



Faculty of Industrial Technology

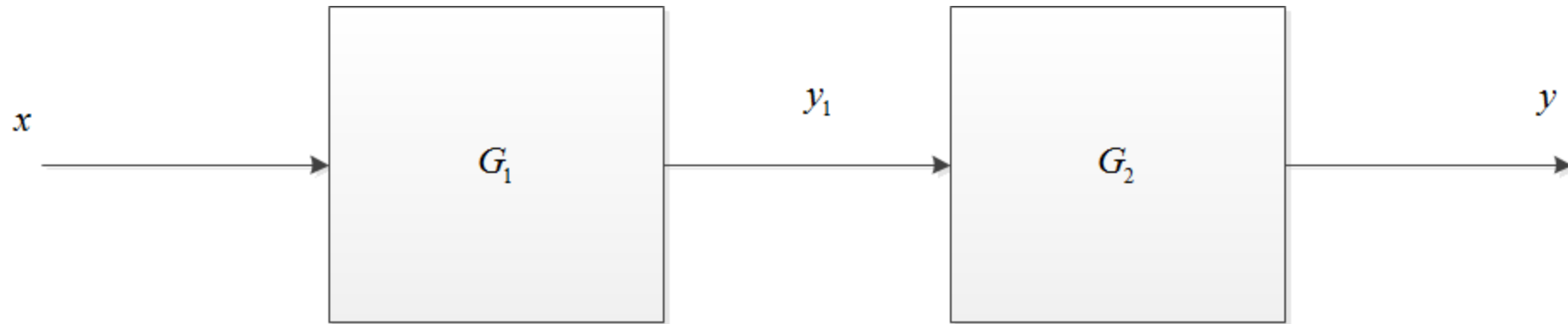
Suan Sunandha Rajabhat University

# Software and Systems Engineering

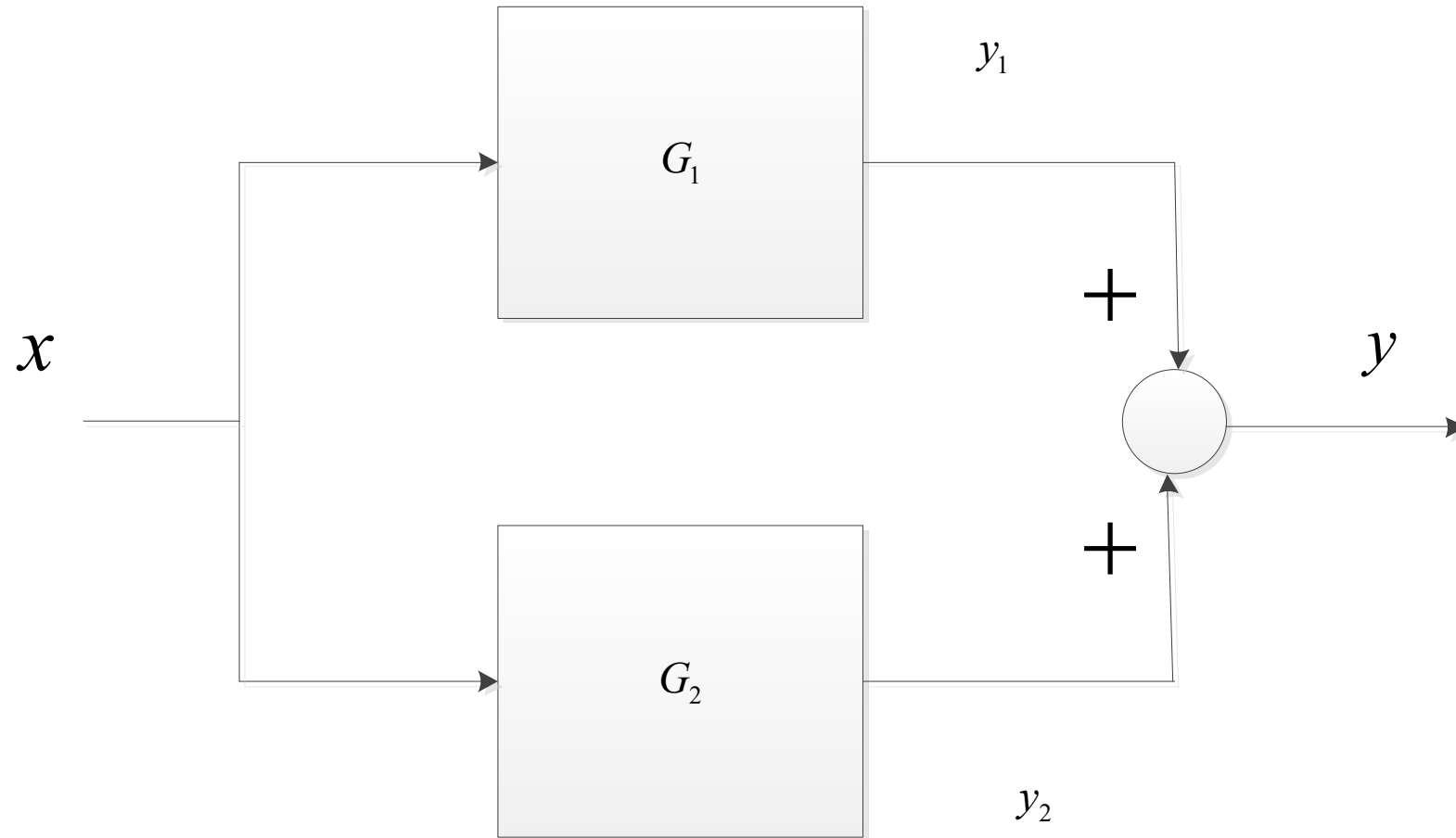
## CPE3202

**Pornpawit Boonsrimuang**

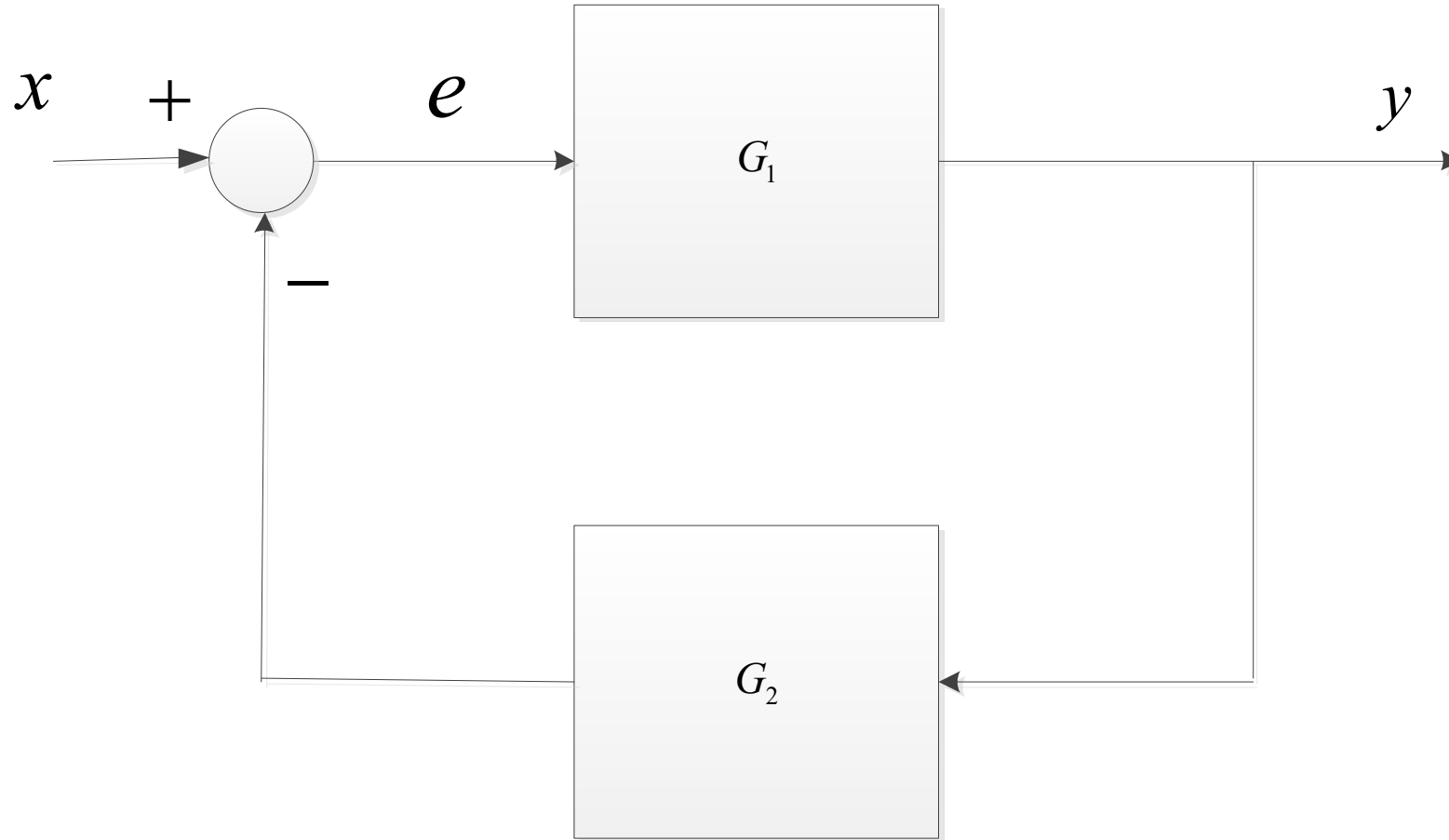
