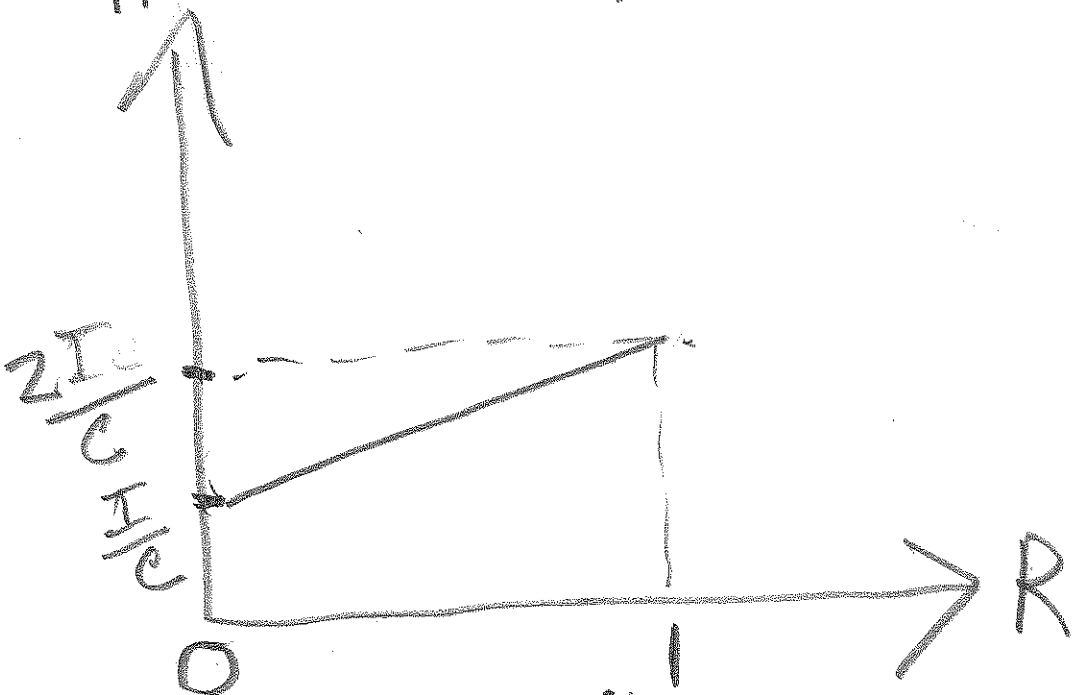
10-7-13

Ch 32 In reality: MOST SURFACES:

(partially reflective)
(partially absorptive)

P_{READ} = pressure (units of I)



R = reflectivity

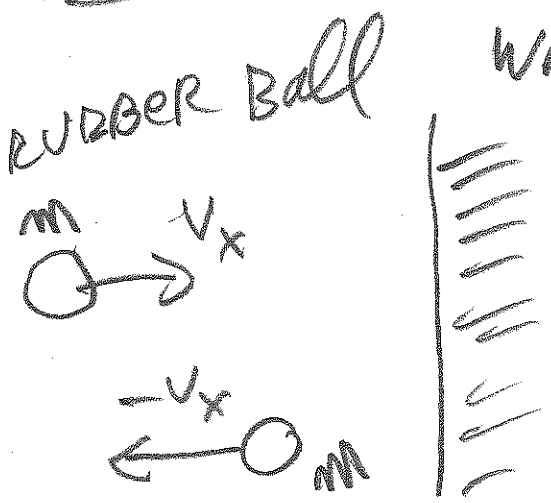
100% = R = 1 → perfect reflector

0% = R = 0 → perfect absorber

sample test 2 problem

Physics 4A Review

(I) RUBBER BALL WALL



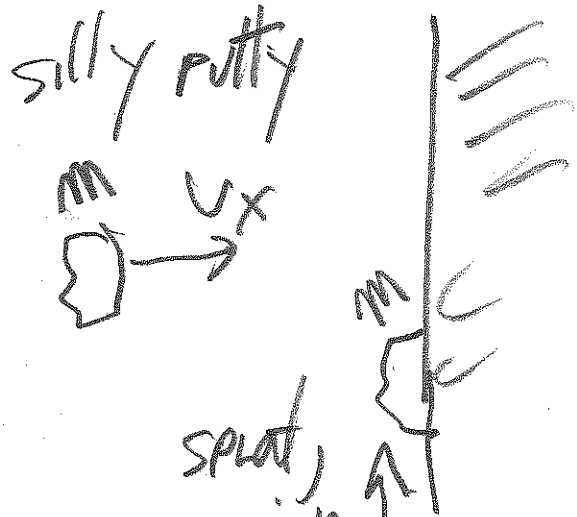
$\Sigma p_{before} = \Sigma p_{after}$

$mv_x + 0 = -mv_x + \boxed{2mv_x}$

mv_x ↑ ball, 0 ↑ wall, $-mv_x$ ↑ ball, $2mv_x$ ↑ wall

gains $2mv_x$

(II) WALL



$mv_x + 0 = "0" + mv_x$

mv_x ↑ putty, 0 ↑ WALL, "0" ↑ putty, mv_x ↑ WALL

gains mv_x

EXPLAIN: "0"

