

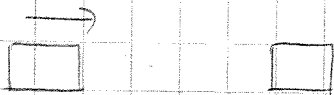
a)

$$m_1 = .5 \text{ kg}$$

$$v_1 = 6.0 \text{ m/s}$$

$$m_2 = .5 \text{ kg}$$

$$v_2 = 0 \text{ m/s}$$



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

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

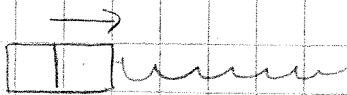
$$(.5 \text{ kg})(6 \text{ m/s}) + (.5 \text{ kg})(0) = (1.0 \text{ kg}) \cdot v'$$

$$v' = 3.0 \text{ m/s}$$

b)

$$x_1 = 0 \text{ m/s}$$

$$v_1 = 3 \text{ m/s}$$



$$m = 1.0 \text{ kg}$$

$$k = 625 \text{ N/m}$$

$$x_2 = ?$$

$$v_2 = 0$$

$$\cancel{PE_1} + KE_1 = PE_2 + \cancel{KE_2}$$

$$\frac{1}{2} \cdot m \cdot v_1^2 = \frac{1}{2} \cdot k \cdot x_2^2$$

$$\frac{1}{2} (1 \text{ kg})(3 \text{ m/s})^2 = \frac{1}{2} (625 \text{ N/m}) \cdot x_2^2$$

$$x_2 = 12 \text{ cm}$$

c)

$$m = 1 \text{ kg}$$

$$k = 625 \text{ N/m}$$

$$T = 2 \cdot \pi \cdot \sqrt{\frac{m}{k}} = 2 \cdot \pi \cdot \sqrt{\frac{1 \text{ kg}}{625 \text{ N/m}}}$$

$$T = .25 \text{ sec}$$

$$f = \frac{1}{T} \quad f = 4.0 \text{ Hz}$$

d)

$$y = A \cdot \cos(2\pi f \cdot t)$$

$$= (.12) \cdot \cos(2\pi(4 \text{ Hz}) \cdot t)$$

$$y = .12 \cos(8\pi \cdot t)$$