



Real-life graphs

Year 7 About 75 minutes No calculator 45 marks

Date _____

A Do Now

Quick questions to start.

- A1** Needed today [1 mark] Write 20 minutes as a fraction of an hour.
- A2** Needed today [1 mark] A train goes 60 km in one hour. How far does it go in 15 minutes?

Answer

Answer

- A3** Last lesson [1 mark] Work out $y = x^2 - 8$ when $x = -3$.
- A4** From chapter 6 [1 mark] A cube has edges of 3 cm. Work out its surface area.

Answer

Answer

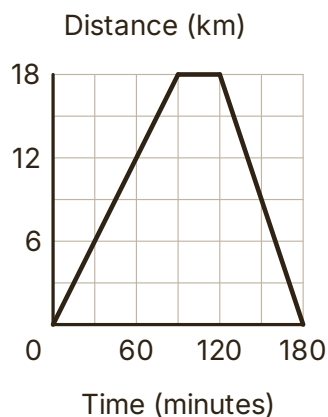
B Example, then your turn

Year 7

Your teacher works through each example with you. Then try the one beside it.

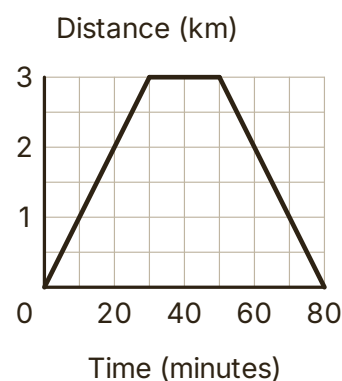
EXAMPLE 1

The graph shows Ella's bike ride from home. Describe her ride. Give the speed of each part in km/h.



Hint Up means moving away from home, flat means stopped, down means coming back. Change the minutes to hours before you divide.

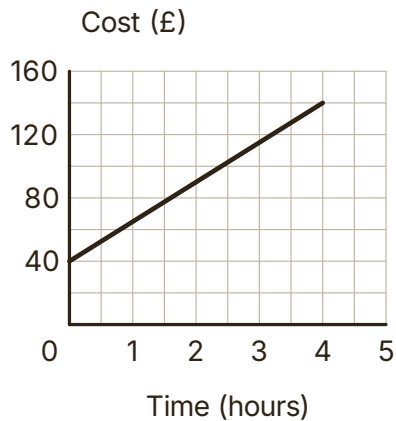
- B1** The graph shows Sam's walk from home. For how many minutes did Sam stop? Work out his speed on the way out, in km/h. [3 marks]



Answer

EXAMPLE 2

The graph shows what a plumber charges. Write down the call-out charge (the cost for 0 hours) and the charge for each hour.



Hint The call-out charge is where the line meets the cost axis. The charge for each hour is how much the cost goes up for one hour across.

B3 The graph shows the cost of a taxi. Write down (i) the fixed charge, (ii) the cost for each mile, (iii) the cost of an 8 mile journey. [3 marks]



Answer

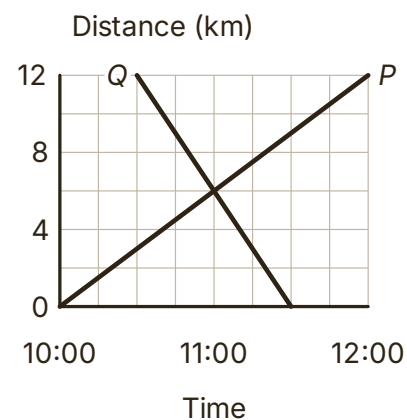
EXAMPLE 3

Cars A and B leave the same place along the same road. When and how far from the start does B pass A?



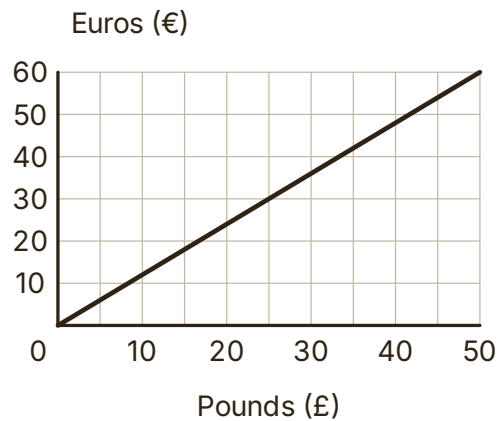
Hint They are at the same place at the same time where the two lines cross.

