




PHY WS-1  
Impulse - Momentum


1) A)   $P = mV = (112 \text{ kg})(4.80 \text{ m/s}) = 538 \text{ kg}\cdot\text{m/s}$   
 $m = 112 \text{ kg}$   
 $v = 4.80 \text{ m/s}$


B)  $-538 \text{ kg}\cdot\text{m/s}$

C)  $F \Delta t = \Delta P$   $F = \frac{\Delta P}{\Delta t} = \frac{-538 \text{ kg}\cdot\text{m/s}}{1.20 \text{ s}} = 448 \text{ N}$

2)   $m_g = 1.20 \times 10^3 \text{ kg}$   $P_g = M_g V_g = (1.20 \times 10^3 \text{ kg})(5.00 \times 10^4 \text{ m/s})$   
 $\Delta t = 1 \text{ second}$   $P_g = 6.00 \times 10^7 \text{ kg}\cdot\text{m/s}$   
 $v_g = 5.00 \times 10^4 \text{ m/s}$   $F \Delta t = \Delta P$   
 $F_g = 5.80 \times 10^7 \text{ N}$   $F_m = \frac{\Delta P}{\Delta t} = \frac{6.00 \times 10^7 \text{ kg}\cdot\text{m/s}}{1 \text{ s}} = 6.00 \times 10^7 \text{ N}$   
yes

3)   $m_b = 100 \text{ kg} = .100 \text{ kg}$   
 $v_0 = 40.0 \text{ m/s}$   $v = -50 \text{ m/s}$  A)  $\text{Impulse} = m(v_2 - v_1) = (.100 \text{ kg})(-50 \text{ m/s} - 40.0 \text{ m/s})$   
 $\text{Impulse} = -9.00 \text{ kg}\cdot\text{m/s}$   
 B)  $F = \frac{\Delta P}{\Delta t} = \frac{-9.00 \text{ kg}\cdot\text{m/s}}{.00100 \text{ s}} = 9.00 \times 10^3 \text{ N}$

4)   $P = mV$   $m = \frac{P}{V} = \frac{432 \text{ kg}\cdot\text{m/s}}{16. \text{ m/s}} = 27 \text{ kg}$   
 $m = ?$   
 $v = 16. \text{ m/s}$   
 $P = 432 \text{ kg}\cdot\text{m/s}$

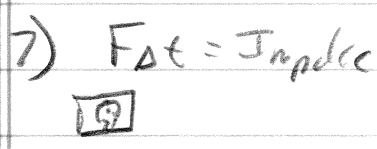
5)   $F \Delta t = \Delta P = (25.0 \text{ kg})(54.0 \text{ s}) = 1350 \text{ N s}$   
 $F = 25.0 \text{ N}$   
 $m = 10.0 \text{ kg}$   
 $\Delta t = 54.0 \text{ s}$

Phy WS Impulse - Newton Pt. 2



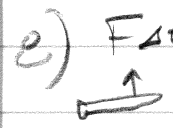
6)  $F = 50.0\text{ N}$   
 $\Delta t = .0100\text{ s}$

$F \Delta t = J_{\text{impulse}} = (50.0\text{ N})(.0100\text{ s}) = .5\text{ N s}$



7)  $F \Delta t = J_{\text{impulse}}$

$F = \frac{J_{\text{impulse}}}{\Delta t} = \frac{25.0\text{ N s}}{.500\text{ s}} = 50.0\text{ N}$



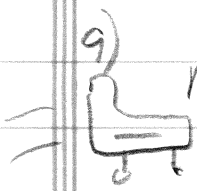
8)  $F \Delta t = m \Delta v$

$\Delta v = \frac{F \Delta t}{m} = \frac{(10.0\text{ N})(.100\text{ s})}{.500\text{ kg}} = 2.00\text{ m/s}$

$F = 10.0\text{ N}$

$\Delta t = .100\text{ s}$

$m_B = .500\text{ kg}$



$m = 13000\text{ kg/s}$

$\Delta t = 2.00\text{ s}$

$\Delta p = 325000\text{ kg} \cdot \text{m/s}$

$F \Delta t = \Delta p$

$F = \frac{\Delta p}{\Delta t} = \frac{325000\text{ kg} \cdot \text{m/s}}{2.00\text{ s}} = 162500\text{ N}$

$F = 163000\text{ N}$