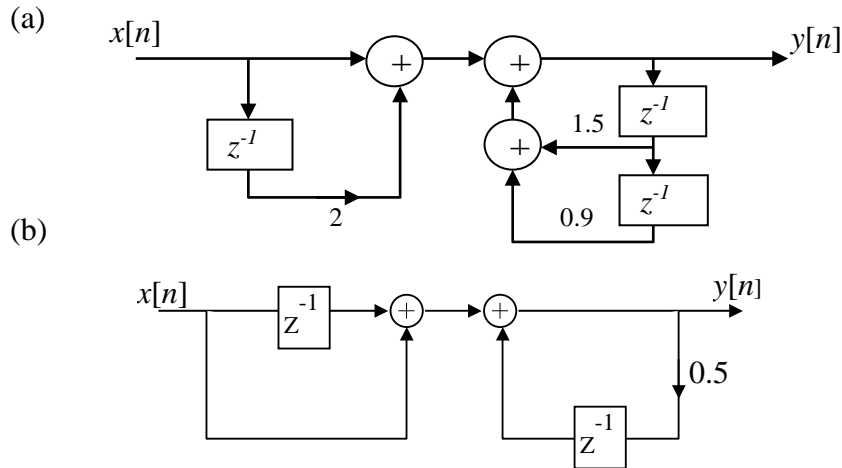


**** Reading Assignment: Chap. 2 in A.V. Oppenheim and R.W. Schafer, 1999.**

1. Please determine the difference equation of the following systems,



2. A causal linear time-invariant system is described by the difference equation,

$$y[n] - 5y[n-1] + 6y[n-2] = 2x[n-1].$$

- Determine the general form of homogeneous response of the system,
- Determine the impulse response of the response,
- Determine the step response of the system, i.e., when $x[n] = u[n]$.

3. A causal linear time-invariant system is described by the input-output relation,

$$y[n] = x[n] + 2x[n-1] + x[n-2],$$

- Determine the impulse response of the system,
- Is this system stable?

4. A causal linear time-invariant system is described by the difference equation,

$$y[n] - (1/4)y[n-1] - (1/8)y[n-2] = 3x[n].$$

- Determine the general form of homogeneous response of the system,
- Determine the impulse response of the response,
- Show that this system is stable,
- Find a particular solution when $x[n] = (1/2)^n u[n]$.

5. Consider the difference equation representing a causal LTI system

$$y[n] + (1/a)y[n-1] = x[n-1]$$

- Find the input response of the system, $h[n]$, as the function of the constant a .
- For what range of values of a will the system be stable?