

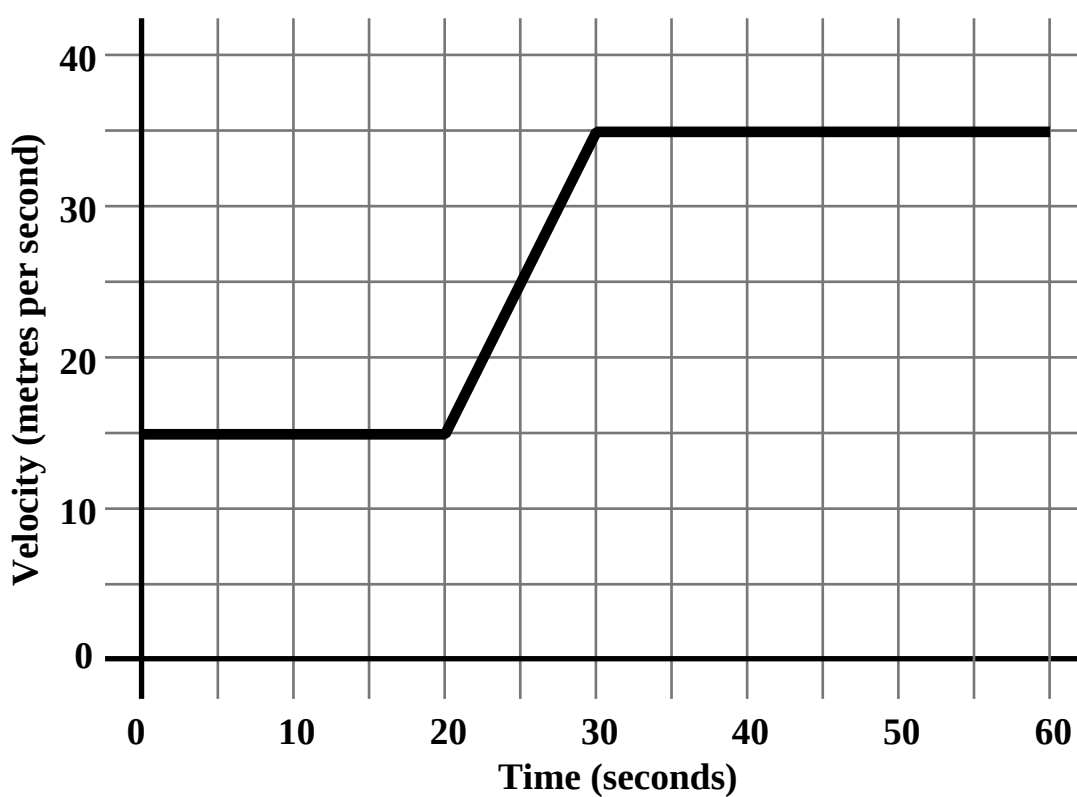
9.1 Velocity-Time Graph Work-Out (Homework)

*You May Use A Calculator***Question 1**

A car travels at a steady 15 m/s for 20 seconds before accelerating uniformly for 10 seconds to a speed of 35 m/s.

This speed is maintained for half a minute.

