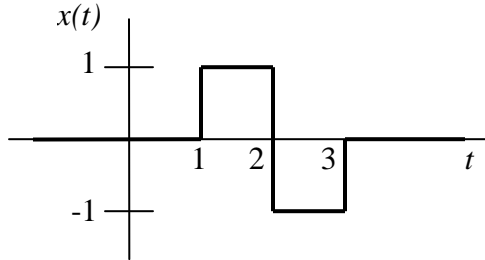
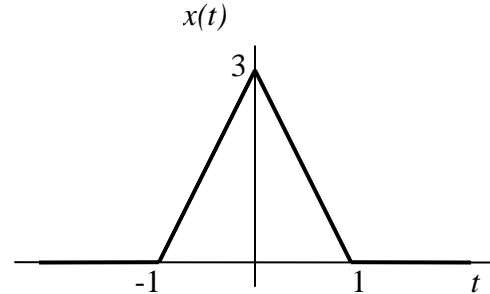


EE 327 Signals and Systems 1  
Homework 1

1. Determine an expression for the following signals. Simplify your answer.



(a)

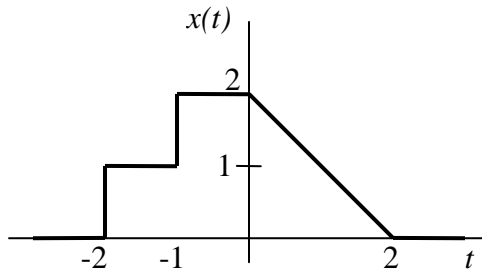


(b)

2. Sketch the following continuous-time signals.

- a.  $x(t) = u(t + 2) + u(t - 3)$
- b.  $x(t) = 5u(-2t + 6)$
- c.  $x(t) = (3t + 1)(u(t - 2) - u(t - 4))$
- d.  $x(t) = e^t (u(t - 1) - u(t - 2))$

3. A continuous-time signal,  $x(t)$ , is shown below. Sketch each of the following signals.



- a.  $y(t) = x(t - 1)$
- b.  $y(t) = x(2 - t)$
- c.  $y(t) = x(2t + 1)$
- d.  $y(t) = x\left(4 - \frac{t}{2}\right)$
- e.  $y(t) = (x(t) + x(-t))u(t)$
- f.  $y(t) = x(t) \left( \delta\left(t + \frac{3}{2}\right) - \delta\left(t - \frac{1}{2}\right) \right)$

4. Determine whether or not the following continuous-time signals are periodic. If the signal is periodic, determine what the fundamental frequency is.

a.  $x(t) = 5 \sin\left(4t - \frac{\pi}{6}\right)$

b.  $x(t) = e^{\cos(t)}$

c.  $x(t) = te^{\cos(t)}$

5. For the following waveform, determine the amplitude, period, frequency, time shift, and phase delay. Write an expression for the waveform.

