

Averages from Grouped Frequency Tables

For AQA GCSE Mathematics (8300) • Foundation tier

Name _____

Total marks: **30**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

- 1** The table shows information about the lengths of 25 phone calls.

Length (t minutes)	Frequency	Midpoint
$0 < t \leq 4$	6	
$4 < t \leq 8$	9	
$8 < t \leq 12$	7	
$12 < t \leq 16$	3	

- (a) Complete the midpoint column in the table.

[1 mark]

- (b) Write down the modal class.

[1 mark]

Answer _____

- (c) Work out an estimate of the mean length of a phone call.

[3 marks]

Answer _____ minutes

- 2 The table shows the distances that 40 members of a running club ran last Sunday.

Distance (d km)	Frequency
$0 < d \leq 5$	6
$5 < d \leq 10$	15
$10 < d \leq 15$	12
$15 < d \leq 20$	7

- (a) Kim says,
 'The modal class is 15.'
Kim is wrong.
Write down the correct modal class.

[1 mark]

Answer _____

- (b) Find the class interval that contains the median.
You must show your working.

[2 marks]

Answer _____

- (c) Work out an estimate of the mean distance.

[3 marks]

Answer _____ km

(d) Why is your answer to part (c) an estimate?

[1 mark]

3 The table shows information about the heights of some plants.

Height (h cm)	Frequency
$140 < h \leq 150$	6
$150 < h \leq 160$	11
$160 < h \leq 170$	9
$170 < h \leq 180$	4

(a) Could the range of the heights be 45 cm? Tick a box.
Give a reason for your answer.

[1 mark]

☐ Yes ☐ No

(b) What percentage of the plants are taller than 160 cm?

[2 marks]

Answer _____ %

- 4 The table shows the masses of 40 parcels.

Mass (m kg)	Frequency
$0 < m \leq 4$	7
$4 < m \leq 8$	15
$8 < m \leq 12$	13
$12 < m \leq 16$	5

Work out an estimate of the mean mass.
Give your answer to 1 decimal place.

[3 marks]

Answer _____ kg

- 5 The table shows the times, in seconds, some people took to complete a puzzle.

Time (t seconds)	Frequency
$10 < t \leq 20$	4
$20 < t \leq 30$	9
$30 < t \leq 40$	7

Tom works out an estimate of the mean as 41.5 seconds.
Without working out the mean, explain why Tom must be wrong.

[1 mark]

- 6 The table shows information about the lengths, l cm, of 15 fish caught in a river.

Length (l cm)	Frequency
$10 < l \leq 20$	4
$20 < l \leq 30$	8
$30 < l \leq 40$	3

Tick **one** box for each statement.

[3 marks]

	True	False
The shortest fish could be exactly 10 cm long	☐	☐
At least one fish is longer than 30 cm	☐	☐
The median length is in the class $20 < l \leq 30$	☐	☐
An estimate of the mean length is 30 cm	☐	☐

- 7 The table shows how long 30 patients waited at a health clinic one morning.

Waiting time, t (minutes)	Number of patients	Midpoint
$0 \leq t < 10$	9	
$10 \leq t < 20$	12	
$20 \leq t < 30$	6	
$30 \leq t < 40$	3	

- (a) Work out an estimate of the mean waiting time.
You may use the midpoint column to help you.

[3 marks]

Answer _____ minutes

- (b) Later that day, 10 more patients are seen.
Each of them waits less than 10 minutes.
Without doing any more calculations, explain what happens to the estimate of the mean waiting time.

[1 mark]

- 8 A café starts using a new ordering system.
Before the change, the mean time customers waited for their food was 8 minutes.
After the change, the café records the waiting times of 50 customers.

Waiting time, t (minutes)	Frequency
$0 \leq t < 4$	18
$4 \leq t < 6$	20
$6 \leq t < 10$	9
$10 \leq t < 16$	3
	Total = 50

The café wanted the mean waiting time to fall by at least 40%.
Use an estimate of the mean to decide whether the café met its target.
You must show your working.

[4 marks]
