Quiz 5 — October 11, 2006

1. Consider the CT LTI system given by the differential equation

$$y(t) + 2\frac{dy(t)}{dt} = -x(t)$$

(a) Determine the frequency response.
(b) Sketch the magnitude of the frequency response. Give the exact values for $\omega = 0$ and $\omega = \sqrt{2}$.

2. Consider the DT LTI system given by

$$y[n] = \frac{1}{2}y[n-1] + x[n] + x[n-2].$$

(a) Determine the frequency response.
(b) Find the magnitude response for $\omega = 0$ and $\omega = \pi$.
(c) For which frequency ω is the frequency response zero?