# Cascade interconnection of systems



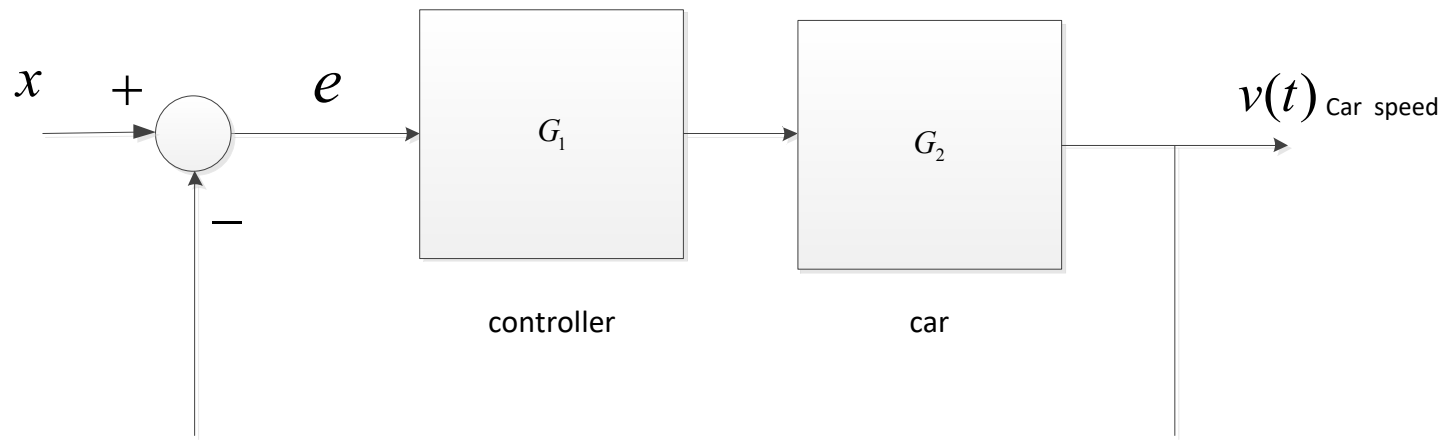
# Parallel interconnection of systems



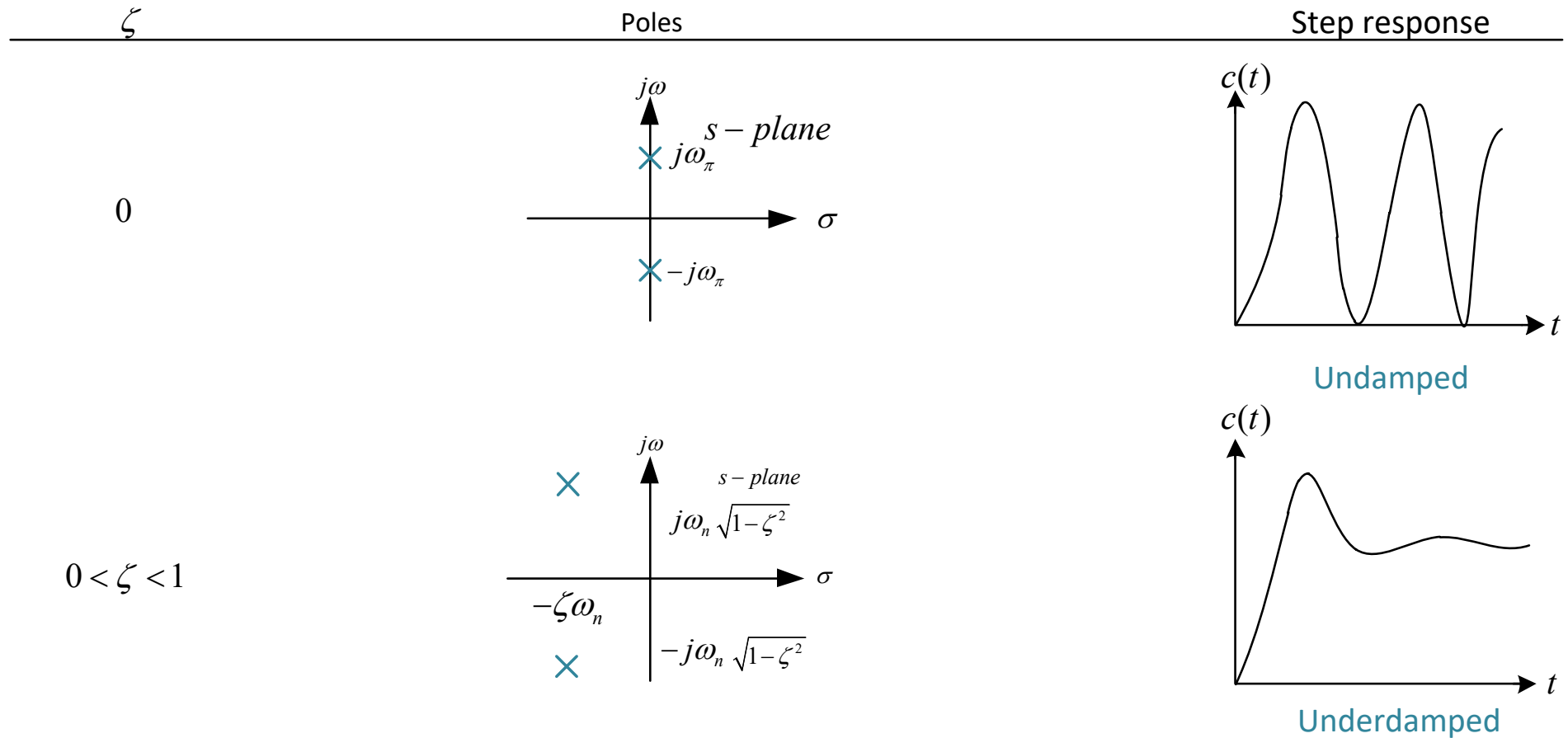
# Feedback interconnection of systems



# Feedback interconnection of a car cruise control systems

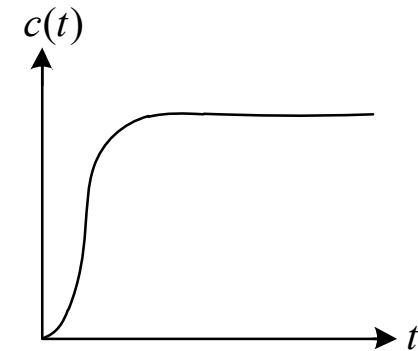
