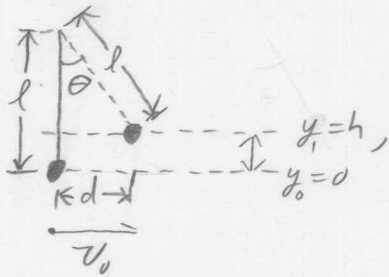


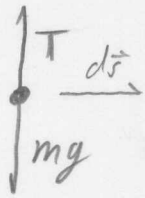
Physics III  
Homework

Ch7-64

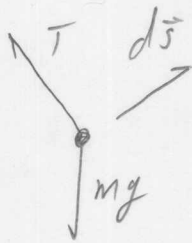


$$h = l - l \cos \theta, \quad d = l \sin \theta$$

$$\Rightarrow \theta = \sin^{-1} \left( \frac{l}{d} \right)$$



Initial



Final

$$U_I = mgy_0, \quad y_0 = 0$$

$$U_F = mgy_1$$

$$\underbrace{W_T}_{NCF} = \int \vec{T} \cdot d\vec{s} = 0, \quad \vec{T} \perp d\vec{s}$$

$$K_I = \frac{1}{2} m v_0^2$$

$$K_F = 0$$

Conserve...

$$U_I + K_I + W_{NCF} = U_F + K_F$$

$$\frac{1}{2} m v_0^2 = mg(l - l \cos \theta)$$

$$v_0 = \left[ 2gl \left( 1 - \cos \left( \sin^{-1} \left( \frac{l}{d} \right) \right) \right) \right]^{1/2}$$