$mv_x + 0 = (m_p + m_w) \cdot V$

$mv_x + 0 = m_p V + m_w V$

$m_w >> m_p$

"0" "mv_x"

Test Problem:

Kino sail with:

$A = 4m^2$ $(2m \times 2m)$

$I = 100 \frac{Watts}{m^2 \cdot s} \times 10^9$ (Giga)

$c = 3 \times 10^8 m/s$, $R = 80\%$

(a) FIND: Average force

(b) IF sail mass = 500 kg,

FIND acceleration.

(c) How far did Kham (on the sail) move in 5 seconds? (ignore Kham mass)

Starts from rest

Clear, Look, Wood

Notes about the "mass" of light and light particles (photons)

Physics 5

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

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

PHOTON $m = 0$

SINCE $v = c$

PHOTON has momentum:

THUS, $m = 0$ SINCE $v = c$.

Use $E = mc^2$ to show:

photon "mass"

$$= \frac{hf}{c^2}$$

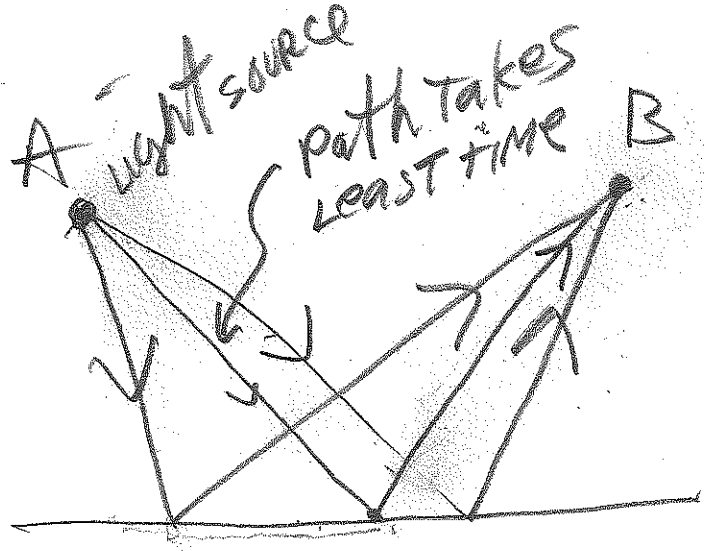
since $E = mc^2$ = energy

and $E = hf$ = photon energy

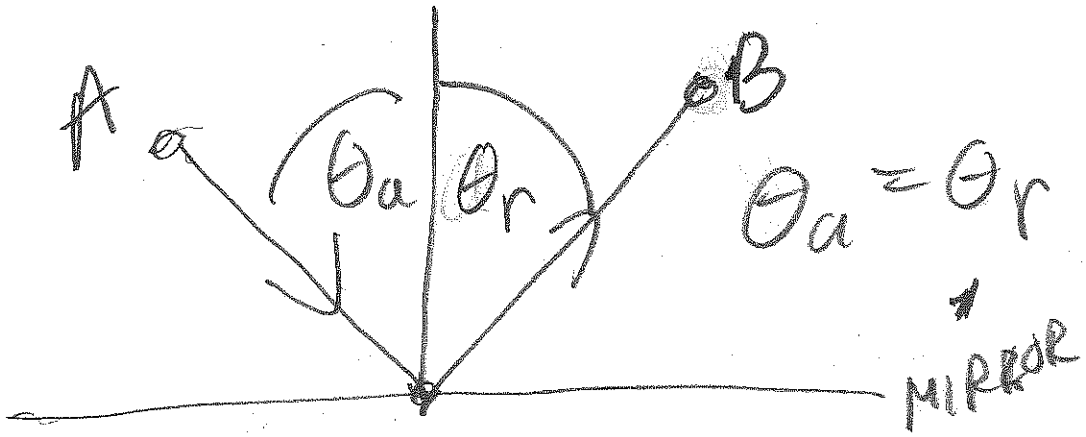
h = plank's constant

f = frequency of light associated proton.

ch 33



LAW of reflection



$\theta_a = \theta_r$

ABOVE path takes light the LEAST time from A to B.