Planner

Graphs of real-life situations

- Using a graph to convert one quantity into another
- Interpreting distance–time graphs

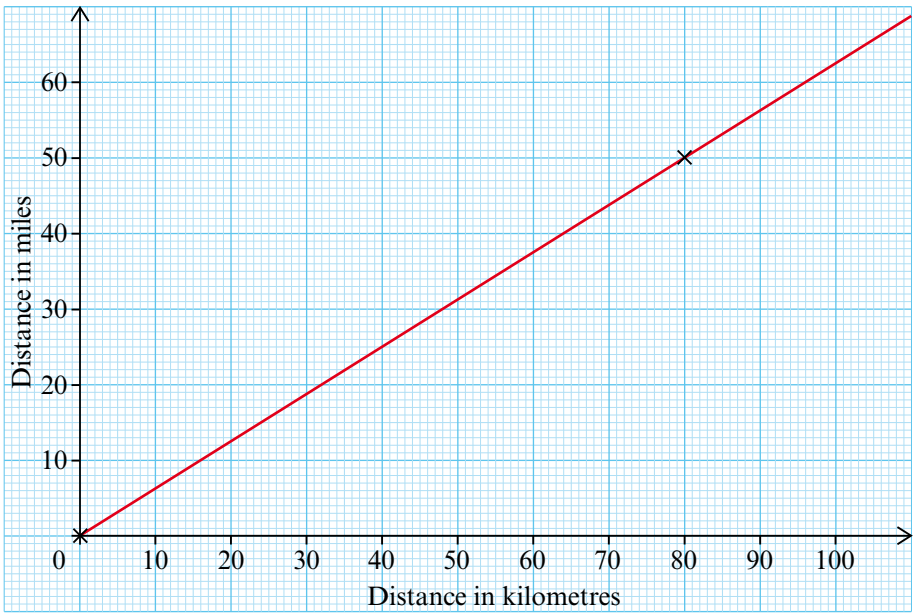
Keywords

You should know

explanation 1

online

1 You can use this graph to convert between miles and kilometres.



a **i** How many kilometres does each small square on the x-axis represent?

ii How many miles does each small square on the y-axis represent?

b Write these distances to the nearest mile.

i 40 km **ii** 60 km **iii** 25 km **iv** 92 km

c Explain how you can use the graph to work out that 120 km is approximately 75 miles.

d Write these distances to the nearest kilometre.

i 50 miles **ii** 20 miles **iii** 15 miles **iv** 36 miles

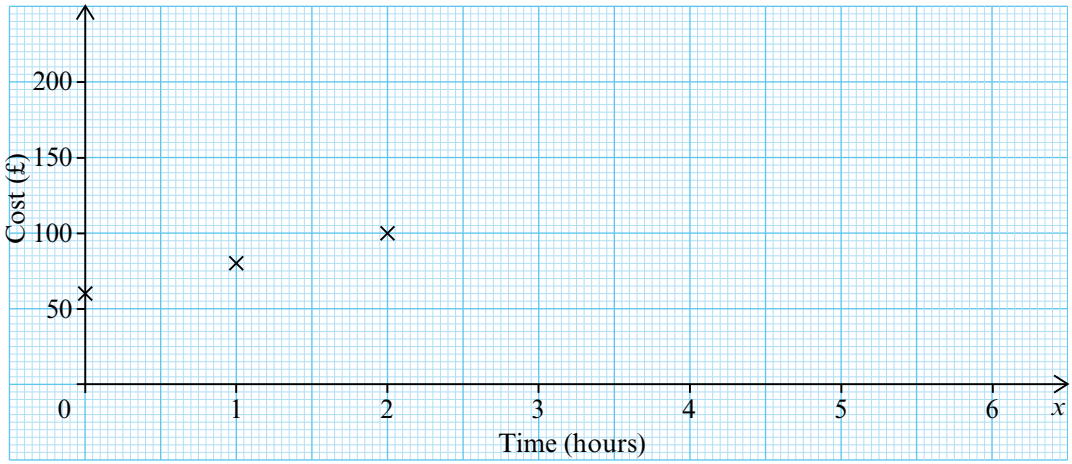
e Explain how you can use your graph to work out that 120 miles is approximately 192 km.

2 A plumber charges a £60 call out fee and then £20 for each hour worked.
The table shows the cost of hiring the plumber for different lengths of time.

Number of Hours	0	1	2	3	4
Cost (£)	60	80	100	120	140

a The axes shows the cost (in £) against time (in hours) of hiring the plumber.

