

$$\frac{dx}{dt} = -x + y + z + e^t$$

$$x(0) = 6$$

$$\frac{dy}{dt} = x - y + z + e^{3t}$$

$$y(0) = -2$$

$$\frac{dz}{dt} = x + y + z + 4$$

$$z(0) = 10$$

$$\frac{dx_1}{dt} = x_2$$

$$x_1(0) = 0$$

$$\frac{dx_2}{dt} = -2x_2 - 5x_3 + 3$$

$$x_2(0) = 0$$

$$\frac{dx_3}{dt} = x_2 + 2x_3$$

$$x_3(0) = 1$$

CASO I:

$$M_1 = M_2$$

$$k_1 < k_2$$

CASO II

$$M_1 = M_2$$

$$k_1 > k_2$$

CASO III

$$M_1 > M_2$$

$$k_1 = k_2$$

$$M_1 \frac{d^2 x_1}{dt^2} = -k_1 x_1 + k_2 (x_2 - x_1)$$

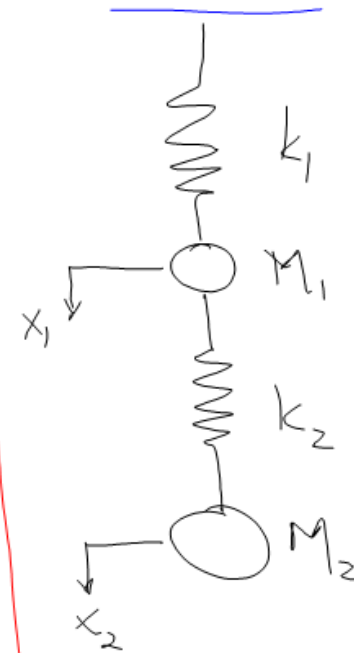
$$M_2 \frac{d^2 x_2}{dt^2} = -k_2 (x_2 - x_1)$$

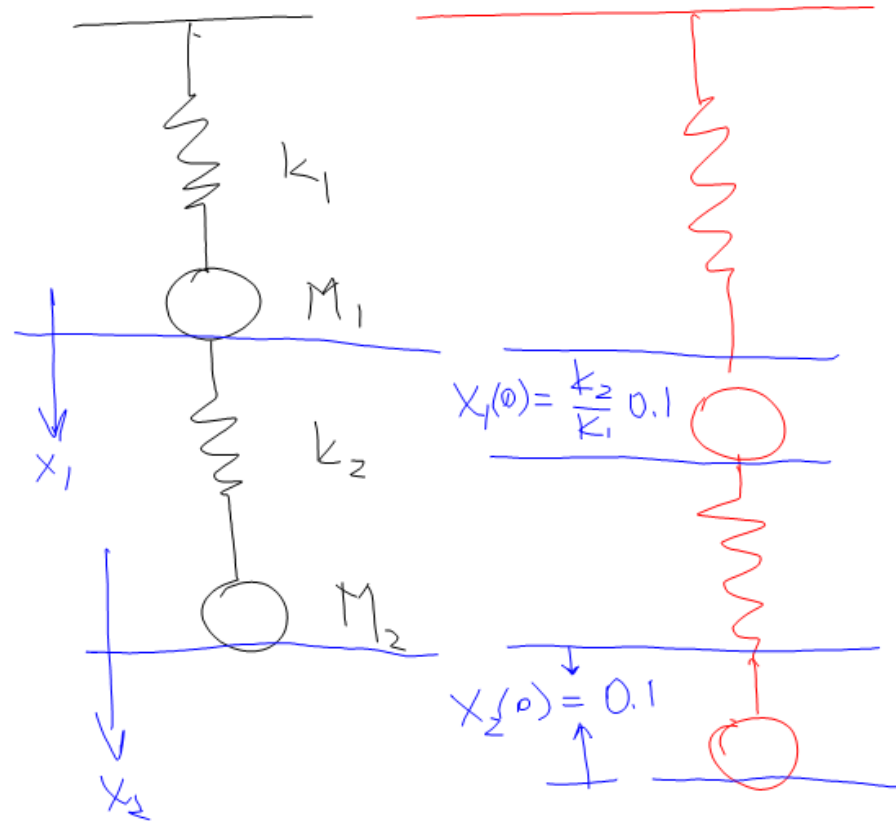
$$\frac{dx_1}{dt} = x_3$$

$$\frac{dx_2}{dt} = x_4$$

$$\frac{dx_3}{dt} = \left(-\frac{k_1}{M_1} - \frac{k_2}{M_1} \right) x_1 + \frac{k_2}{M_1} x_2$$

$$\frac{dx_4}{dt} = \frac{k_2}{M_2} x_1 - \frac{k_2}{M_2} x_2$$





$$x_1(0) = \frac{k_2}{k_1}(0.1)$$

$$\frac{dx_1}{dt}(0) = 0$$

$$x_2(0) = 0.1 \text{ [m]}$$

$$\frac{dx_2}{dt}(0) = 0$$