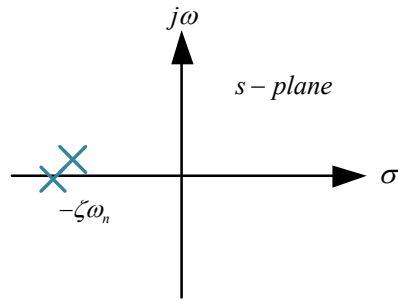


# Second-order response as a function of damping ratio



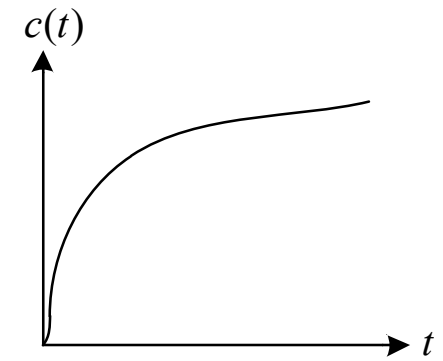
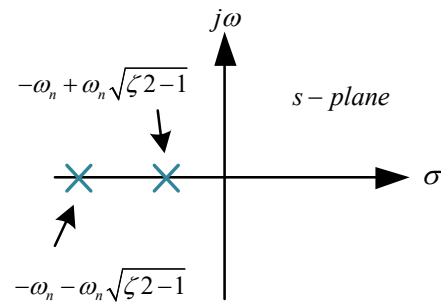
# Second-order response as a function of damping ratio

