

## SPEED AND DENSITY

OCR GCSE – Monday 9 November 2020 – Paper 6 (Calculator) Higher Tier

1.

- 6 A truck is used to transport some wood panels.  
Each wood panel is a cuboid measuring 2.4 m by 1.2 m by 1.8 cm.  
The density of each wood panel is  $750 \text{ kg/m}^3$ .

The truck can carry 15 tonnes of these wood panels.

Calculate the maximum number of wood panels that the truck can carry.  
Show how you decide.

..... [6]

OCR GSCE – Monday 11 November 2019 – Paper 6 (Calculator) Higher Tier

2.

- 12 (a) Arron ran a distance of 5 km at an average speed of 2.2 m/s.

How long did Arron run for?

Give your answer in minutes and seconds, to the nearest second.

(a) ..... minutes ..... seconds [4]

- (b) Claudine cycled a distance of 53 km in 2.7 hours.  
The distance is measured correct to the nearest km.  
The time is given correct to 1 decimal place.

Calculate the lower and upper bounds of her average speed.

Give your answers correct to 2 decimal places.

(b) lower bound = ..... km/h

upper bound = ..... km/h [6]

3.

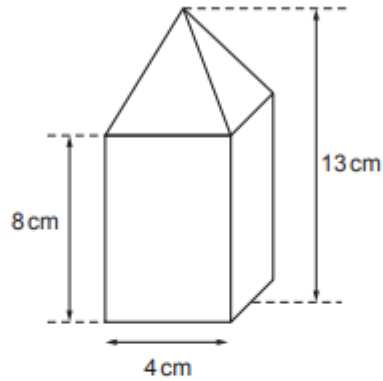
- 4 A solid metal block has mass 500g and volume  $125\text{ cm}^3$ .

Work out the density of the block.  
Give the units of your answer.

..... [3]

4.

- 8 The object below is made from a square-based pyramid joined to a cuboid.



The base of the cuboid and the base of the pyramid are both squares of side 4 cm.  
The height of the cuboid is 8 cm and the total height of the object is 13 cm.  
The total mass of the object is 158 g.

The cuboid is made from wood with density  $0.67 \text{ g/cm}^3$ .  
The pyramid is made from granite.

Calculate the density of the granite.

[The volume of a pyramid is  $\frac{1}{3} \times \text{area of base} \times \text{perpendicular height}$ .]

.....g/cm<sup>3</sup> [5]

5.

- 9 A sculptor needs to lift a piece of marble.  
It is a cuboid with dimensions 1 m by 0.5 m by 0.2 m.  
Marble has a density of  $2.7 \text{ g/cm}^3$ .  
The sculptor's lifting gear can lift a maximum load of 300 kg.

Can the lifting gear be used to lift the marble?  
Justify your decision.

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..... [4]

OCR GSCE – Sample Papers – Paper 6 (Calculator) Higher Tier

6.

- 1 180 g of copper is mixed with 105 g of zinc to make an alloy.

The density of copper is  $9 \text{ g/cm}^3$ .

The density of zinc is  $7 \text{ g/cm}^3$ .

- (a) Work out the volume of copper used in the alloy.

(a) .....  $\text{cm}^3$  [2]

- (b) What is the density of the alloy?

(b) .....  $\text{g/cm}^3$  [4]

7.

- 11 A solid piece of silver has  
mass 2.625 kilograms  
volume 250 cm<sup>3</sup>

Work out the density of the piece of silver.

Give your answer in grams per cubic centimetre.

**[2 marks]**

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Answer \_\_\_\_\_ g/cm<sup>3</sup>

AQA GCSE – Thursday 6 June 2019 – Paper 2 (Calculator) Higher Tier

8.

6

Beth drives 200 miles in 4 hours.

She drives the first 18 miles at an average speed of 36 mph

Work out her average speed for the rest of the journey.

[3 marks]

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Answer \_\_\_\_\_ mph



9.

7 Two solids, J and K, have the same density.

Complete the table.

Include units in your answers.

[3 marks]

	J	K
Mass	48 g	78 g
Volume	8 cm <sup>3</sup>	
Density		

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AQA GCSE – Thursday 7 June 2018 – Paper 2 (Calculator) Higher Tier

10.

16 Some concrete has volume  $3.8 \text{ m}^3$

16 (a) The density of the concrete is  $2400 \text{ kg/m}^3$

Work out the mass of the concrete.

[2 marks]

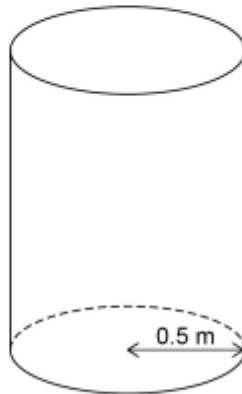
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Answer \_\_\_\_\_ kg

16 (b) The  $3.8 \text{ m}^3$  of concrete is made into the shape of a cylinder.  
The base has radius 0.5 metres.



Work out the height of the cylinder.

[2 marks]

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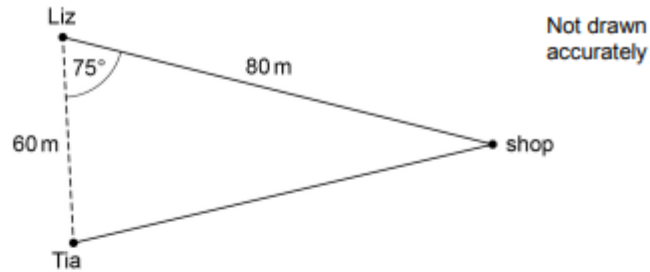
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Answer \_\_\_\_\_ m

AQA GCSE – Thursday 7 June 2018 – Paper 2 (Calculator) Higher Tier

11.

- 21 Liz and Tia are walking towards a shop along different straight paths.  
The diagram shows their positions at 2 pm



- 21 (a) Assume they walk at the same speed.

Who will arrive at the shop first?

You **must** show your working.

[3 marks]

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Answer \_\_\_\_\_

- 21 (b) In fact, Liz walks at a faster speed than Tia.

How does this affect the answer to part (a)?

[1 mark]

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12.

9 (a) Density =  $\frac{\text{mass}}{\text{volume}}$

The mass of solid A is 6 times the mass of solid B.

The volume of solid A is 3 times the volume of solid B.

Complete the sentence.

[1 mark]

The density of solid A is \_\_\_\_\_ times the density of solid B.

9 (b) Average speed =  $\frac{\text{distance}}{\text{time}}$

If the distance is halved and the time is doubled, what happens to the average speed?

Circle your answer.

[1 mark]

$\times 2$

$\times 4$

no change

$\div 2$

$\div 4$



AQA GCSE – Sample Paper 2 (Calculator) Higher Tier

14.

17 The distance from the Earth to the Sun is 93 million miles.

Assume

it takes 365 days for the Earth to travel once around the Sun  
the Earth travels in a circle with the Sun at the centre.

17 (a) Work out the average speed of the Earth in miles per hour.

[4 marks]

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Answer \_\_\_\_\_ miles per hour

17 (b) It actually takes  $365\frac{1}{4}$  days for the Earth to travel once around the Sun.

How does this affect your answer to part (a)?

[1 mark]

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