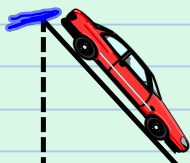


EX 13.3 p 396



$$F = ma = mg$$

$$13,000 \text{ N} = mg$$

$$v_i = 0$$

$$h_i = 10 \text{ m}$$

$$v_f = 0$$

$$h_f = 0$$

$$x_i = 0$$

$$x_f = ?$$

$$k = 1 \times 10^6 \frac{\text{N}}{\text{m}}$$

$$\frac{1}{2} m v_i^2 + m g h_i + \frac{1}{2} k x_i^2 = \frac{1}{2} m v_f^2 + m g h_f + \frac{1}{2} k x_f^2$$

$$m g h_i = \frac{1}{2} k x_f^2$$

$$\sqrt{\frac{m g h_i}{\frac{1}{2} k}} = \sqrt{x_f^2}$$

$$\sqrt{\frac{13000 (10)}{.5 (1 \times 10^6)}} = x_f$$

$$\boxed{.51 \text{ m}}$$

Conservation of E $\Delta E = W = F \cdot d$ Joule

$$\Delta E = 0$$

$$E_i = E_f$$

$$F = kx$$

$$= \frac{\text{N}}{\text{m}} \cdot \text{m}$$

$$\frac{1}{2} m v_i^2 + m g h_i + \frac{1}{2} k x_i^2 = \frac{1}{2} m v_f^2 + m g h_f + \frac{1}{2} k x_f^2$$

elastic

KE *PE_g* *PE_s*

$$\text{kg} \left(\frac{\text{m}}{\text{s}} \right)^2 + \text{kg} \frac{\text{m}}{\text{s}^2} \cdot \text{m} + \frac{\text{N}}{\text{m}} \cdot \text{m}^2 = \text{kg} \frac{\text{m}^2}{\text{s}^2} + \text{kg} \frac{\text{m}^2}{\text{s}^2} + \frac{\text{N}}{\text{m}} \cdot \text{m}^2$$

$$F = ma$$

$$N = \text{kg} \frac{\text{m}}{\text{s}^2}$$

$$\text{kg} \frac{\text{m}}{\text{s}^2} \cdot \text{m} = \text{N} \cdot \text{m}$$

$$J = J$$

$$\Delta E = W \text{ Joule}$$

$$= F \cdot d \text{ N} \cdot \text{m}$$

Rearrange 1st
then substitute

10a