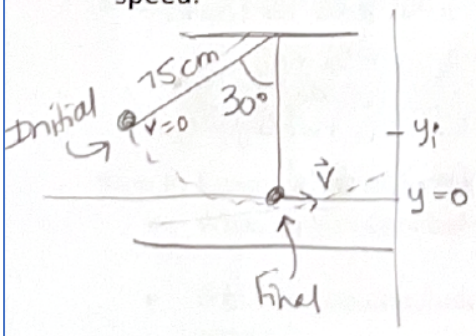
Evaluate your work for each problem. Did you…

- ☐ Indicate the Initial and Final states of the scenario you were analyzing?
- ☐ Define the system by state the objects I am including in it?
- ☐ Write the energy equation for the scenario
- ☐ Substitute numbers with units
- ☐ Correctly solve for the needed quantity and include units?

Problem 2: Page 256 #9. First write an energy equation for the scenario, then solve for the speed.



system: Ball, earth

$E_i + W = E_f$ → no work done by external force of tension

$U_{Gi} = K_f$

$mgy_i = \frac{1}{2}mv_f^2$

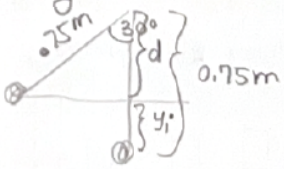
$gy_i = \frac{1}{2}v_f^2$

$(9.8\frac{N}{m})(0.10m) = \frac{1}{2}v_f^2$

$.98 = v_f^2$

$.99 m/s = v_f$

I need to find y_i: I can use geometry/trig

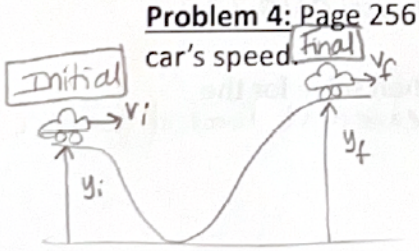


$\cos 30° = \frac{d}{0.75m}$

$d = .65m$

$y_i = 0.75m - 0.65m = 0.10m$

Problem 4: Page 256 #11. First write an energy equation for the scenario, then solve for the car's speed.



system: car, earth

$E_i + W = E_f$ → work is zero because the external force of the road, $\vec{n}$, is ⊥ to displacement and does no work.

Assume rolling friction is negligible.

$U_{Gi} + K_i = U_{Gf} + K_f$

$mgy_i + \frac{1}{2}mv_i^2 = mgy_f + \frac{1}{2}mv_f^2$

$(9.8 N/kg)(10m) + \frac{1}{2}(10 m/s)^2 = (9.8 N/kg)(15m) + \frac{1}{2}v_f^2$

$98 + 50 = 147 + \frac{1}{2}v_f^2$

$1.4 m/s = v_f$