**Question #61704, Physics /** Mechanics

a dolphin accelerates at -1.77 m/s squared for 3.33 seconds, and ends with a velocity of -8.77 m/s. what is the displacement of the dolphin in that time?

## Solution

Dolphin moves uniformly accelerated with negative acceleration, we write the law of motion of a dolphin:

$$\begin{cases} v = v_0 + at \\ S = v_0 t + \dfrac{at^2}{2} \end{cases};$$

$$\begin{cases} v_0 = v - at \\ S = v_0 t + \dfrac{at^2}{2} \end{cases};$$

That is the displacement of the dolphin:

$$S = (v - at)t + \frac{at^2}{2} = vt - \frac{at^2}{2} = \frac{8.77m}{s} \cdot 3.33s + \frac{\frac{1.77m}{s^2} \cdot 3.33^2}{2} \approx 38.63\ m$$

**Answer the question: 38.63 m.**