Exercise 18:

Given is a discrete system with the following difference equation:

$$g(k) = \frac{1}{2}s(k) + \frac{1}{2}s(k-1)$$

Determine the impulse response $h(k)$

(a) by inverse z transform of the system function $H_z(z)$
(b) by inserting the unit pulse $\gamma_0(k)$ in the difference equation

(c) Determine the transfer function $H_z(\mathrm{e}^{j\omega T_\mathrm{a}})$, with the sampling period T_a.

Exercise 19:

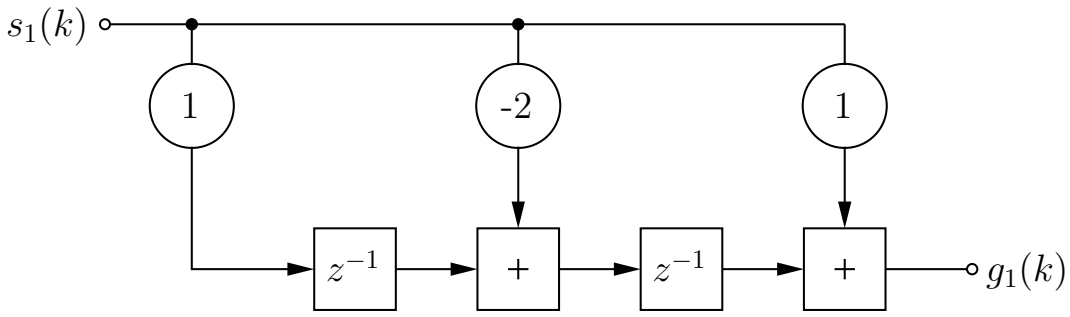
The following difference equation is given:

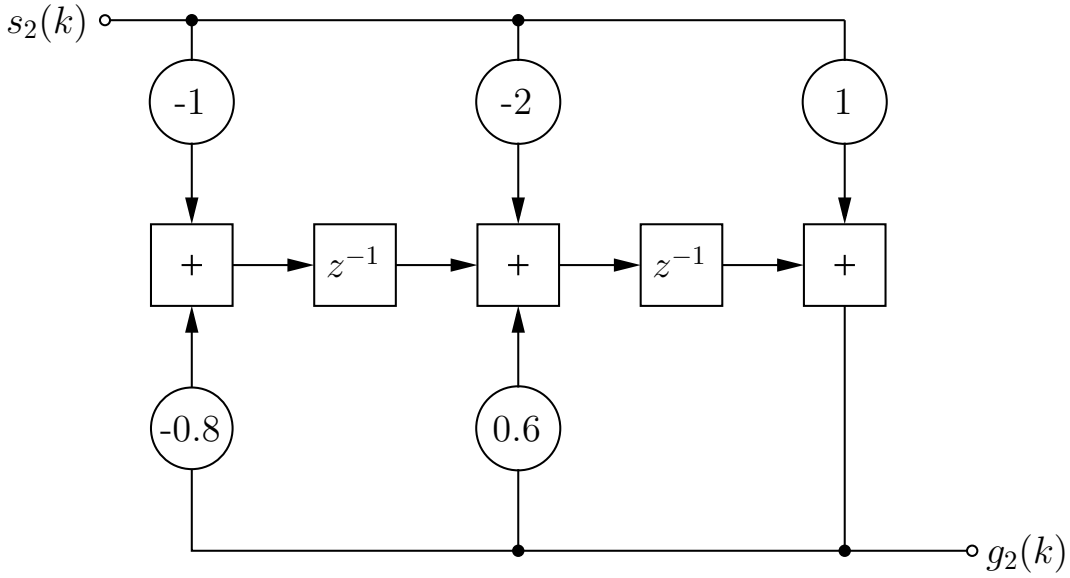
$$5 \cdot s(k-1) + 2 \cdot s(k-2) = 2 \cdot g(k) + 16 \cdot g(k-1) + 50 \cdot g(k-2)$$

(a) Determine the system function $H_z(z)$ of the system
(b) Determine the poles and the zeros of the system function

Exercise 20:

Given are the following systems:





(a) Determine the difference equation and the system function of both systems.
(b) Calculate the first 5 values of the impulse response for both systems.
(c) Determine the resulting system function for
  (c1) serial connection,
  (c2) parallel connection,
  (c3) Deleted
  of both systems.