



S03-30min Averages from a Frequency Table: 30-minute Pack

EDEXCEL 1ST0 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** A small bakery kept a record of the number of loaves of bread bought by each customer during one morning. The frequency table shows the results.

Number of loaves bought	1	2	3	4
Frequency	4	6	3	2

- (a) Write down the modal number of loaves bought. (1)

- (b) Work out the total number of customers recorded in the table. (2)

- (c) Find the median number of loaves bought. (2)

(Total for Question 1 is 5 marks)

- 2** Which calculation correctly finds the mean from a frequency table?

- A) $\text{sum}(x)$ divided by n
B) $\text{sum}(f \text{ times } x)$ divided by $\text{sum}(f)$
C) $\text{sum}(f)$ divided by $\text{sum}(x)$
D) $\text{sum}(f \text{ times } x)$ divided by the number of different values

- ☐ A) $\text{sum}(x)$ divided by n
☐ B) $\text{sum}(f \text{ times } x)$ divided by $\text{sum}(f)$
☐ C) $\text{sum}(f)$ divided by $\text{sum}(x)$
☐ D) $\text{sum}(f \text{ times } x)$ divided by the number of different values

(Total for Question 2 is 1 mark)

- 3** The number of items bought by 20 customers at a market stall is shown below.

Items bought	1	2	3	4
Frequency	6	9	4	1

Write down (i) the modal number of items bought, and (ii) the total number of customers.

(Total for Question 3 is 2 marks)

- 4** Decide whether each statement about averages from a frequency table is True or False, then answer part (iv).

(i) The mode of a frequency table is the value with the highest frequency. (1)

(ii) For a frequency table with n data values, the position of the median is the $(n+1)$ th value. (1)

(iii) To find the mean from a frequency table, you should divide the sum of (frequency times value) by the number of different values (categories) in the table. (1)

(iv) Which calculation correctly finds the mean from a frequency table? (1)

- ☐ A) $\text{Sum}(x)$ divided by n
- ☐ B) $\text{Sum}(f \text{ times } x)$ divided by $\text{Sum}(f)$
- ☐ C) $\text{Sum}(f)$ divided by $\text{Sum}(x)$
- ☐ D) $\text{Sum}(f \text{ times } x)$ divided by the number of categories

(Total for Question 4 is 4 marks)

- 5 The amount spent, in pounds, by 8 customers at a bakery stall is shown below.

Amount spent (£)	2	3	5
Frequency	3	4	1

Calculate the mean amount spent, giving your answer correct to 2 decimal places.

(Total for Question 5 is 2 marks)

- 6 A hockey team recorded the number of goals it scored in each of 15 matches.

Goals scored	0	1	2	3
Frequency	3	6	4	2

Calculate the mean number of goals scored per match, giving your answer correct to 2 decimal places.

(Total for Question 6 is 2 marks)

- 7 A car dealership recorded the number of cars sold each day over a 15-day period. The frequency table shows the results.

Cars sold	0	1	2	3
Frequency	2	5	6	2

- (a) Write down the modal number of cars sold in a day. (1)

-
(b) Find the median number of cars sold in a day. (2)

-
(c) Calculate the mean number of cars sold per day, giving your answer correct to 2 decimal places. (3)

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(Total for Question 7 is 6 marks)

- 8** A student wants to investigate whether pupils in her school complete enough homework, compared with a recommendation of an average of 90 minutes (3 half-hour sessions) of homework every night of the week, equivalent to 21 half-hour sessions per week. She plans to survey a sample of pupils about their homework.

(a) Write down one suitable question the student could ask on her data collection sheet, including a set of response boxes, to find out how many half-hour homework sessions each pupil completed last week. (1)

(b) She surveys 30 pupils. The frequency table shows the number of half-hour homework sessions each pupil completed last week. (3)

Number of half-hour sessions	4	5	6	7	8
Frequency	3	8	10	6	3

Calculate the mean number of half-hour sessions completed, giving your answer correct to 1 decimal place.

