

Proportional Reasoning (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. A building company used 24 workers to prepare a building site.

The site measured 30 acres and the work was completed in 10 days. 3 acres/day .

- (a) The company is asked to prepare another site measuring 45 acres. 8 men/acre/day .
This work has to be completed in 15 days. 3 acres/day .

Calculate the least number of workers the company should employ for this work.

24 workers 12

30 acres 15

10 days 5

45 acres

15 days

24

I think!

[3]

- (b) State one assumption you have made in your answer to part (a).

How would your answer to part (a) change if you did not make this assumption?

I have assumed the rate of working is the same but if the men work slower it will take longer. [2]

2. To complete a task in 15 days a company needs

4 people each working for 8 hours per day. $32 \text{ hours} \times 15$

The company decides to have

$= 480 \text{ man hours}$.

5 people each working for 6 hours per day.

Assume that each person works at the same rate.

- (a) How many days will the task take to complete?

You must show your working.

$5 \times 6 = 30 \text{ hours/day}$

$480 \div 30 = 16 \text{ days}$

[3]

- (b) Comment on how the assumption affects your answer to part (a).

if people don't work at the same rate it could take more or less time. [1]

3. 18 rice cakes weigh a total of 130 g.

There are 329 calories in 100 g of rice cakes.

How many calories are there in one rice cake?

$$\begin{array}{l}
 18 = 130g \quad \downarrow \div 18 \\
 1 \text{ cake} = 7.2\dot{2}g \\
 100g = 329 \text{ calories} \quad \downarrow \div 1 \\
 1g = 3.29 \\
 7.2\dot{2}g = 23.76 \\
 \dots\dots\dots 23.76 \dots\dots\dots \text{ calories [3]}
 \end{array}$$

4. Sam and two friends put letters in envelopes on Monday.

The three of them take two hours to put 600 letters in envelopes.

$$3 = 2 \text{ hours} = 600 \text{ letters}$$

(a) On Tuesday Sam has three friends helping.

(so 4 in total)

Working at the same rate, how many letters should the four of them be able to put in envelopes in two hours?

$$\begin{array}{l}
 1 \text{ person} = 200 \text{ letters in 2 hours} \\
 1 \text{ person} = 100 \text{ / hour}
 \end{array}$$

$$\begin{array}{l}
 4 \text{ people} = 4 \times 100 \times 2 \\
 = 800
 \end{array}$$

(a) 800 [2]

(b) Working at the same rate, how much longer would it take four people to put 1000 letters in envelopes than it would take five people?

$$\begin{array}{r}
 4 \text{ people} = 400 \\
 400 \\
 200 \\
 \hline
 2\frac{1}{2} \text{ hours}
 \end{array}$$

(b) 30 mins [4]

(c) Sam says

It took two hours for three people to put 600 letters in envelopes. If I assume they work all day, then in one day three people will put 7200 letters in envelopes because

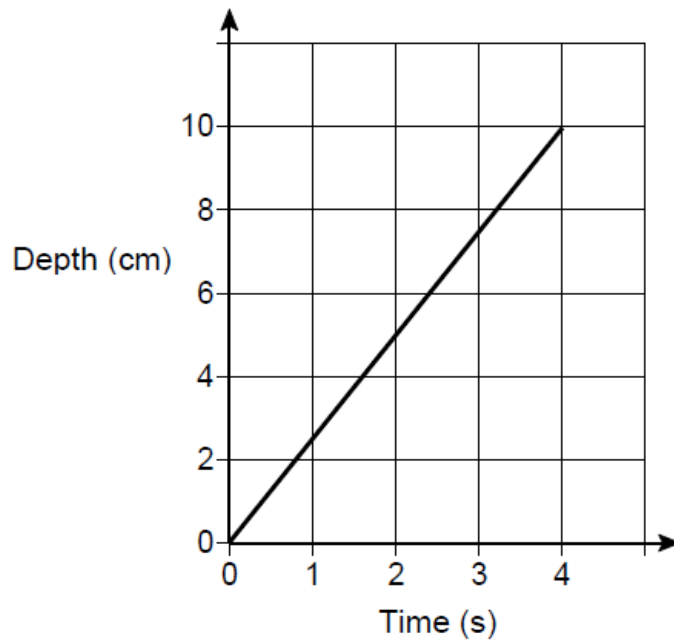
$$600 \times 12 = 7200.$$

Why is Sam's assumption not reasonable? No. Sam has assumed they will work 12 hours per day. This is unlikely, so it will take longer.

[2]

5. Water is poured into a glass for 4 seconds.

The graph shows the depth of the water in the glass.



$$10 \div 4 = 2.5$$

What is the rate of change of the depth of the water?

Circle your answer.

0.4 cm/s

1.25 cm/s

2.5 cm/s

10 cm/s

[1]

CREDITS AND NOTES

Question	Awarding Body
1	WJEC Eduqas
2	AQA
3	OCR
4	OCR
5	AQA

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