# 3.1

In Figure 3-1, is the system function of a causal LTI system.

1. Using z-transforms of the signals shown in the figure, obtain an expression for in the form

where both and are expressed in terms of .

1. For the special case , determine and .
2. Is the system stable? Are the systemand stable?

+

-+

**+**

**+**

+

+

Figure 3-1

# 3.2

When the input to an LTI system is

the output is

1. Find the system function of the system. Plot the poles and zero of , and indicate the region of convergence.
2. Find the impulse response of the system.
3. Write the difference equation that characterizes the system.
4. Is the system stable? Is it causal?

# 3.3 (Optional)

When the input to a causal LTI system is

the -transform of the output is

1. Find the -transform of .
2. What is the region of convergence of ?
3. Find the impulse response of the system.
4. Is the system stable?