

Answer on Question 63392, Physics, Other

Question:

A boy while catching a ball experiences an impulse of $6 \text{ N}\cdot\text{s}$. If the mass of the ball is 200 g , what was the speed of the ball before it was caught?

Solution:

By the definition, the impulse is the change in momentum (because the ball finally comes to stop after it is caught, the change in momentum will be equal to mv):

$$J = \Delta p = mv,$$

here, m is the mass of the ball, v is the speed of the ball before it was caught.

From this formula we can find the speed of the ball before it was caught:

$$v = \frac{J}{m} = \frac{6 \text{ N}\cdot\text{s}}{0.2 \text{ kg}} = 30 \frac{\text{m}}{\text{s}}.$$

Answer:

$$v = 30 \frac{\text{m}}{\text{s}}.$$