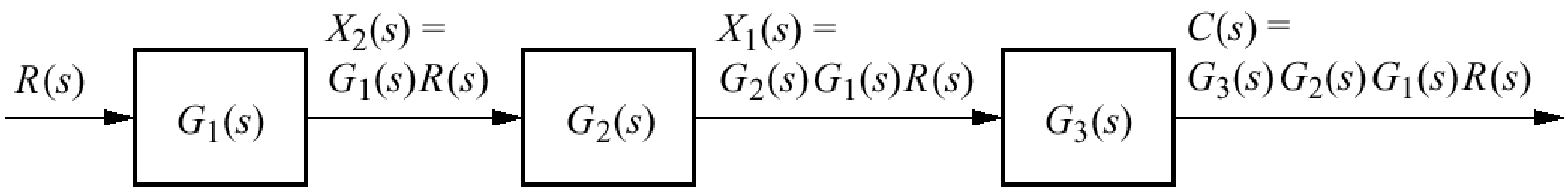
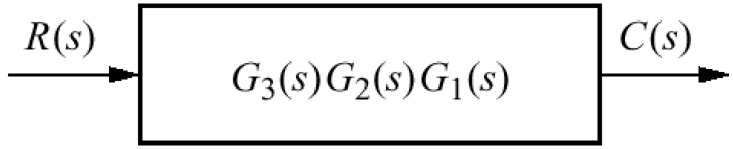
Lecture: Block Diagram Reduction and Mason's Rule

Prof. Yi Guo

Block-Diagram Reduction



(*a*)

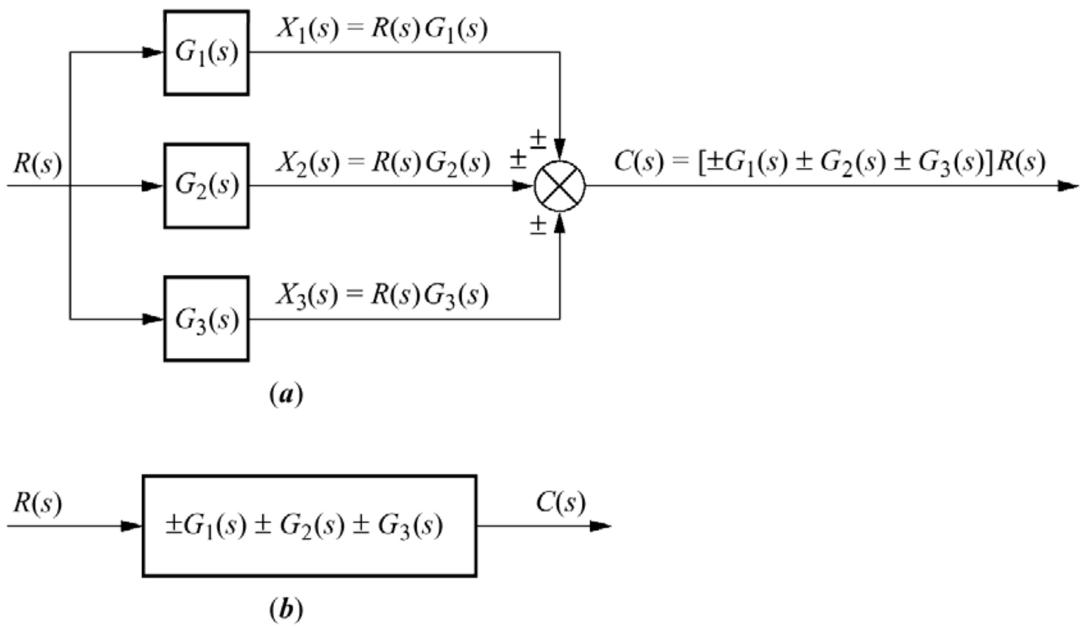


(*b*)

a). Cascaded subsystems;

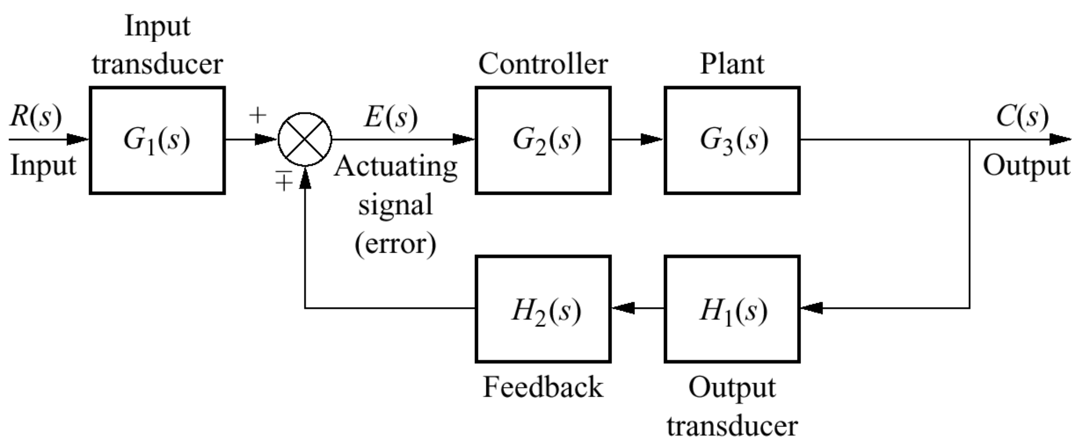
b). Equivalent transfer function.

