Homework question

Science, Physics

Homework Question A car slows down uniformly from a speed of 21. 0 m/s to rest in 6. 00s. How far did it travel in this time?

Known;

u = 0m/s

v = 21m/s

t = 6 seconds

Unknown; s =?; a =?

Distance is calculated using the formula;

Distance = Average velocity multiplied by total time taken

Implies,

The same problem can be solved by first calculating the acceleration of the car and using the results in the second equation of uniformly accelerated motion (Jaiswal and Juneja 66).

Acceleration is given by

Implies,

The distance can be calculated using the third equation of linear motion;

= 63

Therefore the distance is 63 metres

Uniform means steady or at a constant rate or not changing. In this case, the word uniform means the deceleration of the car is constant. Inclusion of the word uniform gives a clear picture of how the car was travelling, though braking, it was doing so at a constant rate. This information is very vital since it enables the use of any of the three equations of linear motion to calculate any required kinematic variable. If the word uniform was missing, then the problem cannot be solved. To solve the problem, the equation of

velocity at a given instant and the time limits should be provided. With the limits and the equation of either velocity or acceleration known, then calculus can be used to calculate the distance the car has travelled.

Works Cited

Jaiswal, J and J Juneja. Comprehensive Physics IX. United States: Laxmi Publications, 2009.