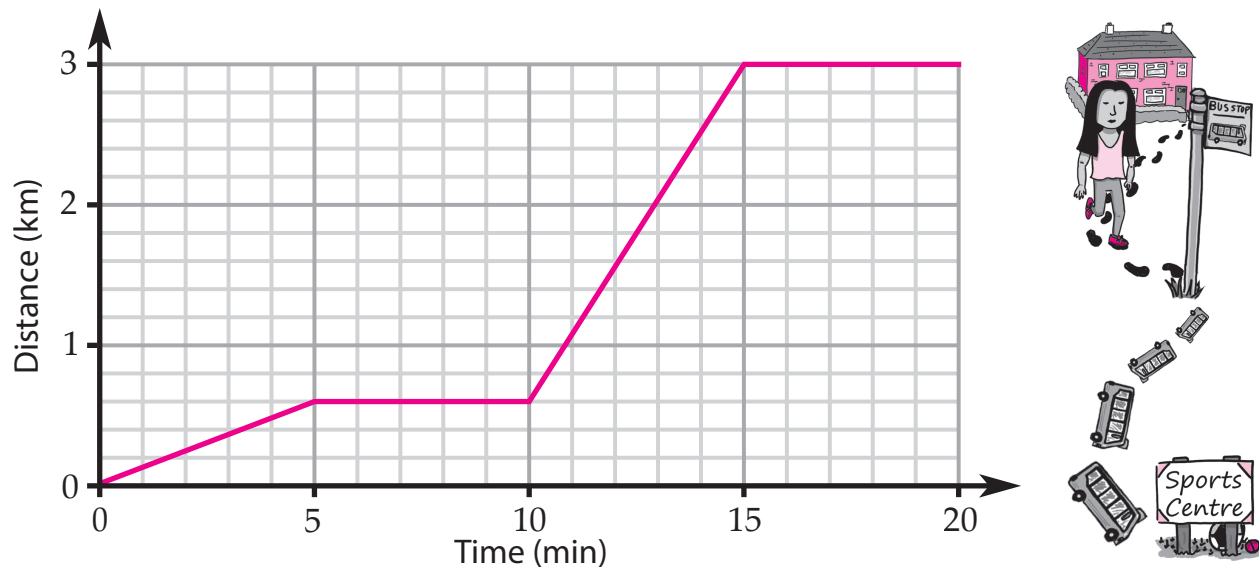


Distance-Time Graphs

In a **distance-time** graph the total **distance** travelled so far is plotted against the **time** since the journey **started**.

Here is a distance-time graph. It shows a teenager's journey from home to a sports centre. They **walk** to a bus stop, **wait** for the bus, and then ride the bus to the sports centre.



1 This question is about the teenager's journey to the sports centre shown on the graph. Label these moments in the journey with the letters indicated:

A The teenager leaves home

C The teenager boards the bus

B They get to the bus stop.

D They arrive at the sports centre.

2 This question is also about the teenager's journey to the sports centre.

(a) How much time did it take to walk to the bus stop?

(b) How far is the bus stop from the teenager's home?

(c) How much time did the teenager have to wait for the bus?

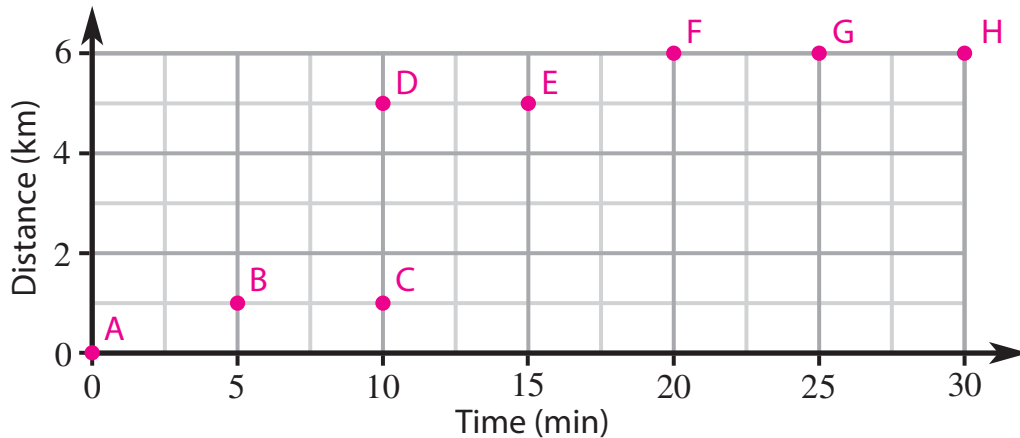
(d) How far did the teenager ride the bus?

