

1. Determine whether the following signals are periodic or not. If periodic, specify the fundamental period and frequency in Hz.
 - (a) $x(t) = \cos^4(4\pi t)$
 - (b) $x(t) = \cos^2(3\pi t) + \sin(3t)$
 - (c) $x(t) = \exp(\sin t) = e^{\sin t}$
 - (d) $x(t) = \cos(4t) + 3\exp(-i12t)$, where $i = j = \sqrt{-1}$
 - (e) Signal in Figure P1.1-4 on page 140.

2. Determine whether the following signals are even or odd. If neither, find and sketch the even and odd parts of the signals.
 - (a) $x(t) = \exp(-2t)u(t)$, where u is the step function defined on page 87.
 - (b) Signal in Figure P1.5-7 on page 145.
 - (c) $x(t) = \sin(\pi t)u(t)$
 - (d) $x(t) = \sin(t) + \cos(t)$

3. Sketch or graph the following signals.
 - (a) $x(t) = r(t+2) - r(t+1) - r(t-1) + r(t-2)$, where r is the ramp function $r(t) = tu(t)$.
 - (b) $x(t) = 5u(t+2) - 2u(t) + 3u(t-2) - 6u(t-5)$
 - (c) Graph the function $x(t) = u(t+1) - r(t) + (r(t-2))^2$ over the time interval $-2 \leq t \leq 3$ using MATLAB. Please turn in your m-file along with your plot.
 - (d) Graph the function $x(t) = \cos(u(t+1) - r(t) + (r(t-2))^2)$ over the time interval $-2 \leq t \leq 3$ using MATLAB. Please turn in your m-file along with your plot.

4. Express the following signals using the unit step and ramp functions. Simplify your answers as much as possible.
 - (a) The signal $x_3(t)$ in Figure P1.2-3 on page 142.
 - (b) The signal $x_5(t)$ in Figure P1.2-3 on page 142.
 - (c) The signal in Figure P1.2-2 on page 141.
 - (d) The signal in Figure P1.5-8 on page 145.