Corbettmaths

Displacement-Time Graphs

Mechanics

Video Tutorial

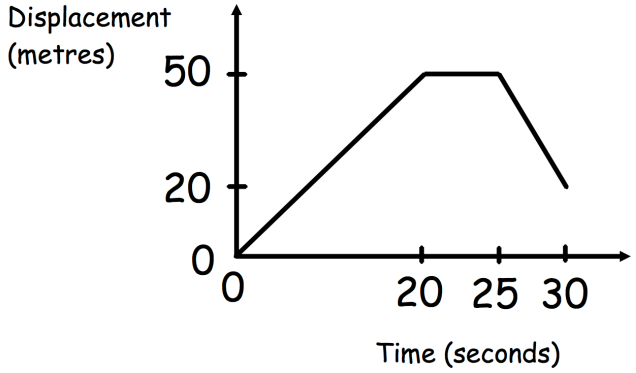
Displacement (s) is the distance from a fixed point in a certain direction. (units: m)

Velocity (u or v) is the rate of change of displacement. (units: m/s)

The gradient of the line is the velocity.

If the line is horizontal, the object is at rest.

$$\text{Average speed} = \frac{\text{total distance travelled}}{\text{time taken}} \qquad \text{Average velocity} = \frac{\text{displacement from start}}{\text{time taken}}$$



(a) Find the velocity over the first 20 seconds

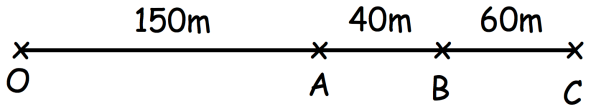
(b) Find the velocity between 20 and 25 seconds.

(c) Find the velocity over the last 5 seconds.

(d) Find the average speed for the entire journey.

(e) Find the average velocity for the entire journey.

A particle travels along a straight line, OABC.



The particle starts at O and travels to A at a constant speed.
It takes 10 seconds.

The particle stops for 5 seconds and then travels to C at a speed of 20m/s.

The particle then travels to B at a constant speed.
It takes 12 seconds.

(a) Draw a displacement-time graph for this information.



(b) Calculate the average speed of the particle over the entire journey.

(c) Calculate the average velocity of the particle over the entire journey.