

Answer on Question 73421, Physics, Other

Question:

An object with an initial velocity of 20 m/s accelerates uniformly at 5 m/s^2 in the direction of its motion for a distance of 10 m . What is the final velocity?

Solution:

We can find the final velocity of an object from the kinematic equation:

$$v^2 = v_0^2 + 2ad,$$

here, v_0 is the initial velocity of an object, v is the final velocity of an object, a is the acceleration of an object and d is the distance.

Then, we get:

$$v = \sqrt{v_0^2 + 2ad} = \sqrt{\left(20 \frac{\text{m}}{\text{s}}\right)^2 + 2 \cdot 5 \frac{\text{m}}{\text{s}^2} \cdot 10 \text{ m}} = 22.36 \frac{\text{m}}{\text{s}}.$$

Answer:

$$v = 22.36 \frac{\text{m}}{\text{s}}.$$

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