DISTANCE–TIME GRAPHS

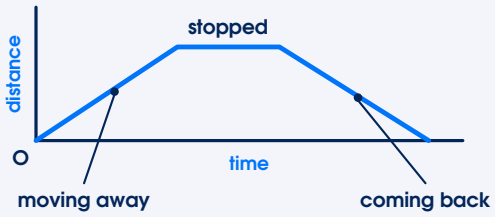
BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

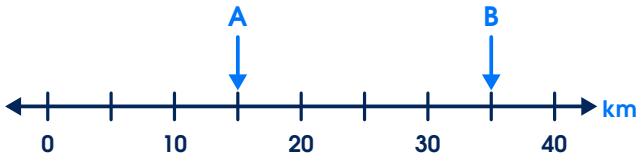
KEY IDEA

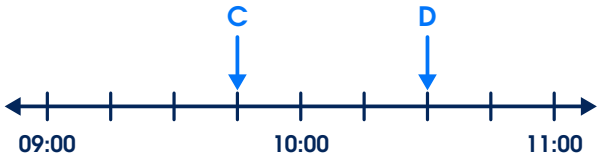
A distance–time graph shows a journey.

Line going up:	moving away
Flat line:	stopped
Line going down:	coming back



1 Write the value that each arrow points to.



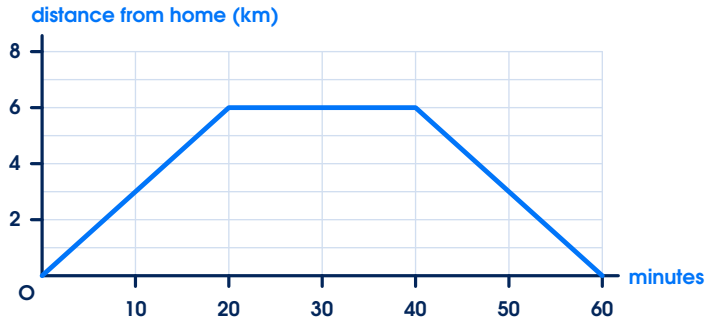


A = ☐ km B = ☐ km C = ☐ D = ☐

2 How many minutes are there from:

a) 10:00 to 10:30 ☐ min **b)** 09:45 to 10:30 ☐ min **c)** 10:30 to 11:15 ☐ min

3 This graph shows Ella's bike ride from home to the park and back.



a) How far is the park from home?
☐ km

b) How long did Ella stay at the park?
☐ minutes

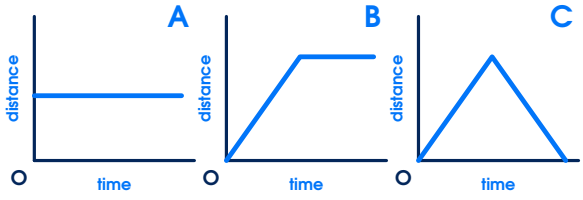
c) How long did the ride home take?
☐ minutes

4 Write the letter of the graph that matches each story.

Jo walks to the shop and back. ☐

Jo waits at the bus stop. ☐

Jo walks to the park and sits. ☐



DISTANCE–TIME GRAPHS

SUPPORT

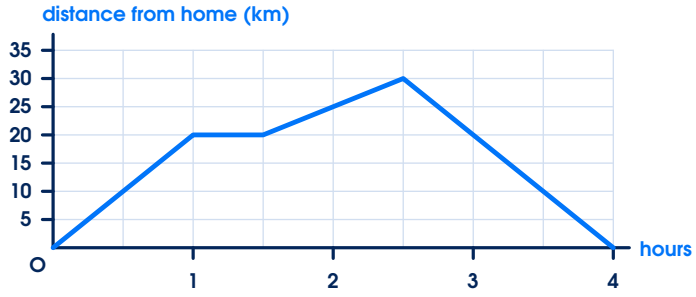
NAME _____ CLASS _____ DATE _____

KEY IDEA

Speed = distance ÷ time for each part of the graph.

Steeper line = faster. Flat line = stopped.

