Signals and Systems – Spring 2025

Problem Set 5

Issued: Mar. 25, 2025 Due: Apr. 1, 2025

Reading Assignments:

Signals and Systems (OWN), Chapter 9.4, 10.4, 3.8-3.11, 6.0-6.2, 6.5

Problem 1 OWN, Problem 6.9

Problem 2 OWN, Problem 6.12

Problem 3 OWN, Problem 6.21(a)

Problem 4 OWN, Problem 6.28(a)-(iv)(viii)

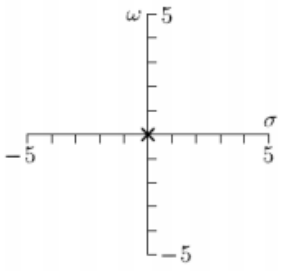
Problem 5 OWN, Problem 6.37(a)(b)(d)

Problem 6 For a second-order CT system with poles at -1 and -4 (and no zeros), find the frequency at which the phase is ° , using any method except for the vector method. Then illustrate and confirm that result using the vector method.

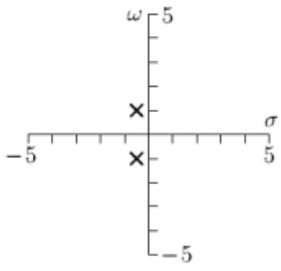
Problem 7 OWN, Problem 10.50

Problem 8 The following plots show pole-zero diagrams, impulse responses, Bode magnitude plots, and Bode angle plots for six causal CT LTI systems. Determine which corresponds to which.

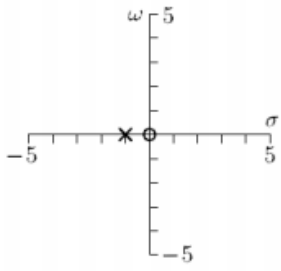
Pole-zero diagram 1



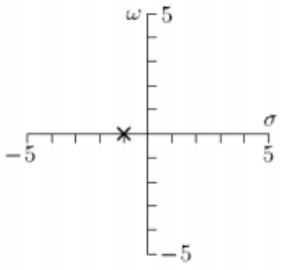
Pole-zero diagram 2



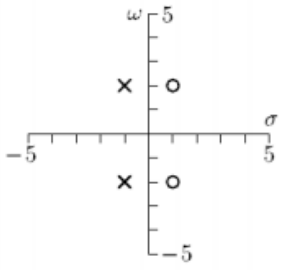
Pole-zero diagram 3



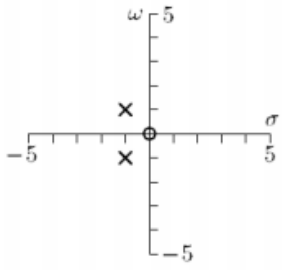
Pole-zero diagram 4



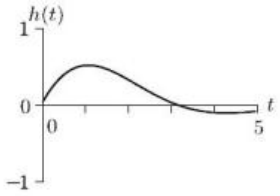
Pole-zero diagram 5



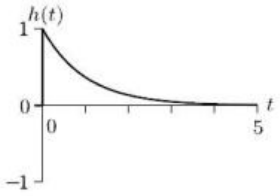
Pole-zero diagram 6



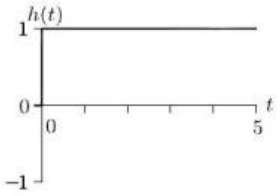
Impulse response 1



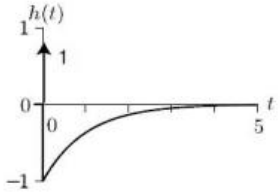
Impulse response 2



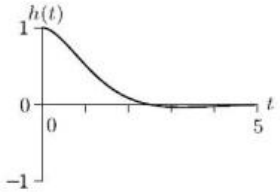
Impulse response 3



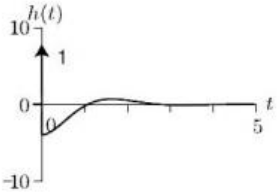
Impulse response 4



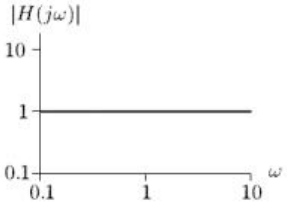
Impulse response 5



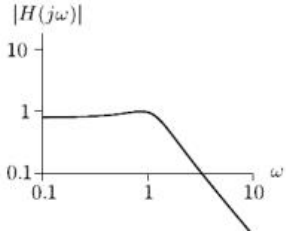
Impulse response 6



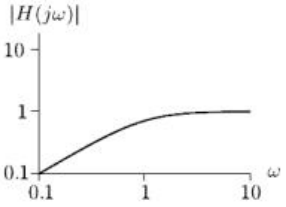
Bode Magnitude 1



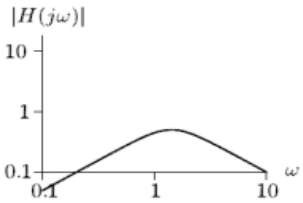
Bode Magnitude 2



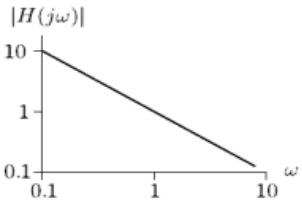
Bode Magnitude 3



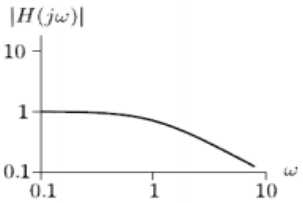
Bode Magnitude 4



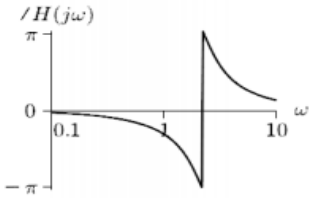
Bode Magnitude 5



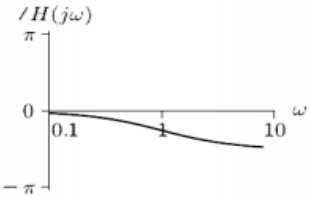
Bode Magnitude 6



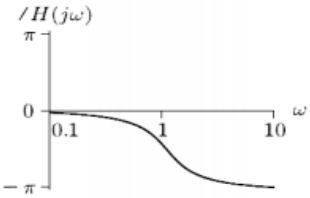
Bode Angle 1



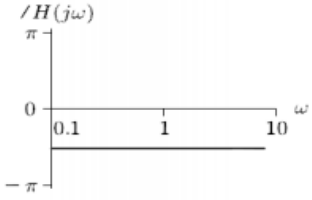
Bode Angle 2



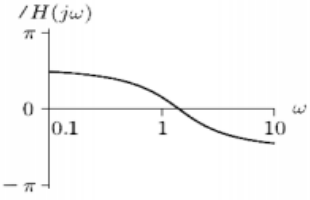
Bode Angle 3



Bode Angle 4



Bode Angle 5



Bode Angle 6