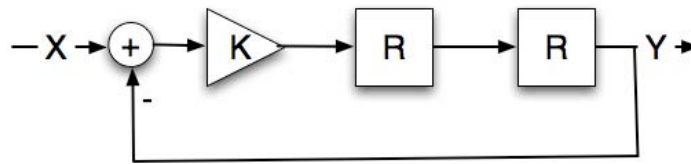


Problem Wk.6.2.2: System representations

Consider the system specified by this block diagram



To specify the answers below, enter one or more numbers in the boxes; do not enter any commas, just numbers separated by spaces.

1. Write the difference equation for the block diagram, assume that $\kappa=5$.

A difference equation is in the form:

$$y[n] = c_0y[n-1] + c_1y[n-2] + \dots + c_{k-1}y[n-k] + d_0x[n] + d_1x[n-1] + \dots + d_jx[n-j]$$

Specify the dCoeffs: $d_0 \dots d_j$ and the cCoeffs: $c_0 \dots c_{k-1}$ for each of the difference equations below. For each question, enter a sequence of numbers representing the coefficients.

If one set of coefficients is empty, enter `none`, otherwise enter a sequence of numbers separated by spaces (no commas, parens, brackets, etc).

Difference equation:

dCoeffs: cCoeffs:

2. Write the system function for the block diagram, assume that $\kappa=5$.

The system function is represented by the coefficients of the numerator and denominator polynomials. The coefficients of the polynomial are written highest order first.

System function:

numerator coeffs:

denominator coeffs:

3. If you know that the poles are at $+0.5j$ and $-0.5j$, what is the value of K (enter a floating point number)?
4. If you know that $K = 1$, what is the response of the system to a unit sample?
y[0] =
y[1] =
y[2] =
y[3] =
y[4] =

MIT OpenCourseWare
<http://ocw.mit.edu>

6.01SC Introduction to Electrical Engineering and Computer Science
Spring 2011

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.