

## Answer on Question 66655, Physics, Mechanics, Relativity

### Question:

A block of mass  $1.0 \text{ kg}$  rests on a horizontal surface. A force of  $0.5 \text{ N}$  is required to start the block into motion. Compute the coefficient of static friction.

### Solution:

Applying the Newton's Second Law of Motion we get (at the moment when the block begins to move the acceleration is zero):

$$\sum F_x = ma_x = 0,$$

$$F_{\text{appl}} - F_{s.\text{fr.}} = 0.$$

$$F_{\text{appl}} = F_{s.\text{fr.}} = \mu_s N = \mu_s mg.$$

From this formula we can find the coefficient of static friction between the block and the horizontal surface:

$$\mu_s = \frac{F_{\text{appl}}}{mg} = \frac{0.5 \text{ N}}{1.0 \text{ kg} \cdot 9.8 \frac{\text{m}}{\text{s}^2}} = 0.05.$$

### Answer:

$$\mu_s = 0.05.$$

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