$$\zeta = 1$$



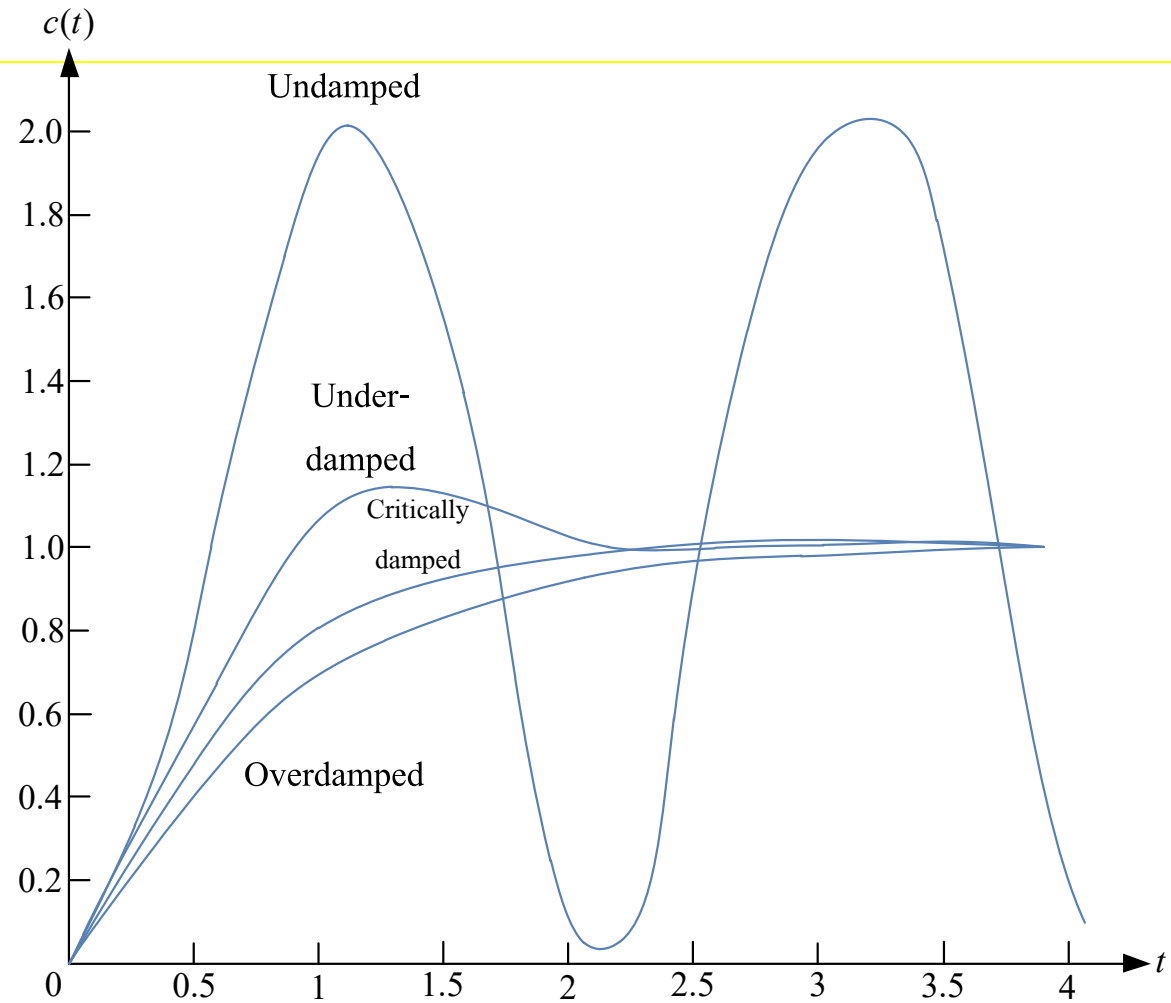
Critically damped

$$\zeta > 1$$



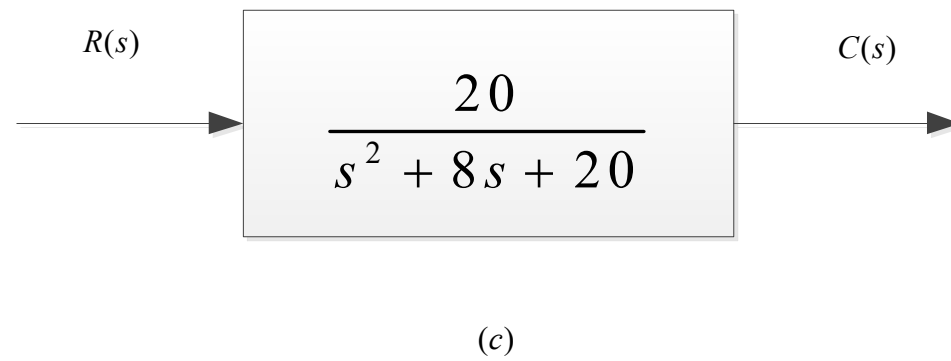
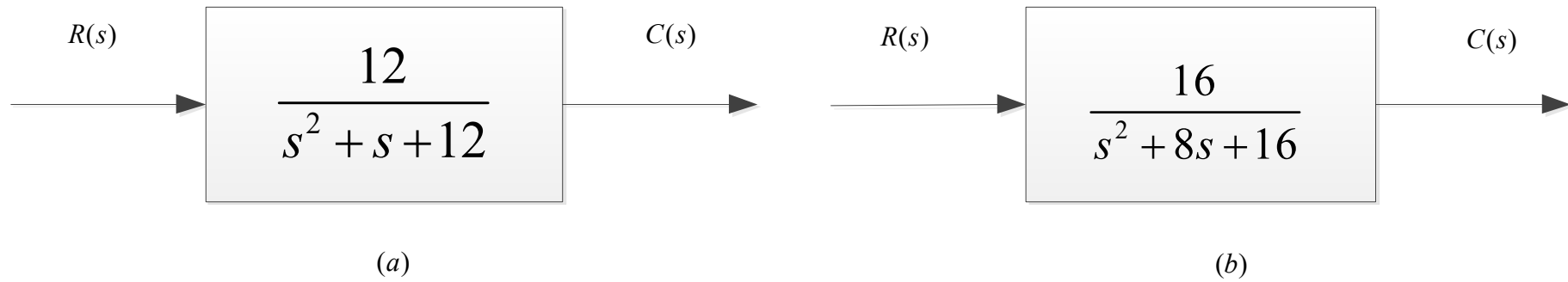
Overdamped