Copy the axes onto graph paper and plot the points from the table.
The first three points are shown on the graph.



b Draw a straight line through the points and continue it to the edge of the graph paper to complete the conversion graph.

c **i** How many pounds does each small square on the y-axis represent?

ii How many minutes does each small square on the x-axis represent?

d Use your graph to work out approximately how much the plumber would charge for a job that lasted for these times.

i 6 hours **ii** $2\frac{1}{2}$ hours **iii** $3\frac{1}{4}$ hours **iv** $1\frac{3}{4}$ hours

e Use your graph to work out approximately how long the plumber would have worked if he charged these amounts for different jobs.

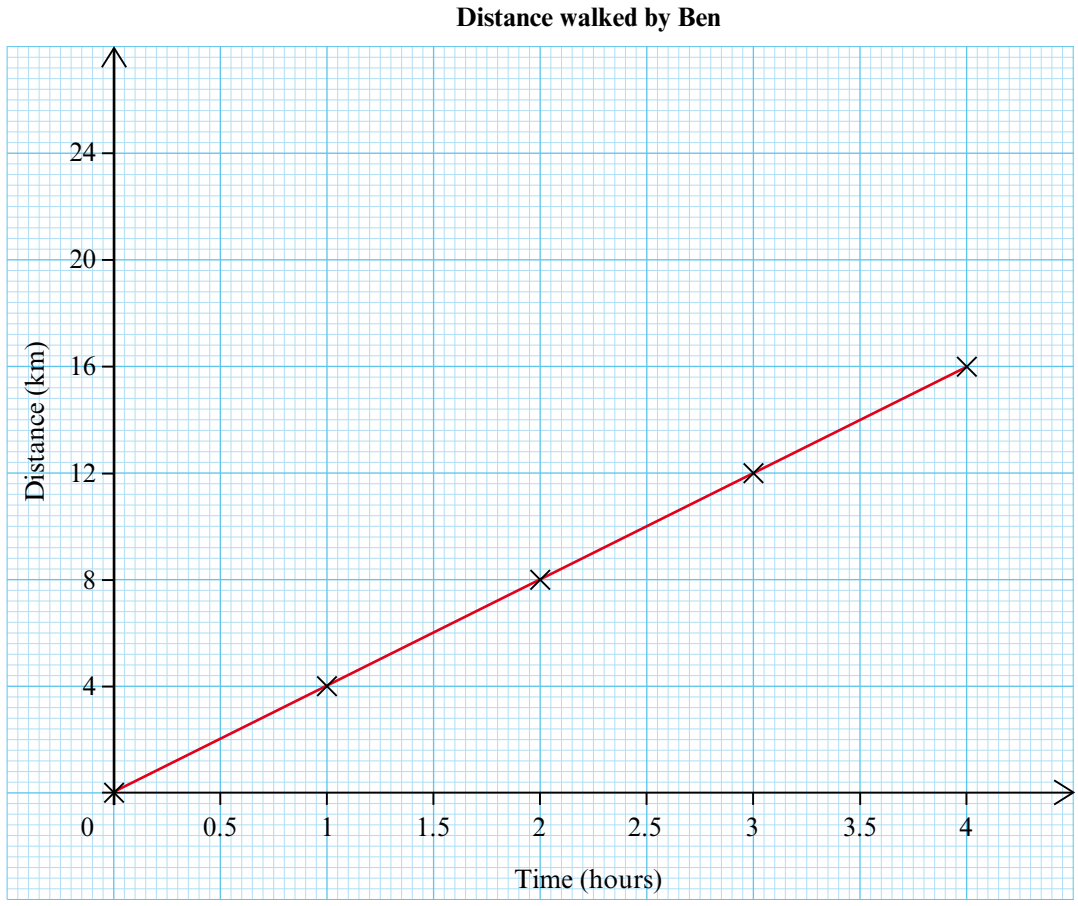
i £60 **ii** £150 **iii** £85 **iv** £115

***f** Gill said, 'Since 3 hours costs £120, 6 hours would cost £240 because it would be double.'

How can you tell from the graph that Gill's method doesn't work?

