1、回路：$L_{11} = -G_1G_2H_1$

$L_{21} = -G_2G_3H_2$

$L_{31} = -G_1G_2G_3$

$L_{41} = -G_1G_4$

$L_{51} = -G_4H_2$

$\Delta = 1 + G_1G_2H_1 + G_2G_3H_2 + G_1G_2G_3 + G_1G_4 + G_4H_2$

前向：$P_1 = G_1G_2G_3$，$\Delta_1 = 1$

$P_2 = G_1G_4$，$\Delta_2 = 1$

$$\frac{Y(s)}{R(s)} = \frac{G_1G_2G_3 + G_1G_4}{\Delta}$$

2、回路：$L_{11} = -G_2H_1$

$L_{21} = G_1G_2H_1$

$L_{31} = -G_2G_3H_2$

$\Delta = 1 + G_2H_1 - G_1G_2H_1 + G_2G_3H$

前向：$P_1 = G_1G_2G_3$，$\Delta_1 = 1$

$P_2 = G_4$，$\Delta_2 = \Delta$

$$\frac{Y(s)}{R(s)} = \frac{G_1G_2G_3 + G_4(1 + G_2H_1 - G_1G_2H_1 + G_2G_3H_2)}{\Delta}$$

3. 回路：$L_{11} = -G_2H$

$L_{21} = -G_1G_2$

$L_{31} = -G_1G_3$

不相交回路：$L_{12} = G_1G_2G_3H$

$\Delta = 1 + G_2H + G_1G_2 + G_1G_3 + G_1G_2G_3H$

求 $\frac{Y(s)}{R(s)}$：前向 $P_1 = G_1G_2$，$\Delta_1 = 1$

$P_2 = G_1G_3$，$\Delta_2 = 1 + G_2H$

$$\frac{Y(s)}{R(s)} = \frac{G_1G_2 + G_1G_3 + G_1G_2G_3H}{\Delta}$$

求 $\frac{Y(s)}{N(s)}$：$P_1 = 1$，$\Delta_1 = 1 + G_2H$

$P_2 = 1 \cdot G_1G_2G_4$，$\Delta_2 = 1$

$P_3 = G_1G_3G_4$，$\Delta_3 = 1 + G_2H$

$$\frac{Y(s)}{N(s)} = \frac{G_1G_2G_4 + (G_1G_3G_4 - 1)(1 + G_2H)}{\Delta}$$