

Compound Measures

GCSE Maths · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

A cyclist travels 27 km in 1 hour 30 minutes. Find the average speed.

Step 1 · Time in hours

$$1 \text{ h } 30 \text{ min} = 1.5 \text{ h}$$

Step 2 · speed = $d \div t$

$$27 \div 1.5 = 18 \text{ km/h}$$

Answer: 18 km/h

Check: Not 1.30 h — 30 minutes is half an hour ✓

2. Now try one with the steps

A block of metal has mass 540 g and volume 200 cm³. Find its density, then the mass of 350 cm³ of the same metal.

Step 1 · density = $m \div V$

Step 2 · mass = density $\times V$

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. A train travels 240 km in 3 hours. Find its average speed, in km/h. [1]

2. A car travels at 65 km/h for 4 hours. How far does it go, in km? [1]

3. How long does it take to walk 10 km at 4 km/h? Give your answer in hours. [1]

4. Write 2.5 hours in hours and minutes. [1]

5. A runner covers 12 km in 45 minutes. Find the average speed, in km/h. [2]

6. A stone has mass 375 g and volume 150 cm³. Find its density, in g/cm³. [1]

7. Oak has density 0.75 g/cm³. Find the mass of a 2000 cm³ block, in g. [2]

8. A liquid has density 1.25 g/cm³. What volume has a mass of 500 g, in cm³? [2]

9. A force of 90 N acts on an area of 0.3 m². Find the pressure, in N/m². [1]

10. A pressure of 250 N/m² acts on 4 m². Find the force, in N. [2]

11. Convert 15 m/s to km/h. [2]

12. Convert 90 km/h to m/s. [2]

13. Convert a density of 2.4 g/cm³ to kg/m³. [3]

14. A tap fills a 60-litre tank at 2.5 litres per minute. How long does it take, in minutes? [2]

15. Amir drives 90 km at 60 km/h, then 70 km at 70 km/h. Find his average speed for the whole journey, in km/h. [3]

4. Before you hand it in

1 h 30 min = 1.3 h

Divide minutes by 60: $30 \div 60 = 0.5$, so 1.5 h.

Average speed = mean of the two speeds

Average speed = TOTAL distance $\div$ TOTAL time.

Converting km/h to m/s by $\div 60$

Convert both: $\times 1000$ for km $\rightarrow$ m and $\div 3600$ for hours $\rightarrow$ seconds (overall $\div 3.6$).

Mixing units, e.g. area in cm^2 with pressure in N/m^2

Convert everything to matching units before calculating.