

Surname	
Other Names	
Candidate's Signature	

GCSE 9 - 1 Questions

Averages from Frequency Tables

Calculator Allowed

INSTRUCTIONS TO CANDIDATES

Write your name in the space provided.

Write your answers in the spaces provided in this question paper.

Answer ALL questions.

Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

You should have a ruler, compass and protractor where required.

Total Marks :

1) The number of books in the bags of a class were recorded.

Number of Books	Frequency
0	2
1	6
2	7
3	6
4	4
5	5

(a) Write down the modal number of books.

Answer _____ [1]

(b) How many pupils were in the class?

Answer _____ [1]

2) Rhodri's toolbox contains some nails.
He measures the lengths of all these nails in mm.

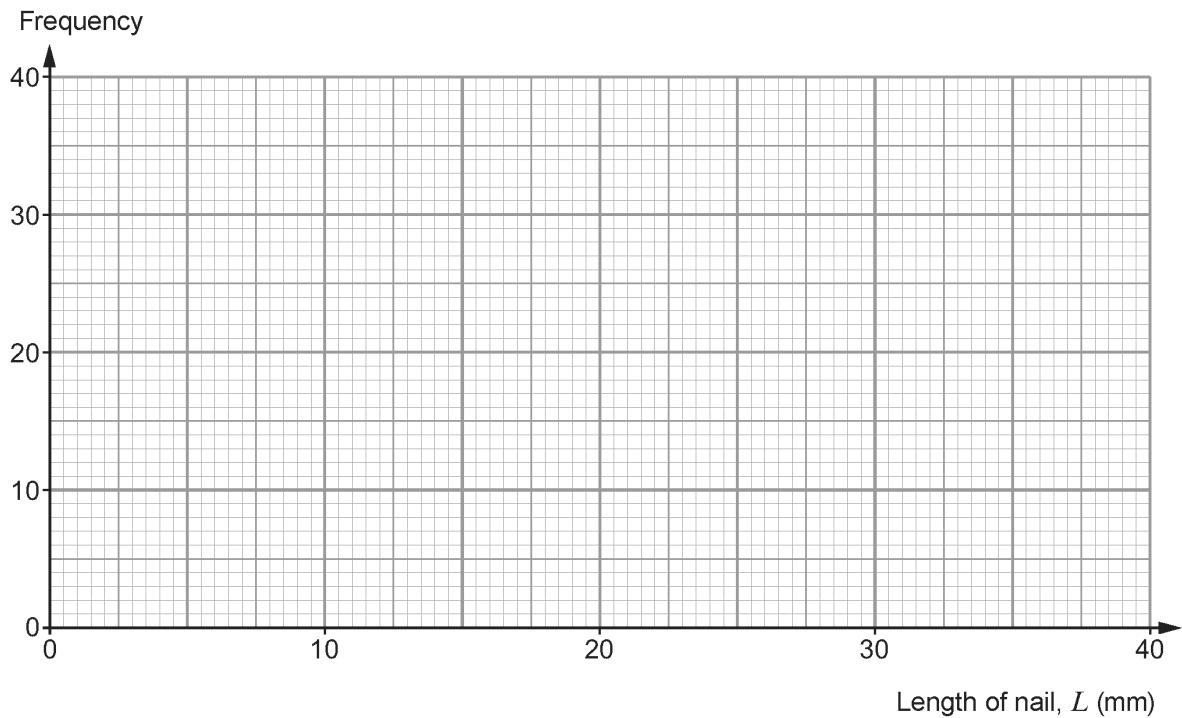
(a)

Length of nail, L (mm)	$10 < L \leq 15$	$15 < L \leq 20$	$20 < L \leq 25$	$25 < L \leq 30$	$30 < L \leq 35$
Frequency	12	18	27	39	24

(i) In which group would Rhodri find the median length of nail? [2]

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- (ii) On the graph paper below, draw a grouped frequency diagram to show all the data given in the table. [2]



- 3) The speed, S mph, of each vehicle passing through a village is recorded and the results are grouped as shown.

Speed (S mph)	Frequency	Midpoint
$0 \leq S < 10$	5	5
$10 \leq S < 20$	6	15
$20 \leq S < 30$	9	
$30 \leq S < 40$	8	
$40 \leq S < 50$	10	
$50 \leq S < 60$	2	

Calculate an estimate for the mean speed.

Answer _____ mph [3]

- 4) The heights of trees in an orchard were recorded. The heights were grouped as shown in the table.

Height h (metres)	Frequency	Mid Point	
$0 < h \leq 2$	12	1	
$2 < h \leq 4$	8	3	
$4 < h \leq 6$	12		
$6 < h \leq 8$	10		
$8 < h \leq 10$	7		
$10 < h \leq 12$	1		

- (a) Which class interval contains the median height?