# Step responses for second-order system damping cases



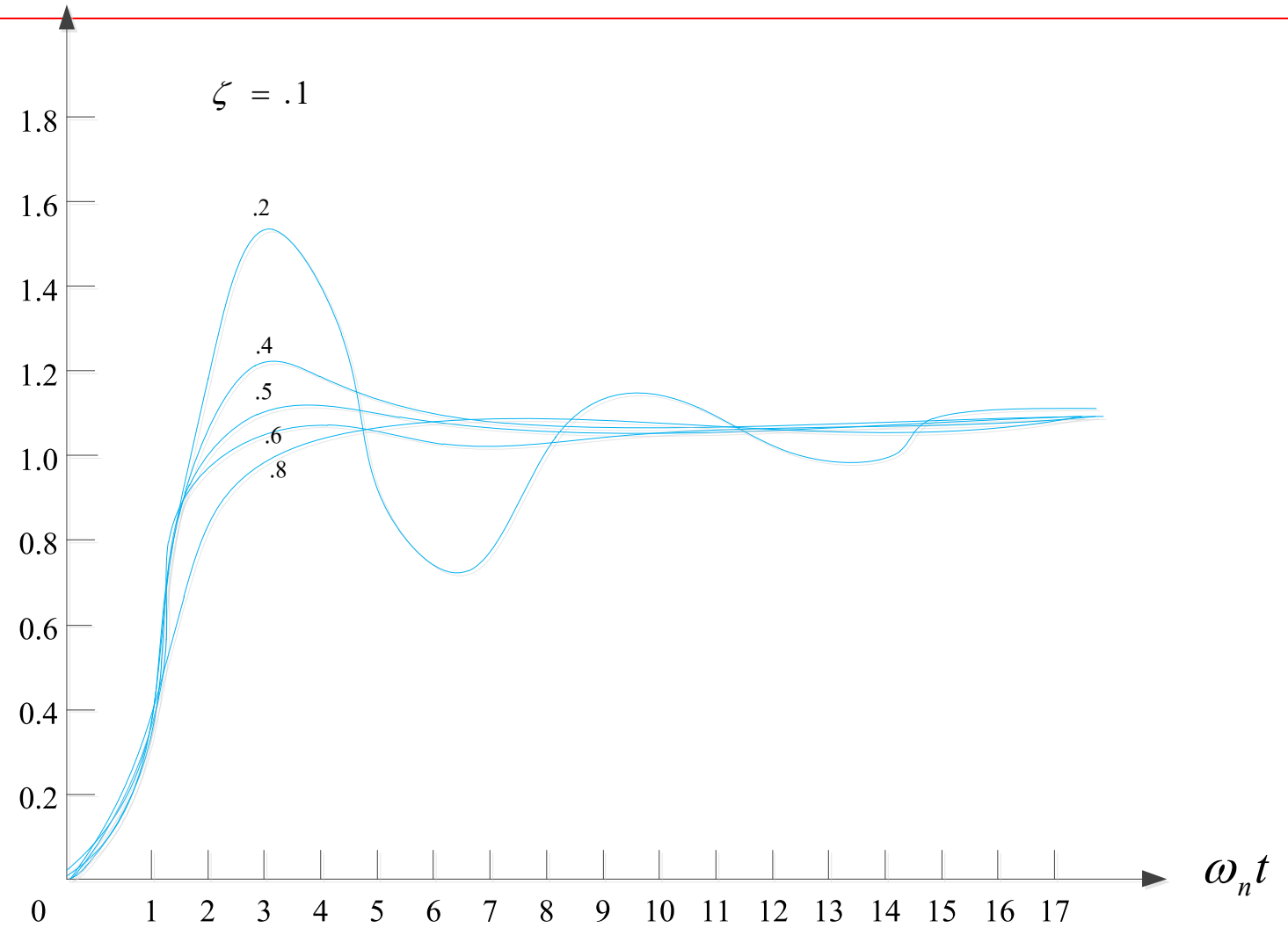


Ex.

