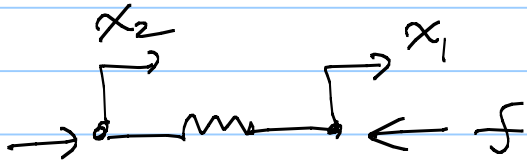


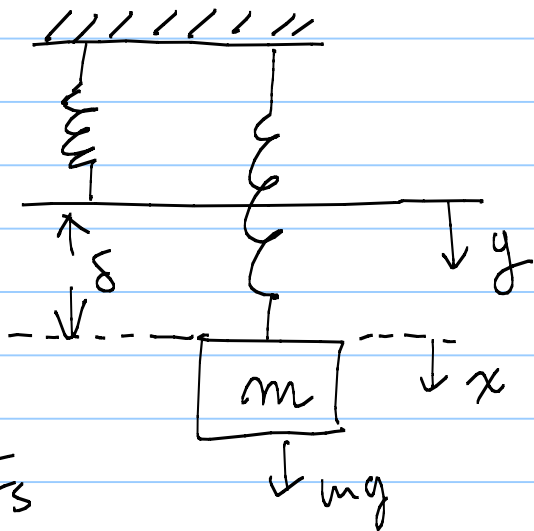
$$f = k(x_2 - x_1)$$

$$x_2 - x_1 > 0$$



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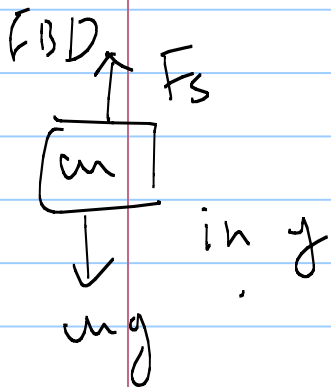


