

Year 10 Physical Science Week 2

Questions

1. A rally driver is driving down a straight road at 90.0 km h^{-1} when she approached a bend and rapidly slowed to 12.0 ms^{-1} in 0.905 s . Calculate the acceleration of the car.

$$\begin{aligned}u &= 90 \text{ kmh}^{-1} \\ &= 25 \text{ ms}^{-1} \\ v &= 12 \text{ ms}^{-1} \\ t &= 0.905 \text{ s}\end{aligned}$$

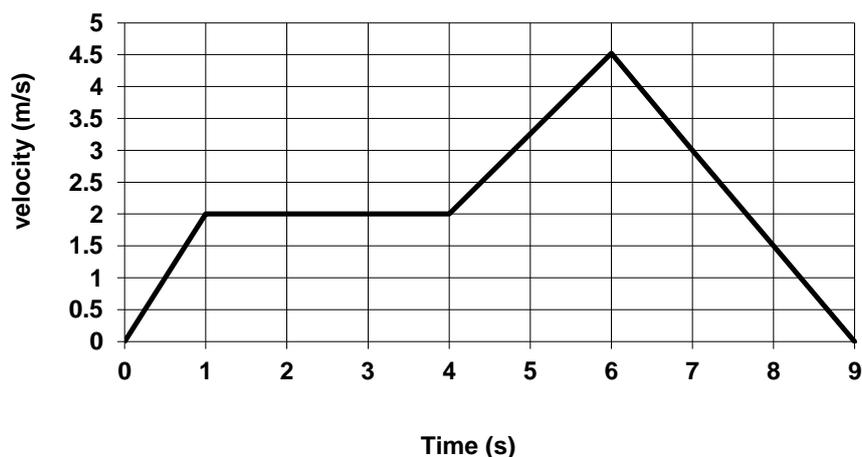
$$a = \frac{v - u}{t}$$

$$a = \frac{(12 - 25)}{0.905}$$

$$a = -14.4 \text{ ms}^{-2}$$

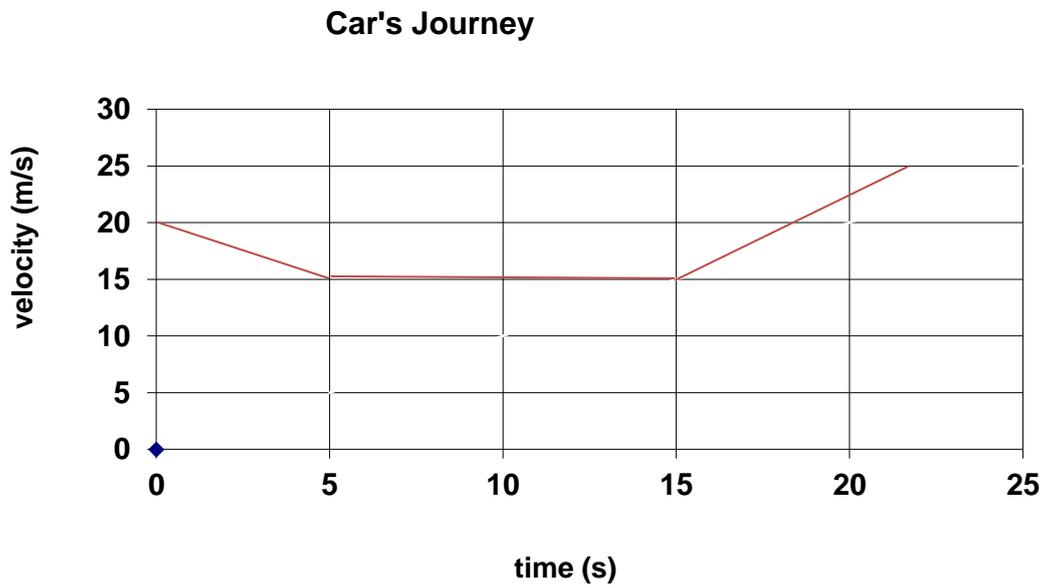
2. Exercise: Consider the following graph of a remote controlled toy car and then describe the journey.

Journey of a remote controlled car



The toy car starts from rest with a positive uniform acceleration of 2 ms^{-1} for 1 second. It then continues at a positive constant velocity of 2 ms^{-1} for 3 s. The car then uniformly accelerates at 1.25 ms^{-1} for 2 s and is now 13.5 m from where it started. Finally the car accelerates at -1.5 ms^{-1} for 3 s at which point it has returned to its starting point.

3. Exercise: Graph the following journey. A car travelling at 20 m s^{-1} slows to 15 m s^{-1} in 5 seconds. It then continues its journey for 10 seconds when it increases its velocity to 25 m s^{-1} in 7 seconds.



Calculate the displacement

A: $\frac{1}{2} \times 5 \times 5 = 12.5$

B: $15 \times 22 = 330$

C: $\frac{1}{2} \times 7 \times 10 = 35$

$s = 377.5 \text{ m}$