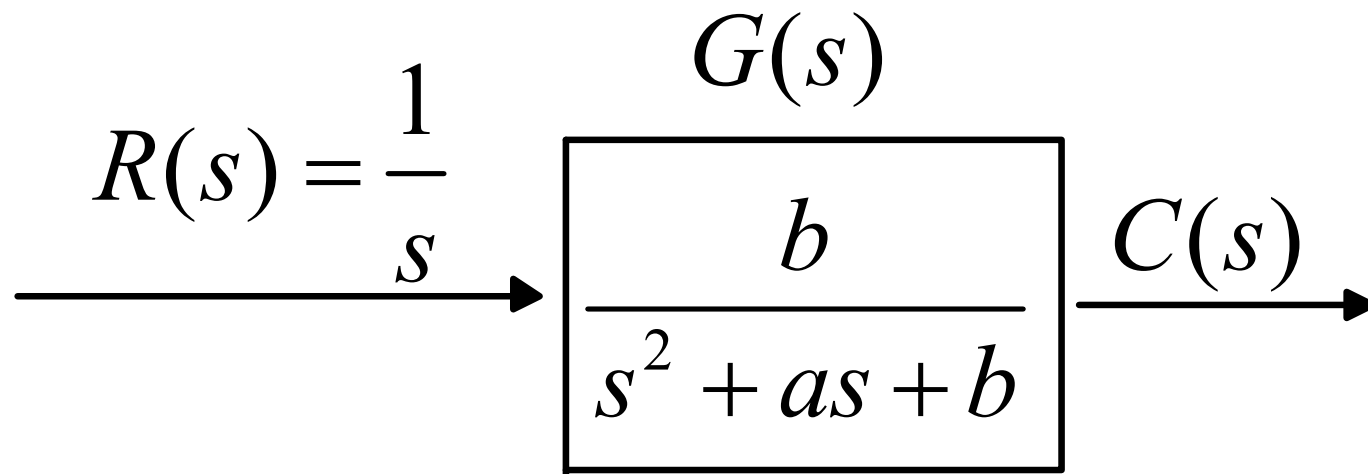


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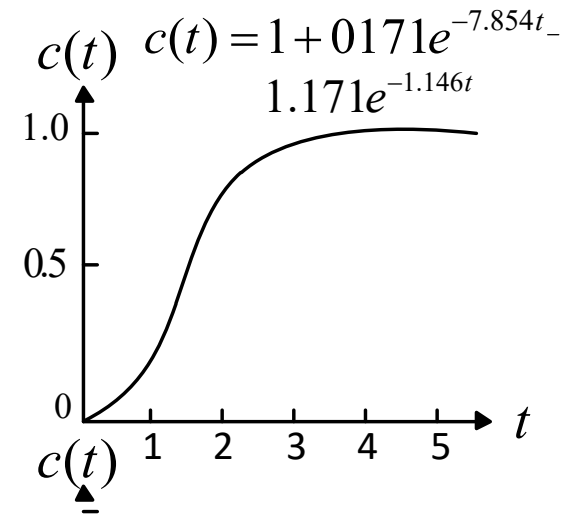
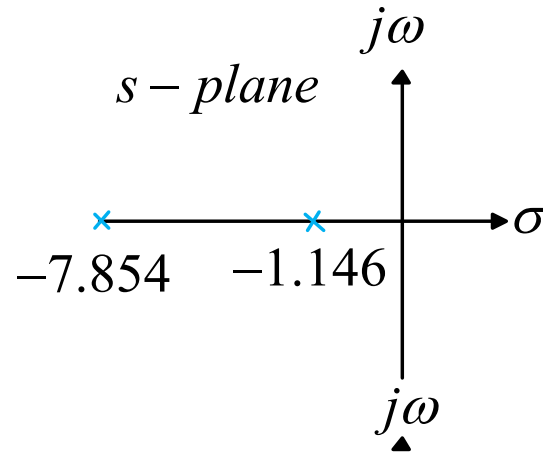
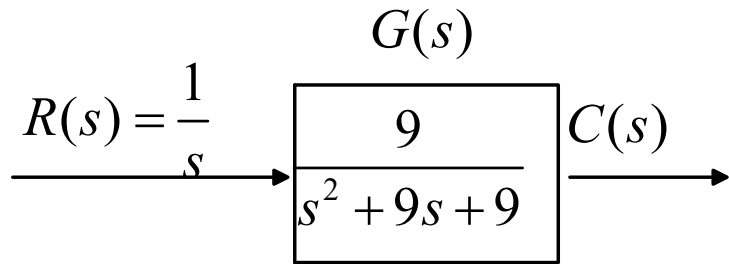
$c(\omega_n t)$



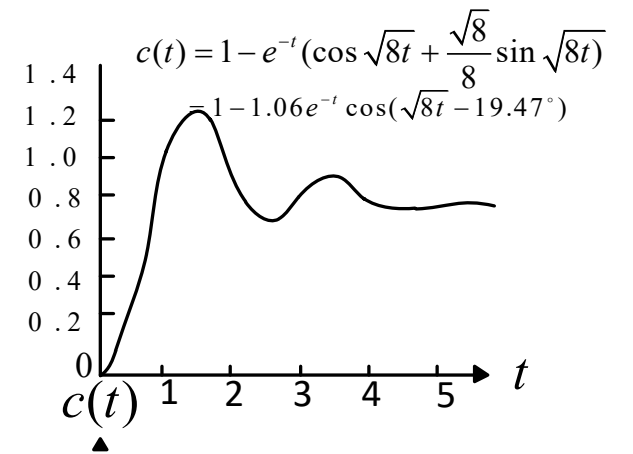
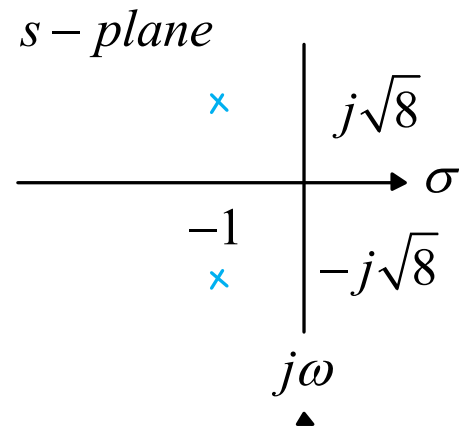
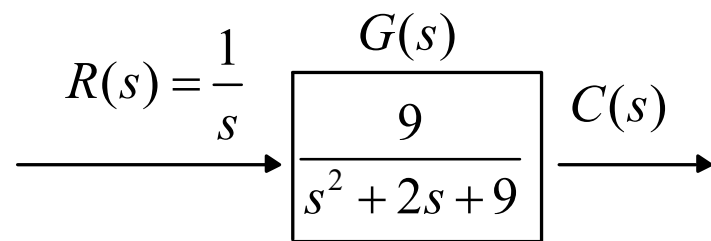
Ex.



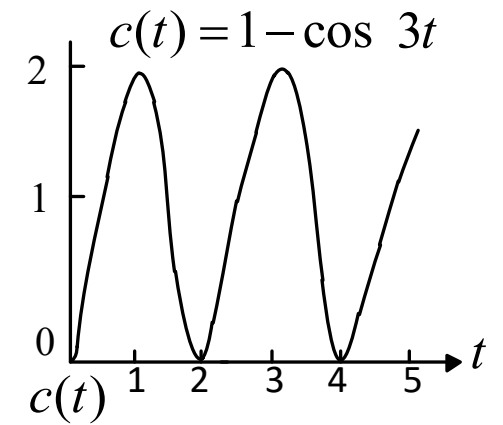
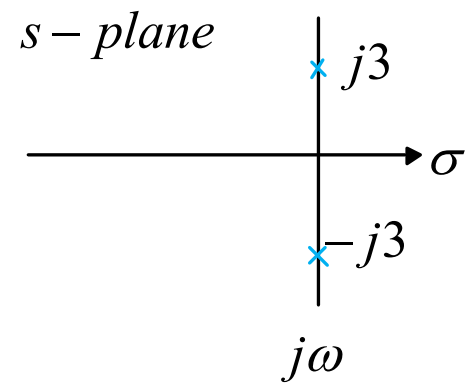
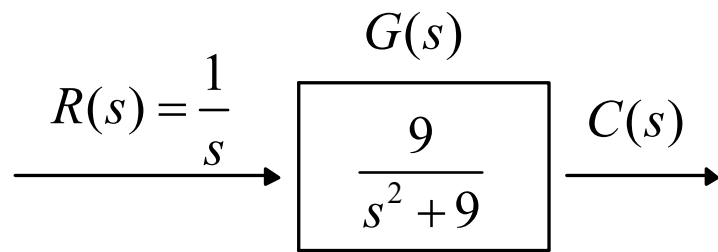
Ex.



