13>

$P_B = P_A$

$0 = P_1 + P_{1.5}$

$-P_1 = P_{1.5}$

$-m_1 v_1 = m_{1.5} v_{1.5}$

$m_1(-v_1) = 1.5 m_1 v_{1.5}$

~~speed~~ $m_1(v_1) = 1.5 m_1 v_{1.5}$

$-v_1 = 1.5 v_{1.5}$

$v_{1.5} = \frac{-v_1}{1.5}$

$m_{1.5} = 1.5 m_1$

$\Delta E = \overbrace{7100\,J}^{\text{~~1000~~}} = KE_1 + KE_{1.5}$

$= \frac{1}{2} m_1 v_1^2 + \frac{1}{2} m_{1.5} v_{1.5}^2$

$7100 = \frac{1}{2} m_1 v_1^2 + \frac{1}{2}(1.5 m_1)\left(\frac{-v_1}{1.5}\right)^2$

$7100 = \frac{1}{2} m_1 v_1^2 + \frac{1}{2}\left(\frac{1}{1.5}\right)\left[m_1 v_1^2\right]$

$7100 = \left(\frac{1}{2} m_1 v_1^2\right)\left(1 + \frac{1}{1.5}\right)$

$7100 = KE_1\left(\frac{2.5}{1.5}\right)$

9)

a) area under the graph

b) $\Delta p = \Delta p$

$Ft = m\Delta V$

$N_s = (.075)\Delta V$

10)

$P_B = P_A$ $\quad KE_B = KE_A$

$P_4 + P_6^{\circ} = P_4' + P_6'$ $\quad KE_4 + KE_6^{\circ} = KE_4' + KE_6'$

$m_4 V_4 = m_4 V_4' + m_6 V_6'$ $\quad \frac{1}{2} m_4 V_4^2 = \frac{1}{2} m_4 V_4'^2 + \frac{1}{2} m_6 V_6'^2$

$(.44)(3) = (44) V_4' + (.66) V_6'$ $\quad (.44)(3)^2 = (.44)\left(3 - \frac{3}{2} V_6'\right)^2 + (.66) V_6'^2$

$1.32 - .66 V_6' = .44 V_4'$

$3 - \frac{3}{2} V_6' = V_4'$

$V_6' =$ ⌊ ⌋

$V_4' =$ ⌊ ⌋

6>

$P_B = P_A$

$m_B v_B = m_A v_A$

$(5740)(\frac{1}{6}) = (5740 + (3.5)(85))\, V_A$

$m_A = m_B + \text{Snow}$

Rate (time)

2>

$\Delta p = \Delta p$

$Ft = \Delta m \Delta V$

$Ft = m(V_f - V_i)$

$F(1 \times 10^{-4}) = (.145)(-52 - 43)$