Averages (H)

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

courtesy of:- @mccreaemma.

Name:	
Total Marks:	

1. (a) When visiting a hat shop, each customer had the circumference of their head measured.

The table shows the results for the customers who bought a hat during December.

Head circumference, c (cm)	Number of customers
$50 \leq c < 54$	12
$54 \leq c < 58$	32
$58 \leq c < 62$	14
$62 \leq c < 66$	2

52 × 12
56 × 32
50 × 14
50 × 2
60
3384

Calculate an estimate for the mean head circumference.

3384 ÷ 60 = 56.4

[4]

(b) The hat shop sells 4 different sizes of hats.

The conversion table from head circumference to hat size is shown below

12
32
14
2

Head circumference, c (cm)	Hat size
$50 \leq c < 54$	1
$54 \leq c < 58$	2
$58 \leq c < 62$	3
$62 \leq c < 66$	4

12/60 = 1/5
32/60 ≈ 1/2
14/60 ≈ 1/4
2/60

A salesman places an order for new stock for the hat shop.

The salesman's order form shows that about half of the hats ordered are size 2.

The owner of the shop says the order should show that about a quarter of the hats ordered are size 2.

Who is more likely to be correct, the salesman or the owner of the shop?

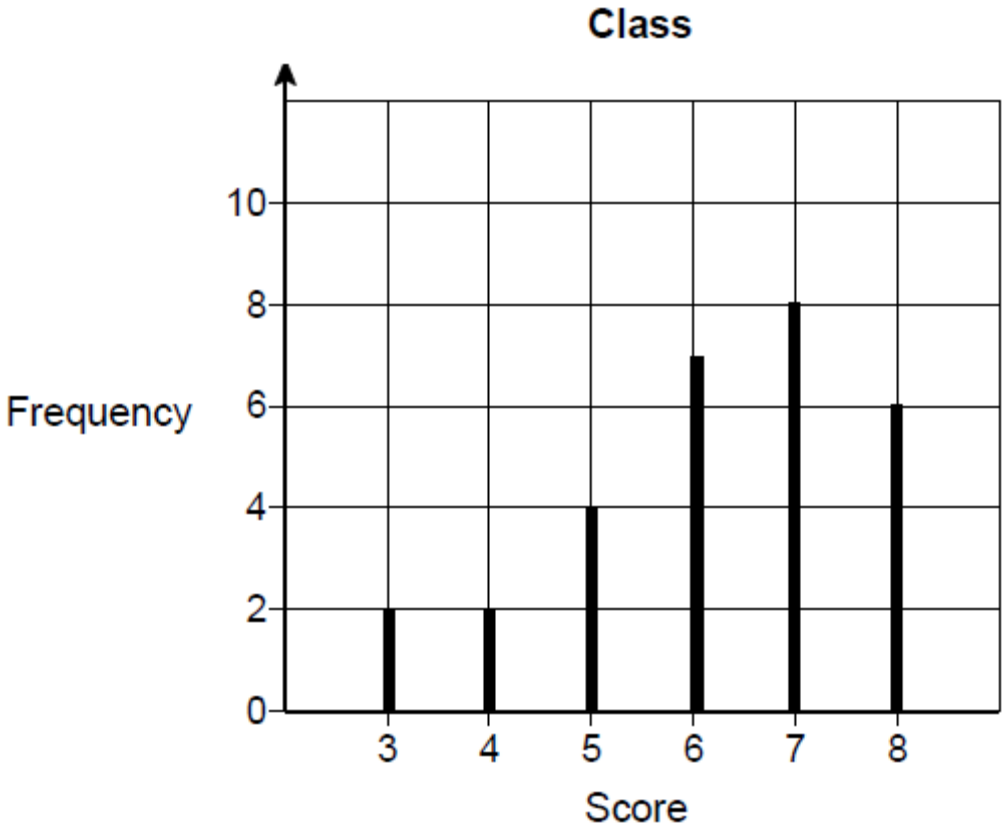
You must give a reason for your answer.

The salesman is correct $\frac{32}{60}$ is about $\frac{1}{2}$

[2]

2. Students in a class took a spelling test.

The diagram shows information about the scores.



Score	Frequency
3	2
4	2
5	4
6	7
7	8
8	6
	29

Lucy is one of the 29 students in the class.

Her score was the same as the median score for her class.

Work out her score.

6

[2]

3. A prime number between 300 and 450 is chosen at random.

The table shows the probability that the number lies in different ranges.

Prime number, n	Probability
$300 \leqslant n < 330$	0.16
$330 \leqslant n < 360$	0.24
$360 \leqslant n < 390$	x
$390 \leqslant n < 420$	0.16
$420 \leqslant n < 450$	0.24

Number 4 → ×100 ÷ 4

0.2

0.8

(a) Work out the value of x.

