

## Answer on Question 58970, Physics, Mechanics | Relativity

### Question:

The mass of  $43.3 \text{ kg}$ , is pulled along the ground. The static friction coefficient is  $\mu_s = 0.35$  and the sliding friction coefficient  $\mu_k = 0.16$ .

- What does the table weigh?
- What force will be needed to start the table moving?
- What force is needed to keep the table moving at a constant velocity?

### Solution:

- The mass and weight are related by the formula:

$$W = mg,$$

here,  $W$  is the weight of the table,  $m$  is the mass of the table and  $g$  is the acceleration due to gravity.

Then, from this formula we can find the weight of the table:

$$W = mg = 43.3 \text{ kg} \cdot 9.8 \frac{\text{m}}{\text{s}^2} = 424.34 \text{ N}.$$

- We can find the horizontal pulling force needed to start the table moving:

$$F_{appl} = \mu_s N = \mu_s mg = 0.35 \cdot 43.3 \text{ kg} \cdot 9.8 \frac{\text{m}}{\text{s}^2} = 148.52 \text{ N}.$$

- The horizontal pulling force needed to keep the table moving at a constant velocity:

$$F_{appl} = F_k = \mu_k N = \mu_k mg = 0.16 \cdot 43.3 \text{ kg} \cdot 9.8 \frac{\text{m}}{\text{s}^2} = 67.9 \text{ N}.$$

### Answer:

- $W = 424.34 \text{ N}.$
- $F_s = 148.52 \text{ N}.$
- $F_k = 67.9 \text{ N}.$