$$mg = k\delta$$

$$\Sigma F = ma$$

$$y = x + \delta, \quad \dot{y} = \dot{x}$$

$$\ddot{y} = \ddot{x}$$



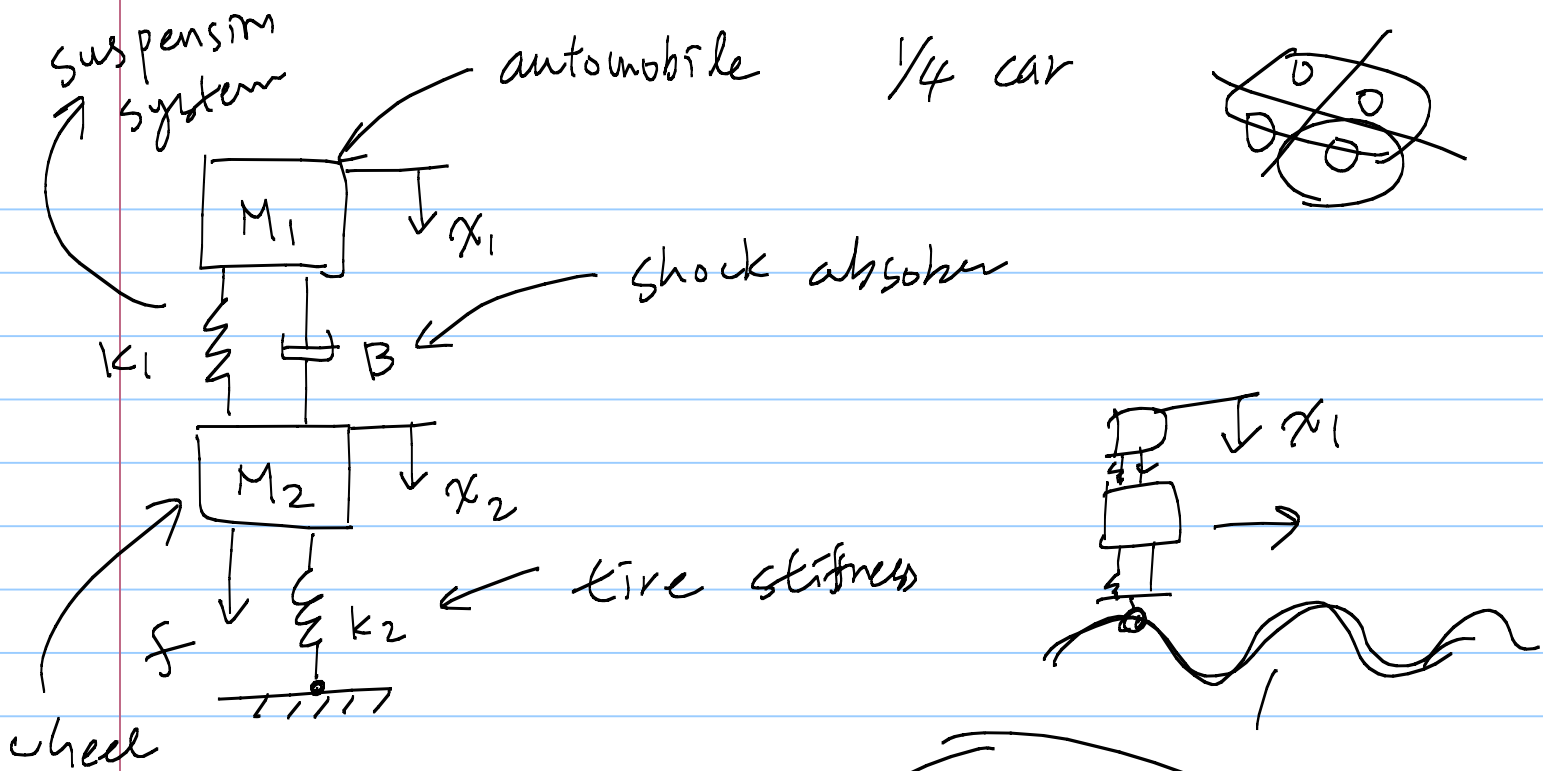
$$m\ddot{y} = mg - ky$$

in \textcircled{x}

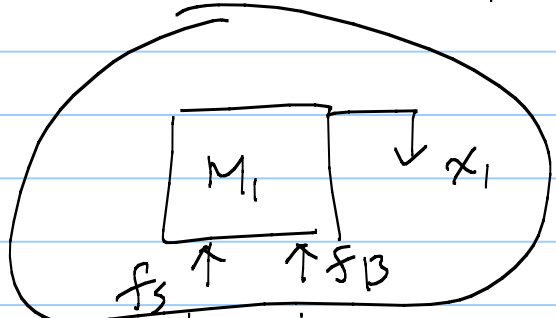
$$m\ddot{x} = mg - k(x + \delta)$$

$$= \cancel{mg} - kx - \cancel{k\delta}$$

$$\rightarrow m\ddot{x} = -kx$$



FBD

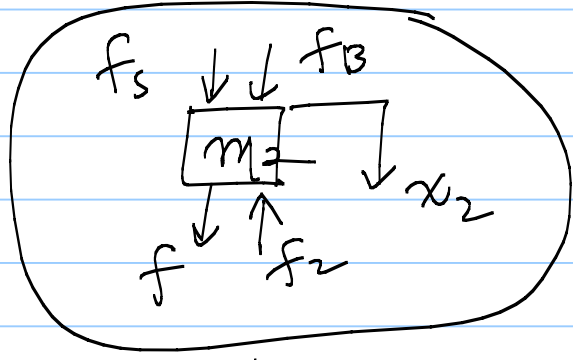


$$K(x_1 - x_2) = f_s$$

$$f_B = B(\dot{x}_1 - \dot{x}_2)$$

$$\sum F_i = ma$$

$$m_1 \ddot{x}_1 = -B(\dot{x}_1 - \dot{x}_2) - k(x_1 - x_2)$$



$$f_2 = kx_2$$

$$m_1 \ddot{x}_1 + B \dot{x}_1 + kx_1 = B \dot{x}_2 + kx_2$$

$$\mathcal{L} \left\{ (m_1 s^2 + Bs + k) X_1(s) = (Bs + k) \cdot X_2(s) \right.$$

$$\frac{X_1(s)}{X_2(s)} = \frac{Bs + k}{m_1 s^2 + Bs + k}$$

