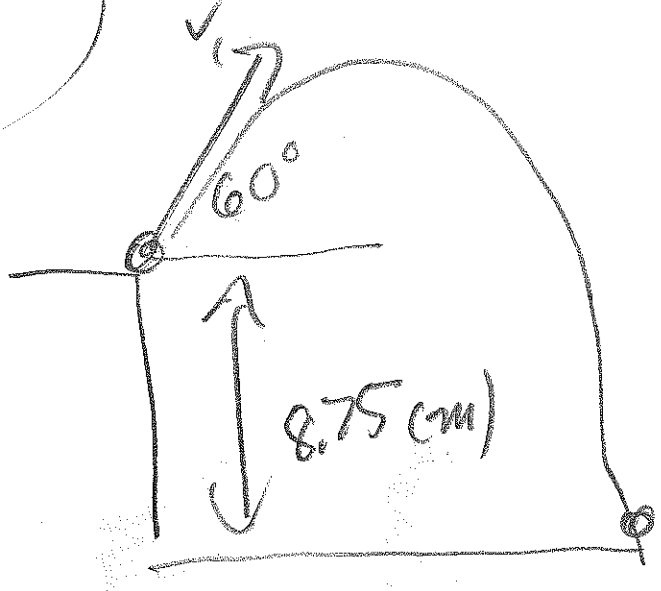
3-1-13

PHYSICS HW

comments on # 56, 65 - Q4, CW 3

56



$\Delta y = -8.75 = 15 \cdot \sin 60 \cdot \Delta t - \frac{1}{2} g \Delta t^2$

solve quadratic equation

and get $3.2\,(s) = \Delta t_{TOTAL}$

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other ways: Get Δt_{TOTAL}: FIND v_f;

v_{f_y}; then use $\Delta y = \bar{v}_y \cdot \Delta t$

where $\Delta y = -8.75\,(m)$

$v_{f_y}^2 = v_{i_y}^2 - 2g\Delta y = (15\sin 60)^2 - 2(9.8)(-8.75)$

$v_{f_y} = -\sqrt{(225)\sin^2 60 + (2)(9.8)(8.75)} = -18.95\ m/s$

$$\Delta t = \frac{\Delta y}{V_y} = \frac{-8.75(cm)}{\left(\frac{V_{iy} + V_{fy}}{2}\right)}$$

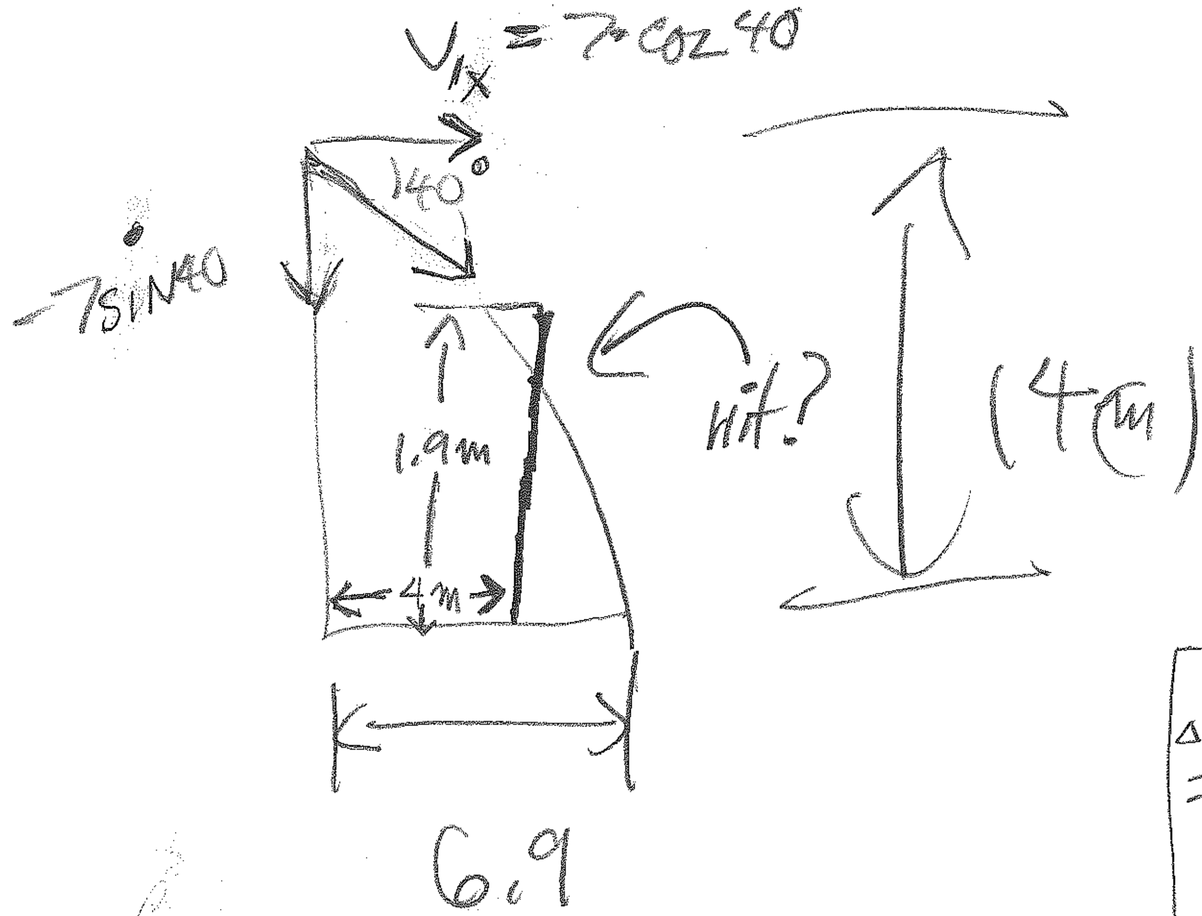
$$V_{iy} = 12.99 \frac{cm}{s} = 155 \sin 60 \frac{cm}{s}$$