Answer _____ [1]

- (b) Complete the table and hence find an estimate for the mean height of the trees.

Answer _____ m [3]

- 5) The times that 100 students spent watching TV during one weekend were recorded. The times were grouped as shown in the table.

Time t (hours)	Frequency		
$0 < t \leq 2$	4		
$2 < t \leq 4$	18		
$4 < t \leq 6$	32		
$6 < t \leq 8$	20		
$8 < t \leq 10$	16		
$10 < t \leq 12$	10		

Calculate an estimate for the mean time.

Answer _____ hours [4]

6) The percentage marks in a class test were recorded in the following table:

Marks (%)	Frequency		
55–59	1		
60–64	1		
65–69	2		
70–74	5		
75–79	9		
80–84	5		
85–89	2		

Calculate an estimate for the mean mark.

Answer _____% [4]

- 7) The PSNI recorded the speeds of a number of vehicles passing under a bridge on the M2 motorway during a 2 minute period one morning. The speeds recorded are in miles per hour (mph).

Speed s (mph)	Frequency		
$44 \leq s < 50$	3		
$50 \leq s < 56$	7		
$56 \leq s < 62$	8		
$62 \leq s < 68$	6		
$68 \leq s < 74$	5		
$74 \leq s < 80$	1		

Calculate an estimate for the mean speed.

Answer _____ mph [4]

8) A tray of rings in a jeweller's shop window had rings of the following values

Price of rings (£ P)	Frequency
$0 < P \leq 500$	3
$500 < P \leq 1000$	3
$1000 < P \leq 1500$	4
$1500 < P \leq 2000$	5
$2000 < P \leq 2500$	4
$2500 < P \leq 3000$	4
$3000 < P \leq 3500$	2

Calculate an estimate for the mean value of the rings.

Answer £ _____ [4]

9) The times that students spent on surfing the Internet during one week were recorded. The times were grouped as shown in the table. [4]

Time t (hours)	Frequency
$0 < t \leq 5$	15
$5 < t \leq 10$	18
$10 < t \leq 15$	22
$15 < t \leq 20$	14
$20 < t \leq 25$	8
$25 < t \leq 30$	3

Calculate an estimate for the mean time.

10)

Two batsmen, Adam and Ben, have both played 20 matches for their team.

A record of how many runs they scored in each match is summarised below.

	Number of runs scored	0 - 19	20 - 39	40 - 59	60 - 79	80 - 99
Number of matches played	Adam	0	0	12	5	3
	Ben	3	8	7	2	0

Explain clearly how it is possible for the range of the number of runs scored by Adam to be greater than the range of the number of runs scored by Ben.

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[3]

11)

A hockey team took part in a tournament.
A total of 25 players were used during the tournament.

A record was kept of the number of goals scored by each player.
A summary of this record is shown below.

Number of goals scored	Number of players
0	7
1	8
2	4
3	5
4	1

(a) What was the mean number of goals scored per player?

[3]

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(b) Explain clearly why a player, chosen at random, would be more likely to have scored the modal number of goals rather than the mean number of goals per player.

[1]

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12)

Two groups of six people took part in a quiz.

(a) The six members of group A gained the following scores.

52 29 78 56 24 37

(i) Calculate the mean score per person. [3]

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(ii) What was the range of the scores gained? [1]

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(b) The scores gained by the six members of group B are summarised below.

Score	Number of people
22	2
25	2
26	1
28	1

(i) Without doing any further calculations, state which group had the larger mean score per person.
You must give a reason for your choice. [1]

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(ii) Which group had the larger range of scores?
You must give a reason for your choice. [1]

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13)

