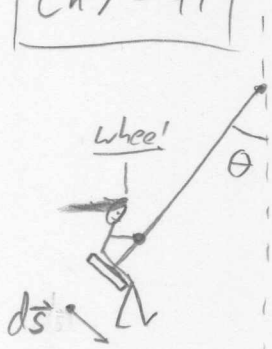
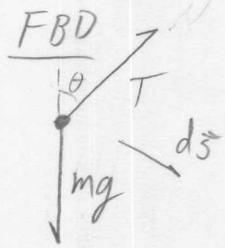
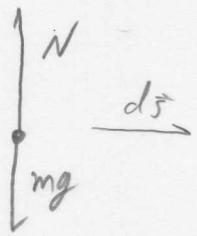
Physics Homework
111

Ch 7 - 41



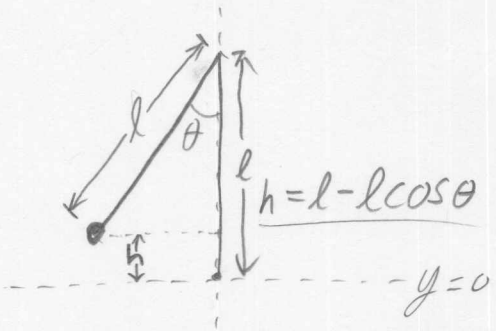


Initial



Final

The "Final" position is at the bottom of the swing when she has achieved maximum velocity, having converted all of the available potential energy into kinetic energy.



$\ell = 3.2\,m$

$\theta = 50°$

$U_I = mgh \qquad U_F = 0$

$K_I = 0$ ↑ Stop at max. θ $\qquad K_F = \frac{1}{2}mv^2$

NCF

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

conserve

$mgh = \frac{1}{2}mv^2$

$g\ell(1-\cos\theta) = \frac{1}{2}v^2$

$$\boxed{v = \left(2g\ell(1-\cos\theta)\right)^{1/2}}$$