**Answer on Question#37802 -Physics – Mechanics | Kinematics | Dynamics**

A pendulum bob is released from some initial height such as the speed of the bob at the bottom of the swing is 1.0 m/s. What is the initial height of the bob? Answer in units of m

**Solution:**

We can use conservation on Energy equation:

$$W_{top} = W_{bottom}$$

So for any increase in KE, there is an equal decrease in PE.

At the initial height all the energy is PE since the mass isn't moving ($W_{KE} = 0$). At the bottom of the swing, where $v = 1\frac{m}{s}$, the energy is all converted to KE ($W_{PE} = 0$).

$$mgh = \frac{mv^2}{2}$$

$$h = \frac{v^2}{2g} = \frac{\left(1\frac{m}{s}\right)^2}{2 \cdot 9.8\frac{m}{s^2}} = 51 \times 10^{-3} m$$

**Answer:** height of the bob is $51 \times 10^{-3} m$.