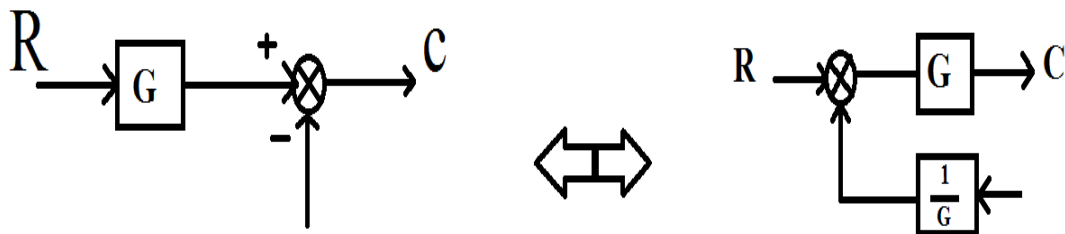
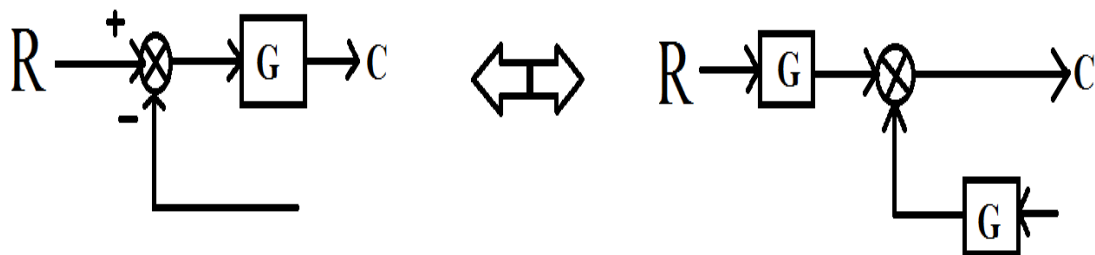


Block Diagram Reduction

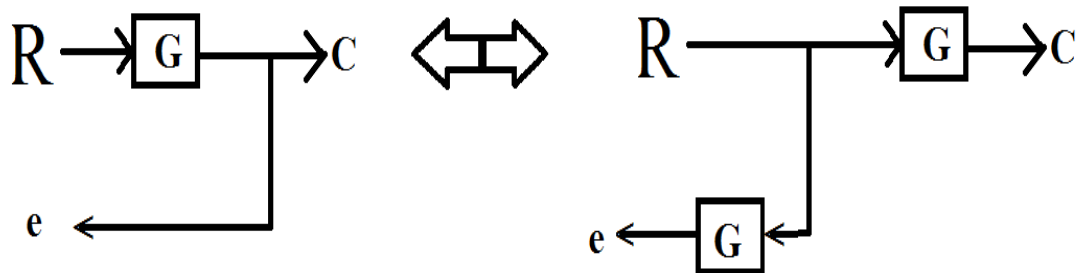
Rule 4: moving a summing point a head of a block



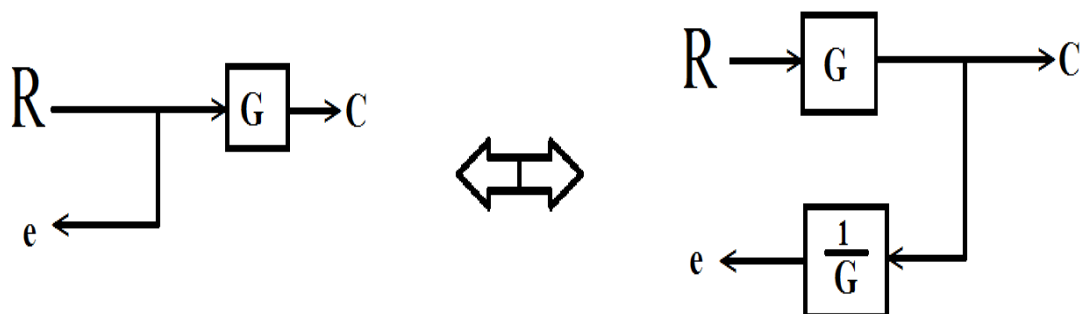
Rule 5: moving a summing point behind a block



