Answer on Question #84620 - physics - Relativity

1. Block of mass M1 shown in the figure is fastened to the spring and block of mass M2 is placed against it the blocks are pushed for the distance of 2/ K M1+ M2 g sintheta against the spring and released what is the speed of the block at the time of separation

Answer : Calculate the common speed by the relationa s follows:

$\frac{(m_1+m_2)V^2}{2} - 0 = \frac{(x_1+x_2)k}{2}$ - $(m_1 + m_2)gsin\theta(x + x_1)$

Here, m1 ,m2 are the masses of the block respectively. θ is the angle of system from the horizontal and v is the final velocity of blocks after separation and $(x_1 + x)$ $is\ the\ t$otal displacement of the system.

$\frac{(m_1+m_2)V^2}{2} = (\frac{k}{2})(\frac{3}{k})\ (m_1 + m_2)gsin\theta$ - $(m_1 + m_2)gsin\theta(x + x_1)$

$$\frac{(m_1 + m_2)V^2}{2} = \frac{(m_1 + m_2)gsin\theta}{2} \times \left(\frac{3}{k}\right)(m_1 + m_2)gsin\theta$$

$$V = \sqrt{\frac{3}{k(m_1 + m_2)}}\, gsin\theta$$

Answer:

$$V = \sqrt{\frac{3}{k(m_1 + m_2)}}\, gsin\theta$$