$$V_{fy} = -18.45 \frac{cm}{s}$$

$$\text{Thus: } \Delta t = \frac{(-8.75(cm)) \cdot 2}{(12.99 - 18.45)}$$

$$= 3.2(s)$$

#65 — comment, Ch 3, Quiz 4



$\Delta t = \frac{-17.1-(-4.5)}{-9.8} = 1.29(s)$

(a.) $6.9 = 7\cdot\cos 40\cdot\Delta t$

and $\Delta t = \frac{v_{fy} - v_{iy}}{-g} \Leftrightarrow g = \frac{\Delta v}{\Delta t}$

$v_{fy} = -\sqrt{(-7\sin 40)^2 + 29.14} = -17.1\ m/s$

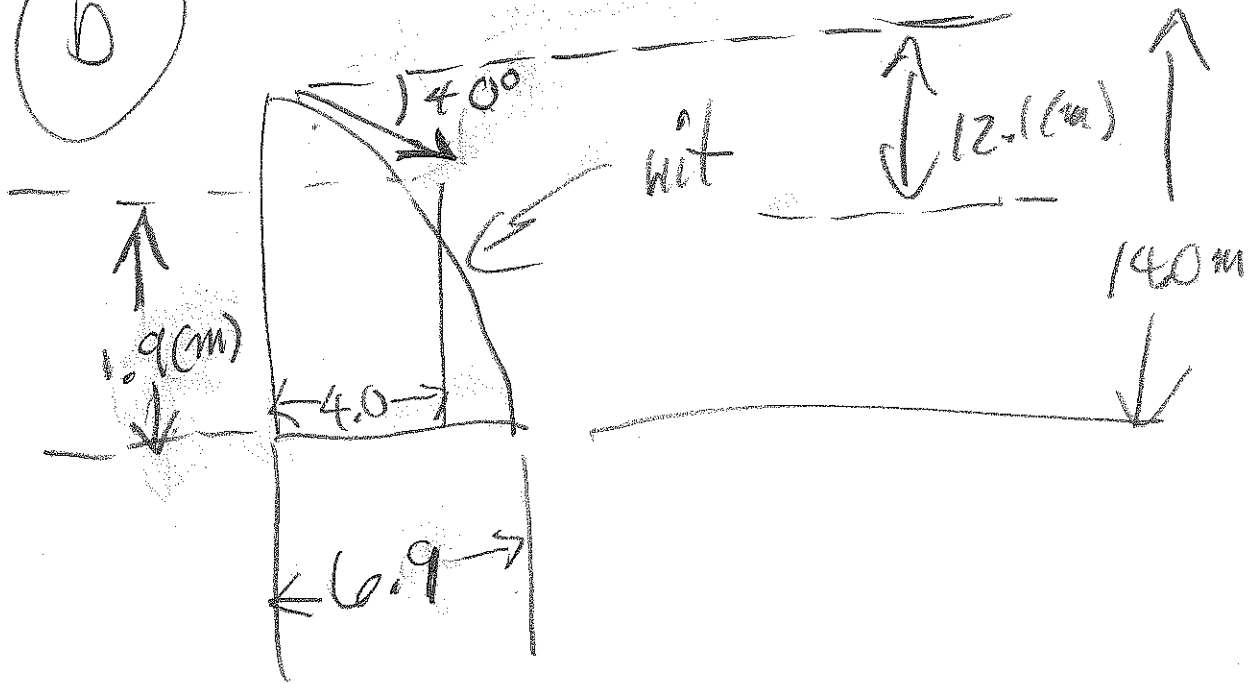
$\Delta t = 1.29(s)$

(c) ✓

(a) $\Delta x = 7.0 \cos 40 \cdot \Delta t = 6.9\,(cm)$

$(\Delta t = 1.29\,(s))$

(b)



CHECK $4.0\,(cm) = 7.0 \cos 40 \cdot \Delta t$

$$\Delta t = \frac{4.0\,(cm)}{7.0 \cos 40\,(cm/s)}$$

$$= 0.746\,(s)$$

