

P #46

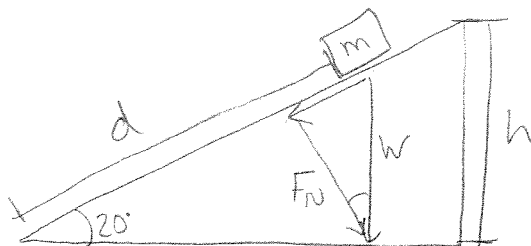
Ch 5 - pg 149

$$m = 20 \text{ kg}$$

$$\mu_k = .20$$

$$v_i = 4.0 \text{ m/s}$$

$$\theta = 20^\circ$$



$$\begin{aligned} F_N &= W \cdot \cos 20^\circ \\ &= (20 \text{ kg})(9.8 \text{ m/s}^2) \cdot \cos 20^\circ \\ &= 184.2 \text{ N} \end{aligned}$$

$$\begin{aligned} F_f &= \mu \cdot F_N \\ &= (.20)(184.2 \text{ N}) \\ &= 36.8 \text{ N} \end{aligned}$$

By right triangles:

$$h = d \cdot \sin 20^\circ$$

$$KE_1 + PE_1 + W = KE_2 + PE_2$$

$$\frac{1}{2} \cdot (20 \text{ kg})(4 \text{ m/s})^2 + 0 + (-36.8 \text{ N}) \cdot d = 0 + (20 \text{ kg})(9.8 \text{ m/s}^2) \cdot d \cdot \sin 20^\circ$$

$$160 = 36.8 \cdot d + 67.0 \cdot d$$

$$d = 1.54 \text{ m}$$