eClassroom

GCSE Mathematics

# Compound Measures

## Questions

Pearson Edexcel GCSE & iGCSE Mathematics

# Section A — Foundation

## Worked Examples

**[Fluency]**

**A car travels 150 miles in 2.5 hours. Find its average speed.**

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{150}{2.5} = 60 \text{ mph}$$

**[Reasoning]**

**A block has mass 360 g and volume 45 cm³. Find its density.**

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}} = \frac{360}{45} = 8 \text{ g/cm}^3$$

**[Problem Solving]**

**A force of 500 N acts on an area of 0.25 m². Find the pressure.**

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}} = \frac{500}{0.25} = 2000 \text{ Pa}$$

**[Fluency]**

**1.** A car travels at 60 mph for 2.5 hours. How far does it travel?

**(1 mark)**

**[Fluency]**

**2.** A cyclist travels 150 km in 2.5 hours. Find their average speed.

**(1 mark)**

**[Fluency]**

**3.** A train travels 240 miles at an average speed of 48 mph. How long does the journey take? Give your answer in hours and minutes.

**(2 marks)**

**[Fluency]**

**4.** A block has mass 360 g and volume 45 cm³. Find its density in g/cm³.

**(1 mark)**

**[Fluency]**

**5.** A piece of metal has density 8.9 g/cm³ and volume 25 cm³. Find its mass.

**(2 marks)**

[Reasoning]

**6.** A journey is made in two stages:

Stage 1: 60 km at 80 km/h. Stage 2: 40 km at 60 km/h.

Find the average speed for the whole journey. Give your answer to 1 decimal place.

**(3 marks)**

[Reasoning]

**7.** A force of 500 N is applied to an area of 0.25 $m^2$.

Find the pressure in Pa.

**(2 marks)**

[Reasoning]

**8.** An alloy is made by combining 3 $cm^3$ of copper (density 8.9 $g/cm^3$) and 2 $cm^3$ of zinc (density 7.1 $g/cm^3$).

Find the density of the alloy.

**(3 marks)**

[Problem Solving]

**9.** A bus travels for 30 minutes at 40 mph, stops for 10 minutes, then travels for 45 minutes at 56 mph.

Find the total distance travelled.

**(3 marks)**

[Problem Solving]

**10.** A hydraulic press exerts a pressure of 80 000 Pa over an area of 0.5 $m^2$.

Find the force exerted in Newtons.

**(2 marks)**

## Section B — Higher

### Worked Examples

**[Fluency]**

**Convert 90 km/h to m/s.**

$$90 \text{ km/h} = \frac{90 \times 1000}{3600} = 25 \text{ m/s}$$

**[Reasoning]**

**Two objects A and B have the same mass. Density of A = 3 g/cm³, density of B = 8 g/cm³. Find the ratio V■:V■.**

V=m/ρ. V■=m/3, V■=m/8

$$V_A : V_B = \frac{m}{3} : \frac{m}{8} = 8 : 3$$

**[Problem Solving]**

**A metal sphere has radius 4 cm and density 7.87 g/cm³. Find its mass.**

$$V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi(64) \approx 268.08 \text{ cm}^3$$

$$m = 268.08 \times 7.87 \approx 2109.8 \text{ g}$$

**[Fluency]**

**1.** Convert 90 km/h to m/s.

**(2 marks)**

**[Fluency]**

**2.** An object travels 200 m in 8 seconds, then 300 m in 15 seconds.

Find the average speed for the whole journey in m/s. Give your answer to 3 s.f.

**(2 marks)**

**[Fluency]**

**3.** A piece of metal has density 2.7 g/cm³ and mass 540 g. Find its volume.

**(2 marks)**

**[Reasoning]**

**4.** Objects A and B have the same mass. Object A has density 3 g/cm³ and Object B has density 8 g/cm³.

Find the ratio of their volumes V■:V■.

**(3 marks)**

[Reasoning]

**5.** A distance-time graph has a straight line from (0,0) to (5,200).

**(a)** Calculate the speed. (2)

**(b)** Explain what a horizontal line segment represents. (1)

**(3 marks)**

[Reasoning]

**6.** A person of mass 60 kg is standing on one heel. The heel has area 1.5 $cm^2$ = 0.00015 $m^2$.

Take g = 9.8 $m/s^2$.

Find the pressure on the heel in Pa. Give your answer in standard form.

**(3 marks)**

[Problem Solving]

**7.** A solid iron sphere has radius 4 cm. The density of iron is 7.87 $g/cm^3$.

Find the mass of the sphere in grams. Give your answer correct to 1 decimal place.

**(3 marks)**

[Problem Solving]

**8.** A car travels at an average speed of 70 mph for 2 hours 15 minutes, then at 20 mph for 30 minutes through roadworks.

Find the overall average speed for the whole journey. Give your answer to 1 decimal place.

**(4 marks)**

[Problem Solving]

**9.** The pressure at depth h metres underwater is given by $P = \rho gh$, where $\rho = 1025$ $kg/m^3$ is the density of seawater and g = 9.8 $m/s^2$.

Find the pressure at a depth of 50 m. Give your answer in kPa.

**(3 marks)**

[Problem Solving]

**10.** 200 g of liquid A (density 0.8 g/ml) is mixed with 300 g of liquid B (density 1.2 g/ml).

Find the density of the mixture.

**(4 marks)**