Rule 6: moving a take - off point a head of a block

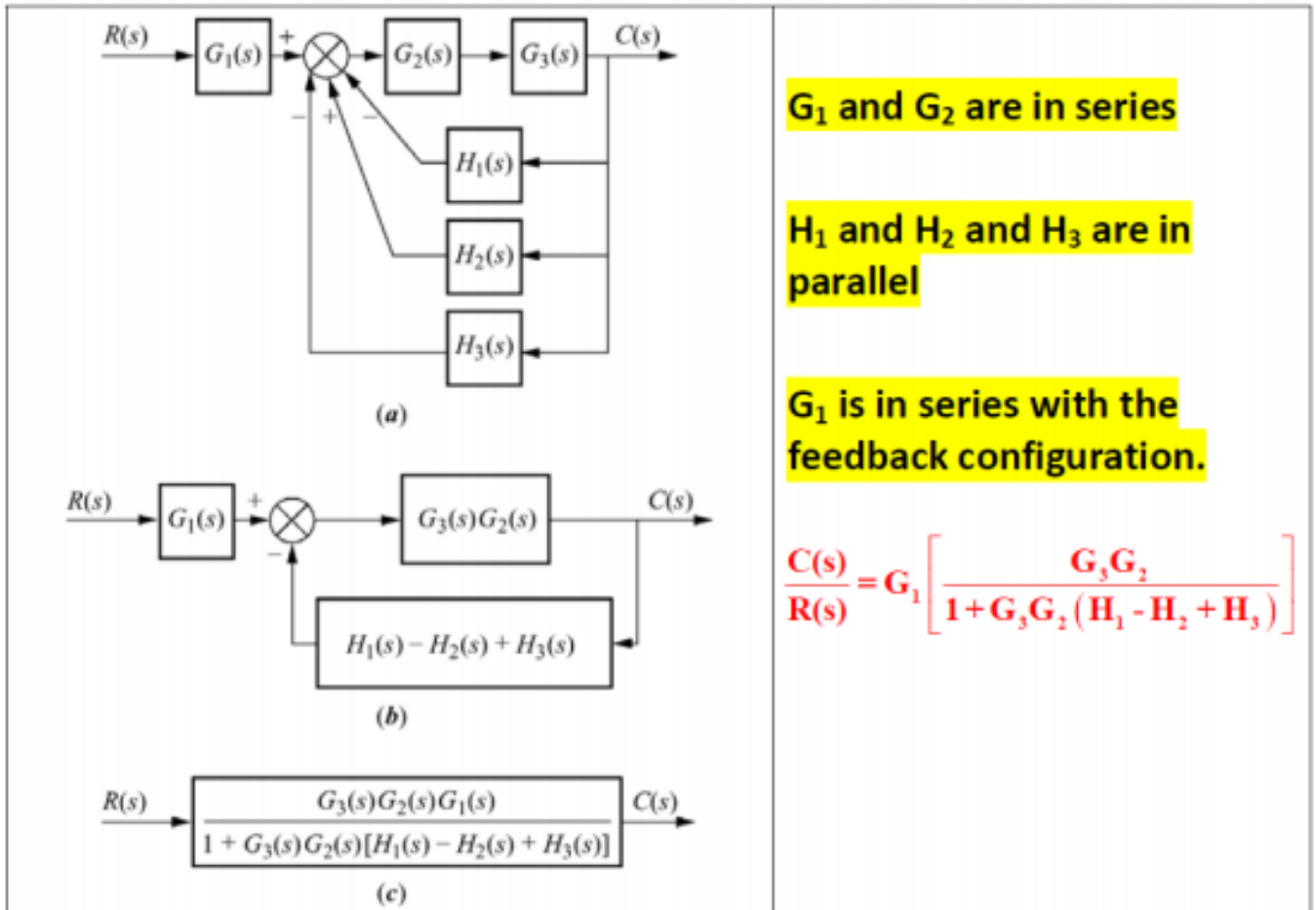


Rule 7: moving a take - off point a behind a block

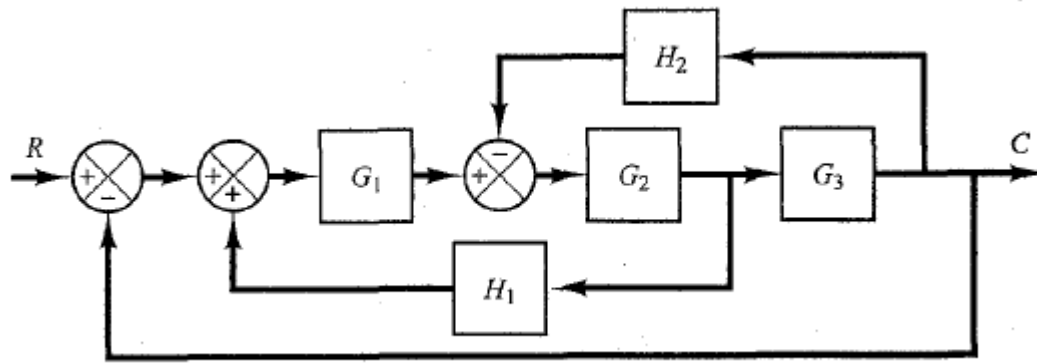


Example 1/ Find the transfer function between C to R for the diagram below.

Solution

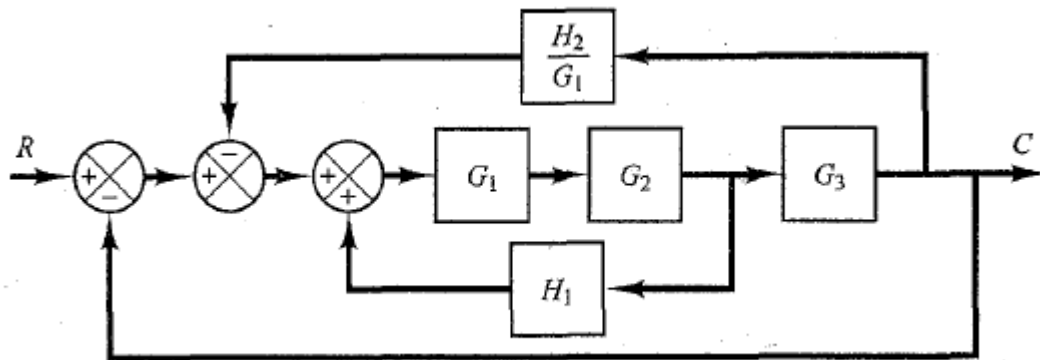


