Sampling (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. Lei is in a class of 28 students, 3 of whom are left-handed. There are 1250 students in the school.

a range of answers is acceptable!

a) Use this information to estimate how many students in the school are left-handed.

non calc !! $\frac{3}{28} \approx \frac{3}{30} = \frac{1}{10}$ $\frac{1}{10}$ of 1250 (120-180)

$\frac{3}{28} > \frac{3}{30}$

a) 125 [3]

b) Is your solution to (a) likely to be an overestimate or an underestimate?

Explain your reasoning.

depends on your estimate. 3 out of 30 is smaller than 3/28 so my answer is an underestimate [1]

c) Vid is at a different school.
He is in a class of 26 students, 6 of whom are left-handed.

Vid says to Lei: L 3/28 V 6/26

In our two classes there are 54 students, 9 of whom are left-handed.

We can use this bigger sample to improve the estimate for your school.

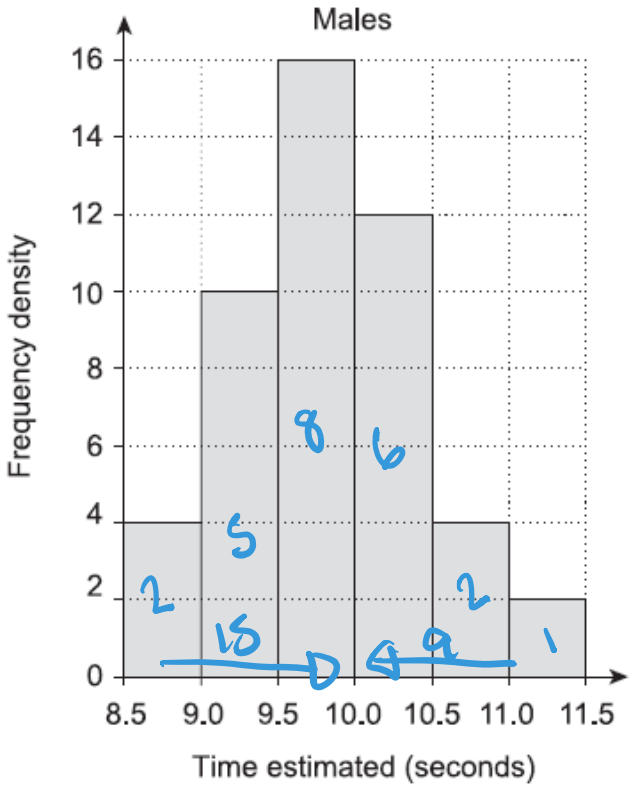
What assumption has Vid made?

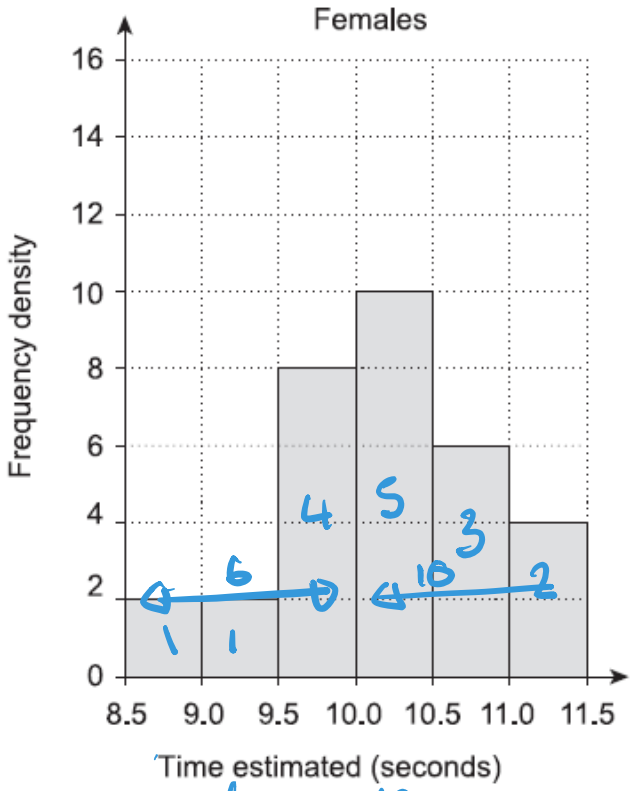
Explain whether you think that his argument is correct.

he has assumed the proportions of left handers is the same in each school; yes a bigger sample should give a more reliable estimate so he is correct. [2]

2. John wants to investigate whether men in the UK are better at estimating a time interval of 10 seconds than women in the UK. He decides to sample the population by asking his work colleagues to take the test.

