name and lab time here:

Last Name _____ First _____ Lab time _____

1. Three pairs of continuous-time signals x and h are specified in figure 1. For each pair plot the signal $y = h * x$. On the plot, denote important values of $t, y(t)$.

2. Recall the DTFT pair:

$$\forall \omega \in Reals, \ X(\omega) = \sum_{m=-\infty}^{\infty} x(m)e^{-i\omega m}, \quad \forall n \in Integers, \ x(n) = \frac{1}{2\pi}\int_0^{2\pi} X(\omega)e^{i\omega n}d\omega.$$

Fill in the blanks in the following DTFT transform pairs:

   (a) $\forall n, \quad x(n) = \delta(n)$ (Kronecker delta) $\quad \forall \omega, \quad X(\omega) =$

   (b) $\forall \omega, \quad X(\omega) = e^{-i\omega N} \quad \forall n, \quad x(n) =$

3. Recall the CTFT pair:

$$\forall \omega \in Reals, \ X(\omega) = \int_{-\infty}^{\infty} x(t)e^{-i\omega t}dt, \quad \forall t \in Reals, \ x(t) = \frac{1}{2\pi}\int_{-\infty}^{\infty} X(\omega)e^{i\omega t}d\omega.$$

Fill in the blanks in the following CTFT transform pairs:

   (a) $\forall t, \quad x(t) = e^{i60t} \quad \forall \omega, \quad X(\omega) =$

   (b) $\forall \omega, \quad X(\omega) = \delta(\omega - 30) + \delta(\omega + 30)$ (Dirac delta) $\quad \forall t, \quad x(t) =$