

Question#18420

A crate with a mass of 40 kg is being dragged along a horizontal floor at a constant velocity by an applied force of 180 N. What is the coefficient of kinetic friction? ($g = 10 \text{ m/s}^2$)

Solution:

Let:

$$m = 40 \text{ kg}$$

$$F = 180 \text{ N}$$

$$g = 10 \text{ m/s}^2$$

$$k - ?$$

$$F_{friction} = km \cdot g, \quad k = \frac{F_{friction}}{mg}$$

According to the first Newton's Law, the friction force is equal to the applied force.

$$F_{friction} = F$$

$$k = \frac{F}{mg} = \frac{180}{40 \cdot 10} = 0.45$$

Answer: 0.45