Proportional Reasoning (H & F)

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:	Worked Solutions

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.

(a) The company is asked to prepare another site measuring 45 acres.

   This work has to be completed in 15 days.

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

workers site days
24 30acres 10

so 3 acres a day are cleared by 24 men, which means each man clears $\frac{3}{24} = \frac{1}{8}$ of an acre a day

=> 45 acres in 15 days is still 3 acres a day, so assuming each man clears $\frac{1}{8}$ of an acre they still require 24 men

[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 men can clear $\frac{1}{8}$ of an acre per day. If they clear more per day it will take less time.. if they clear less it will take more time.

[2]

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

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

S + 2 = 3 people.
2 hours = 600 envelopes
60 1 hour = 300 envelopes
with 3 people = 100 envelopes per hour each

a) On Tuesday Sam has three friends helping.

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

4 people at 100 envelopes per hour each = 400 in 1 hour.
800 in 2 hrs

(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?

4 people.
400 × 2.5 = 1000
2.5 hours.

5 people
500 × 2 = 1000
2 hours

(b) ..30 minutes.. [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 × 12 = 7200.

Why is Sam's assumption not reasonable? Sam has assumed they work for 24 hours.

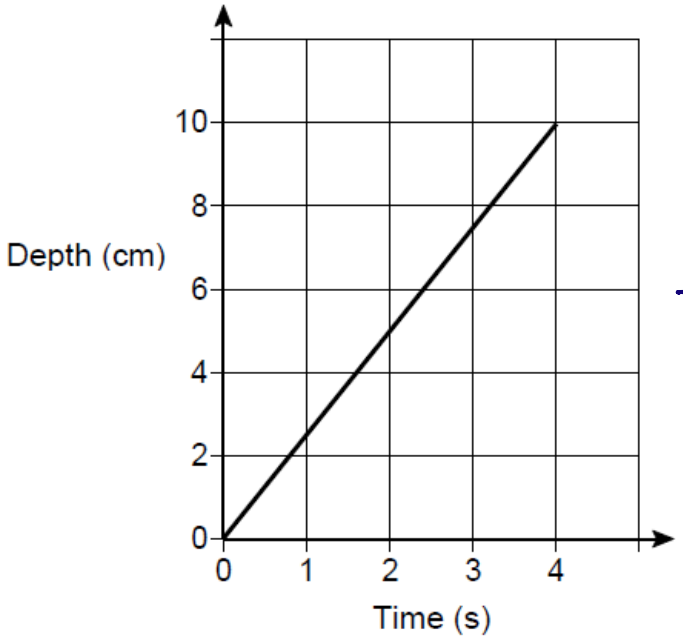
What effect has Sam's assumption had on her answer?

less envelopes will get filled... for example assuming 8 hours
600 × 4 = 2400

[2]

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

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



$\frac{10\text{cm}}{4\text{ s}} = 2.5\text{ cm/s}$

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	OCR
3	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