

Answer on Question 72584, Physics, Mechanics | Relativity

Question:

A 10 kg box is being pushed by a 20 N force. What is the coefficient of kinetic friction?

Solution:

By the definition of the coefficient of kinetic friction we have:

$$\mu_k = \frac{F_{appl}}{W} = \frac{F_k}{N},$$

here, F_{appl} is the horizontal pushing force, $W = mg$ is the weight of the box directed downward, F_k is the kinetic friction force directed opposite to the horizontal pushing force and equal to it, N is the force of reaction directed upward and equal to the weight of the box.

From this formula we can find the coefficient of kinetic friction:

$$\mu_k = \frac{F_{appl}}{W} = \frac{F_{appl}}{mg} = \frac{20 \text{ N}}{10 \text{ kg} \cdot 9.8 \frac{\text{m}}{\text{s}^2}} = 0.2.$$

Answer:

$$\mu_k = 0.2.$$