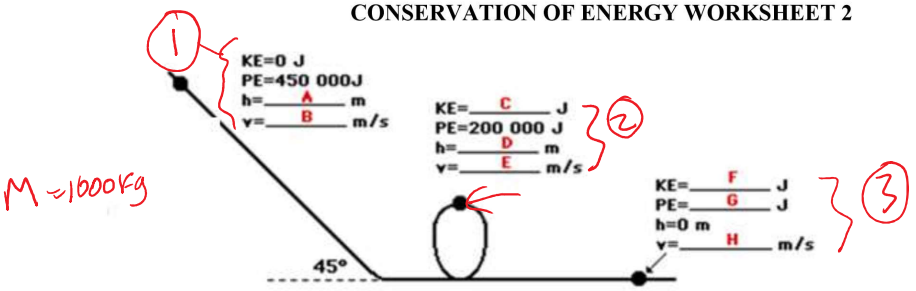
CONSERVATION OF ENERGY WORKSHEET 2



M = 1000kg

Assume that the mass of the object moving through the track is 1,000 kg. Using the Conservation of Energy and assuming no friction, fill in each of the blanks.

A. $h_1 = ?$ $PE_1 = mgh_1 \rightarrow h_1 = \frac{PE_1}{mg} = \frac{450{,}000J}{(1000kg)(9.81 m/s^2)} = 45.9m$

B. $v_1 = ?$ $KE_1 = 0J$ so $v_1 = 0 m/s$

C. $KE_2 = ?$ $KE_1 + PE_1 = KE_2 + PE_2$ (KE1 = 0) $\rightarrow 450{,}000J = KE_2 + 200{,}000J \rightarrow KE_2 = 250{,}000J$

D. $h_2 = ?$ $PE_2 = mgh_2 \rightarrow h_2 = \frac{PE_2}{mg} = \frac{200{,}000J}{(1000kg)(9.81 m/s^2)} = 20.4m$

E. $v_2 = ?$ $KE_2 = \frac{1}{2}mv_2^2 \rightarrow v_2 = \sqrt{\frac{2KE_2}{m}} = \sqrt{\frac{2(250{,}000J)}{1000kg}} = 22.4 m/s$

F. $KE_3 = ?$ $h_3 = 0$ $KE_1 + PE_1 = KE_3 + PE_3$ ($h_3 = 0$) $\rightarrow 450{,}000J = KE_3$

G. $h_3 = 0$ so $PE_3 = 0J$

H. $v_3 = ?$ $KE_3 = \frac{1}{2}mv_3^2 \rightarrow v_3 = \sqrt{\frac{2KE_3}{m}} = \sqrt{\frac{2(450{,}000J)}{1000kg}} = 30.0 m/s$

CONTINUED ON THE BACK