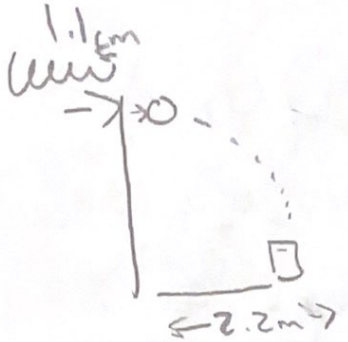
Nobu Magensky

9)



1.1 compressed

.27 short

$V_s = \frac{1}{2} k \Delta x^2$

$\omega_0 = \sqrt{\frac{g}{L}}$

$x = v_0 t$ $\quad g = 10$

$F = -kx$

$h = \frac{1}{2} g t^2$

$\frac{1}{2} m v_0 = \frac{1}{2} k l^2$

$x = v_0 \sqrt{2hg}$

$I_1 = \frac{2.2}{1.93} = 1.25$ cm back

10) $m = .2\,kg$ $V_0 = 0$ $h = 3$ $\theta = 30°$

$g = 10\ m/s^2$ $I = \frac{1}{2} MR^2$

$I = \frac{1}{2}(.2)(\ )$

$I = .831$

$\Delta y = \frac{1}{2} a_x t^2$

$3 = \frac{1}{2} 10\cos(30) t^2$

b) ~~$\omega = \omega_0 + \alpha t$~~

~~$\omega = 0 + 10\cos(30) t$~~

$\omega^2 = \omega_0^2 + 2\alpha\theta$

$\omega^2 = 0 + 2(10\cos(30))$

$\omega^2 = 10\sqrt{3}$

$= 4.16179$

Nolan Magensky

11) a) T_A & T_B

A	4×10^5	$.5\times10^{-3}$	300 K $= T_A$	> -180
B	4×10^5	2×10^{-3}	120 K $= T_B$	
C	1×10^5	2×10^{-3}	300K $= T_C$	> 180

b)

200	-900	700
A→B	B→C	C→A

$$W = -\int_{V_i}^{V_f} P\,dV$$

$$\Delta E_{int} = Q + W$$

c)

-270	-540	810
A→B	B→C	C→A

$\Delta E_{int} = Q + W$

$=$

$Q = nC_p\Delta T$

$Q = nC_V\Delta T$

d)

e) $W_{eng} = |Q_h| - |Q_c|$

10.8

10.8 / x

12) a) $t = \gamma t_p$ $\quad v = .3c \quad c = 3.00 \times 10^8$

$$\gamma = \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}}$$

$$\gamma = \frac{1}{\sqrt{1 - \frac{.3c^2}{c^2}}} = \frac{1}{\sqrt{1 - .81}} = 2.294$$

b) $.3c = .9 \times 10^8 = 9 \times 10^7$

$$\frac{3 \cdot 10^9}{9 \cdot 10^7} = 33.33 \text{ years}$$