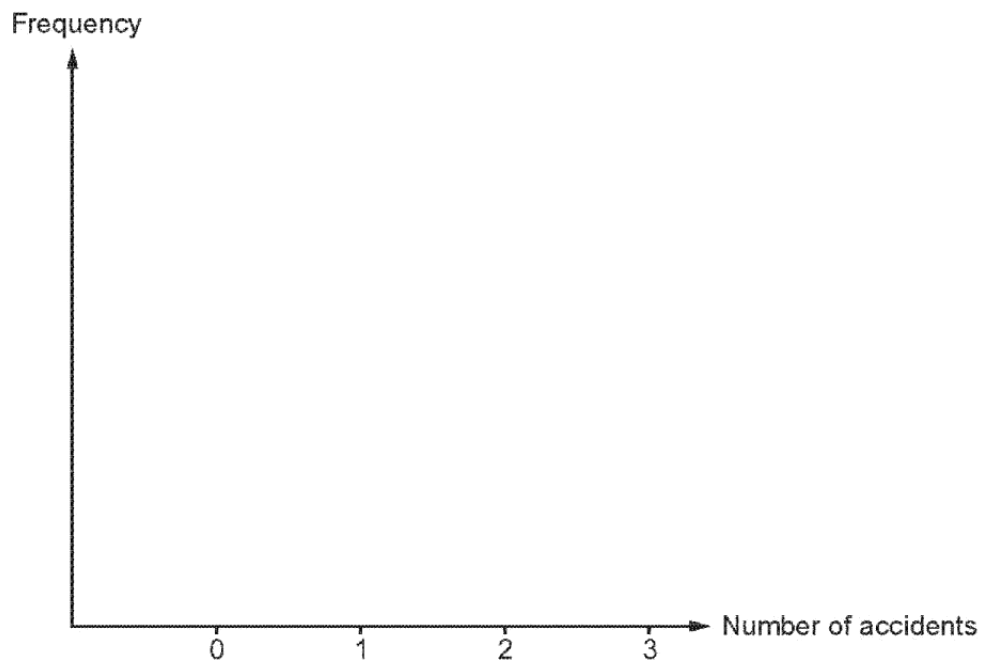
In a survey, a council recorded the number of accidents reported at each of its secondary schools over a period of one week.

A summary of the results is given below.

Number of accidents	0	1	2	3
Frequency	7	3	4	1

(a) Draw a vertical line diagram to show this information.

[3]



(b) How many secondary schools were there in this survey?

[1]

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(c) Calculate the total number of accidents that were reported.

[2]

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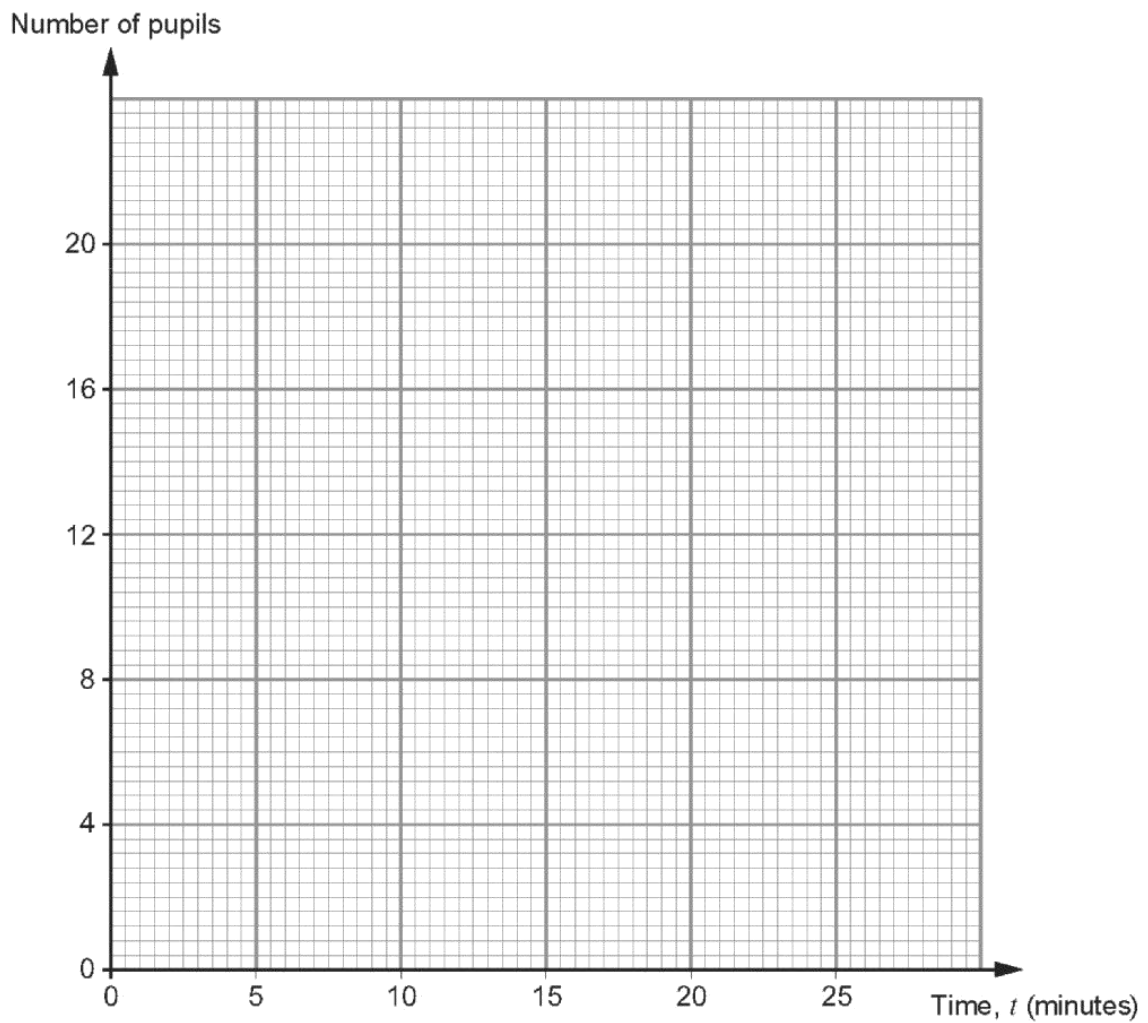
14)

