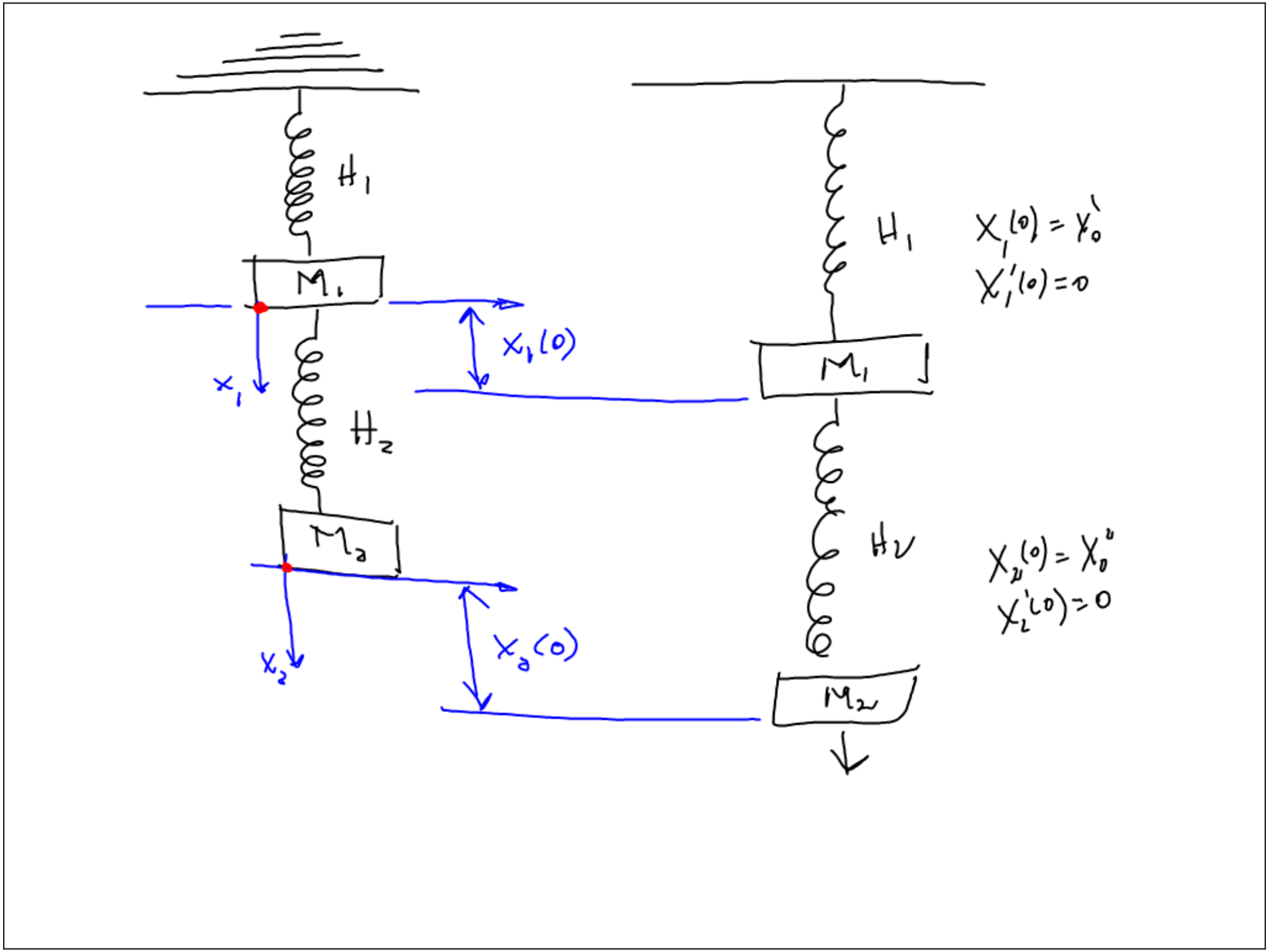
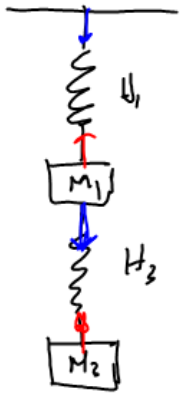

