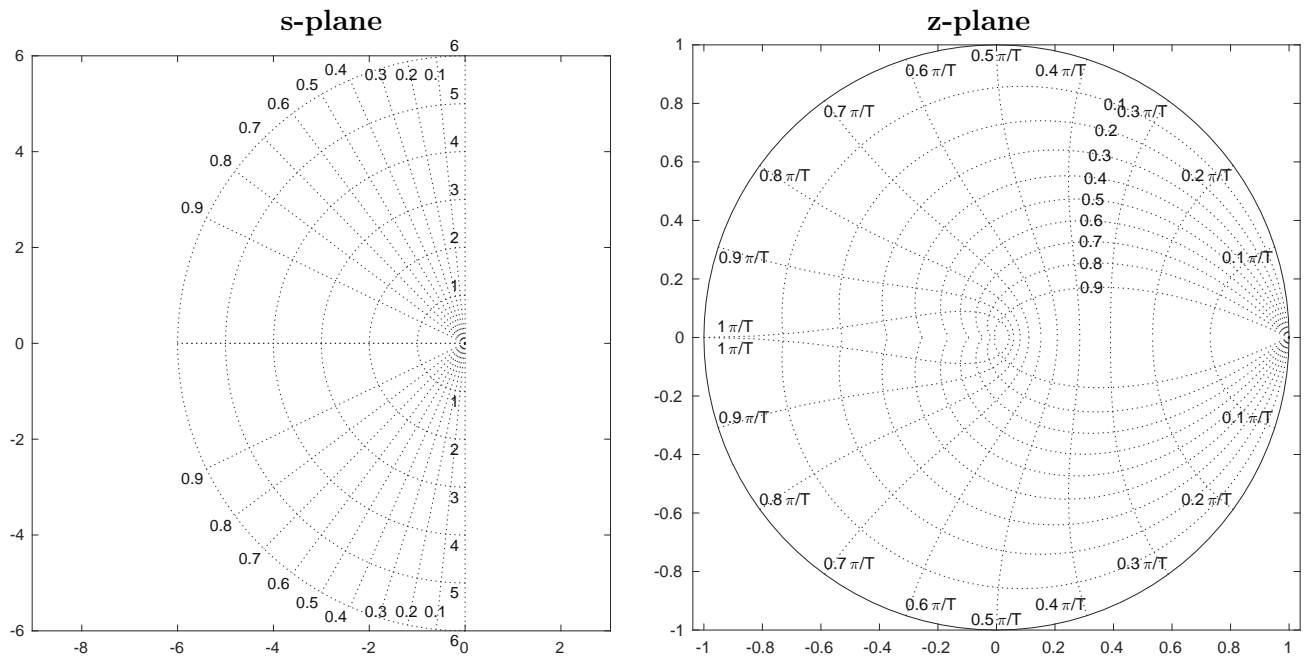# Polynomial design (RST) exercise

Kjartan Halvorsen

Choosing the closed-loop poles

Plot the poles of the following closed-loop discrete-time systems (as crosses in the z-plane). Plot also the corresponding continous-time poles (in the s-plane) using the sampling period $h = 0.2$. Rank the systems from 1 to 5 according to how desirable the performance of each system is.

a $G_c(z) = \frac{0.026z+0.024}{z(z-0.95)}$

b $G_c(z) = \frac{0.13z+0.12}{z^2-z+0.25}$

c $G_c(z) = \frac{0.54z+0.52}{(z-0.5)^2+0.81}$

d $G_c(z) = \frac{0.025z+0.025}{(z-0.8)^2-0.09}$

e $G_c(z) = \frac{0.068z+0.062}{(z-0.8)^2+0.09}$

Pole placement and step response

Pair each of the discrete-time systems in the previous exercise with the correct step response below.