(e) How far did the teenager travel in total?

3 How can you tell **from the graph** that the bus travelled faster than the teenager walked?

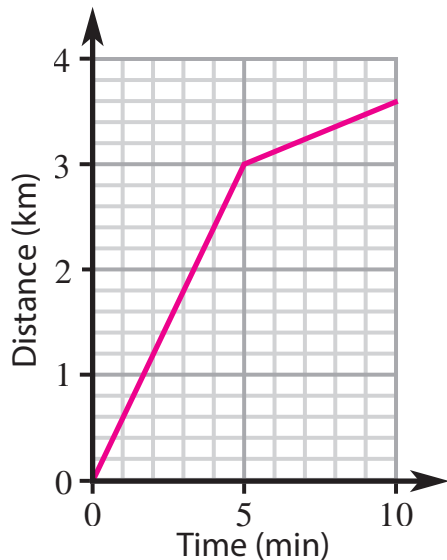
A group of artists cycle 5 km to the base of a hill. This takes them 15 minutes. Next, they take 10 minutes to walk 1 km up the hill. They then stand still for 5 minutes to admire the view.

- 4 Use the axes to plot a distance-time graph of the artists' journey. Then write down which points your line goes through (it goes through **some** of the labelled points).



- 5 This question is about the distance-time graph you plotted in Q4.
- (a) Which point on your graph is the moment where the artists parked their bikes? Write its letter, and explain how you decided.
- (b) Which point on your graph is the moment where the artists arrived at the top of the hill? Write its letter and explain how you decided.
-
- 6 How far did the artists in Q4 move each minute while they were walking?
- 7 When the artists were cycling,
- (a) how far did they cycle? Give your answer in metres. (1 km = 1000 m)
- (b) how much time did the cycle ride take? Give your answer in seconds.
- (c) how far did the artists cycle each second?
- 8 If the artists cycled for one hour at the speed they cycled to the hill, how far would they go? Give your answer in kilometres. This number is the cyclists' speed in km/h.

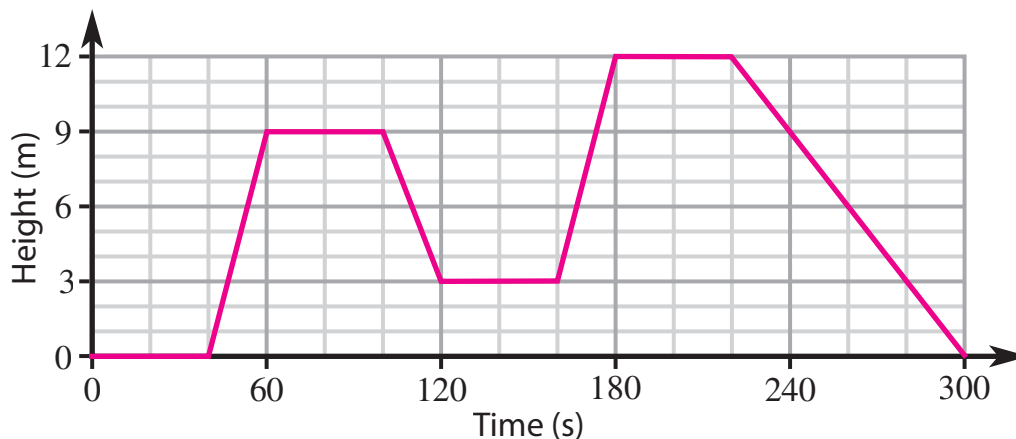
- 9 The graph shows a student travelling from home to a laboratory. They cycle to the cycle park at their usual cycling speed. They then walk the rest of the way at their usual walking speed.



- (a) How far does the student travel in total?
- (b) How far would the student cycle in an hour?
- (c) How far would the student walk in an hour?
- (d) What is the student's cycling speed in km/h?
- (e) What is the student's cycling speed in m/s?

- 10 If the student in Q9 were able to cycle all the way to the lab, how much time would it take them to get there?

This graph shows the height of the lift (elevator) in a building during a five minute period of time. The height is an example of a **displacement**. Displacement measures the location of something in a particular direction (here upwards from the ground).



- 11 Use the graph of the lift's height to answer these questions.
- (a) Label the graph with an **A** when the lift is not moving.
 - (b) How can you tell **from the graph** if the lift is moving up or down?
 - (c) When is the lift moving at its slowest speed (but not stationary)?
 - (d) How far does the lift move in total during the five minutes?