

Answer on Question #38308, Physics, Other

Question:

A ball of mass 0.6kg, moving at a velocity of 20m/s is suddenly hit by a force of 10N for a time of 0.6s. Find its new velocity of motion.

Answer:

Newton's second law of motion can be expressed in equation form as follows:

$$\vec{F} = \frac{\Delta \vec{p}}{\Delta t}$$

If force directed opposite to motion:

$$F = -\frac{\Delta p}{\Delta t}$$

where F is force, p is momentum, t – time.

Change of momentum equals:

$$\Delta p = mv' - mv_0$$

Therefore:

$$F\Delta t = -(mv' - mv_0)$$

$$v' = v_0 - \frac{F\Delta t}{m} = 10 \frac{m}{s}$$

Answer: $10 \frac{m}{s}$