A group of pupils was timed in completing a maths test. The results are shown in the grouped frequency table below.

Time, t (minutes)	Number of pupils
$0 < t \leq 5$	19
$5 < t \leq 10$	17
$10 < t \leq 15$	10
$15 < t \leq 20$	5
$20 < t \leq 25$	2

(a) Draw a grouped frequency diagram to illustrate these results.

[2]



(b) Calculate an estimate of the mean time taken to complete the test. [4]

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(c) Write down the modal group. [1]

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15) As part of a nature study, 30 frogs found near a pond were weighed. Their weights (to the nearest gram) are recorded below.

112 140 87 155 117 148 136 103 141 93

147 172 129 148 96 102 161 145 106 146

111 122 148 88 119 170 83 133 139 97

Using **equal** class intervals, complete the following table.

Weight (g)	75 to 99	100 to 124 to	150 to 174
Tally	 /			
Frequency	6			

[4]

16)

At a stall in a school fair, thirty-two people each paid £3 to choose a sealed envelope from a bag. Each envelope contained a shopping voucher.

The table below shows the number of each type of voucher in the bag.

Value of voucher	Number of vouchers
£1	15
£2	10
£5	5
£10	2

(a) The person in charge of the stall was asked,

"What was the average value of the vouchers?"

She replied,

"Are you asking for the mode, the median or the mean value?"

Show clearly that these three values are different.

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17)

To encourage people to visit their new shop, the owners placed the following advert in the local newspaper.

**WILL YOU BE A LUCKY
CUSTOMER?**

**The first 500 customers who
spend more than £50
will receive a sealed envelope
containing a voucher worth
£100 or £5 or £1.**

The number of each type of voucher that the owners put in the envelopes is shown below.

Value of voucher	Number of vouchers
£1	400
£5	90
£100	10

(a) Calculate the mean value of the vouchers.

[3]

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- (b) All the vouchers were given out, as planned.
 Complete the table below by writing 'TRUE' or 'FALSE' in the second column and giving a reason for your decision in the third column. [4]

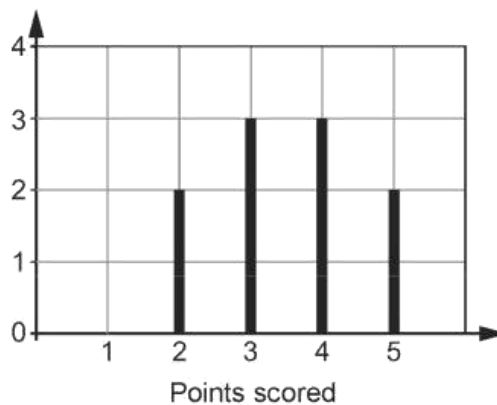
Statement	TRUE or FALSE	Reason
At least one customer received a voucher equal in value to the mean value.		
At least one customer received a voucher equal in value to the modal value.		
At least one customer received a voucher equal in value to the median value.		

- 18) Catrin and Samir each played a game ten times.
 In each game, between one and five points were scored.

Catrin had a mean score of 2.7 points for her ten games.
 The range of the number of points she scored on her games was 4.

Samir recorded his scores as shown on the grid below.

Number of games



- (a) Who had the bigger mean score?
 You **must** give a reason for your answer. [1]

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- (b) Who had the bigger range of the number of points scored?
 You **must** give a reason for your answer.

[1]

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- 19) The mean temperature in Moscow for a 12 month period is 4°C.

It is warmest in July, typically 26°C.

What would be the estimate for the mean temperature in Moscow if the temperature for July was not included? [4]

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- 20) One year, during the 31 days in March, the temperature was recorded every day at midday. The results are shown in the table below.

Midday temperature, t in °C	Number of days
$-12 \leq t < -10$	1
$-10 \leq t < -8$	3
$-8 \leq t < -6$	5
$-6 \leq t < -4$	8
$-4 \leq t < -2$	4
$-2 \leq t < 0$	10

Calculate an estimate for the mean midday March temperature in Moscow.
 You must show all your working.

[4]

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