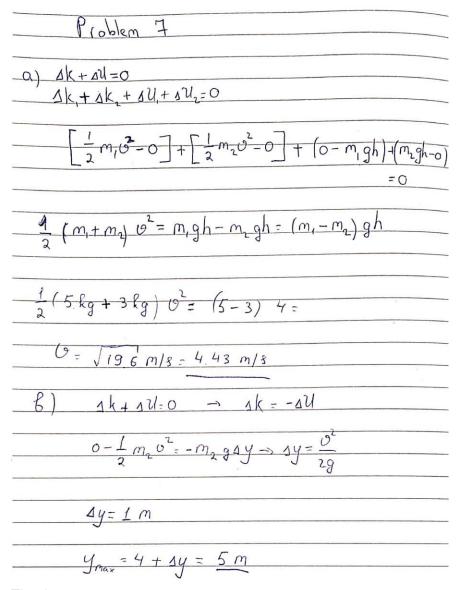## Objective question 2

Answer (c). When the individual exits the trampoline board, it is just conservative (its weight) that works on it. The athlete-earth device therefore retains its overall mechanical energy throughout its flight: Kf + Uf = Ki + Ui. Also, when the full height is exceeded, her speed is zero or Kf = 0. This gives the maximum height as Uf = Ki or mgymax = ½ mvi2

ymax =v2i

2g=(8.5 m/s)2

2(9.80 m/s2) = 3.7 m.

Problem 7

Problem 7

a) $\Delta k + \Delta u = 0$

$\Delta k_1 + \Delta k_2 + \Delta u_1 + \Delta u_2 = 0$

$$\left[\frac{1}{2}m_1 v^2 - 0\right] + \left[\frac{1}{2}m_2 v^2 - 0\right] + \left(0 - m_1 gh\right) + \left(m_2 gh - 0\right) = 0$$

$$\frac{1}{2}(m_1 + m_2)v^2 = m_1 gh - m_2 gh = (m_1 - m_2)gh$$

$$\frac{1}{2}(5\,kg + 3\,kg)\,v^2 = (5 - 3)\,4 =$$

$$v = \sqrt{19.6}\,m/s = 4.43\,m/s$$

b) $\Delta k + \Delta u = 0 \quad \rightarrow \quad \Delta k = -\Delta u$

$$0 - \frac{1}{2}m_2 v^2 = -m_2 g \Delta y \Rightarrow \Delta y = \frac{v^2}{2g}$$

$$\Delta y = 1\,m$$

$$y_{max} = 4 + \Delta y = 5\,m$$

Thank you

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