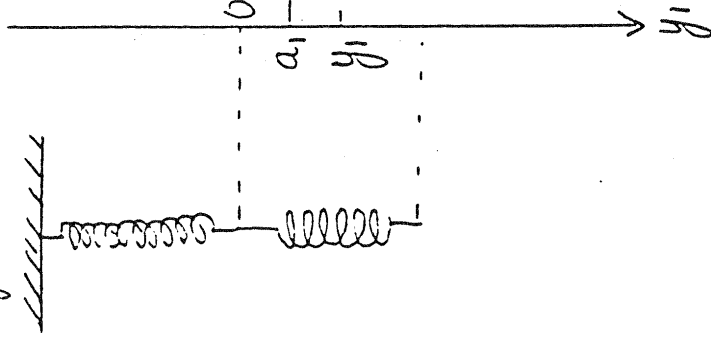
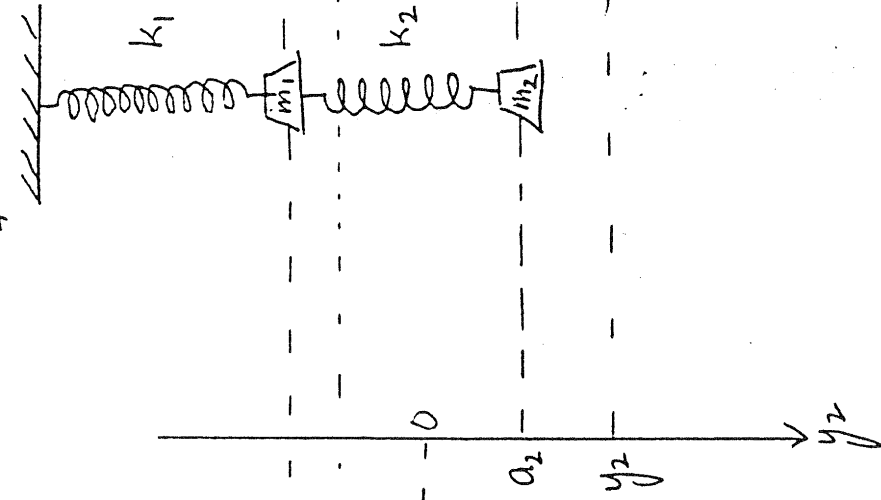


Springs (two) only, at rest



Springs and masses, at equilibrium



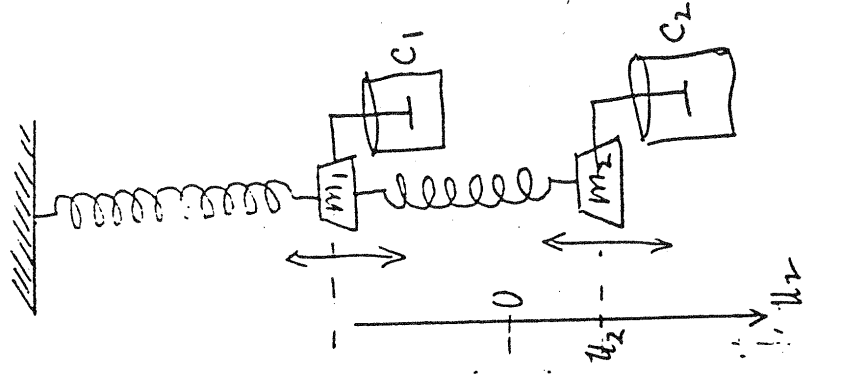
$$(m_1 + m_2)g = k_1 a_1 - \frac{-k_2(a_2 - a_1)}{-u_1}$$

$$m_2 g = k_2 (a_2 - a_1)$$

$$u_1 = y_1 - a_1$$

$$u_2 = y_2 - a_2$$

System (with damping) in motion



Newton's Law Equations:

$$\underbrace{(m_1 + m_2)g - c_1 y_1' - k_1 y_1 + k_2 (y_2 - y_1)}_{= k_1 a_1 - k_2 (a_2 - a_1)} = m_1 y_1''$$

$$\underbrace{m_2 g - c_2 y_2' - k_2 (y_2 - y_1)}_{= k_2 (a_2 - a_1)} = m_2 y_2''$$

or:

$$m_1 u_1'' + c_1 u_1' + (k_1 + k_2) u_1 + k_2 u_2 = 0$$

$$m_2 u_2'' + c_2 u_2' + k_2 u_2 - k_2 u_1 = 0$$