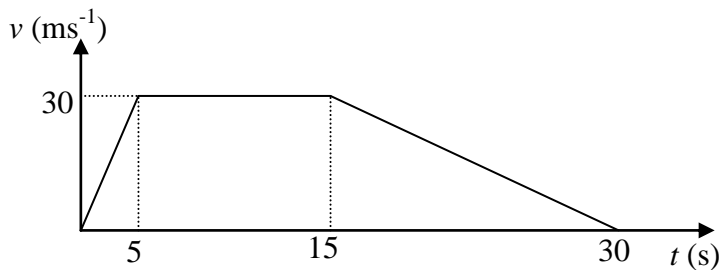


Section 2: Velocity and acceleration

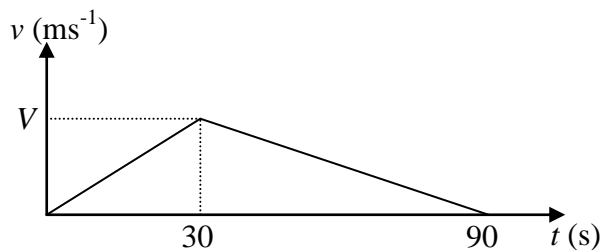
Exercise level 2

1. A and B are two stations on a line. An express train passes through A at $t = 0$ and, maintains a constant speed of 120 km h^{-1} for 45 minutes. In this time it covers $\frac{6}{7}$ of the distance from A to B. The train then decelerates uniformly to rest at B.
 - (i) Draw a velocity–time graph for the motion from A to B.
 - (ii) Find the distance from A to B.
 - (iii) Find the final deceleration in ms^{-2} .

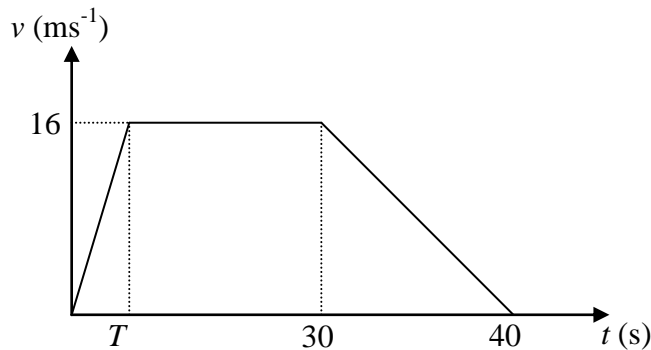
2. From the graph below find
 - (i) the distance travelled in the first 10 seconds,
 - (ii) the acceleration when $t = 20$,
 - (iii) the total distance travelled.



3. The total distance travelled during the motion modelled by the velocity-time graph below is 900 m. Use this information and the graph to find V .



4. In the motion modelled by in the graph below, the initial acceleration is 2 ms^{-2} .



- (i) Find T .
- (ii) Find the total distance travelled.
- (iii) Find the average speed for the whole journey.

Edexcel AS Maths Kinematics 2 Exercise

5. A train takes 12 minutes to travel the 12 km between Parkway and Haymarket. It starts from rest at Parkway and accelerates uniformly to a speed of $V \text{ kmh}^{-1}$ in 5 minutes. It then decelerates uniformly to come to rest at Haymarket. Draw a velocity–time graph to represent this motion and use this to find a value for V . Are the assumptions made in this question realistic?



6. A train stops at both Newcastle and Durham, 30 km apart. Starting from Newcastle it takes 4 minutes to accelerate uniformly to 40 ms^{-1} , maintaining this speed until, with uniform deceleration over 1500 m, it comes to rest in Durham. Find the total time for the journey.