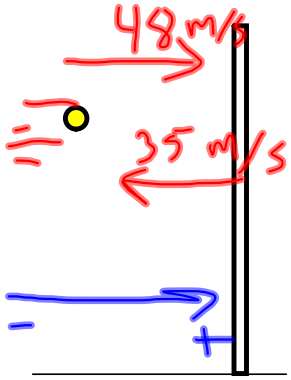
Model Problem - Page 201

A student practices her tennis volleys by hitting a tennis ball against a wall.

a) If the 0.060 kg ball travels 48 m/s before hitting the wall and then bounces directly backward at 35 m/s, what is the impulse of the interaction? (-5.0 kgm/s)

b) If the duration of the interaction is 25 ms, what is the average force exerted on the ball by the wall? (-2.0×10^2 N)



$J = Ft = m(v_f - v_0)$ use this!

opposite direction

$J = (0.60)(-35 - 48)$

$= (0.060)(-83\ m/s)$

$= -5.0\ kg\ m/s$ ⇐ Both ΔP and J

b) $F = ?$

$t = 25\ ms = 0.025\ s$ ÷ 1000

$J = \Delta P$

$Ft = m(v_f - v_0)$

$F(0.025) = -5.0\ kg\ m/s$ ÷ 0.025

$F = -200\ N$

Textbook: Page 208, #37-45

Attachments

Song - Momentum.jpg