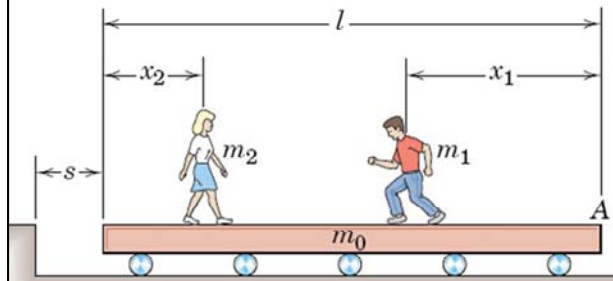


Question of the Day

A man of **mass** m_1 and woman of **mass** m_2 are at opposite ends and begin to approach each other on a platform of **mass** m_0 which moves with negligible friction and initially at rest with $s = 0$.

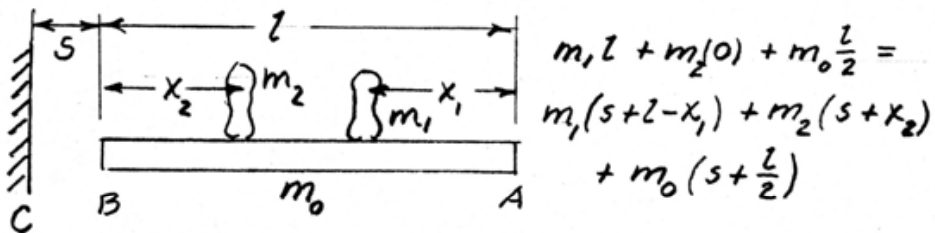


Determine an expression for the **displacement** s of the platform when the two meet **in terms** of x_1 relative to the platform.

ME 231: Dynamics

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With respect to C, $\sum m_i x_i = \text{constant}$



$$m_1 l + m_2(0) + m_0 \frac{l}{2} = m_1(s+l-x_1) + m_2(s+x_2) + m_0(s+\frac{l}{2})$$

Simplify & get $s = \frac{m_1 x_1 - m_2 x_2}{m_0 + m_1 + m_2}$

But they meet when $x_2 + x_1 = l$ so

$$s = \frac{(m_1 + m_2) x_1 - m_2 l}{m_0 + m_1 + m_2}$$