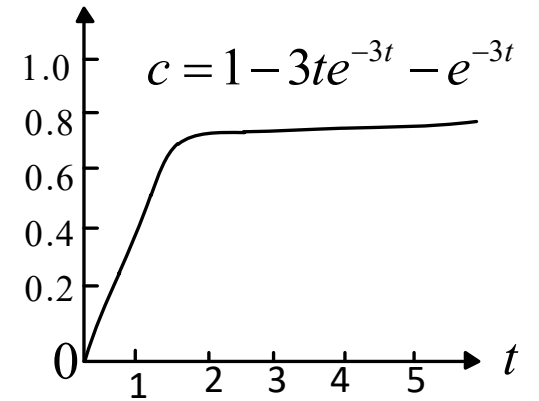
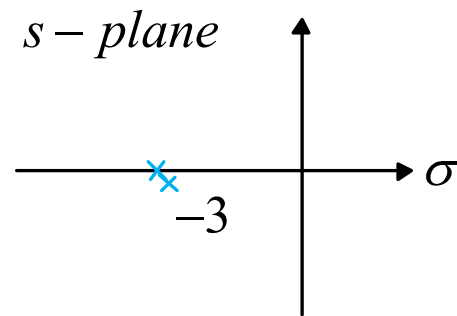
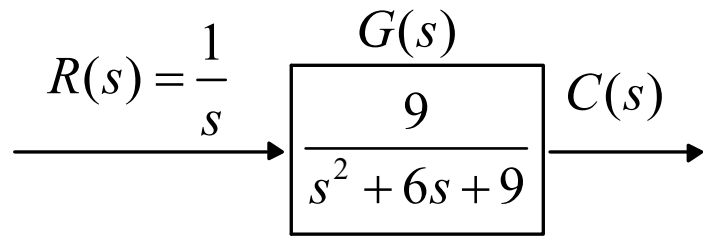
Ex.



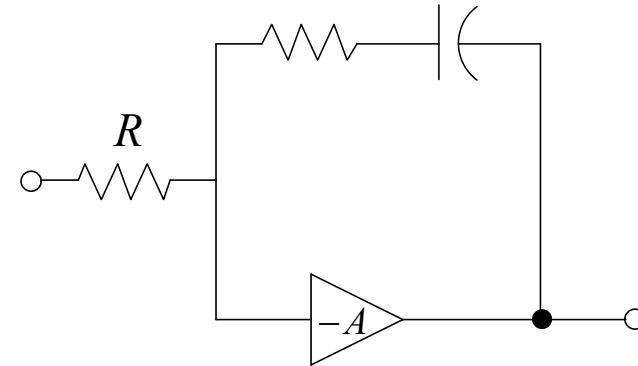
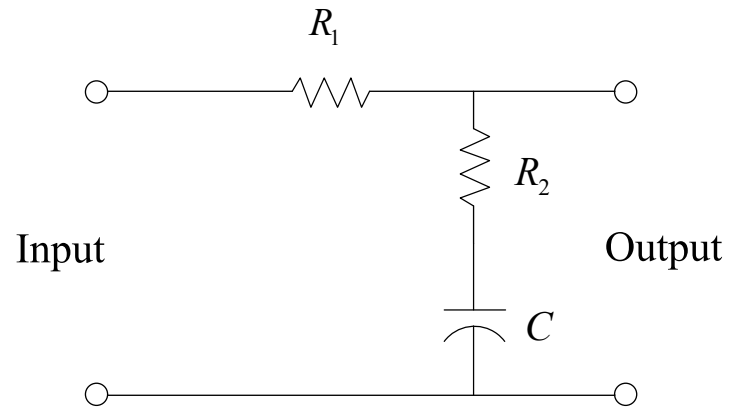
Ex.



Ex.