Example 2/ Find the transfer function between $C(s)$ to $R(s)$ for the diagram below.

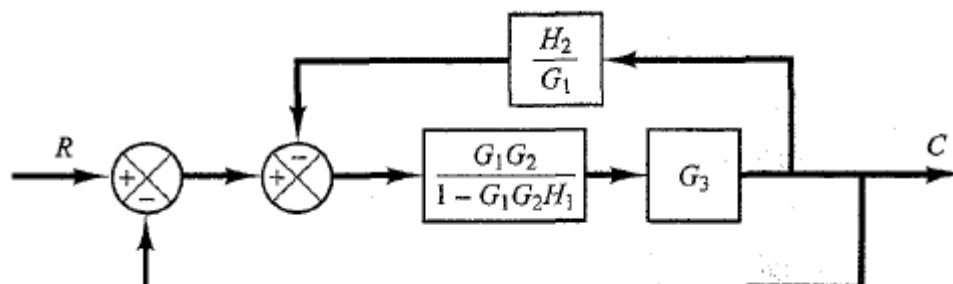


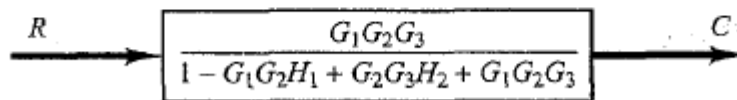
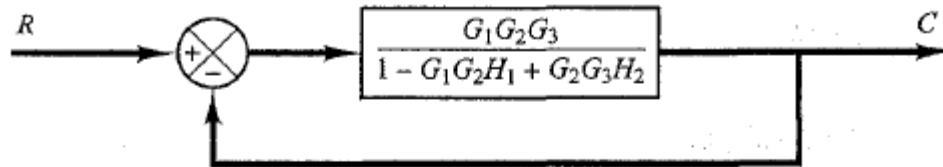
Solution

Then move the summing point between G_1 and C_2 , to the left-hand side of the first summing point.

