

b) $m_1 = 90 \text{ kg}$
 $v_1 = 5.0 \text{ m/s, east}$
 $KE_1 = ?$



$$KE_1 = \frac{1}{2} \cdot m \cdot v^2 = \frac{1}{2} (90 \text{ kg}) (5 \text{ m/s})^2$$

$$KE_1 = 1125 \text{ J}$$

$m_2 = 95 \text{ kg}$
 $v_2 = 3.0 \text{ m/s, north}$
 $KE_2 = ?$

$$KE_2 = \frac{1}{2} \cdot m \cdot v^2 = \frac{1}{2} (95 \text{ kg}) (3 \text{ m/s})^2$$

$$KE_2 = 427.5 \text{ J}$$

$$\text{Total KE before collision: } 1125 \text{ J} + 427.5 \text{ J} = 1552.5 \text{ J}$$

$m_1 + m_2 = 185 \text{ kg}$
 $v' = 2.9 \text{ m/s}$

$$KE' = ?$$

$$KE' = \frac{1}{2} \cdot m \cdot v'^2 = \frac{1}{2} (185 \text{ kg}) (2.9 \text{ m/s})^2$$

$$\text{Total KE' after collision: } 766.8 \text{ J}$$

$$\Delta KE = 1552.5 \text{ J} - 766.8 \text{ J}$$

$$\Delta KE = 785 \text{ J}$$