Answer on Question #38570, Physics, Mechanics

We are given $v_0 = 0\frac{m}{s}; S = 100\,m; t = 8\,s; a = const$.

First, let us find the acceleration. The equation of motion with zero initial velocity is $S = \frac{a t^2}{2}$.

Hence, knowing that car traveled 100m in 8 seconds, obtain $100 = \frac{a 8^2}{2} \Rightarrow a = 3.125\frac{m}{s^2}$ - this is the acceleration.

Knowing the acceleration we know explicit equation of motion $S(t) = \frac{3.125 t^2}{2}$. Thus, for 5 seconds, $S(t=5) = \frac{3.125 \cdot 5^2}{2} = 39.1\,m$.

Average velocity might be found by formula $\bar{v} = \frac{1}{T}\int_0^T v(t)\,dt$. Velocity as a function of time is $v(t) = a t = 3.125 t$. For 8 seconds, obtain $\bar{v} = \frac{1}{8}\int_0^8 3.125\,t\,dt = \frac{1}{8}\frac{3.125 \cdot 8^2}{2} \approx 12.5\frac{m}{s}$ - average velocity.