Answer on Question #64783-Physics-Other

A 15.0 kg object is moving with a velocity of 17.5 m/s. A force of -50.0 N acts on the object and its velocity becomes 3.20 m/s. What is the displacement of the object while the force acts?

Solution

From the second Newton's law:

$$ma = F \to a = \frac{F}{m}.$$

We use kinematic equation:

$$v_f^2 - v_i^2 = 2aS$$

The displacement of the object while the force acts is

$$S = \frac{v_f^2 - v_i^2}{2a} = m\frac{v_f^2 - v_i^2}{2F} = 15\left(\frac{3.2^2 - 17.5^2}{2(-50)}\right) = 44.4\ m.$$

Answer: $44.4\ m$.