A box with a mass of $m = 6.0$ kg is thrown on the floor, slides, and stops. If the initial velocity was $v = 8$ m/s and the friction coefficient $\mu = 0.30$, calculate the distance s travelled by the box before it stopped.

Solution:

$$\text{The change of energy=work done}$$

$$\frac{mv^2}{2} = F_{\text{frict}}s$$

$$\frac{mv^2}{2} = \mu mgs$$

Thus

$$s = \frac{v^2}{2\mu g}$$

$$s = \frac{8^2}{2 \times 0.30 \times 9.8} = 10.9 \text{ m}$$

Answer: 10.9 m