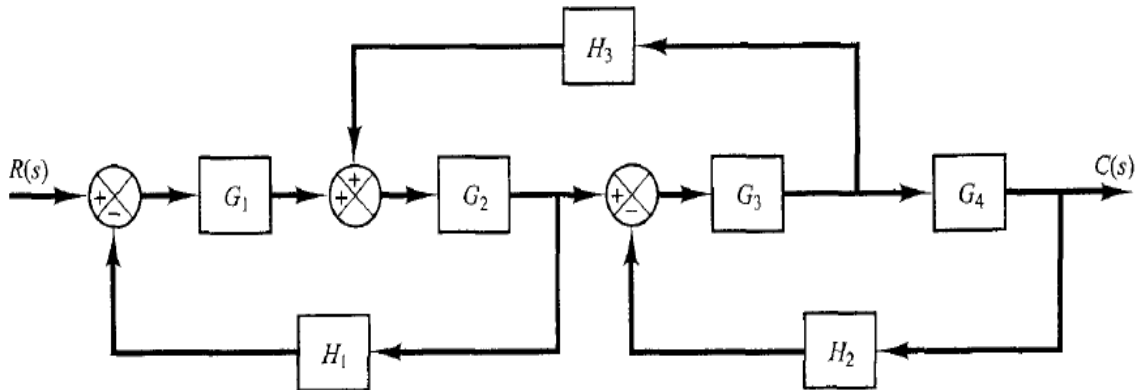


Apply feedback loop between G_1, G_2, H_1





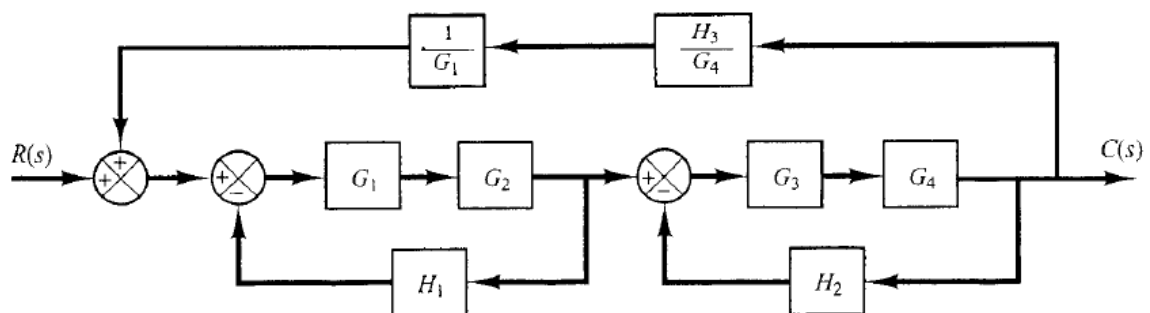
Example 3/ Simplify the block diagram shown. Then, obtain the closed-loop transfer function $C(s)/R(s)$.

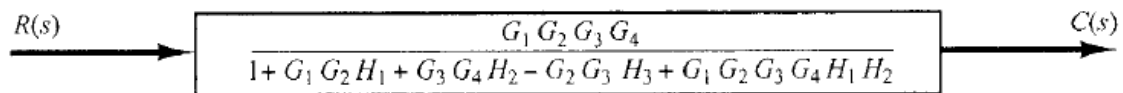
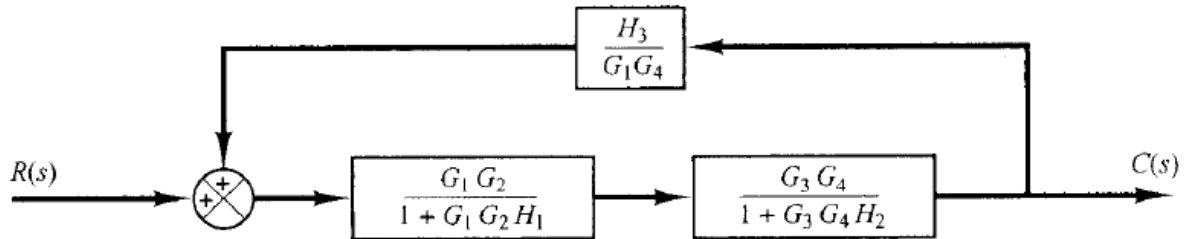