Block-Diagram Reduction

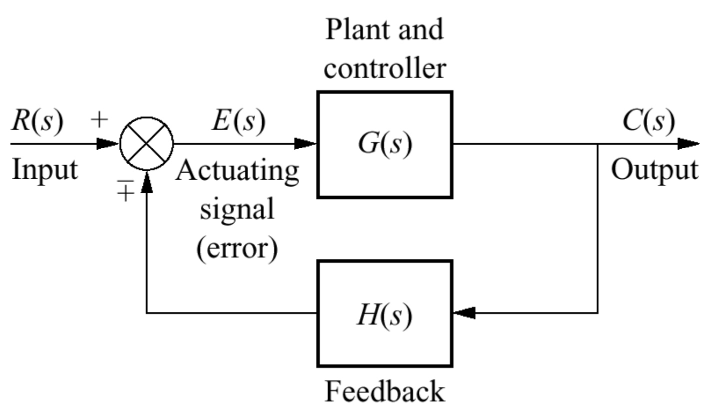


a. Parallel subsystems;
b. Equivalent transfer function.

Feedback Control System and Simplified Model

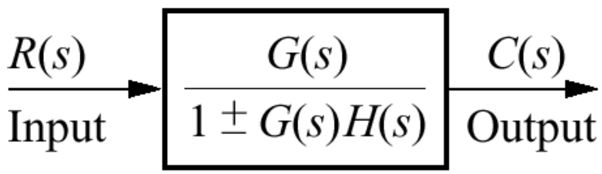


(*a*)



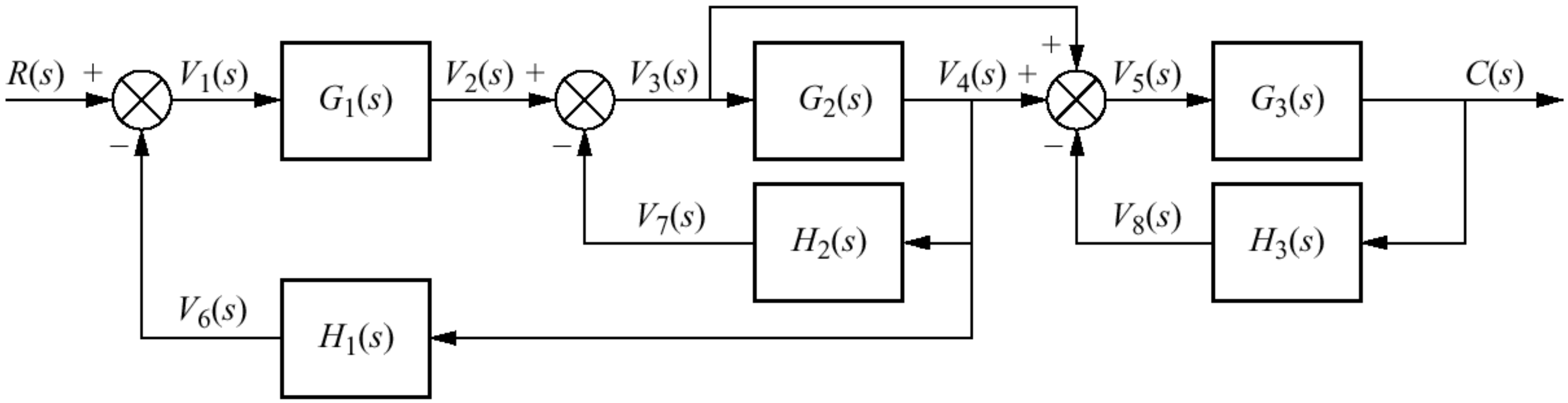
(*b*)