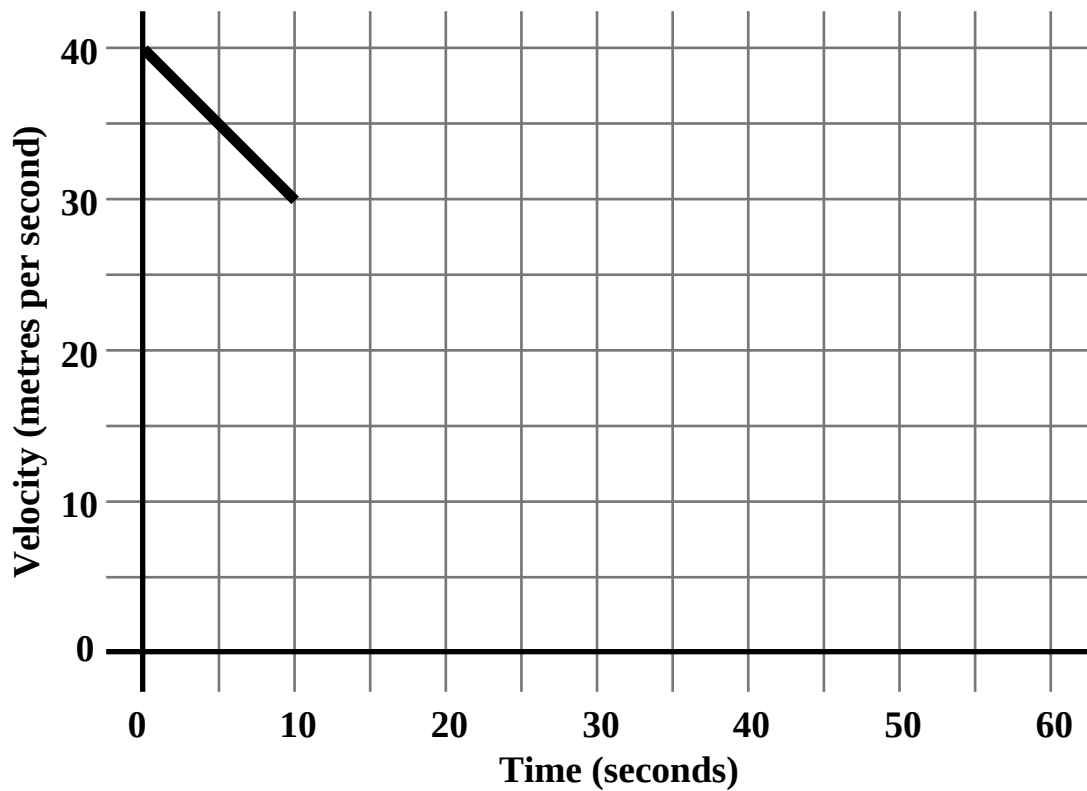
This information is shown on the velocity-time graph presented below:



- (i) Calculate the total distance covered over the 60 second period.
- (ii) What, in m/s^2 is the acceleration ?

Question 2 : Trouble Ahead

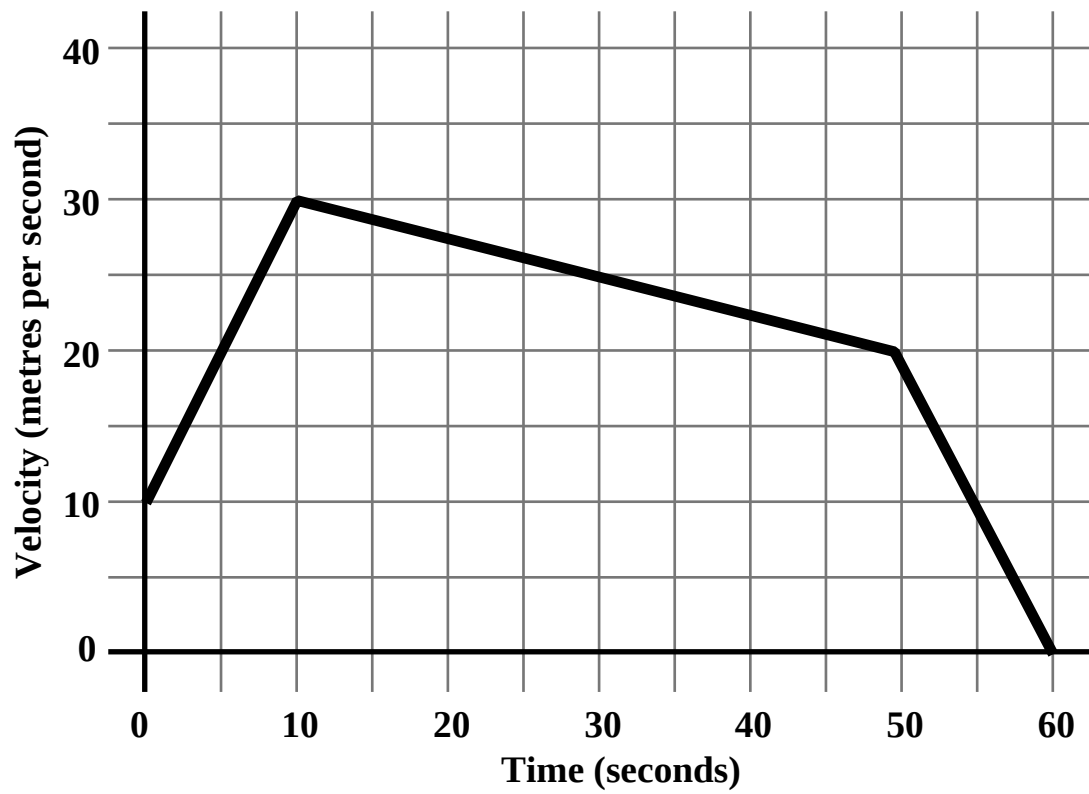
A car is travelling down a motorway at 40 m/s when its driver sees trouble ahead. She slows down to 30 m/s over ten seconds as shown in the graph below:



She then travels at a constant speed for twenty seconds before slowing at a constant rate over thirty seconds to come to a stop just in front of the trouble.

