Compound Measures (H)

A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR, Pearson-Edexcel and WJEC Eduqas.

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Total Marks:	

1. Gary drove from London to Sheffield.

   It took him 3 hours at an average speed of 80km/h.

   Lyn drove from London to Sheffield.

   She took 5 hours.

   Assuming that Lyn drove along the same roads as Gary and did not take a break,

   (a) work out Lyn's average speed from London to Sheffield.

Gary
time 3hours.
speed 80km/h.
Distance = 3x80 = 240km

Lyn
5hours.
?
Distance = 240

Speed = $\frac{240}{5}$
= 48

48 .....km/h [3]

(b) If Lyn did not drive along the same roads as Gary, explain how this could affect your answer to part (a).

her distance could have been longer so her speed would be slower

[1]

2. $Pressure = \frac{force}{area}$ ✓ ✓

needs to be m^2
0.6m 60cm
0.01m/1cm

0.6 x 0.01
= 0.006

Find the pressure extered by a force of 900 newtons on an area of 60cm^2.

Give your answer in newtons/m^2.

F = 900 N
A = 0.006m^2

P = $\frac{900}{0.006}$

150,000

..... newtons/m^2 [2]

$D = \frac{m}{V}$ ✓ ✓

3. A sculptor needs to lift a piece of marble.

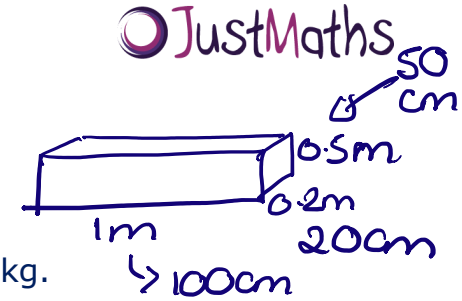
It is a cuboid with dimensions 1 m by 0.5 m by 0.2 m.

Marble has a density of 2.7 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.



Volume = $50 \times 20 \times 100 = 100,000\ cm^3$

Mass = $100,000 \times 2.7 = 270,000\ g$

$= 270\ kg.$

Yes the lifting gear can be used $270 < 300$

[4]

4. 180 g of copper is mixed with 105 g of zinc to make an alloy.

The density of copper is 9 g/cm^3.

The density of zinc is 7 g/cm^3.

$D = \frac{m}{V}$

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

	Copper	Zinc
mass	180g	105g
Density	9g/cm^3	7g/cm^3
volume	20 cm^3	15cm^3

Volume $= \frac{180}{9} = 20$

a) ..... 20 ..... cm^3 [2]

b) What is the density of the alloy?

Volume of Zinc = $105 \div 7 = 15$

Total mass = 285g

Total volume = $35\ cm^3$

Density $= \frac{285}{35}$

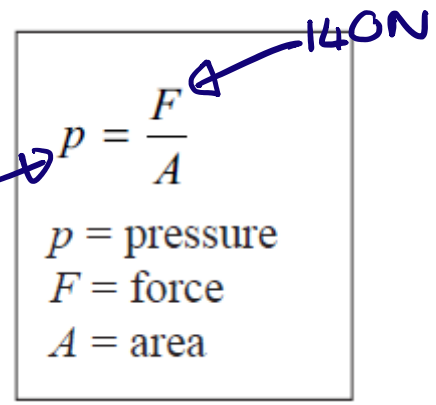
$= 8.\dot{1}4285\dot{7}$

b) ..... 8.14 (2dp) ..... g/cm^3 [4]

3. A box exerts a force of 140 newtons on a table.

   The pressure on the table is 35 newtons/m^2.

   Calculate the area of the box that is in contact with the table.



$\text{Area} = \frac{140}{35}$

$= 4\text{m}^2$

[3]

6. Which of these is used to work out density?

$D = \frac{m}{V}$

mass × volume	☐
mass^2 × volume	☐
mass ÷ volume	☑
volume ÷ mass	☐

Tick a box.

[1]

7. Zahra mixes 150g of metal A and 150g of metal B to make 300g of an alloy.

   Metal A has a density of 19.3g/cm^3.
   Metal B has a density of 8.9g/cm^3.

   Work out the density of the alloy.

	A	B	Alloy
mass	150g	150g	300g
density	19.3g/cm³	8.9g/cm³	?
Volume	7.772 cm³	16.8539 cm³	= 24.63

$D = \frac{m}{V}$

$V = \frac{m}{D}$

$7.772.. + 16.85 = 24.6259\text{cm}^3$

$300 \div 24.6259 = 12.18\text{g/cm}^3$

..... g/cm^3 [4]

8. A solid metal sphere has radius 9.8 cm.

The metal has a density of 5.023 g/cm^3.

Lynne estimates the mass of this sphere to be 20 kg.

Show that this is a reasonable estimate for the mass of the sphere.

[The volume V of a sphere with radius r is $V = \frac{4}{3}\pi r^3$]

$D = 5.023 \text{ g/cm}^3$

$\approx 5 \text{ g/cm}^3$

$r = 9.8\text{cm} \approx 10\text{cm}$

estimated Volume $= \frac{4}{3} \times \pi \times 10^3$

$= \frac{4}{3} \times 3 \times 10 \times 10 \times 10$

$= 4000\text{cm}^3$ [5]

$D = \frac{m}{V}$

estimated mass $= 4000 \times 5$

$= 20000\text{g}$

$= 20\text{kg}$.

CREDITS AND NOTES

Question	Awarding Body
1	Pearson Edexcel
2	Pearson Edexcel
3	OCR
4	OCR
5	Pearson Edexcel
6	AQA
7	Pearson Edexcel
8	OCR

Notes:

These questions have been retyped from the original sample/specimen assessment materials and whilst every effort has been made to ensure there are no errors, any that do appear are mine and not the exam board s (similarly any errors I have corrected from the originals are also my corrections and not theirs!).

Please also note that the layout in terms of fonts, answer lines and space given to each question does not reflect the actual papers to save space.

These questions have been collated by me as the basis for a GCSE working party set up by the GLOW maths hub - if you want to get involved please get in touch. The objective is to provide support to fellow teachers and to give you a flavour of how different topics "could" be examined. They should not be used to form a decision as to which board to use. There is no guarantee that a topic will or won't appear in the "live" papers from a specific exam board or that examination of a topic will be as shown in these questions.

Links:

AQA http://www.aqa.org.uk/subjects/mathematics/gcse/mathematics-8300

OCR http://ocr.org.uk/gcsemaths

Pearson Edexcel http://qualifications.pearson.com/en/qualifications/edexcel-gcses/mathematics-2015.html

WJEC Eduqas http://www.eduqas.co.uk/qualifications/mathematics/gcse/

Contents:

This version contains questions from:

AQA – Sample Assessment Material, Practice set 1 and Practice set 2

OCR – Sample Assessment Material and Practice set 1

Pearson Edexcel – Sample Assessment Material, Specimen set 1 and Specimen set 2

WJEC Eduqas – Sample Assessment Material