

Speed

Year 8 About 75 minutes Calculator allowed 51 marks

Hints online, answers free with an account:
mathswariz.uk/worksheets/ks3-year-8-speed/

Date _____

A Do Now

Quick questions to start.

- A1** Needed today [1 mark] Write 45 minutes as a decimal of an hour.
- A2** Needed today [1 mark] Change 2.7 km into metres.

Answer

Answer

- A3** Last lesson [1 mark] Work out the value of $x^3 - 2x$ when $x = 3$.
- A4** Year 7 [1 mark] 8 pens cost £6. Work out the cost of 12 pens.

Answer

Answer

B Example, then your turn

Year 8

Speed = distance ÷ time. Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

A cyclist rides 54 km in 3 hours. Work out her average speed.

Hint Speed = distance ÷ time. Kilometres and hours give km/h.

- B1** A train travels 225 km in 2.5 hours. Work out its average speed. [2 marks]

Answer ... km/h

EXAMPLE 2

A bus travels 21 km in 35 minutes. Work out its average speed in km/h.

Hint Change the time to hours first: divide the minutes by 60.

- B2** A car travels 66 km in 1 hour 12 minutes. Work out its average speed in km/h. [3 marks]

Answer ... km/h

EXAMPLE 3

A boat sails at 14 km/h for 2 hours 15 minutes. How far does it sail?

Hint Distance = speed $\times$ time. 15 minutes is 0.25 of an hour.

B3 Zara walks at 4.8 km/h for 1 hour 40 minutes. How far does she walk? [3 marks]

Answer ... km

EXAMPLE 4

A coach travels 130 km at an average speed of 60 km/h. How long does the journey take? Give your answer in hours and minutes.

Hint Time = distance $\div$ speed. Then change the decimal part of the hours into minutes.

B4 A van travels 99 km at an average speed of 54 km/h. How long does the journey take? Give your answer in hours and minutes. [3 marks]

Answer ... hours ... minutes

EXAMPLE 5

Change a speed of 72 km/h into metres per second.

Hint 1 km = 1000 m and 1 hour = 3600 seconds.

B5 Change a speed of 126 km/h into metres per second. [2 marks]

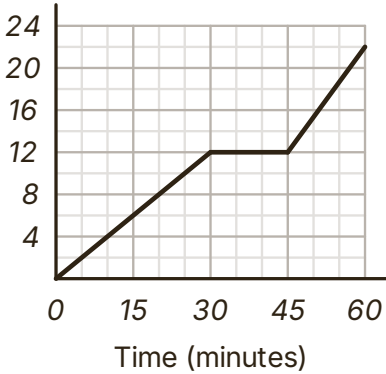
Answer ... m/s

C1 A cheetah can run at 28 m/s. [2 marks]
Change this speed into km/h.

Answer ... km/h

C2 The graph shows Ben's bike ride. Work out his speed, in km/h, for the first 30 minutes and for the last 15 minutes. [3 marks]

Distance from home (km)



C3 Ella runs 1800 m in 8 minutes. [3 marks]
Ravi runs at 14 km/h. Who runs faster? Show how you decide.

C4 A drone flies at 12.5 m/s. How long does it take to fly 1 km? [2 marks]
Give your answer in minutes and seconds.

Answer ... minutes ... seconds

C5 A journey is 240 km long. Work out the missing times in the table. [3 marks]

Speed (km/h)	Time (hours)
40	?
60	4
80	?
120	?

C6 A plane flies at 840 km/h. How far does it fly in one minute? [2 marks]

Answer ... km

- D1** Ali drives 60 km at 30 km/h. Then he drives another 60 km at 60 km/h. He says: "My average speed for the whole journey is 45 km/h, because $(30 + 60) \div 2 = 45$." [3 marks]

Show that Ali is wrong. Work out his average speed for the whole journey.

- D2** A train leaves Leeds at 09:45 and arrives in London at 12:05. The journey is 287 km. [4 marks]
Work out the average speed of the train in km/h.

Answer ... km/h

- D3** Mia cycles 18 km from her home to her gran's house at an average speed of 15 km/h. [2 marks]
(a) How many minutes does the ride take?

Answer ... minutes

- (b) Mia leaves home at 13:50. She stays at her gran's for 2 hours 15 minutes. She [3 marks]
cycles home along the same road at 12 km/h. At what time does she get home?

Answer

Total for D3: 5 marks

- D4** A car travels 500 m in 25 seconds. The speed limit on the road is 70 km/h. Is the car [4 marks]
going faster than the speed limit? You must show your working.

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

E1 Sam leaves home at 10:00 and walks along a path at 5 km/h. Tom leaves the same home at 10:30 and cycles along the same path at 15 km/h. At what time does Tom catch up with Sam? [3 marks]

Answer

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** At 10:30 Sam has already walked 5×0.5 km.
Hint 2 Each hour Tom closes the gap by $15 - 5 = 10$ km.
Hint 3 The gap is 2.5 km. $2.5 \div 10 = 0.25$ hours = 15 minutes after 10:30.

How did it go?

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

I can work out a speed, a distance or a time. ☐ ☐ ☐

I can work with times in hours and minutes. ☐ ☐ ☐

I can change a speed between km/h and m/s. ☐ ☐ ☐

I can read a speed from a distance-time graph. ☐ ☐ ☐