TEST – FRIDAY 10/17

PART I 2-3 MINS.

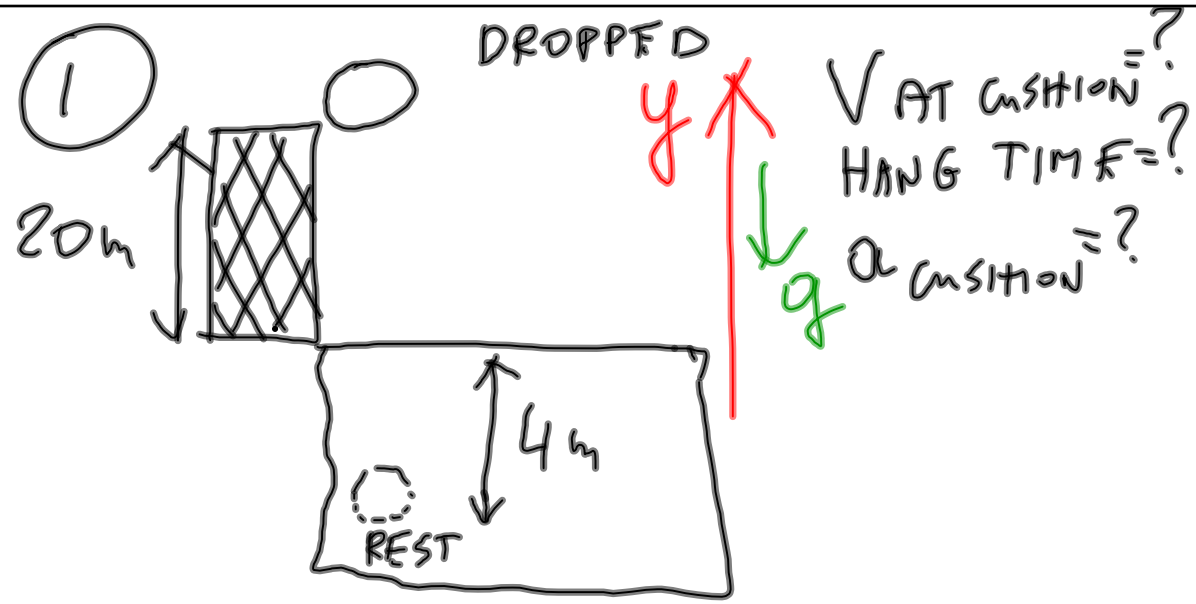
EXCHANGE II & III

PART II – 16 MC

PART III – 1 FR { a b c d

90 pts.

Oct 15-1:13 PM



BALL CAME TO REST 4 m BELOW THE SURFACE OF THE CUSHION.

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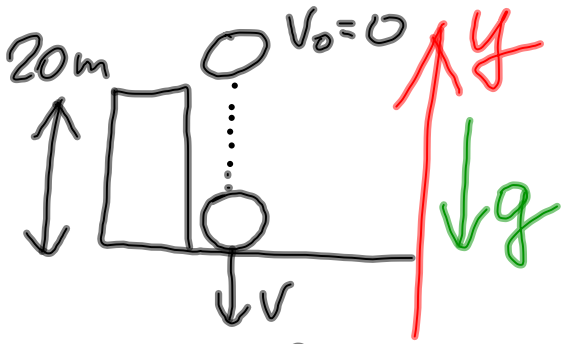
These are really 2 problems.
1. Free fall problem from the top of the building to the surface of the cushion.
2. Kinematics problem from the surface of the cushion until it stops.

Oct 15-2:41 PM



$$\Delta y = \frac{V^2 - V_0^2}{2g}$$

$$-20 = \frac{V^2 - 0^2}{2(-9.8)}$$

$V_0 = 0$
$V = ?$
$g = -9.8 \frac{m}{s^2}$
$t = ?$
$\Delta y = -20\ m$

$V^2 = \#$

$V = -19.8 \frac{m}{s}$

Oct 16-9:37 AM

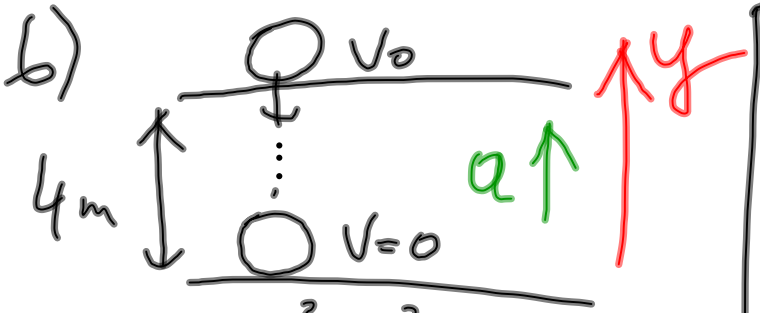
$$V = V_0 + gt$$

$$-19.8 = 0 - 9.8t$$

$$\boxed{t = 2.02\ s}$$

Oct 16-9:40 AM

b)



$V_0 = -19.8\ \frac{m}{s}$

$V = 0$

$a = ?$

$t = ?$

$\Delta y = -4\ m$

$$\Delta y = \frac{V^2 - V_0^2}{2a}$$

$$-4 = \frac{0^2 - (-19.8)^2}{2a}$$

$$\boxed{a = 49\ \frac{m}{s^2}} \quad \pm 5 g_s$$

Oct 16-9:43 AM

$V_{AT\ CUSHION} = -19.8 \frac{m}{s}$

$t = 2.02\ s$

$V_{AT\ CUSHION\ FROM\ FREE\ FALL} = V_{0\ INSIDE\ CUSHION}$

$a = 49.0 \frac{m}{s^2}$

Oct 15-1:27 PM