Solution

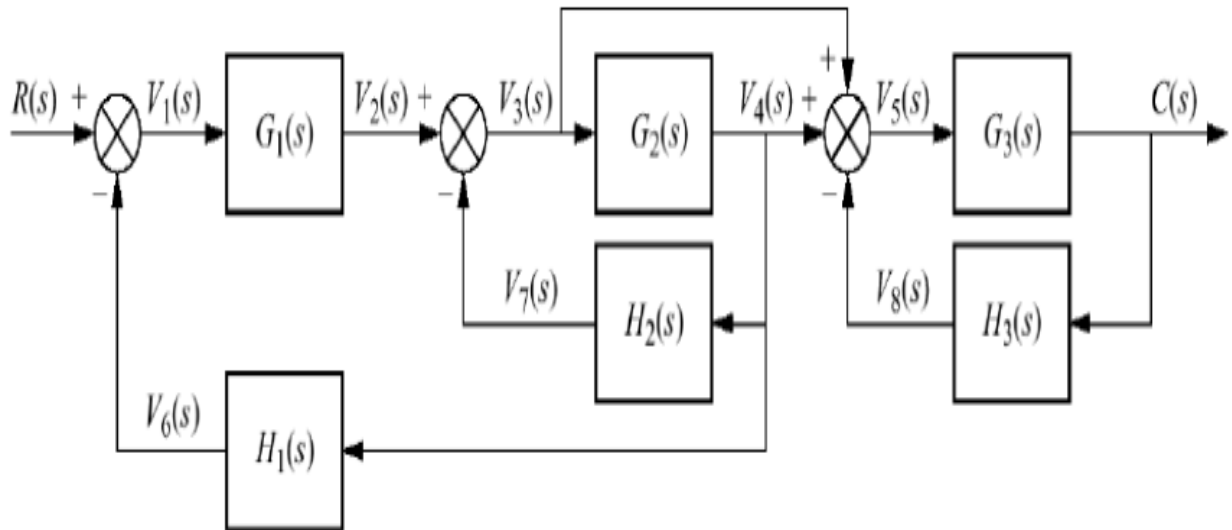
First move the take-off point between G_3 , and G_4 to the right-hand side of the loop containing G_3 , G_4 , and H_2 .

Then move the summing point between G_1 and G_2 , to the left-hand side of the first summing point.



