

PROB. 14-2

$$v_1 = v_2 = 2.4 \frac{m}{s}, \quad v_3 = 0, \quad m_3 = 25 \text{ kg}$$

a)  $v' = 1.2 \frac{m}{s}, \quad m_1 = 15 \text{ kg}, \quad \text{FIND } m_2$

$$m\bar{v} = \sum m_i \bar{v}_i$$

FIRST SUITCASE:  $(15 + 25)v = (15)(2.4)$

$$v = 0.9 \frac{m}{s}$$

SECOND SUITCASE:  $(15 + 25 + m_2)(1.2) = (15 + 25)(0.9) + m_2(2.4)$

$$\boxed{m_2 = 10 \text{ kg}}$$

b) FIND  $v'$  FOR  $m_2$  FIRST,  $m_1$  SECOND

$$(10 + 25)v = (10)(2.4) + (25)(0)$$

$$v = 0.6857 \frac{m}{s}$$

$$(10 + 25 + 15)v' = (10 + 25)(0.6857) + (15)(2.4)$$

$$\boxed{v' = 1.2 \frac{m}{s}}$$