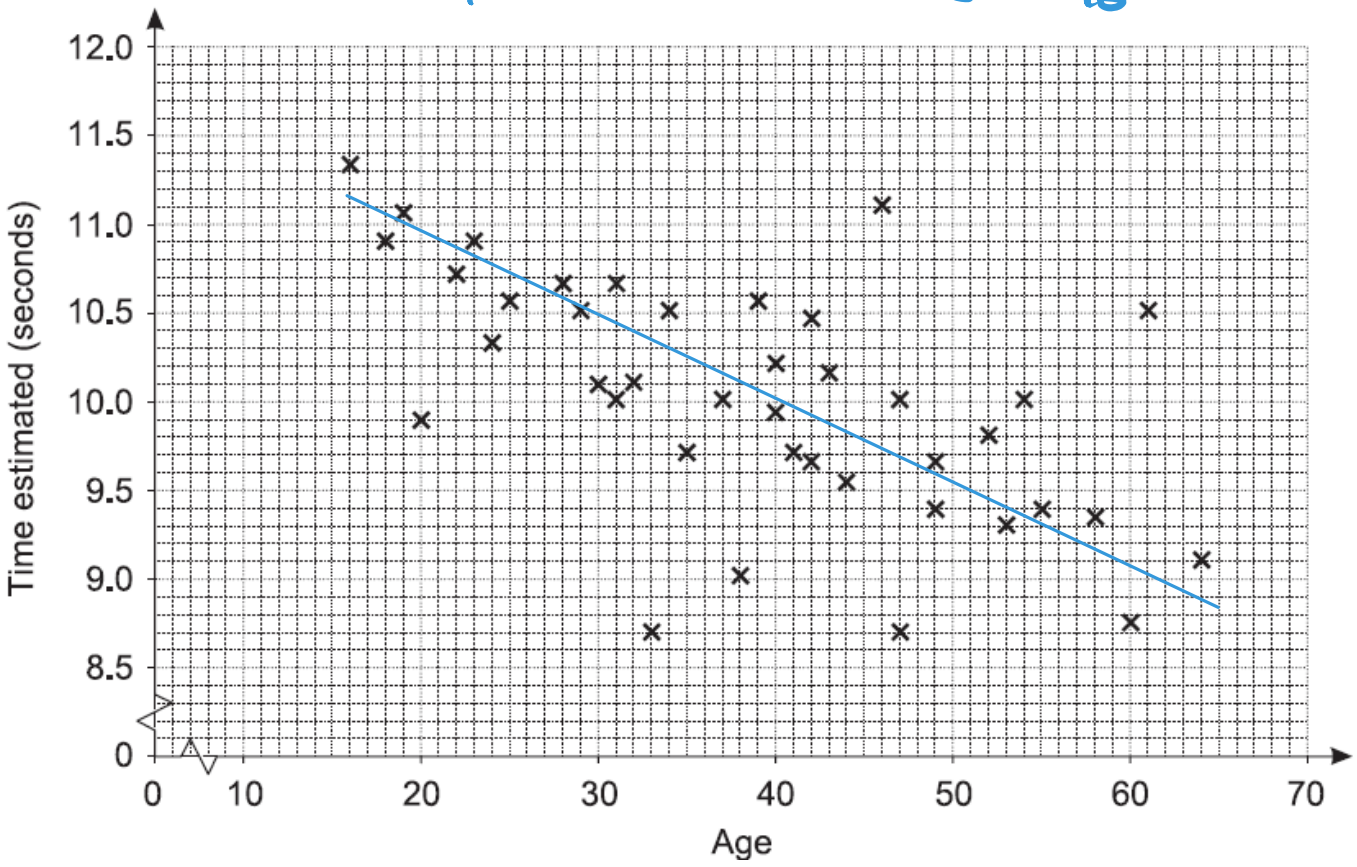
The diagrams below summarise John's results.





15/24 9/24

6/16 10/16



a) What information from the diagrams can be used to support each of these statements?

(i) *The older John's colleagues are, the lower their estimate is.*

The negative correlation on the scatter graph. [1]

(ii) *Males in the sample tend to underestimate the interval and females in the sample tend to overestimate the interval.*

Histograms 15/24 of men are < 10s
8/16 women are > 10s

[2]

b) Comment on whether any conclusions can be drawn for the UK population from the results of this sample.

The sample is too small to be used to represent the UK population [2]

3. The speed of 50 vehicles was measured travelling along a road.

Speed, s (mph)	Number of cars
$0 < s \leqslant 40$	2
$40 < s \leqslant 60$	11
$60 < s \leqslant 75$	24
$75 < s \leqslant 90$	9
$90 < s$	4
	50

24 (60, 65, 70, 75)

$\frac{1}{3}$ of 24 = 8

8 ✓ 9 ✓ 4 ✓

a) Every driver travelling at more than 70 mph is fined £60

On average, 8400 drivers use the road each day.

Estimate the total amount of money raised from fines on the road each day.

$\frac{8+9+4}{50} \times 8400 = 3528$ drivers

$3528 \times 60 = £211,680$ [3]

b) Mia says,

"4% of vehicles on the road travel at 40 mph or less."

Explain why she might be wrong.

$\frac{2}{50} = \frac{4}{100}$ 4% of the sample travelled at 40 mph or less but it may not be representative of the population [1]

CREDITS AND NOTES

Question	Awarding Body
1	OCR
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