EE424 Homework 6

1) Determine the Fourier transform for each of the sequences below:

   (1) $x[n] = \delta[n-2]$

   (2) $x[n] = 2\delta[n+1] + 2\delta[n-1]$

   (3) $x[n] = (0.5)^{(n-1)} u[n-1]$

   (4) $x[n] = \cos\left(\dfrac{n\pi}{4}\right)$

2) Given that $x[n]$ has Fourier transform $X(e^{j\omega})$, express the Fourier transforms of the following signals in terms of $X(e^{j\omega})$.

   (1) $g[n] = x[-n]$

   (2) $g[n] = x[1-n] + x[-1-n]$

   (3) $g[n] = x[n] - x[n-1]$

3) The Fourier transform of discrete-time signal $x[n]$ is given by

$$X(e^{j\omega}) = \frac{e^{-j\omega} - \frac{1}{5}}{1 - \frac{1}{5}e^{-j\omega}},$$

Determine the signal $x[n]$.