

# Compound Measures

For AQA GCSE Mathematics (8300) • Higher tier

Name \_\_\_\_\_

Total marks: **27**

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Answer **all** questions in the spaces provided. Show your working: marks are given for correct method. You may use a calculator.

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- 1** Circle the speed that is the same as 15 metres per second.

**[1 mark]**

4.2 km/h

25 km/h

54 km/h

900 km/h

- 2** A car travels 150 km in 1 hour 40 minutes.  
Work out its average speed in km/h.

**[2 marks]**

Answer \_\_\_\_\_ km/h

- 3** A washing machine stands on four feet.  
Each foot touches the floor over an area of  $12 \text{ cm}^2$   
The washing machine exerts a force of 900 N on the floor.

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Work out the pressure on the floor.

**[2 marks]**

Answer \_\_\_\_\_  $\text{N/cm}^2$

- 4** A solid cuboid measures 5 cm by 4 cm by 2 cm.  
The cuboid has mass 312 g.  
A solid cube of side 3 cm is made from the same metal.  
Work out the mass of the cube.

**[3 marks]**

Answer \_\_\_\_\_ g

- 5** Water flows from a tap at 12 litres per minute.  
How long does it take to fill a tank of volume  $0.9 \text{ m}^3$ ?  
( $1 \text{ m}^3 = 1000$  litres)

**[2 marks]**

Answer \_\_\_\_\_ minutes

- 6** The district of Ashby has 64 800 people living in it.  
Its population density is 1350 people per  $\text{km}^2$

$$\text{population density} = \frac{\text{population}}{\text{area}}$$

The district boundary is changed so that the area of Ashby increases by  $12 \text{ km}^2$   
The number of people living in Ashby does not change.  
Work out the new population density of Ashby.

**[3 marks]**

Answer \_\_\_\_\_ people per  $\text{km}^2$

- 7** Sam makes a drink by mixing  $50 \text{ cm}^3$  of fruit concentrate with some water.  
The density of the fruit concentrate is  $1.3 \text{ g/cm}^3$   
The density of water is  $1 \text{ g/cm}^3$   
The density of the drink is  $1.06 \text{ g/cm}^3$   
Assume that the volume of the drink is the volume of the concentrate plus the volume of the water.  
Work out the volume of water Sam uses.

**[3 marks]**

Answer \_\_\_\_\_  $\text{cm}^3$

- 8** Ali runs 400 m at 5 m/s and then 600 m at 4 m/s.  
Work out his average speed for the whole run.

**[3 marks]**

Answer \_\_\_\_\_ m/s

- 9** Kofi drives 110 miles in 2 hours 15 minutes.  
For the first part of the journey his average speed is 40 mph.  
For the rest of the journey his average speed is 56 mph.  
How many miles does Kofi drive at 40 mph?

**[3 marks]**

Answer \_\_\_\_\_ miles

- 10** Maryam and Hamid live 20 km apart. A straight road joins their houses.  
Maryam leaves her house at 10.10 am and cycles towards Hamid's house at a constant 15 km/h.  
Hamid leaves his house at 10.30 am and walks towards Maryam's house at a constant 5 km/h.

(a) At what time do they meet?

**[4 marks]**

Answer \_\_\_\_\_

(b) How far from Maryam's house do they meet?

**[1 mark]**

Answer \_\_\_\_\_ km