- (i) Complete the above velocity-time graph to show the additional information.
- (ii) How far was the lady from the trouble ahead when she first saw it ?
- (iii) Calculate her first deceleration.
- (iv) Calculate her second deceleration.

Question 3



(i) Calculate the area under the above velocity-time graph.

(ii) What does this area represent ?

Question 4 : Bank Robbery

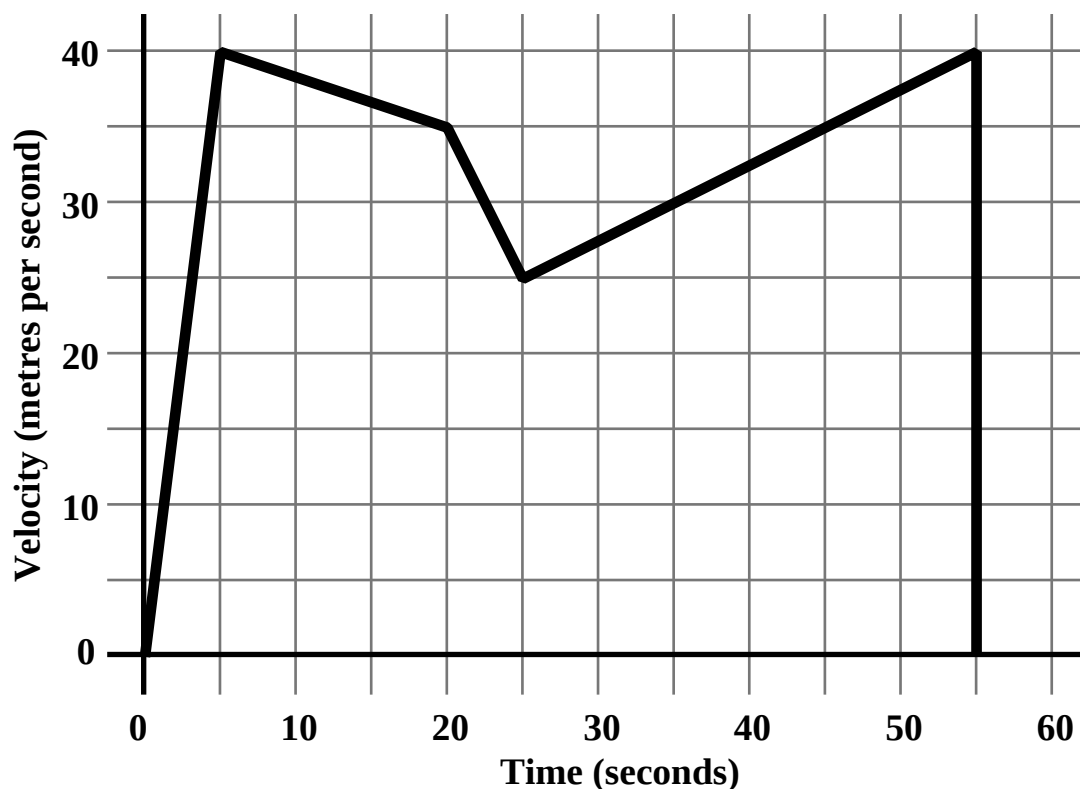
In trying to get away after a bank robbery, a car accelerates from rest to 40 m/s in five seconds.

A mother pushing a baby in a pram across the road causes first a gentle, then a more savage application of the brakes.

The baby safe, the car again accelerates to 40m/s.

Too late, the driver sees a red light, and crashes into a petrol tanker at a cross-roads. Kaargh-boom !

The failed get-away is shown on the velocity-time graph below.



- (i) How far from the bank did the crash occur ?
- (ii) Calculate the two accelerations and the two decelerations.