For all homework throughout the semester you must do the following:

1. Explain in your own words what is being asked.
2. State your strategy for arriving at the solution.
3. Execute your strategy noting the steps.
4. ✎ Write legibly and in a logical order.

For each problem, we provide the approximate percentage of points.

Problem 1 [40 %]

Consider the input $x[n]$

$$x[n] = \frac{1}{2^{(n-2)}}u[n-2],$$

and a unit impulse response $h[n]$ given by

$$h[n] = u[n+2].$$

Compute and plot the output $y[n] = h * x[n]$.

Problem 2 [40 %]

The output $y[n]$ to a linear system with input $x[n]$ is defined by

$$y[n] = \sum_{k=-\infty}^{\infty} x[k]g[n-2k],$$

where

$$g[n] = u[n] - u[n-4].$$

1. Determine $y[n]$ when $x[n] = \delta[n-1]$.
2. Determine $y[n]$ when $x[n] = \delta[n-2]$.
3. Is the system time-invariant?
4. Determine $y[n]$ when $x[n] = u[n]$.

Problems from the textbook [6 x 33.3 % = 20%]

Solve the following problems from the textbook:

- 2.1
- 2.3
- 2.10
- 2.22
- 2.23
- 2.27