

SPEED, DISTANCE & TIME

Mastery Worksheet

I DO

A train travels 135 km in 1 hour and 30 minutes.

Work out the average speed of the train in m/s.

WE DO

A car travels 180 km in 2 hours and 15 minutes.

Work out the average speed of the car in m/s.

YOU DO 1

A bus travels 210 km in 2 hours and 30 minutes.

Work out the average speed of the bus in m/s.

YOU DO 2

A cyclist travels 72 km in 3 hours and 20 minutes.

Work out the average speed of the cyclist in m/s.

CHALLENGE 1 (AVERAGE SPEED OF MULTIPLE STAGES)

A high-speed train travels 360 km at an average speed of 240 km/h.

It then travels a further 200 km at an average speed of 160 km/h.

Calculate the overall average speed of the train for the entire journey in km/h.

Give your answer correct to 1 decimal place.

CHALLENGE 2 (RUNNING SPEED & TIME CONVERSION)

A runner completes a 10 km race. For the first 4 km, their average speed is 5 m/s.

For the remaining distance, their average speed is 4 m/s.

Calculate the total time taken for the race in minutes and seconds.

ANSWERS & WORKED SOLUTIONS

I Do

Step 1: Distance in metres = $135 \times 1000 = 135,000$ m.

Step 2: Time in seconds = $1.5 \text{ hours} \times 3600 = 5400$ seconds.

Step 3: Speed = Distance $\div$ Time = $135,000 \div 5400 = 25$ m/s.

Answer: 25 m/s

We Do

Step 1: Distance in metres = $180 \times 1000 = 180,000$ m.

Step 2: Time in seconds = $2.25 \text{ hours} \times 3600 = 8100$ seconds.

Step 3: Speed = $180,000 \div 8100 = 22.22\ldots$ m/s.

Answer: 22.2 m/s

You Do 1

Step 1: Distance in metres = $210 \times 1000 = 210,000$ m.

Step 2: Time in seconds = $2.5 \text{ hours} \times 3600 = 9000$ seconds.

Step 3: Speed = $210,000 \div 9000 = 23.33\ldots$ m/s.

Answer: 23.3 m/s

You Do 2

Step 1: Distance in metres = $72 \times 1000 = 72,000$ m.

Step 2: Time in seconds = $3 \text{ hours } 20 \text{ mins} = 3 \times 3600 + 20 \times 60 = 12,000$ seconds.

Step 3: Speed = $72,000 \div 12,000 = 6$ m/s.

Answer: 6 m/s

Challenge 1

Step 1: Time 1 = $360 \div 240 = 1.5$ hours.

Step 2: Time 2 = $200 \div 160 = 1.25$ hours.

Step 3: Total distance = $360 + 200 = 560$ km.

Step 4: Total time = $1.5 + 1.25 = 2.75$ hours.

Step 5: Average speed = $560 \div 2.75 = 203.636\ldots$ km/h.

Answer: 203.6 km/h

Challenge 2

Step 1: Time for first 4 km = $4000 \text{ m} \div 5 \text{ m/s} = 800 \text{ seconds}$.

Step 2: Remaining distance = $10 \text{ km} - 4 \text{ km} = 6 \text{ km} = 6000 \text{ m}$.

Step 3: Time for remaining distance = $6000 \text{ m} \div 4 \text{ m/s} = 1500 \text{ seconds}$.

Step 4: Total time = $800 + 1500 = 2300 \text{ seconds}$.

Step 5: Convert to minutes and seconds = $2300 \div 60 = 38 \text{ minutes and } 20 \text{ seconds}$.

Answer: 38 minutes 20 seconds