$$\begin{cases} F(s) = K X_1(s) - K X_2(s) + s^2 M_1 X_1(s) \\ +K X_1(s) = K X_2(s) + s^2 M_2 X_2(s) \end{cases}$$

$$X_1(s) = \frac{K X_2(s) + s^2 M_2 X_2(s)}{K}$$

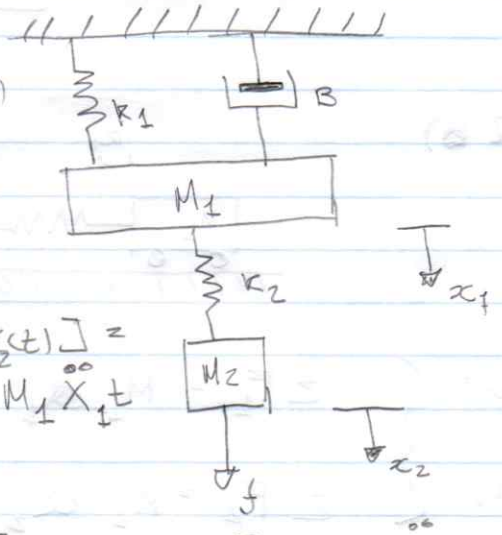
$$\begin{cases} F(s) = X_1(s)(K + s^2 M_1) - K X_2(s) \end{cases}$$

$$\begin{cases} F(s) = \frac{(K X_2(s) + s^2 M_2 X_2(s))}{K} (K + s^2 M_1) - K X_2(s) \end{cases}$$

$$\frac{X_2(s)}{F(s)} = \frac{K}{(s^2 M_1 + K)(s^2 M_2 + K) - K^2} = G(s)$$

2 c)

$\sum F_R = m \cdot a_{(t)}$



$$\begin{cases} \sum F_1 = M_1 a_1 \\ \sum F_2 = M_2 a_2 \end{cases}$$

$$\begin{cases} -K_1 x_1(t) - B \dot{x}_1(t) - K_2 [x_1(t) - x_2(t)] = M_1 \ddot{X}_1 t \\ f(t) - K_2 [x_2(t) - x_1(t)] = M_2 \ddot{x}_2(t) \end{cases}$$

$$\begin{cases} 0 = K_1 x_1(t) + B \dot{x}_1(t) + K_2 [X_1(t) - X_2(t)] + M_1 \ddot{X}_1(t) \\ f(t) = K_2 [X_2(t) - x_1(t)] + M_2 \ddot{X}_2(t) \end{cases}$$

$$\begin{cases} 0 = K_1 X_1(s) + s B X_1(s) + K_2 [X_1(s) - X_2(s)] + s^2 M_1 X_1(s) \\ F(s) = K_2 [X_2(s) - X_1(s)] + s^2 M_2 X_2(s) \end{cases}$$

$$\begin{cases} X_2(s) = \frac{(K_1 + sB + K_2 + s^2 M_1)}{K_2} X_1(s) \\ F(s) = [K_2 + s^2 M_2] \cdot X_2(s) - K_2 \cdot X_1(s) \end{cases}$$