1 The graph shows Ben's bike ride.

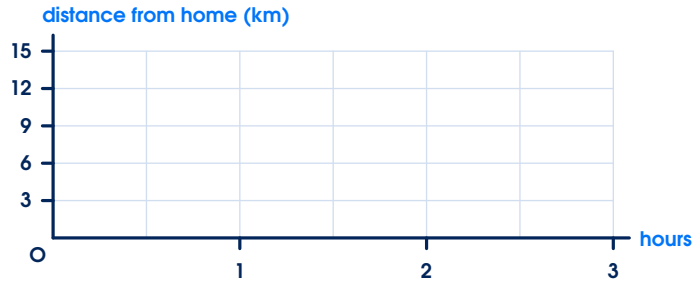


a) Distance from home after 1 hour? ☐ km

b) How long did Ben stop for? ☐ minutes

c) Speed in the first hour? ☐ km/h

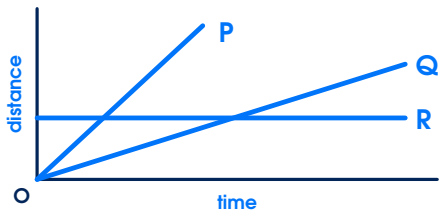
2 Jo cycles 12 km in 1 hour. She stops for 30 minutes. Then she cycles home in 1 hour.



a) Draw Jo's journey.

b) Find Jo's speed on the way home. ☐ km/h

3 The sketch shows three people P, Q and R on the same path.



a) Which person is the fastest? ☐

b) Which person is not moving? ☐

c) Which person is the slowest walker? ☐

4 Circle TRUE or FALSE.

a) A flat line shows moving at a steady speed. TRUE FALSE

b) A steeper line shows a faster speed. TRUE FALSE

c) A line going down shows going downhill. TRUE FALSE

DISTANCE–TIME GRAPHS

CORE

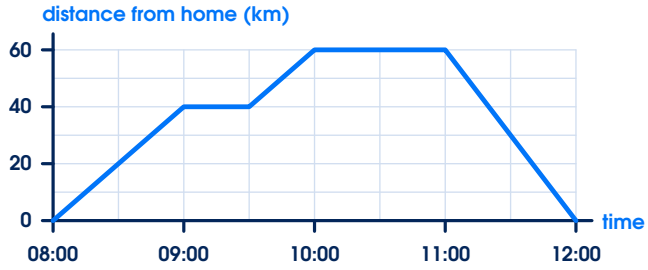
NAME _____ CLASS _____ DATE _____

KEY IDEA

The gradient of a line segment is the speed for that part of the journey. Average speed for the whole journey = total distance ÷ total time (include the stops).

FLUENCY

1 Tom drives from home to a garden centre and back.



a) Time stopped in total? ☐

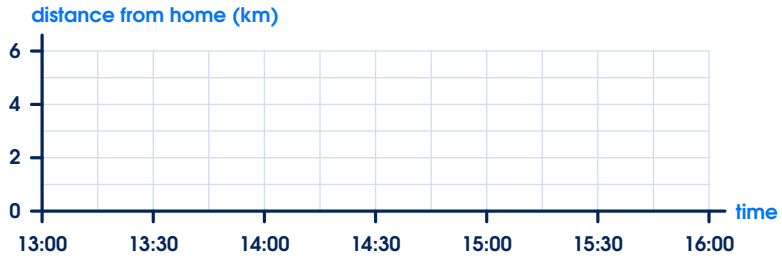
b) Distance at 09:45? ☐

c) Speed 09:30–10:00? ☐

d) Speed going home? ☐

e) Average speed overall? ☐

2 Grace walks at 5 km/h for 1 hour, rests for 30 minutes, then walks home at 4 km/h.



a) She leaves home at 13:00. Draw her journey.

b) When is she home? ☐

REASONING

3 On Ade's graph, the line from 10:00 to 10:30 goes up by 12 km. Ade says, "So my speed was 12 km/h."

a) Explain Ade's mistake.