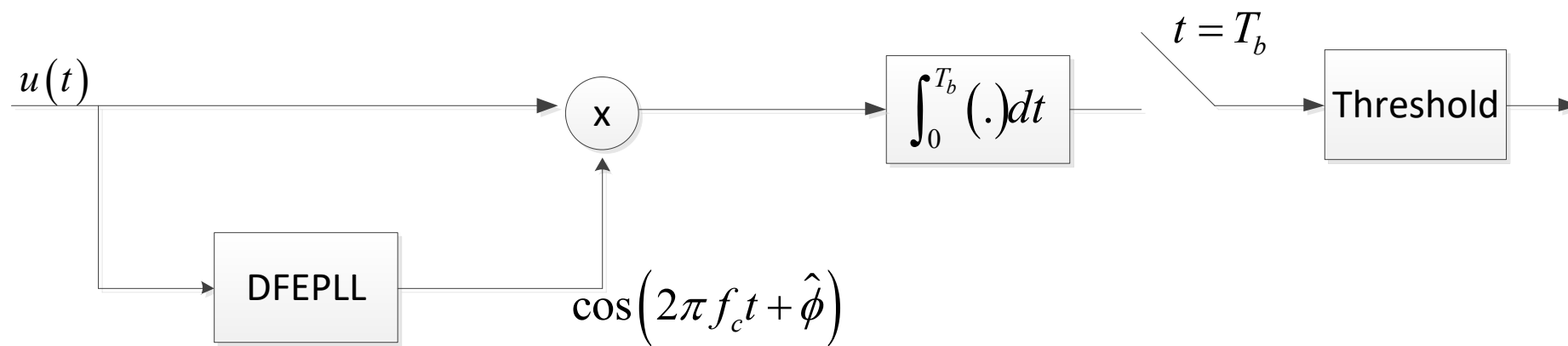


# Ex. RC Circuit & Amp.

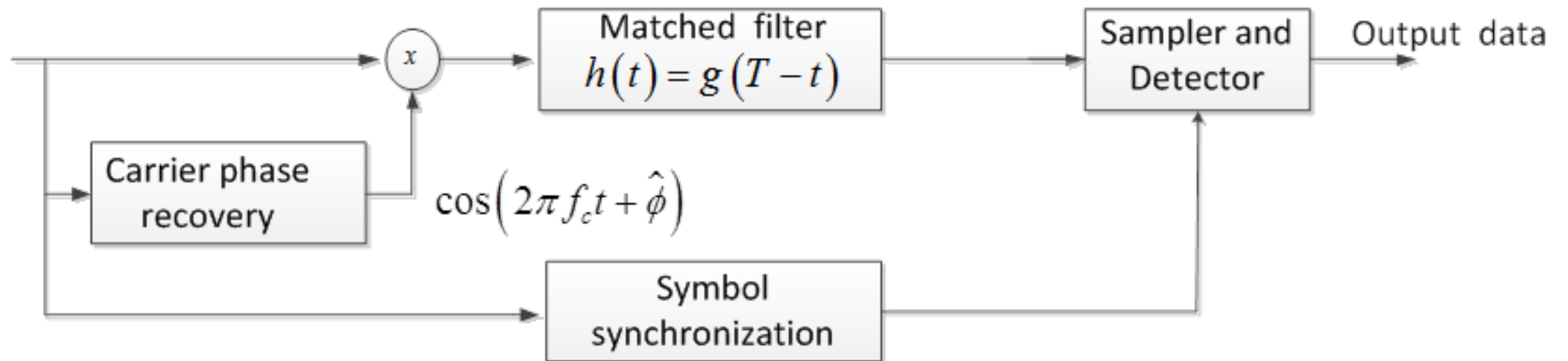




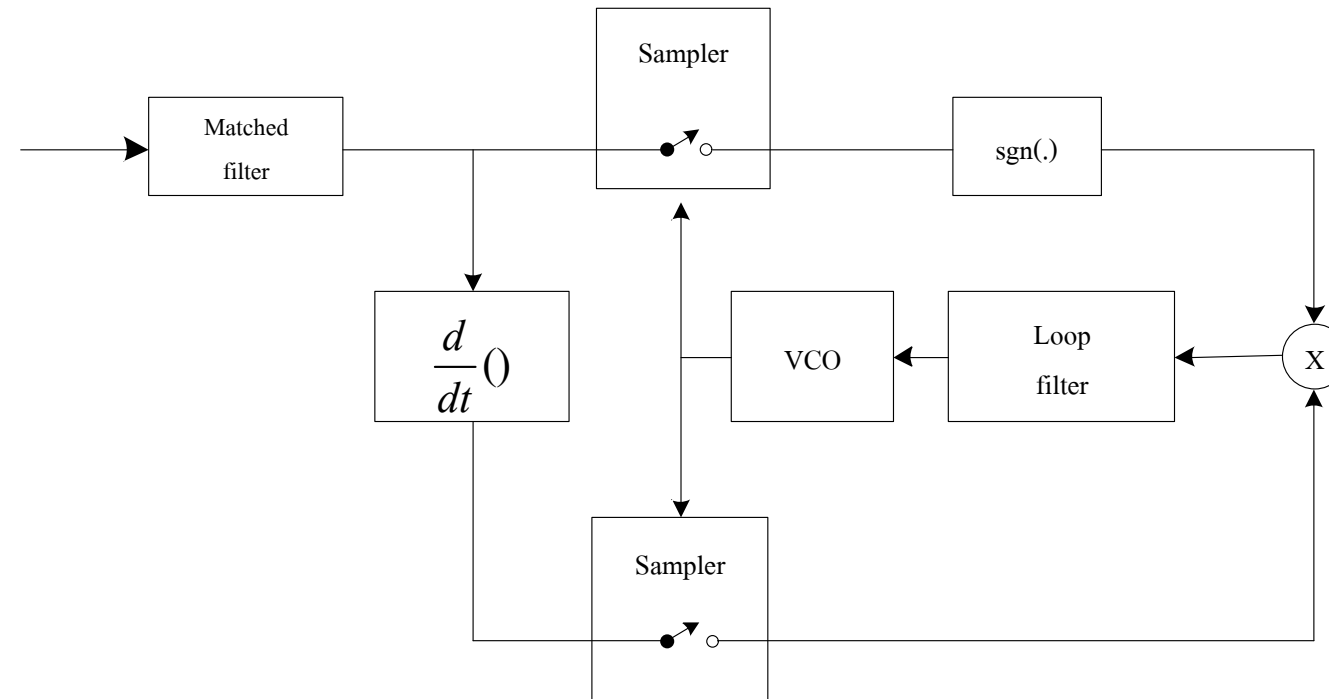
# Ex. Feedback



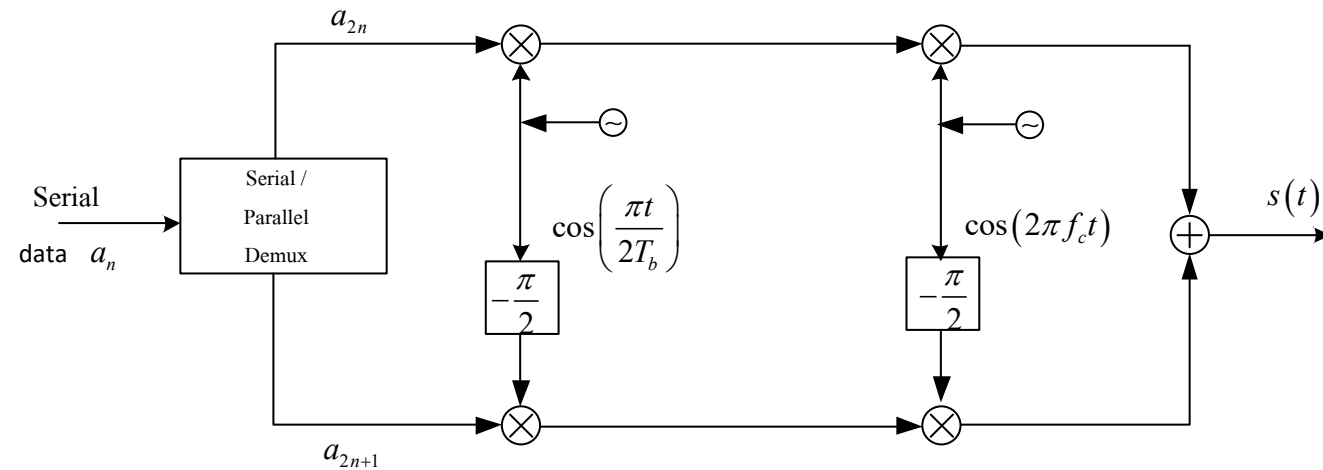
# Ex. Feedback



# Ex. VCO Block



# Ex. Serial to Parallel data



# Ex. Serial to Parallel data