explanation 2

3 The distance–time graph shows the distance Ben walked at a constant speed.



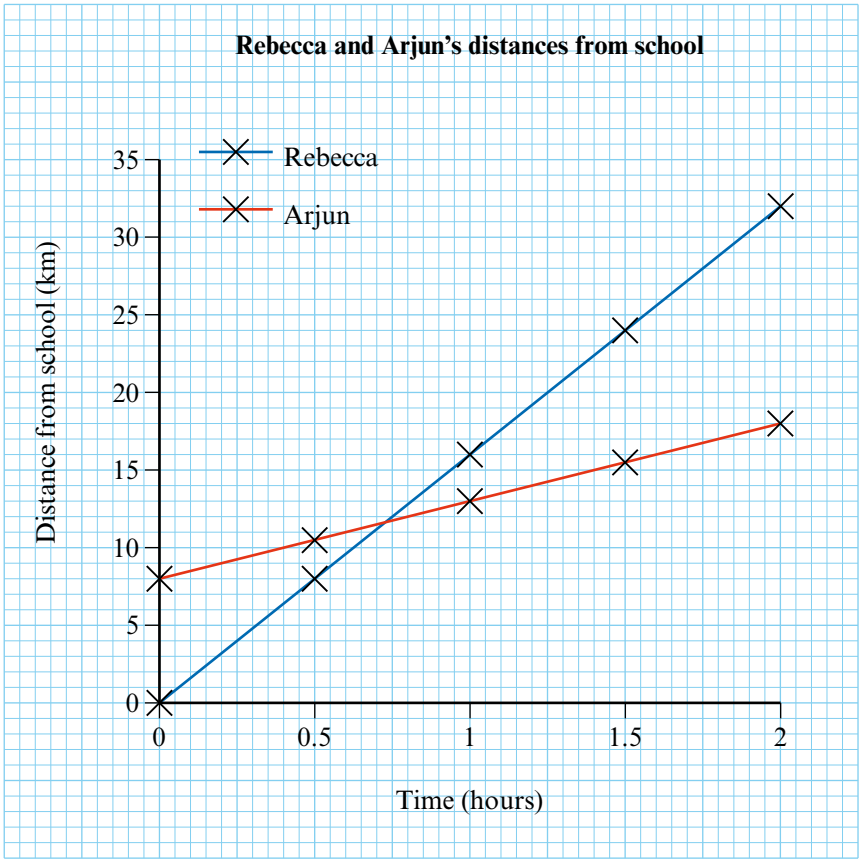
a How far did Ben walk in 2 hours?

b How long did it take him to walk 14 km?

c Ben is going to do a walk for charity. The distance he has to walk is 24 km.

Assuming that he walks at the same constant speed, approximately how long will it take him to walk the 24 km?

4 Rebecca was at school and Arjun was at his house 8 km away.
Rebecca started cycling towards Arjun at a steady speed.
At the same time, Arjun started walking in the same direction at a steady speed.
This distance–time graph shows their distances from school.



a How far does Rebecca cycle in the first 30 minutes?

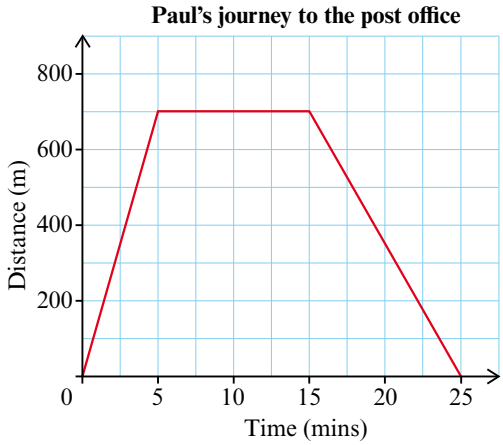
b Explain how you can work out that Arjun travelled 5 km in the first hour.

c After how many minutes does Rebecca overtake Arjun?
Explain how you know.

d After two hours, what was the distance between Rebecca and Arjun?

e How can you tell from looking at the graph that Rebecca travelled faster than Arjun?

5 Paul walked to the local post office to post a parcel.
The distance–time graph shows his journey.



a How far is the post office from Paul's house?

b How long did it take him to get there?

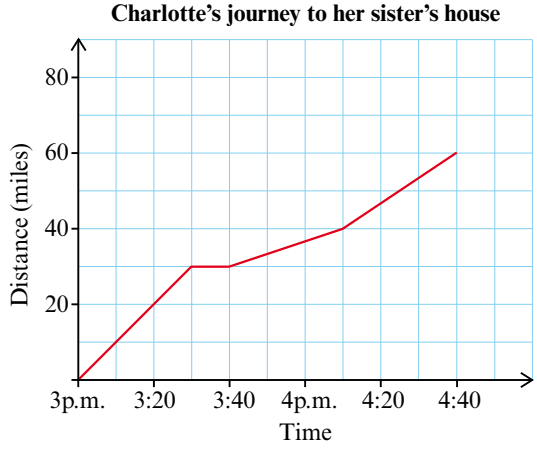
c How long did he spend at the post office?

d How long did it take him to get home?

e How long was he away from his house?

f How far did he walk altogether?

6 The distance–time graph shows Charlotte's journey on the motorway as she travelled to her sister's house.



a How far did Charlotte travel on the motorway?

b For how long did Charlotte travel on the motorway?

c Charlotte was stuck in a traffic jam for part of the journey. What time did she reach the traffic jam?

d For how long did the traffic not move?

e Between what times did Charlotte travel at her fastest speed?