We have the following three equivalent relations

$$\frac{m_i m_j (q_i - q_j)^2}{MI} = \frac{m_k v_k^2}{K}, \quad \frac{m_k q_k^2}{I} = \frac{m_i m_j (v_i - v_j)^2}{MK},$$

$$\frac{m_k q_k^2}{I} + \frac{m_k v_k^2}{K} = \frac{m_i m_j (q_i - q_j)^2}{MI} + \frac{m_i m_j (v_i - v_j)^2}{MK}$$

$$= \frac{m_i + m_j}{M}.$$

$(i, j, k) = (1, 2, 3), (2, 3, 1), (3, 1, 2).$