B4 P and Q walk towards each other along one path. The graph shows each one's distance from P's home. When do they meet, and how far from P's home? [2 marks]



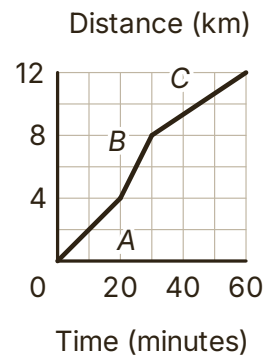
Answer

- C1** The graph changes pounds into [3 marks]
euros. Change (a) £25 into
euros, (b) €150 into pounds.



Answer

- C2** The graph shows a journey in [3 marks]
three stages, *A*, *B* and *C*. Which
stage was the fastest? Work out
its speed in km/h.



Answer

- C3** A train travels at 80 km/h. How [2 marks]
many minutes does it take to
travel 20 km?

Answer

- C4** A bus travels 12 km in 20 [2 marks]
minutes. Work out its speed in
km/h.

Answer

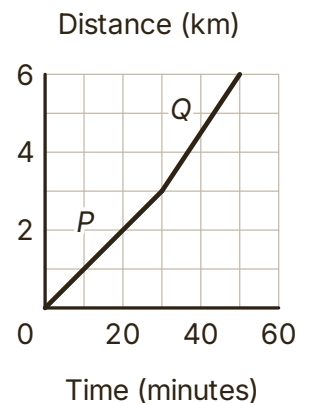
D Exam-style questions

GCSE Foundation

- D1** Ana says, "Leo ran faster in part *P*, because part *P* lasted longer." [4 marks]

The graph shows Leo's run. Ana is wrong. Work out Leo's speed in km/h in part *P* and in part *Q*.

Answer



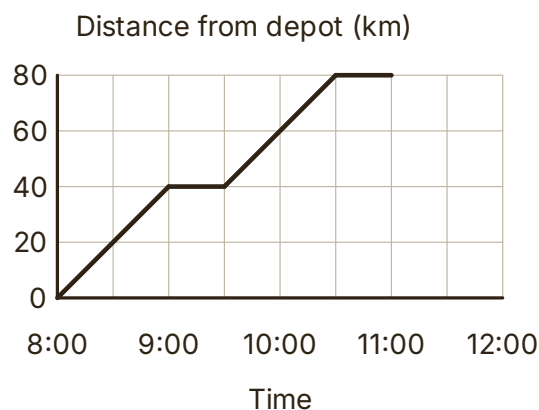
D2 A van leaves the depot at 8:00 and makes two deliveries. The graph shows its journey until 11:00.

- (a) How far from the depot was the van at 10:00? [1 mark]

Answer

- (b) For how many minutes was the van stopped altogether? [1 mark]

Answer



- (c) At 11:00 the van drives back to the depot at 80 km/h. Complete the graph. [2 marks]

- (d) Work out the average speed of the van from 8:00 until it is back at the depot, stops included. [2 marks]

Answer

Total for D2: 6 marks

D3 Firm A and firm B hire out a cement mixer. The graph shows what each firm charges.

- (a) Write down the fixed charge for firm A. [1 mark]

Answer

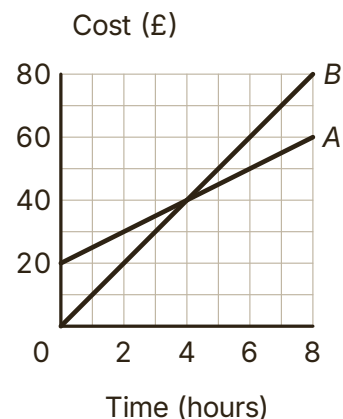
- (b) For how many hours do the two firms charge the same? [1 mark]

Answer

- (c) Which firm is cheaper for 6 hours, and by how much? [2 marks]

Answer

Total for D3: 4 marks



D4

Raj says, "My average speed was 16 km/h, because 12 and 20 have a mean of 16."

[4 marks]

Raj cycles 18 km at 12 km/h, then 10 km at 20 km/h. Work out his average speed for the whole ride.

Answer

E Extension

Stretch

No route is given. The hints are at the end of the sheet. Use one at a time.

- E1** Tom and Lily live 33 km apart. Tom cycles towards Lily's home at 12 km/h, leaving at 10:00. Lily cycles towards Tom's home at 18 km/h, leaving at 10:30. At what time do they meet, and how far from Tom's home? [5 marks]

Answer At , km from Tom's home

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Work out where Tom is at 10:30, when Lily sets off.
Hint 2 At 10:30 Tom has gone 6 km, so 27 km are left between them.
Hint 3 Together they close the gap by $12 + 18 = 30$ km each hour.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

I can describe a journey from a distance-time graph and work out a speed from it. ☐ ☐ ☐

I can read a conversion graph both ways. ☐ ☐ ☐

I can read a fixed charge and a cost per unit from a graph. ☐ ☐ ☐

I can work out an average speed for a whole journey. ☐ ☐ ☐