1.
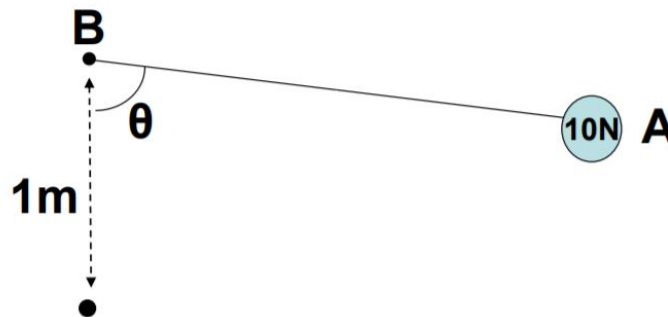
The 10N pendulum 2m in length is released from pt. A with an initial speed tangent to its circular path. The pendulum falls striking a peg 1m below point B. When the pendulum bob reaches point B, it comes to rest momentarily. Determine the initial speed of the pendulum. The angle the pendulum makes with the vertical is $\theta=72^0$.

B

θ

1m

10N **A**

2. A satellite in circular orbit around the Earth moves at constant speed. This orbit is maintained by the force of gravity between the Earth and the satellite, yet no work is done on the satellite. How is this possible? *Hint:* Try calculate the work done by the gravitational force between any two points on the satellite's trajectory.

3. You drop a ball from a height of 2.0m, and it bounces back to a height of 1.6m. *a)* What fraction of its initial energy is lost during the bounce? *b)* What is the ball's speed just before and just after the bounce? *c)* Where did the energy go?

4. An 18kg sled starts up a 28° incline with a speed of 2.3m/s. The coefficient of kinetic friction $\mu_k = 0.25$. *a)* How far up the incline does the sled travel? *b)* What must the coefficient of static friction μ_s be less than if the sled is not to get stuck at the point determined in part *a)*? *c)* If the sled slides back down, what is its speed when it returns to its starting point?