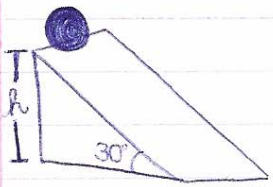
Class Notes – Lecture 23 (Ihas) 10 November 2009

Exam 2 covers up to 8.4, concentrates on 5.4 – 8.4

Supplemental review tonight, in class review Thursday



How fast does it leave the bottom of the incline?

Conservation of Mechanical Energy

$$mgh = \frac{mv^2}{2} + \frac{I\omega^2}{2}$$

$$mgh = \frac{7mv^2}{10}$$

Note: m cancels out as usual

$$v = \sqrt{10gh/7}$$

Chapter 9: Strength of Materials

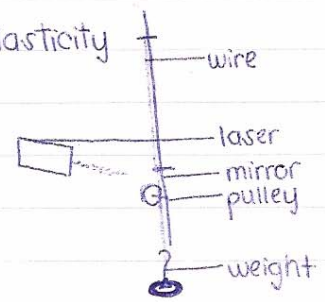
DEMO: Supple flowers @ room temp. → brittle @ 77K, properties change

Also, rubber ball breaks after being in 77K liquid nitrogen

DEMO: Stretch a spring too far, it won't bounce back; if continuous, it will break due to metal fatigue

CQ 1: A doctor, when placing a stent, will inflate the balloon until the wire mesh just exceeds the elastic limit (C).

DEMO: Elasticity



Density: $\rho \equiv \frac{m}{V} \left(kg/cm^3\right)$

DEMO:

put in wood, lead

even though they have different masses, they displace V equally

DEMO: Ductile balloon @ room temp → brittle, small @ 77K N(ℓ)

Pressure: $P \equiv \frac{F}{A}$ in $Pa = \frac{N}{m^2}$

In a column, $P \propto \rho g h$

$L_1 = L_2$

DEMO: Toricelli bent a tube into a U-shape, calculated P from $\rho g h$ when one side is used as a vacuum and a distance could be measured

Weight of the Atmosphere: $F = mg$, $P =$

P doesn't depend on container shape

CQ2: $P_0 = 1\,atm$, $h = 3.2$; $P_{pink\,gas} = 1.1\,atm$