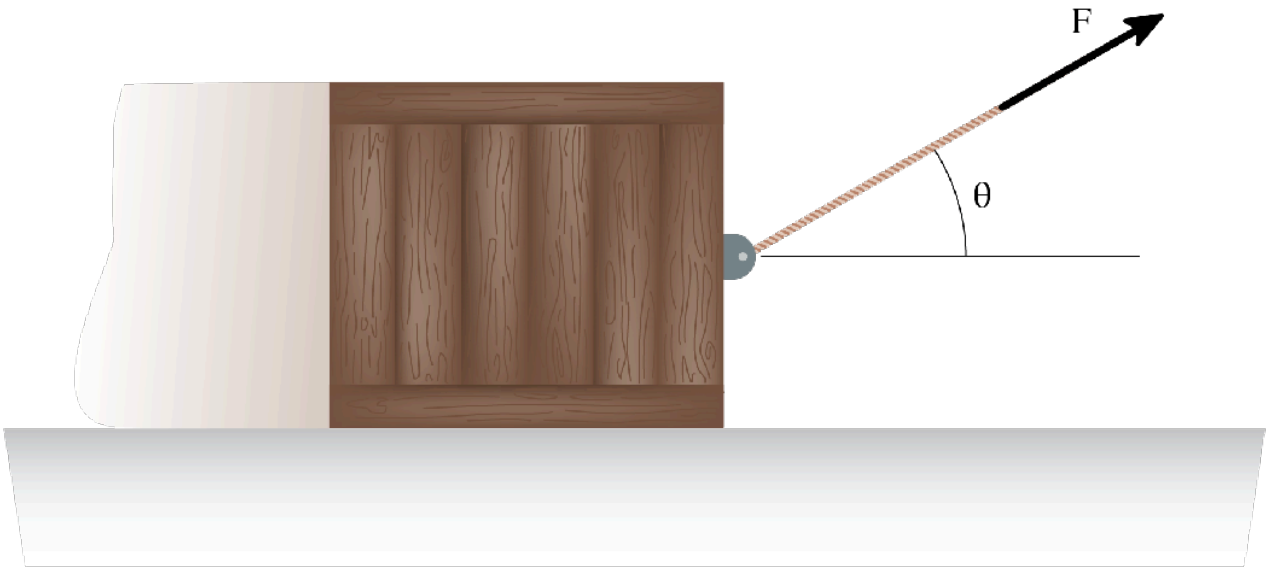

A box with mass $m\,\mathrm{kg}$ is being pulled by a force F, at an angle θ above the horizontal, such that it slides at a constant velocity to the right. If the the static coefficient of friction is μ_s and the kinetic coefficient of friction is μ_k, find the magnitude of the force F.

What is the ratio of friction force magnitude to normal force magnitude in this scenario?

Since the box is moving, μ_k

Find the magnitude of the force F.

$+\uparrow \Sigma F_y = 0 \rightarrow N + F\sin(\theta) - mg = 0$

Since the box is moving, $F_{friction} = \mu_k N$

$+\rightarrow \Sigma F_x = 0 \rightarrow F\cos(\theta) - F_{friction} = 0 \rightarrow F\cos(\theta) - \mu_k N = 0$

Combining both equations:

$$N = mg - F\sin(\theta)$$
$$\rightarrow F\cos(\theta) = \mu_k(mg - F\sin(\theta))$$
$$\Rightarrow F = \frac{\mu_k \cdot mg}{\cos(\theta) + \mu_k \sin(\theta)}$$