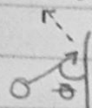


Conservation of Momentum

PH III

Not only for collisions

Collision between a ball and a face



Find the force

Assume contact = 200 ms

$$v_0 = 18 \text{ m/s}$$

$$\vec{F} \Delta t = \Delta \vec{p}$$

$$\vec{v}_{ix} = 18 \sin 55^\circ = 14.7$$

$$m = 0.6 \text{ kg}$$

$$\vec{v}_{iy} = 18 \cos 55^\circ = 10.3$$

$$\theta = 55^\circ$$

$$\vec{v}_{fx} = 18 \sin 55^\circ = 14.7$$

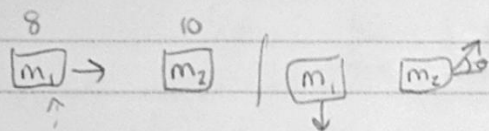
$$F = m(v_f - v_i) / \Delta t$$

$$\vec{v}_{fy} = 18 \cos 55^\circ = 10.3$$

$$\vec{F}_y = 0$$

$$\vec{F}_x = .6(-14.7 - 14.7) / .2 = -17.6 / .2 = -88.2 \text{ N}$$

$$\vec{F}_x = 44.2 \text{ N}$$



$$v_i = 15$$

$$v_f = 4$$

$$8(15) + 10(0) = 8(0) + 10(v_{2fx}) \quad v_{2fx} = 12 \text{ m/s}$$

$$8(0) + 10(0) = 8(-4) + 10(v_{2fy}) \quad v_{2fy} = 3.2 \text{ m/s}$$

$$v_{2f} = 12.4 \text{ m/s} \quad \theta = 14.9^\circ$$