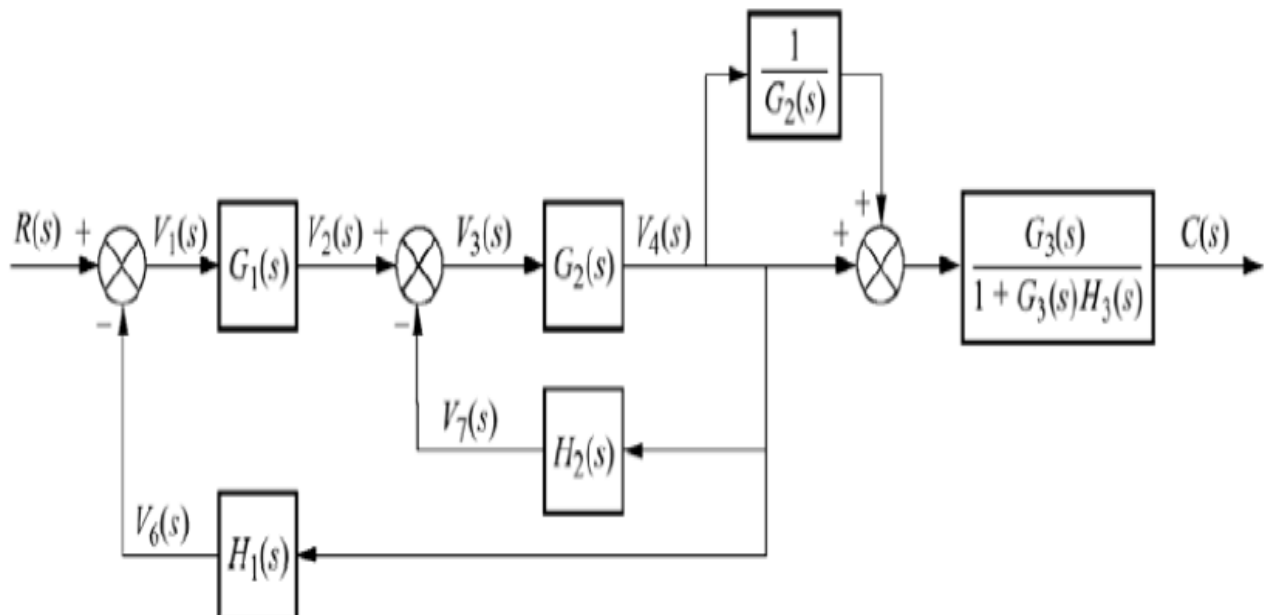


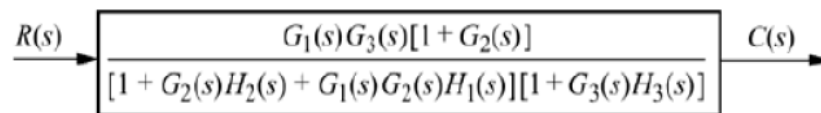
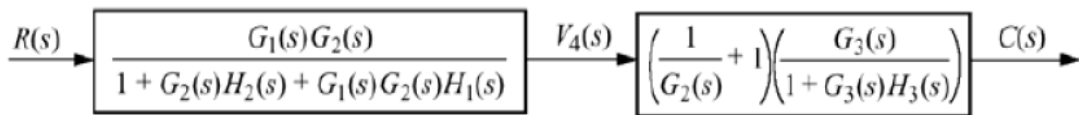
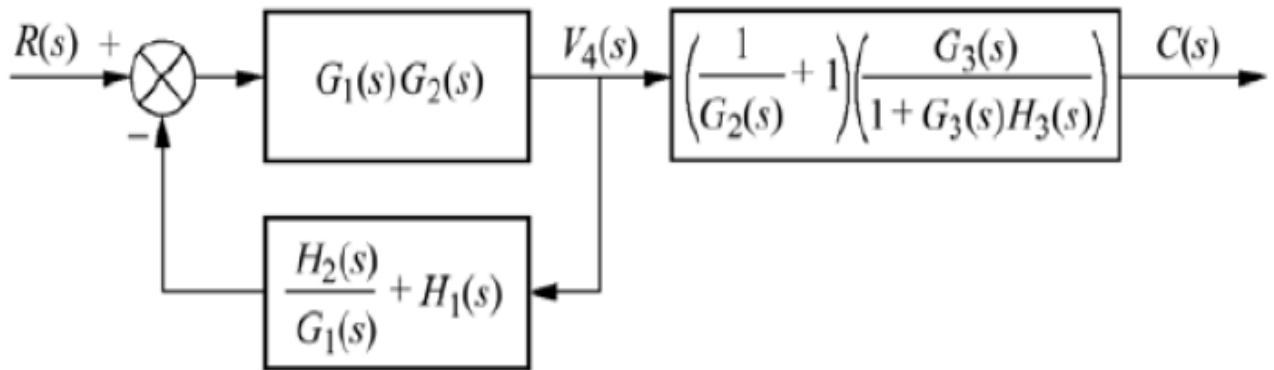
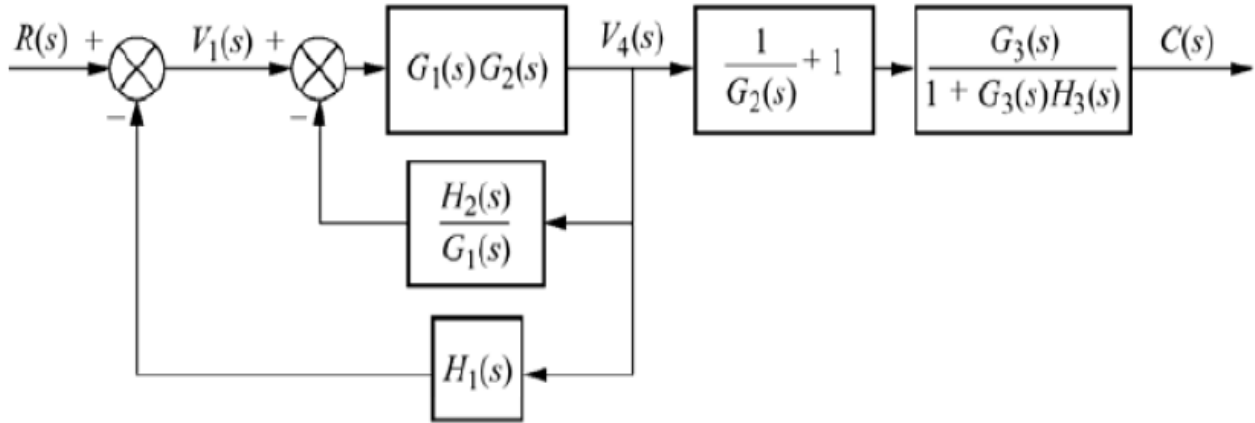
Example 4/ Find the transfer function between C to R for the diagram below.



Solution

Move take off point after G_2





Example 5/ Find the transfer function between C to R for the diagram below.

