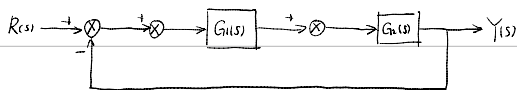


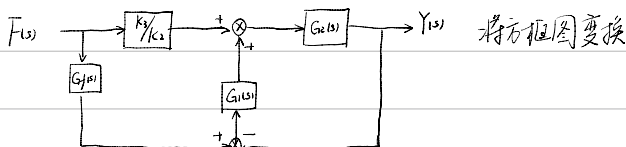
日期: /

2.12 解: ① 求 $\frac{Y(s)}{R(s)}$ 则将 $F(s)$ 置 0, 信号方框图为

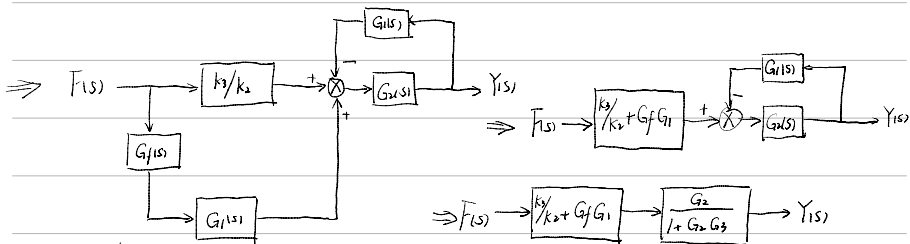


$$\frac{Y(s)}{R(s)} = \frac{G_1(s) G_2(s)}{1 + G_1(s) G_2(s)} = \frac{K_1 K_2}{(T_1 s + 1)(T_2 s + 1) + K_1 K_2}$$

将 $\frac{Y(s)}{F(s)}$ 则将 $R(s)$ 置 0, 信号方框图为



将方框图变换

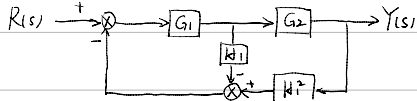


$$\begin{aligned} \text{则 } \frac{Y(s)}{F(s)} &= \left(\frac{K_3}{K_2 + G_f G_1} \right) \cdot \left(\frac{G_2}{1 + G_1 G_2} \right) \\ &= \frac{K_1 K_2}{(T_1 s + 1)(T_2 s + 1) + K_1 K_2} \cdot \left(\frac{K_3}{K_2} + \frac{K_1}{T_1 s + 1} \cdot G_f \right) \end{aligned}$$

② ∵ 补偿输出 故 $\frac{Y(s)}{F(s)} = 0$ 即可 $\frac{K_3}{K_2} + \frac{K_1}{T_1 s + 1} G_f = 0$

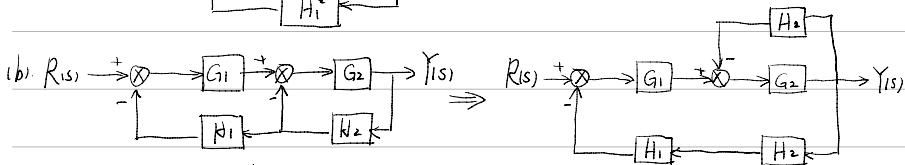
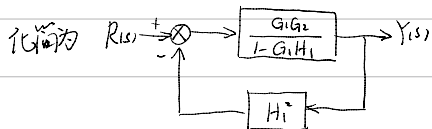
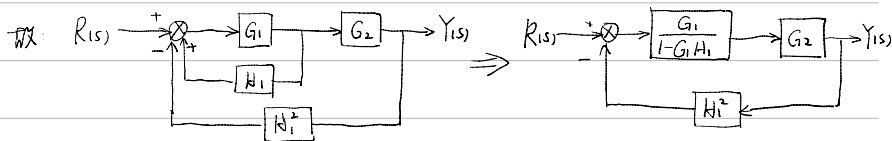
$$\therefore G_f = -\frac{K_3}{K_2} \cdot \frac{T_1 s + 1}{K_1}$$

2.13 解: a. $R(s)$

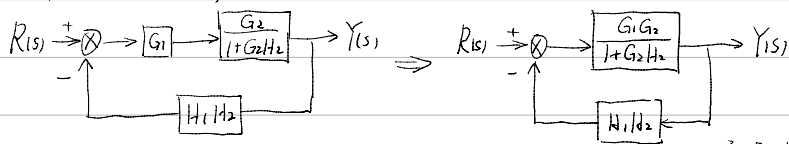


由于相加点可以互换顺序

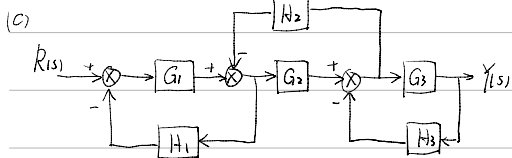
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存在级联结构进一步化简为

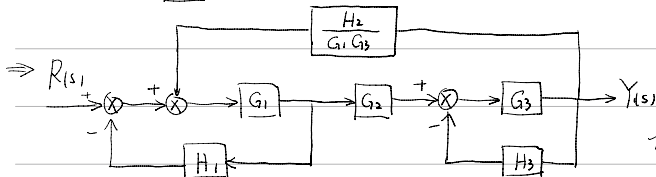


仅有-反馈



分支点向分支点移动

相加点向相加点移动



相加点合并

构造反馈并级联