Equivalent Transfer Function

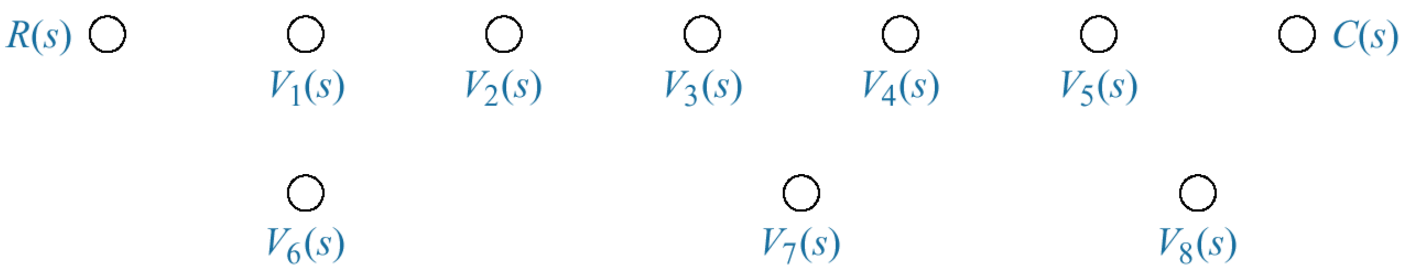


(*c*)

Convert a block diagram to a signal-flow graph

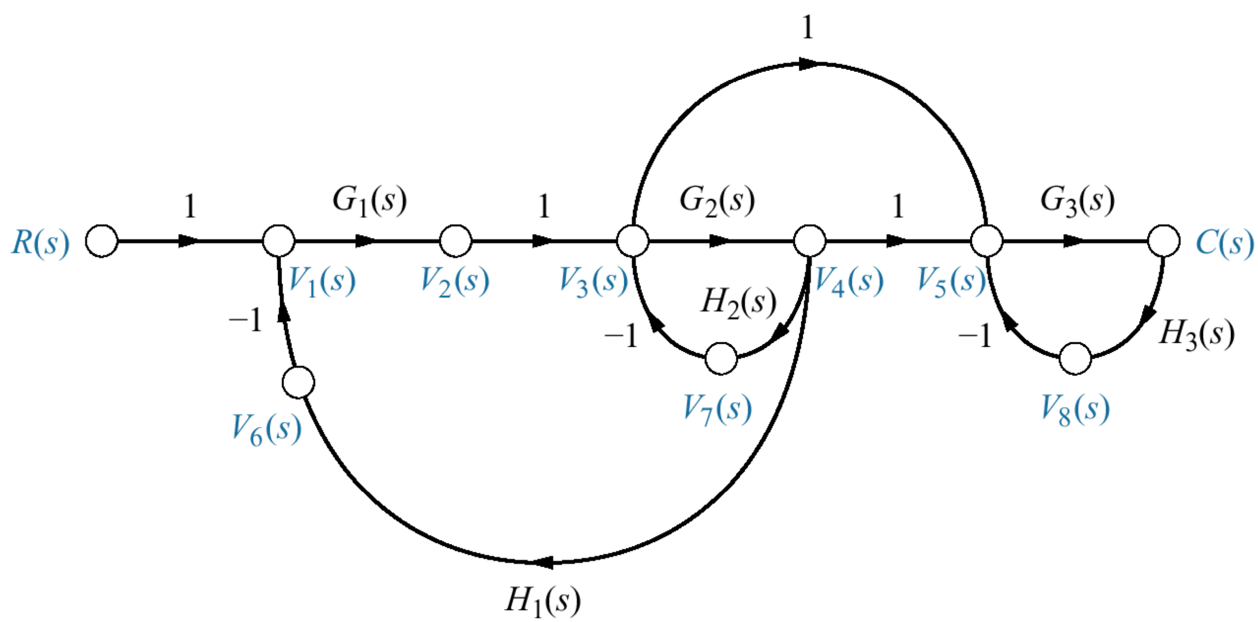


Step 1: signal nodes:



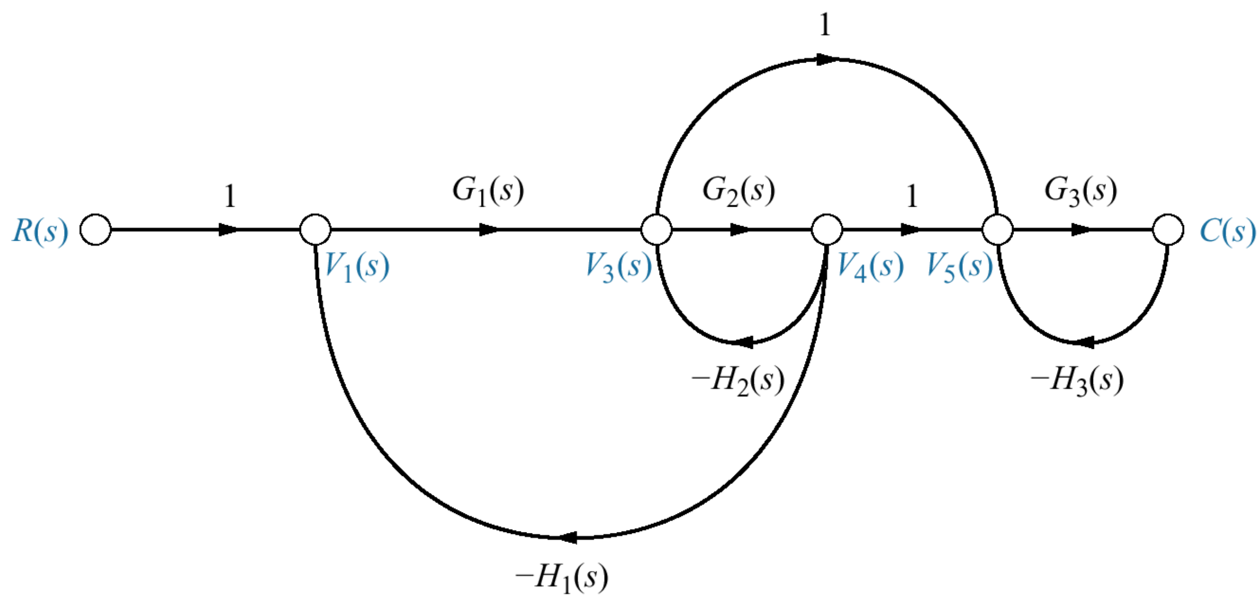
(*a*)

Step 2: Signal-flow graph

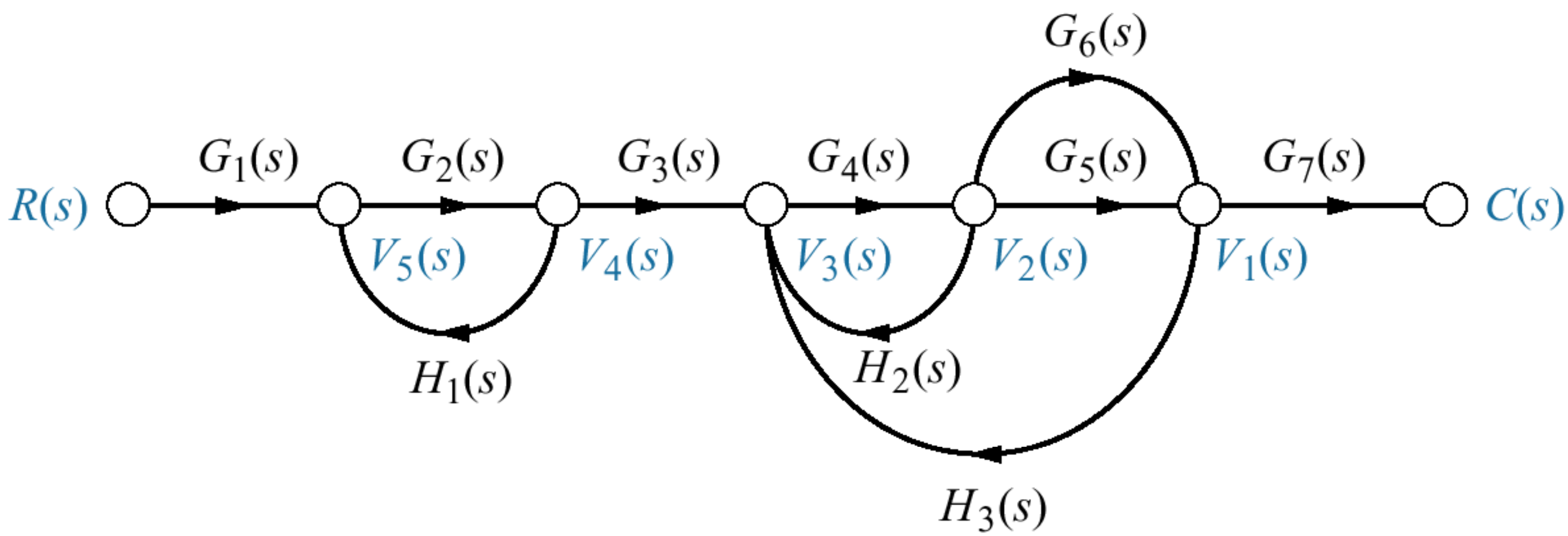


(*b*)

Step 3: Simplified signal-flow graph



(*c*)



$G_6(s)$
$G_1(s)$
$G_2(s)$
$G_3(s)$
$G_4(s)$
$G_5(s)$
$G_7(s)$
$R(s)$
$C(s)$
$V_5(s)$
$V_4(s)$
$V_3(s)$
$V_2(s)$
$V_1(s)$
$H_1(s)$
$H_2(s)$
$H_3(s)$