Bessere Koordinaten : x_s, ϑ

$$x_s = \frac{m_1 x_1 + m_2 x_2}{m_1 + m_2}$$

$$= \frac{1}{m_1 + m_2} \left(m_1 x_1 + m_2 x_1 + m_2 \ell \sin\vartheta \right)$$

$$x_s = x_1 + \frac{m_2}{m_1 + m_2} \ell \sin\vartheta$$

$$x_1 = x_s - \frac{m_2}{m_1 + m_2} \ell \sin\vartheta$$

$$x_2 = x_s + \frac{m_1}{m_1 + m_2} \ell \sin\vartheta$$

$$x_2 = x_s - \frac{m_2}{m_1 + m_2} \ell \sin\vartheta + \ell \sin\vartheta$$

$$= x_s + \frac{\ell \sin\vartheta}{m_1 + m_2} \left(m_1 + m_2 - m_2 \right)$$