

**Answer on Question #46958-Physics-Mechanics-Kinematics-Dynamics**

An automobile with an initial speed of  $4.47 \frac{m}{s}$  accelerates uniformly at the rate of  $3.0 \frac{m}{s^2}$ . Find the final speed and the displacement after 5.0 s.

**Solution**

So first we solve for the displacement. We used this formula.

$$\Delta x = v_i \Delta t + \frac{1}{2} a \Delta t^2,$$

where:  $v_i = 4.47 \frac{m}{s}$ ,  $\Delta t = 5.0 \text{ s}$ ,  $a = 3.0 \frac{m}{s^2}$ .

So,

$$\Delta x = 4.47 \cdot 5.0 + \frac{1}{2} 3.0 \cdot 5.0^2 = 59.85 \text{ m}.$$

Then, the final speed is

$$v_f = v_i + a \Delta t = 4.47 + 3.0 \cdot 5.0 = 19.47 \frac{m}{s}.$$

**Answer:  $19.47 \frac{m}{s}$  and  $59.85 \text{ m}$ .**