

Momentum = mass in motion

$$p = mv$$

units $\text{kg} \cdot \text{m/s}$

e

To Change momentum (Δp)

you apply a Force for a duration of time (t). = Impulse = $F \cdot t$

$$\begin{aligned} \text{Impulse} &= \Delta p \\ &= \Delta(mv) \\ &= m \Delta v \\ &= \Delta m v \end{aligned}$$

$$F \cdot t = \Delta(mv) = \Delta p$$

$$F = ma$$

$$(t) F = m \frac{\Delta v}{t} (t)$$

Impact force \rightarrow $F t = m \Delta v$

$\overbrace{F t}^{\text{impulse}} \leftarrow$ impulse

$$2\text{N} \cdot 5\text{s} = 10 \text{kg} \cdot \text{m/s}$$

$$5\text{N} \cdot 2\text{s} =$$

$$\text{N} \cdot \text{s} = \text{kg} \cdot \text{m/s}$$

$$\frac{\text{kg} \cdot \frac{\text{m}}{\text{s}^2} \cdot \text{s}}{\text{s}}$$

$$\text{kg} \cdot \text{m/s}$$

DE :

$$m = 120 \text{ kg}$$

$$V = 6 \text{ m/s}$$

$$p = 720 \text{ kg}\cdot\text{m/s}$$

RB:

$$m = 100 \text{ kg}$$

$$V = 8 \text{ m/s}$$

$$p = 800 \text{ kg}\cdot\text{m/s}$$

$$m_p = 80 \text{ kg}$$

$$V_p = ?$$

$$m_t = 24,000 \text{ kg}$$

$$V = 1 \text{ mph}$$

$$\text{mph } p_p = p_t$$

$$m_p V_p = m_t V_t$$

$$80 V_p = (24,000) (1 \text{ mph})$$

$$V_p = 300 \text{ mph}$$

P. 109
6.

$$t = 30s$$

$$V_i = 0$$

$$V_f = 44.7 \text{ m/s}$$

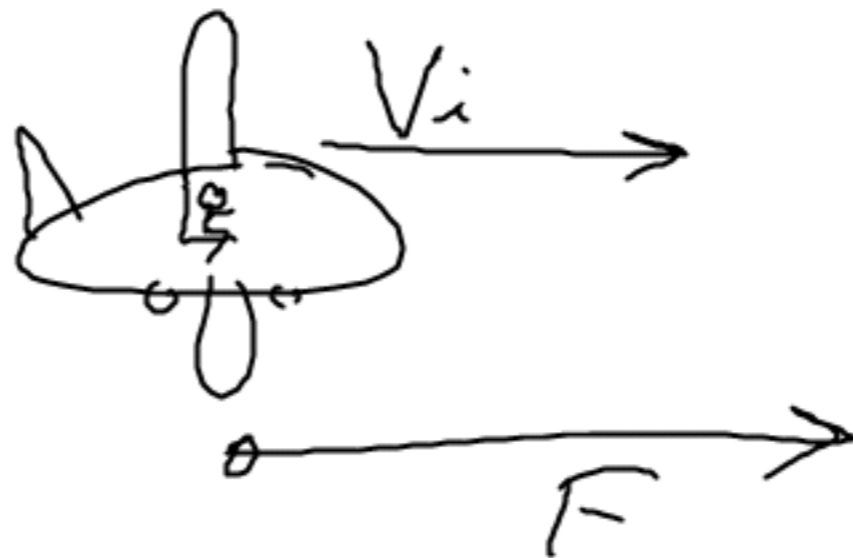
$$m = 60 \text{ kg}$$

$$F = ?$$

$$F t = m \Delta V$$

$$F(30) = 60(44.7 - 0)$$

$$F = 89.4 \text{ N}$$



$$V_f \\ 44.7 \text{ m/s}$$

$$m = 5 \text{ kg}$$

$$V_i = 20 \text{ m/s}$$

$$V_i = 20 \text{ m/s}$$

$$V_f = -20 \text{ m/s}$$

$$t = 1 \text{ s}$$

$$t = 1 \text{ s}$$

$$V_f = 0 \text{ m/s}$$

$$\Delta V = \frac{-20 - 20}{1} = -40 \text{ m/s}$$

$$\Delta V = 0 - 20 = -20 \text{ m/s}$$

$$F \cdot (1) = 5(-20) \\ = -100 \text{ N}$$

$$F \cdot (1) = 5(-40) \\ F = -200 \text{ N}$$