H1
M1
x1
H2
M2
x2
x1(0)
x2(0)
H1
M1
H2
M2
X1(0) = X0'
X1'(0) = 0
X2(0) = X0''
X2'(0) = 0




$$M_1 \frac{d^2 x_1(t)}{dt^2} = -H_1 x_1(t) + H_2\left(x_2(t) - x_1(t)\right)$$

$$M_2 \frac{d^2 x_2(t)}{dt^2} = -H_2\left(x_2(t) - x_1(t)\right)$$

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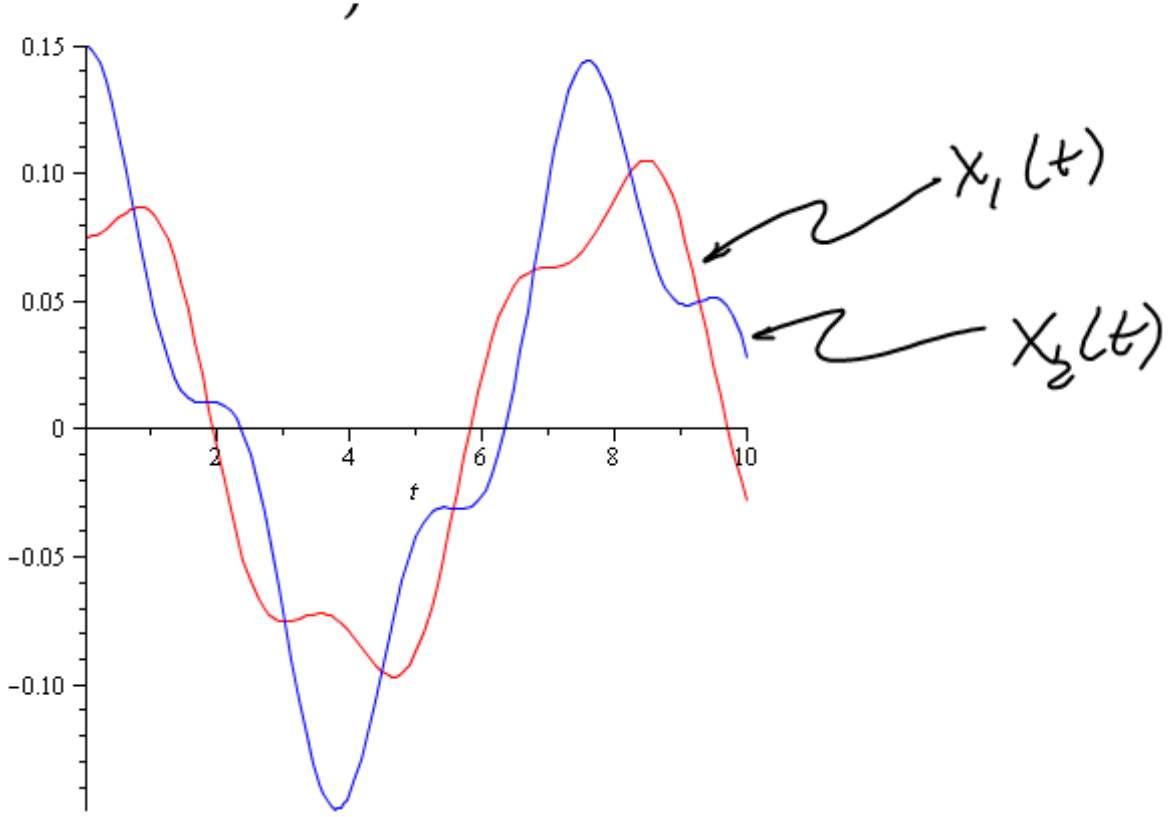
**S(4)EDO(1)LccH.**

$$\begin{cases} x_1(0) = a_1 \\ x_2(0) = a_2 \\ x_3(0) = 0 \\ x_4(0) = 0 \end{cases} \text{ C.I.}$$

$$\begin{cases} \dfrac{dx_1(t)}{dt} = x_3(t) \\ \dfrac{dx_2(t)}{dt} = x_4(t) \\ \dfrac{dx_3(t)}{dt} = \left(-\dfrac{H_1}{M_1} - \dfrac{H_2}{M_1}\right) x_1(t) + \dfrac{H_2}{M_1}\left(x_2(t)\right) \\ \dfrac{dx_4(t)}{dt} = \dfrac{H_2}{M_2} x_1(t) - \dfrac{H_2}{M_2} x_2(t). \end{cases}$$

$$\frac{d}{dt}\begin{bmatrix} x_1(t) \\ x_2(t) \\ x_3(t) \\ x_4(t) \end{bmatrix} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ -\left(\frac{H_1}{M_1} + \frac{H_2}{M_1}\right) & \frac{H_2}{M_1} & 0 & 0 \\ \frac{H_2}{M_2} & -\frac{H_2}{M_2} & 0 & 0 \end{bmatrix} \begin{bmatrix} x_1(t) \\ x_2(t) \\ x_3(t) \\ x_4(t) \end{bmatrix}$$


0.15
0.10
0.05
0
-0.05
-0.10
2
4
6
8
10
t
$X_1(t)$
$X_2(t)$