

Solution of ECE 316 Test #6 S04

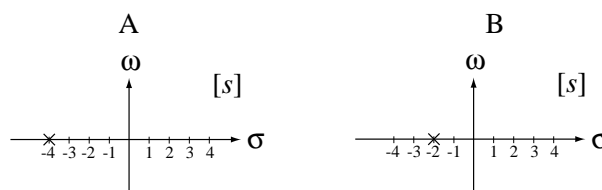
1. A unity-gain feedback system has a forward path transfer function, $H(s) = \frac{s^2 + 3s + 1}{s^3 + 5s^2 + 3s}$. What is the steady state error (difference between excitation and response) if the system is excited by a unit step?

Pole at zero means it is Type 1. Therefore the steady-state error to step excitation is zero.

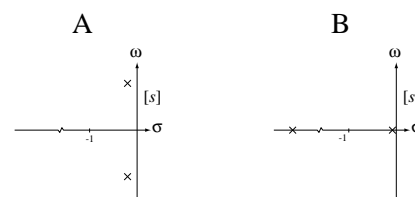
2. A unity-gain feedback system has zero steady-state error in response to step excitation and a finite, non-zero steady state error in response to a ramp excitation.

It is Type 1.

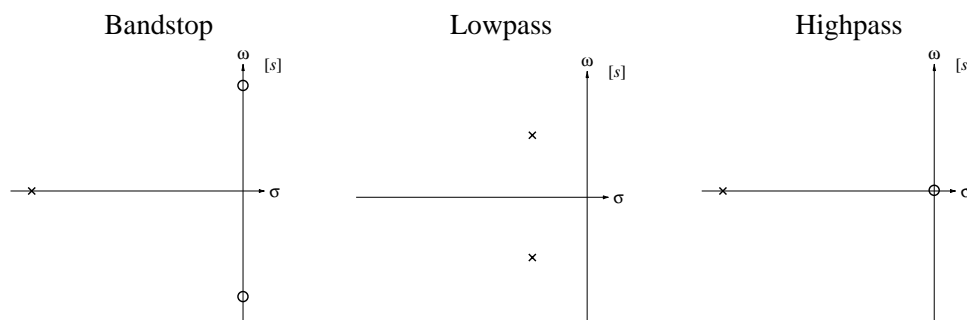
3. Two systems, A and B, have the two pole-zero diagrams below. Which of them responds more quickly to a unit step excitation (approaches the final value at a faster rate)? A responds more quickly



4. Two systems, A and B, have the two pole-zero diagrams below. Which of them has a unit-step response that overshoots the final value before settling to the final value? A overshoots



5. Classify these systems as lowpass, highpass, bandpass or bandstop filters.



The bandstop filter is not in the usual form so I accepted Bandstop as correct but also any explanation of why it was not exactly bandstop but close.