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b) Work out Ade's correct speed. ☐ km/h

4 Sam says, "When the line on a distance–time graph goes down, the bus is going downhill." Explain why Sam is wrong.

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DISTANCE–TIME GRAPHS

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

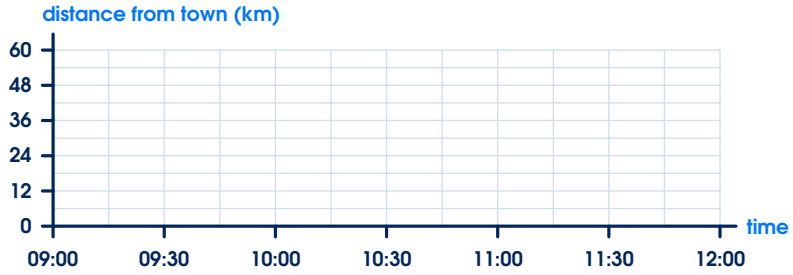
a) Crossing lines show two people at the same place. ALWAYS SOMETIMES NEVER

b) On any two graphs, the steeper line is faster. ALWAYS SOMETIMES NEVER

c) A distance–time graph can have a vertical line. ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 A cyclist leaves a town at 09:00, riding at 18 km/h towards a city 54 km away. A van leaves the city at 10:00 and drives to the town at 54 km/h.



a) Draw both journeys.

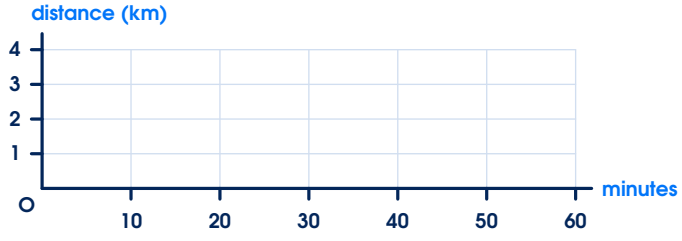
b) When and where do they pass each other?

3 Leo cycles 36 km from home in 1.5 hours, rests, then cycles home at 18 km/h. His average speed for the whole trip, including the rest, is 16 km/h.

How long did Leo rest? ____

★ CHALLENGE FOR ALL

4 Kim runs to a park 4 km away and back. Running there takes twice as long as running back. Her average speed for the whole run is 8 km/h.



a) Work out her speed each way.

there: ____ km/h

back: ____ km/h

b) Draw her run on the grid.

DISTANCE–TIME GRAPHS – ANSWERS

ANSWERS

BUILDING BLOCKS

1. A = 15 km · B = 35 km · C = 09:45 · D = 10:30
2. a) 30 min · b) 45 min · c) 45 min
3. a) 6 km · b) 20 minutes · c) 20 minutes
4. shop and back → C · waits at the bus stop → A · walks to the park and sits → B

SUPPORT

1. a) 20 km · b) 30 minutes · c) 20 km/h
2. a) Straight lines from (0, 0) to (1, 12), flat to (1.5, 12), then down to (2.5, 0) · b) 12 km/h
3. a) P (steepest line) · b) R (flat line) · c) Q
4. a) FALSE (a flat line means stopped) · b) TRUE · c) FALSE (it shows coming back towards the start)

CORE

1. a) 1 hour 30 minutes (09:00–09:30 and 10:00–11:00) · b) 50 km · c) 20 km in ½ hour = 40 km/h · d) 60 km in 1 hour = 60 km/h · e) 120 km ÷ 4 h = 30 km/h
2. a) (13:00, 0) to (14:00, 5), flat to (14:30, 5), then down to (15:45, 0) · b) 5 ÷ 4 = 1.25 h, so 15:45
3. a) 12 km is the distance in ½ hour, not in 1 hour · b) 12 ÷ 0.5 = 24 km/h
4. A line going down shows the distance from the start getting smaller: the bus is travelling back towards where it started, not going downhill.

GREATER DEPTH

1. a) Always · b) Sometimes: true on the same axes, but different scales can make a slower line look steeper · c) Never: it would mean covering a distance in no time
2. Cyclist: (09:00, 0) to (12:00, 54) · van: (10:00, 54) to (11:00, 0) · they pass at 10:30, 27 km from the town
3. Total distance 72 km, so total time = 72 ÷ 16 = 4.5 h · moving: 1.5 h + 36 ÷ 18 = 2 h · rest = 4.5 – 3.5 = 1 hour
4. a) 8 km at 8 km/h takes 1 hour: 40 min there, 20 min back · there: 6 km/h, back: 12 km/h · b) (0, 0) to (40, 4), then to (60, 0)