What is speed of mass 2?

\[ \Delta E = 0 \quad \text{(isolated system \ (Earth + mass))} \]

\[ k_2 + u_2 = k_1 + k_1, \]

\[ \frac{1}{2}y_1v_1^2 + y_1g y_1 = \frac{1}{2}y_2v_2^2 + y_2g y_2 \]

\[ \frac{1}{2}v_2^2 = \frac{1}{2}v_1^2 + g (y_1 - y_2) \]

\[ v_2^2 = v_1^2 + 2g (y_1 - y_2) \]

\[ = \sqrt{(2 \cdot \frac{1}{2}v_1^2) + 2 \cdot (5.8 \cdot 10^{-3}) (8m)} \]

\[ v_2 = 12.7 \text{ m/s} \]

\[ v \propto \sqrt{gh} \]