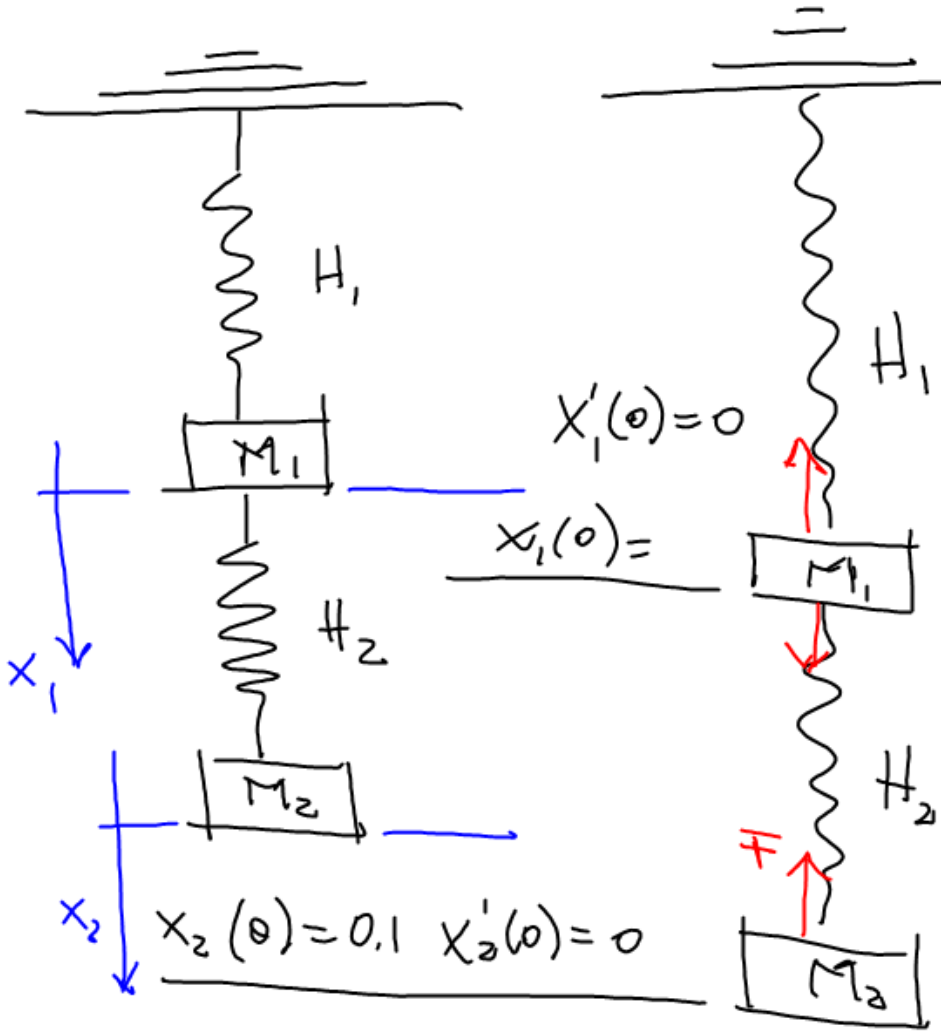

$$M_1 \frac{d^2 x_1}{dt^2} = \sum F_{M_1}$$

$$M_2 \frac{d^2 x_2}{dt^2} = \sum F_{M_2}$$

$$M_1 x_1'' = +H_2(x_2 - x_1) - H_1(x_1)$$

$$M_2 x_2'' = -H_2(x_2 - x_1)$$

$$M_1 x_1'' = H_2 (x_2 - x_1) - H_1 x_1$$

$$M_2 x_2'' = -H_2 (x_2 - x_1)$$

$x_1(0)$

$x_1'(0) = 0$

$x_2(0) = 0.10$

$x_2'(0) = 0$

$$x_1'' = \frac{H_2}{M_1}(x_2 - x_1) - \frac{H_1}{M_1} x_1$$

$$x_2'' = -\frac{H_2}{M_2}(x_2 - x_1)$$

$x_1' = x_3$

$x_2' = x_4$

$x_1(0) = \frac{H_2}{H_1} x_2(0)$

$x_2(0) = 0.10\ [m]$

$x_3(0) = 0$

$x_4(0) = 0$

$$x_1' = x_3$$

$$x_2' = x_4$$

$$x_3' = \left(-\frac{H_2}{M_1} - \frac{H_1}{M_1}\right) x_1 + \left(\frac{H_2}{M_1}\right) x_2$$

$$x_4' = \frac{H_2}{M_2} x_1 - \frac{H_2}{M_2} x_2$$

$S(4) \in Do(1) \subset cc\, H$

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

A

$$\bar{X}(0) = \begin{bmatrix} \frac{H_1}{H_2} \cdot \frac{1}{10} \\ \frac{1}{10} \\ 0 \\ 0 \end{bmatrix}$$

e^{At}

$$\bar{X} = e^{At} \cdot \bar{X}(0)$$