

## Answer on Question 69677, Physics, Other

### Question:

Block of mass  $500\text{ kg}$  is at rest on a horizontal table. What steady force is required to give the block a velocity of  $200\text{ cm/s}$  in  $4\text{ s}$ ?

### Solution:

Let's first find the acceleration of the block from the kinematic equation:

$$v = v_0 + at,$$

here,  $v_0 = 0$  is the initial velocity of the block,  $v$  is the final velocity of the block,  $a$  is the acceleration of the block and  $t$  is the time.

Then, we get:

$$a = \frac{v - v_0}{t} = \frac{200 \frac{\text{cm}}{\text{s}} \cdot \frac{1\text{ m}}{100\text{ cm}}}{4\text{ s}} = 0.5 \frac{\text{m}}{\text{s}^2}.$$

Finally, from the Newton's Second Law of Motion we can find the force:

$$F = ma = 500\text{ kg} \cdot 0.5 \frac{\text{m}}{\text{s}^2} = 250\text{ N}.$$

### Answer:

$$F = 250\text{ N}.$$

Answer provided by AssignmentExpert.com