

Lesson #1 example 3 (b) is a "perfectly inelastic" collision (the objects stick together after the collision)

% elasticity = ?

$$\% \text{ elastic} = \left[\frac{E_k'}{E_k} \right] \times 100\%$$

$$= \left[\frac{\cancel{\frac{1}{2}}(m_A + m_B)V'^2}{\cancel{\frac{1}{2}}m_A V_A^2 + \cancel{\frac{1}{2}}m_B V_B^2} \right] \times 100\%$$

$$= \left[\frac{(1500 + 980)(10.2)^2}{(1500)(20)^2} \right] \times 100\% = \boxed{43\%}$$

Lesson #1 example 3 (d) is a "partially elastic" collision. (the objects do not stick together, but there is transformation of kinetic energy into other forms such as sound and heat)

% elasticity = ?

$$\% \text{ elasticity} = \left[\frac{\cancel{\frac{1}{2}}m_A V_A'^2 + \cancel{\frac{1}{2}}m_B V_B'^2}{\cancel{\frac{1}{2}}m_A V_A^2 + \cancel{\frac{1}{2}}m_B V_B^2} \right] \times 100\%$$

$$= \left[\frac{(1500)(0.57)^2 + (980)(2)^2}{(1500)(4)^2 + (980)(5)^2} \right] \times 100\%$$

$$= \underline{1.75\%}$$

