EE1101 Signals and Systems JAN—MAY 2019
Tutorial 1

1. Check if the following signals are linear, time invariant, memoryless, causal and stable.
   (a) $y(t) = x(t-2) + x(2-t)$
   (b) $y(t) = x(t)cos(3t)$
   (c) $y[n] = nx[n]$
   (d) $y[n] = x[-n]$
   (e) $y[n] = Evenx[n-1]$

2. Determine whether the following systems are invertible. If yes, find the inverse system.
   (a) $y(t) = cos\big(x(t)\big)$
   (b) $y[n] = nx[n]$
   (c) $y[n] = x[2-n]$
   (d) $y[n] = x[2n]$
   (e) $y(t) = x(2t)$

3. For a time invariant system, show that if the input $x(t)$ is periodic, then the output $y(t)$ is also periodic.

4. For the feedback system shown below, sketch the output $y[n]$ for $x[n] = \delta[n]$ and $x[n] = u[n]$