$1 - 0.8 = 0.2$

[2]

(b) Work out the probability that the prime number is greater than 390

$0.16 + 0.24 = 0.4$ [1]

(c) There are four prime numbers between 300 and 330

How many prime numbers are there between 300 and 450?

$1 \times 100 \div 4 = 25$ [2]

4. The table shows some information about the foot lengths of 40 adults.

Foot length (f cm)	Number of adults
$16 \leqslant f < 18$	17 × 3
$18 \leqslant f < 20$	19 × 6
$20 \leqslant f < 22$	21 × 10
$22 \leqslant f < 24$	23 × 12
$24 \leqslant f < 26$	25 × 9

40

(a) Write down the modal class interval.

$22 \leqslant f < 24$ ..... [1]

(b) Calculate an estimate for the mean foot length.

$\frac{876}{40}$

21.9 ..... cm [3]

5. Here is some information about the number of books read by a group of people in 2014

One of the frequencies is missing.

Number of books	Frequency	Midpoint	
0 – 4	16	× 2	= 32
5 – 9	x	× 7	= $7x$
10 – 14	20	× 12	= 240
15 – 19	10	× 17	= 170

Midpoints are used to work out an estimate for the mean number of books read.

The answer is 8.5

Work out the missing frequency.

$\frac{442 + 7x}{46 + x} = 8.5$

$442 + 7x = 391 + 8.5x$

$51 = 1.5x$

$x = 34$

[5]

6. Walkden Reds is a basketball team.

At the end of 11 games, their mean score was 33 points per game.
At the end of 10 games, their mean score was 2 points higher.

Jordan says,

"Walkden Reds must have scored 13 points in their 11th game."

Is Jordan right?

You must show how you get your answer.

games	10	11
mean	35	33
total points	350	363

$363 - 350 = 13$

Jordan right

[3]

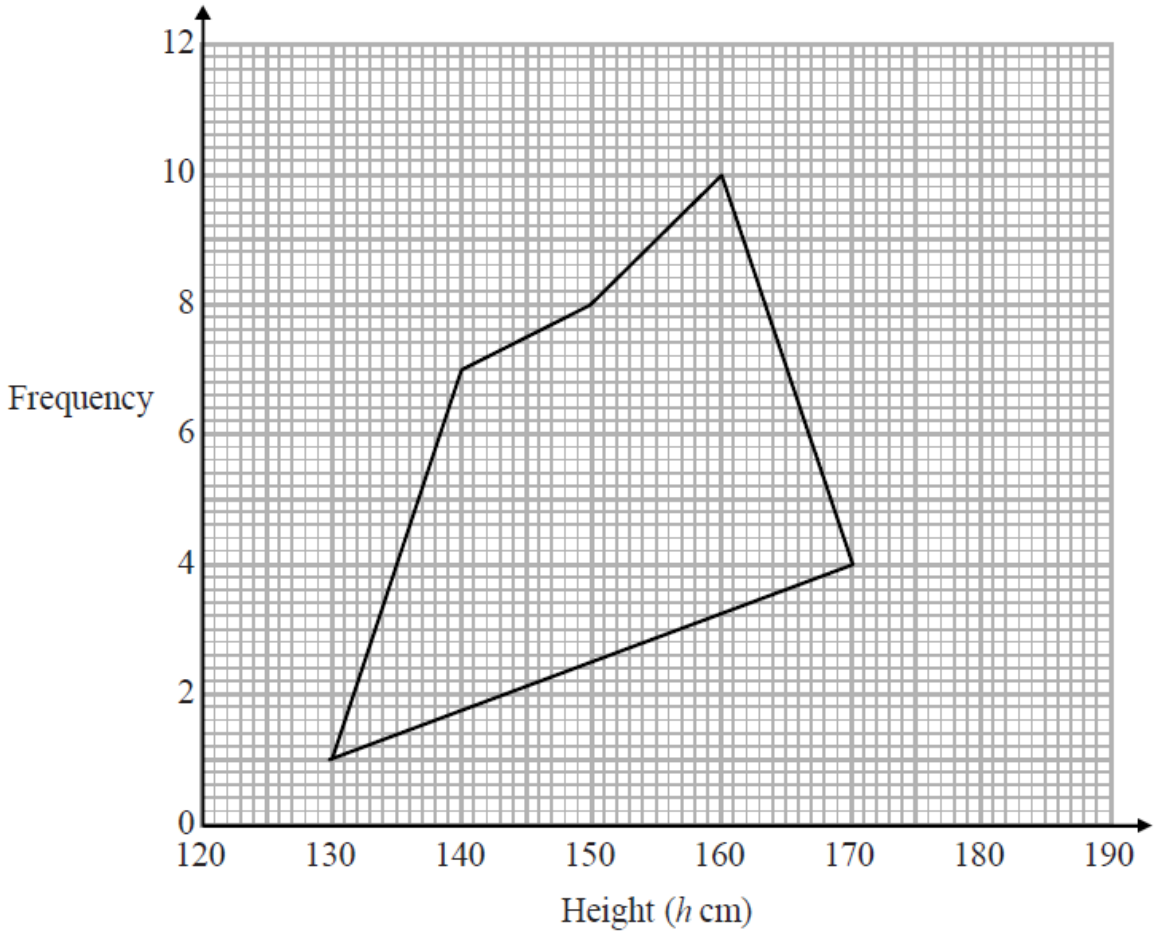
7. The grouped frequency table gives information about the heights of 30 students.