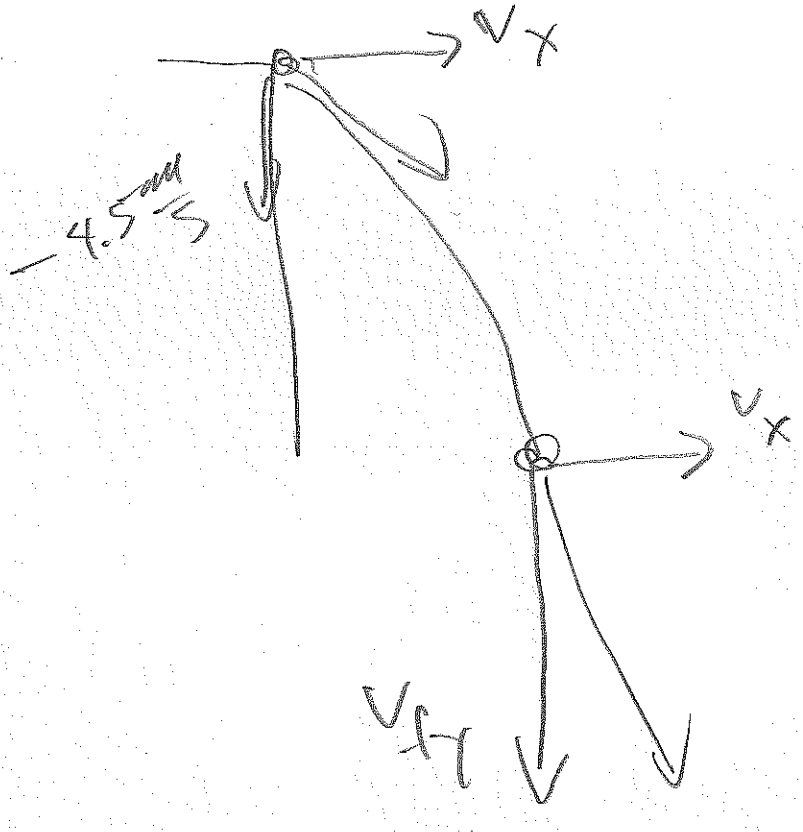
NOW CHECK: $\Delta y = -7.\sin 40 \cdot \Delta t - \frac{1}{2} g \cdot \Delta t^2$

$$\Delta y = -(7)(\sin 40)(0.746) - \frac{1}{2}(9.8)(0.746)^2$$

$$= -3.36 - 2.73 = -6.08\,(cm)$$

NO Bounce needed

continuing for #65 (b)



Set $-12.1 = -4.5\frac{m}{s}\Delta t - \frac{1}{2}g\Delta t^2$

find Δt.

Then check: $\Delta x = 7\cdot\cos 40\cdot\Delta t$

IF $4(m) < 7\cdot\cos 40\cdot\Delta t$, no bang.

$\frac{1}{2}g\Delta t^2 + 4.5\Delta t - 12.1 = 0 \rightarrow \Delta t = \frac{-4.5 \pm \sqrt{4.5^2 + 4(\frac{1}{2}g)(12.1)}}{g}$

$\Delta t = 1.17(s)$

$$\Delta x = 7.0 \cos 90^\circ (1.17)$$

$$= 6.3 \text{ (m)}$$

Since $4.0 \text{ (m)} < 6.3 \text{ (m)}$, no hit.