Referat

(1) E-satz: $\frac{1}{2} m_1 v_1^2 + \frac{1}{2} m_2 v_2^2 = \frac{1}{2} m_1 u_1^2 + \frac{1}{2} m_2 u_2^2$

(2) I-satz: $m_1 v_1 + m_2 v_2 = m_1 u_1 + m_2 u_2$

aus (1) folgt:

$m_1 (v_1^2 - u_1^2) = m_2 (u_2^2 - v_2^2)$

(3) $\Rightarrow m_1 (v_1 - u_1)(v_1 + u_1) = m_2 (u_2 - v_2)(u_2 + v_2)$

aus (2) folgt

(4) $\quad m_1 (v_1 - u_1) = m_2 (u_2 - v_2)$

(3) : (4) :

(5) $\quad v_1 + u_1 = u_2 + v_2$

nach u_2 auflösen: ~~oder $u_1 = u_2 + v_2 - v_1$~~

(6) $\quad u_2 = v_1 + u_1 - v_2$

(6) in (4):

$\quad m_1 v_1 - m_1 u_1 = m_2 v_1 + m_2 u_1 - 2 m_2 v_2$

$\quad u_1 (m_1 + m_2) = (m_1 - m_2) v_1 + 2 m_2 v_2$

$$u_1 = \frac{(m_1 - m_2) v_1 + 2 m_2 v_2}{m_1 + m_2}$$

$$u_2 = \frac{(m_2 - m_1) v_2 + 2 m_1 v_1}{m_1 + m_2}$$