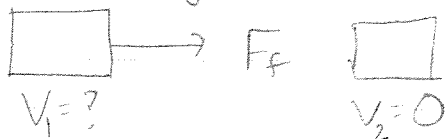


Find the velocity of the block + bullet combination:



$$m = .012 \text{ kg} + .1 \text{ kg} = .112 \text{ kg}$$

$$d = 7.5 \text{ m}$$

$$\mu_k = .650$$

$$KE_1 + W = KE_2$$

$$\frac{1}{2} \cdot m \cdot v_1^2 + F_f \cdot d = 0$$

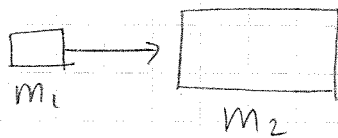
$$\frac{1}{2} (.112 \text{ kg}) \cdot v_1^2 + (-.713 \text{ N})(7.5 \text{ m}) = 0$$

$$v_1 = 9.77 \text{ m/s}$$

$$F_f = \mu \cdot N = \mu \cdot m \cdot g$$

$$= (.65)(.112 \text{ kg})(9.8 \text{ m/s}^2)$$

$$= .713 \text{ N (against motion)}$$



$$v_1 = ? \quad v_2 = 0 \text{ m/s}$$

$$m_1 = .012 \text{ kg} \quad m_2 = .1 \text{ kg}$$

$$v' = 9.77 \text{ m/s (from above)}$$

$$p_1 + p_2 = p_1' + p_2'$$

$$m_1 \cdot v_1 + m_2 \cdot v_2 = (m_1 + m_2) \cdot v'$$

$$(.012 \text{ kg})v_1 + 0 = (.112 \text{ kg}) \cdot (9.77 \text{ m/s})$$

$$v_1 = 91.2 \text{ m/s}$$