(c) The recommendation is equivalent to 21 half-hour sessions per week. Use the mean from part (b) to comment on whether pupils at this school are meeting the recommended amount of homework. (2)

(Total for Question 8 is 6 marks)

- 9** The number of books borrowed from a library by each of a group of members is shown below. One frequency is unknown, shown as x . The mean number of books borrowed is 2.5.

Books borrowed	1	2	3	4
Frequency	3	5	x	2

Work out the value of x .

(Total for Question 9 is 2 marks)

Mark scheme · S03-30min Averages from a Frequency Table: 30-minute Pack

Question 1

- (a) **B1** 2 cao
- (a) **Answer: 2**
- (b) **M1** $4+6+3+2$, oe (adds all four frequencies)
- (b) **A1** 15 cao
- (b) **Answer: 15**
- (c) **M1** identifies the median position as the half($n+1$)th = 8th value, using cumulative frequencies 4, 10, 13, 15
- (c) **A1** 2 cao
- (c) **Answer: 2**

Question 2

- **B1** B cao
- **Answer: B)** $\text{sum}(f \text{ times } x) \text{ divided by } \text{sum}(f)$

Question 3

- **B1** (i) 2 cao
- **B1** (ii) 20 cao
- **Answer: (i) 2 (ii) 20**

Question 4

- (i) **B1** True cao
- (i) **Answer: True**
- (ii) **B1** False cao
- (ii) **Answer: False**
- (iii) **B1** False cao
- (iii) **Answer: False**
- (iv) **B1** B cao
- (iv) **Answer: B)** $\text{Sum}(f \text{ times } x) \text{ divided by } \text{Sum}(f)$

Question 5

- **M1** $2 \times 3 + 3 \times 4 + 5 \times 1$ (=23), oe
- **A1** 2.88 awrt
- **Answer: £2.88**

Question 6

- **M1** $0 \times 3 + 1 \times 6 + 2 \times 4 + 3 \times 2$ (=20), oe
- **A1** 1.33 awrt
- **Answer: 1.33**

Question 7

- (a) **B1** 2 cao
- (a) **Answer: 2**
- (b) **M1** identifies the median position as $\text{half}(15+1) = 8\text{th value}$, using cumulative frequencies 2, 7, 13, 15
- (b) **A1** 2 cao
- (b) **Answer: 2**
- (c) **M1** $0 \times 2 + 1 \times 5 + 2 \times 6 + 3 \times 2 (=23)$, oe
- (c) **M1** 23 divided by 15
- (c) **A1** 1.53 awrt
- (c) **Answer: 1.53**

Question 8

- (a) **B1** a suitable closed question with mutually exclusive, exhaustive response boxes for the number of half-hour sessions completed, e.g. 'How many half-hour homework sessions did you complete this week? Tick one box: 0-2, 3-4, 5-6, 7-8, 9 or more'
- (a) **Answer: Any suitable closed question with clear, non-overlapping response boxes covering all possible values.**
- (b) **M1** $4 \times 3 + 5 \times 8 + 6 \times 10 + 7 \times 6 + 8 \times 3 (=178)$, oe
- (b) **M1** 178 divided by 30
- (b) **A1** 5.9 awrt
- (b) **Answer: 5.9**
- (c) **M1** compares the calculated mean (5.9) with the recommended figure (21)
- (c) **A1** correct conclusion in context, e.g. the mean of 5.9 half-hour sessions per week is much lower than the recommended 21, so on average pupils at this school are completing far less homework than recommended
- (c) **Answer: The mean (5.9) is well below the recommended 21 sessions, so pupils are not meeting the recommendation.**

Question 9

- **M1** sets up the mean equation $(1 \times 3 + 2 \times 5 + 3 \times x + 4 \times 2)$ divided by $(3 + 5 + x + 2) = 2.5$, oe, i.e. $(21 + 3x)$ divided by $(10 + x) = 2.5$
- **A1** $x = 8$ cao
- **Answer: $x = 8$**