PAGE 233 # 1-5

YES THIS IS THE FRONT OF THE CAR

$p = 23159.7\ \text{Kg}\ \text{m/s}$ →

1) a) $m = 725\ \text{Kg}$

$$v = 115\ \frac{\text{Km}}{\text{hr}} \cdot \frac{1\ \text{hr}}{60\ \text{min}} \cdot \frac{1\ \text{min}}{60\ \text{s}} \cdot \frac{1000\ \text{m}}{1\ \text{Km}}$$

$= 31.94\ \text{m/s}$ EAST

$p = mv$

$= (725\ \text{Kg})(31.94\ \text{m/s})$

$= 23159.7\ \text{Kg}\ \text{m/s}$ EAST

b.) $p = 23159.7\ \text{Kg}\ \text{m/s}$

$m = 2175\ \text{Kg}$

$v = ?$

$p = m \cdot v$

$$v = \frac{p}{m} = \frac{23159.7\ \text{Kg}\ \text{m/s}}{2175\ \text{Kg}}$$

$v = 10.65\ \text{m/s}$

THE SECOND CAR HAS 3 x The MASS OF THE 1ST CAR SO IT HAS 1/3 x the speed

2) a.) $t = 2\,s$

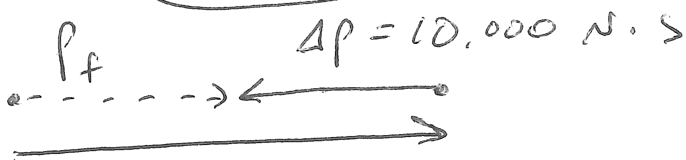
$F = 5\times10^{3}\,N$

$\cancel{J} = F_{net}\,t = \Delta p$

$(5\times10^{3}\,N)(2\,s) = \Delta p$

$10{,}000\ N\cdot s = \Delta p$ WEST

b.)



$p_i = 23159.7\ Kg\,m/s$

$p_f = p_i - \Delta p$

$= 23159.7 - 10{,}000$

$= 13159.7\ Kg\,m/s$

$p_f = m_f v_f$

$v_f = \dfrac{p_f}{m_f} = \dfrac{13159.7\ Kg\,m/s}{725\ Kg}$

$v_f = 18.15\ m/s$ EAST

3) $m = 7\ Kg$

$V = 2\ m/s$

$p = mv$

$= (7\ Kg)(2\ m/s) = 14\ Kg\ m/s$

GRAPH A

$F = 5N$

$t = 1s$

$J = F_{net}\, t = \Delta p$

$F_{net}\, t = p_f - p_i$

$F_{net}\, t = m_f v_f - m_i v_i$

$\frac{F_{net}\, t}{m} = \frac{m(v_f - v_i)}{m}$

$\frac{F_{net}\, t}{m} = v_f - v_i$

$+v_i \qquad +v_i$

$\frac{F_{net}\, t}{m} + v_i = v_f$

$\frac{(5\ Kg\ m/s^2)(1\ s)}{7\ Kg} + 2\ m/s = v_f$

$2.7\ m/s = v_f$

GRAPH B

LOOK BACK AT GRAPH A FOR FORMULA

$F = -5N$

$t = 1s$

$$\frac{F_{net}\, t}{m} + V_i = V_f$$

$$\frac{(-5N)(1s)}{7\,Kg} + 2\,m/s = V_f$$

$$1.29\,m/s = V_f$$

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4) a) $M = 240\,Kg$

$V_i = 6\,m/s$

$V_f = 28\,m/s$

$t = 60\,s$

V_i → $6\,m/s$ V_f → $28\,m/s$

THESE ARE EQUAL

$J = F_{net}\, t = \Delta p$

b) $\Delta p = P_f - P_i$

$= M_f V_f - M_i V_i$

$= m(V_f - V_i)$

$= 240\,Kg(28\,m/s - 6\,m/s)$

$\Delta p = 240\,Kg\,(22\,m/s)$ $= 5280\,Kg\,m/s$

J ↓

c) ~~J~~ $= \frac{F_{net} \not{t}}{\not{t}} = \frac{\Delta p}{t}$

$$F_{net} = \frac{\Delta p}{t} = \frac{5280\ kg\ m/s}{60\ s}$$

$$= 88\ kg\ m/s^2$$

$$= 88\ N$$

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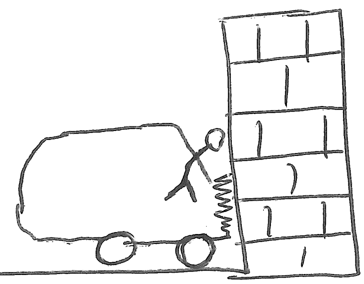
5)



a) $m = 60\ kg$

$v_i = 26\ m/s$

$t = .2\ s$

$v_f = 0\ m/s$

$$J = F_{net}\ t = \Delta p$$

$$F_{net}\ t = p_f - p_i$$

$$F_{net} = \frac{m(v_f - v_i)}{t}$$

$$= \frac{60\ kg\ (0 - 26\ m/s)}{.2\ s}$$

$$= -7800\ N$$

B) 7800 N = 1753 POUNDS

$$W = mg$$

$$m = \frac{W}{g} = \frac{7800\ N}{9.81\ m/s^2} = 795\ Kg$$

NO YOU CAN'T LIFT SUCH A MASS
⟹ YOUR ARMS ARE NOT STRONG ENOUGH TO STOP YOU IN SUCH A CRASH