



S03-test Averages from a Frequency Table: Test Pack

EDEXCEL 1ST0 · Calculator allowed · about 25 minutes

Total Marks

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Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** 10 friends were asked how many pets they owned. The results are shown in the frequency table.

Number of pets owned	0	1	2	3
Frequency	3	4	2	1

- (a) Write down the modal number of pets owned. (1)

- (b) Work out how many friends were asked in total. (2)

(Total for Question 1 is 3 marks)

- 2** State whether this is True or False: The modal value in a frequency table is the value with the highest frequency.

(Total for Question 2 is 1 mark)

- 3** The shoe sizes of 11 customers in a shop are shown below.

Shoe size	5	6	7
Frequency	3	5	3

Find the median shoe size.

(Total for Question 3 is 2 marks)

- 4 A netball team's goals scored in each of its last 20 matches were recorded as a list:

1, 2, 1, 3, 2, 2, 4, 1, 2, 3, 2, 1, 2, 3, 4, 2, 1, 3, 2, 2

Goals scored	1	2	3	4
Frequency				

- (a) Complete the frequency table above by counting through the list of 20 results. (2)

- (b) Write down the modal number of goals scored. (1)

- (c) Find the median number of goals scored. (2)

- (d) Calculate the mean number of goals scored per match. (3)

(Total for Question 4 is 8 marks)

- 5 A shoe shop manager records the shoe size of every pair sold in a week, to help decide which sizes to reorder. The frequency table shows the sizes sold.

Shoe size	4	5	6	7	8
Frequency	3	10	22	15	4

Which average (mode, median or mean) would be most useful to the manager when deciding which shoe size to order more of? Give a reason for your answer.

(Total for Question 5 is 2 marks)

- 6** A call centre records the number of calls answered per hour by staff on two shifts, Morning and Evening, each covering 20 staff-hours.

Morning

Calls per hour	4	5	6	7
Frequency	2	5	8	5

Evening

Calls per hour	4	5	6	7
Frequency	3	4	6	7

- (a)** Calculate the mean calls per hour for the Morning shift. **(1)**

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- (b)** Calculate the mean calls per hour for the Evening shift. **(1)**

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- (c)** State which shift had the higher mean, and by how much. **(1)**

(Total for Question 6 is 3 marks)

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- 7** A cafe till shows the number of coffees bought by 16 customers in an hour. One customer bought an unusually large number of coffees for a work meeting.

Coffees bought	1	2	3	10
Frequency	6	7	2	1

- (a)** Write down the median number of coffees bought. **(1)**

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- (b)** Calculate the mean number of coffees bought, and explain why it is higher than the median. **(2)**

.....

(Total for Question 7 is 3 marks)

- 8** 60 members of a leisure centre were asked how many swimming sessions they attended last month. Two frequencies are unknown, shown as a and b. The mean number of sessions attended is 3.

Sessions	1	2	3	4	5
Frequency	10	a	18	b	4

Work out the values of a and b.

(Total for Question 8 is 3 marks)

Mark scheme · S03-test Averages from a Frequency Table: Test Pack

Question 1

- (a) **B1** 1 cao
- (a) **Answer: 1**
- (b) **M1** $3+4+2+1$, oe
- (b) **A1** 10 cao
- (b) **Answer: 10**

Question 2

- **B1** True cao
- **Answer: True**

Question 3

- **M1** identifies the median position as $\text{half}(11+1) = 6\text{th}$ value, using cumulative frequencies 3, 8, 11
- **A1** 6 cao
- **Answer: 6**

Question 4

- (a) **M1** at least three of the four frequencies correctly tallied
- (a) **A1** all four frequencies correct: 5, 9, 4, 2
- (a) **Answer: 5, 9, 4, 2 (for 1, 2, 3, 4 goals respectively)**
- (b) **B1** 2 cao, ft from (a)
- (b) **Answer: 2**
- (c) **M1** identifies the median position as $\text{half}(20+1) = 10.5\text{th}$ value (mean of 10th and 11th values), using cumulative frequencies 5, 14, 18, 20
- (c) **A1** 2 cao
- (c) **Answer: 2**
- (d) **M1** $1 \times 5 + 2 \times 9 + 3 \times 4 + 4 \times 2 (=43)$, oe
- (d) **M1** 43 divided by 20
- (d) **A1** 2.15 cao
- (d) **Answer: 2.15**

Question 5

- **B1** identifies the mode as the most useful average for this purpose
- **B1** valid justification, e.g. the mode shows the shoe size that sold the most (size 6, with frequency 22), so it tells the manager which size to reorder more of; the mean or median size would not necessarily match a real, whole shoe size that needs restocking
- **Answer: Mode**

Question 6

- (a) **B1** 5.8 cao
- (a) **Answer: 5.8**
- (b) **B1** 5.85 cao
- (b) **Answer: 5.85**
- (c) **B1** Evening, by 0.05 cao (ft from a and b)
- (c) **Answer: Evening, by 0.05 calls per hour.**

Question 7

- (a) **B1** 2 cao
- (a) **Answer: 2**
- (b) **B1** 2.25 cao
- (b) **B1** explains that the customer who bought 10 coffees is an outlier that increases the mean but does not affect the median, oe
- (b) **Answer: Mean = 2.25. It is higher than the median because the one customer who bought 10 coffees is an outlier that pulls the mean up, but does not change the median.**

Question 8

- **M1** total frequency equation: $10+a+18+b+4 = 60$, i.e. $a+b = 28$, oe
- **M1** uses the mean to form $1 \times 10 + 2a + 3 \times 18 + 4b + 5 \times 4 = 3 \times 60$, i.e. $a+2b = 48$, oe, and solves simultaneously with $a+b=28$
- **A1** $a = 8$ and $b = 20$, both cao
- **Answer: $a = 8$, $b = 20$**