Height (h cm)	Frequency
$130 < h \leqslant 140$	1
$140 < h \leqslant 150$	7
$150 < h \leqslant 160$	8
$160 < h \leqslant 170$	10
$170 < h \leqslant 180$	4

(a) Write down the modal class interval.

$160 < h \leqslant 170$ ..... [1]

This incorrect frequency polygon has been drawn for the information in the table.



(b) Write down two things wrong with this incorrect frequency polygon.

1 points should be plotted at midpoints of the intervals

2 130 and 170 points should not be joined

[2]

8. Jenny works in a shop that sells belts.

The table shows information about the waist sizes of 50 customers who bought belts from the shop in May.

Belt size	Waist (w inches)	Frequency
Small	$28 < w \leqslant 32$	24
Medium	$32 < w \leqslant 36$	12
Large	$36 < w \leqslant 40$	8
Extra Large	$40 < w \leqslant 44$	6

30× 34× 38× 42× 50

a) Calculate an estimate for the mean waist size.

$\frac{1684}{50}$

.....33·68.....inches [3]

Belts are made in sizes Small, Medium, Large and Extra Large.

Jenny needs to order more belts in June.

The modal size of belts sold is Small.

Jenny is going to order $\frac{3}{4}$ of the belts in size Small.

The manager of the shop tells Jenny she should not order so many Small belts.

b) Who is correct, Jenny or the manager?

You must give a reason for your answer.

The manager because $\frac{24}{50}$ is about half

[2]

9. The times that 80 customers waited at a supermarket checkout are shown.

Time, t (minutes)	Frequency
$0 \leqslant t < 2$	32
$2 \leqslant t < 4$	19
$4 \leqslant t < 6$	20
$6 \leqslant t < 8$	7
$8 \leqslant t < 10$	2

(a) In which class interval is the median?

Circle your answer.

[1]

$0 \leqslant t < 2$ $\quad$ $2 \leqslant t < 4$ $\quad$ $4 \leqslant t < 6$ $\quad$ $6 \leqslant t < 8$

(b) The manager of the supermarket says,

"90% of our customers wait less than 6 minutes."

Does the data support this statement?

You must show your working.

$\frac{32+19+20}{80} = \frac{71}{80} = 88.75\%$

The data does not quite support this $\quad 88.75 < 90$

[2]

10. Five integers have

a mode of 6

a median of 8

a mean of 10 $\quad \times 5 = 50$

What is the greatest possible range of the five integers?

You must show your working.

total = 50

$-\ 6 \quad 6 \quad 8 \quad 9 \quad 21$

$6+6+8=20 \quad 50-20=30$ $\quad$ 30

$21-6=15$

[3]

11. Adam and six other men ran a race.

The times, in seconds, of the six other men are shown.

9.75 9.79 9.80 9.88 9.94 9.98

The mean time for **all seven** men was 9.83 seconds.

Did Adam win the race?

You must show your working.

$\frac{59.14 + x}{7} = 9.83$

$x = 9.67$ Yes. he won

[3]

12 Mr Brown gives his class a test.
The 10 girls in the class get a mean mark of 70%
The 15 boys in the class get a mean mark of 80%

total = 700
total = 1200

Nick says that because the mean of 70 and 80 is 75 then the mean mark for the whole class in the test is 75%

Nick is not correct.
Is the correct mean mark less than or greater than 75%?
You must justify your answer.

Greater than as it is 76%

[2]

13. At a nursery, the mean age of 4 children is 31 months.

Katy joins the nursery.

The mean age of all 5 children is now 30 months.

Work out the age of Katy.

$\frac{x}{4} = 31$ $x = 124$

$\frac{124 + y}{5} = 30$

$124 + y = 150$

$y = 26$ months

[4]

CREDITS AND NOTES

Question	Awarding Body	Question	Awarding Body
1	WJEC Eduqas	12	Pearson Edexcel
2	AQA	13	AQA
3	AQA	14	
4	Pearson Edexcel	15	
5	AQA	16	
6	Pearson Edexcel	17	
7	Pearson Edexcel	18	
8	Pearson Edexcel	19	
9	AQA		
10	AQA		
11	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