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Edexcel GCSE Mathematics (Linear) – 1MA0

FREQUENCY TABLES

Materials required for examination

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
Tracing paper may be used.

Items included with question papers

Nil



Instructions

Use black ink or ball-point pen.

Fill in the boxes at the top of this page with your name, centre number and candidate number.

Answer all questions.

Answer the questions in the spaces provided – there may be more space than you need.

Calculators may be used.

Information

The marks for each question are shown in brackets – use this as a guide as to how much time to spend on **each** question.

Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed – you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.

Advice

Read each question carefully before you start to answer it.

Keep an eye on the time.

Try to answer every question.

Check your answers if you have time at the end.

1. Amanda collected 20 leaves and wrote down their lengths, in cm.

Here are her results.

5 6 5 2 4 5 8 7 5 4
7 6 4 3 5 7 6 4 8 5

(a) Complete the frequency table to show Amanda's results.

Length in cm	Tally	Frequency
2		1
3		1
4		4
5		6
6		3
7		3
8		2

- (b) Write down the modal length \rightarrow highest frequency 5 cm (1)
 (c) Work out the range. 6 cm (1)

$8 - 2$

(4 marks)

2. Rosie had 10 boxes of drawing pins.

She counted the number of drawing pins in each box.

The table gives information about her results.

Number of drawing pins	Frequency	Number \times freq
29	2	58
30	5	150
31	2	62
32	1	32

$\underline{10}$

$\underline{302}$

TOTAL NUMBER OF PINS

Work out the mean number of drawing pins in a box.

$302 \div 10$

..... 30.2

(3 marks)

3. Andy did a survey of the number of cups of coffee some pupils in his school had drunk yesterday.

The frequency table shows his results.

Number of cups of coffee	Frequency	NO. x FREQ
2	1	2
3	3	9
4	5	20
5	8	40
6	5	30

TOTAL
→ 101

- (a) Work out the number of pupils that Andy asked.
 TOTAL FREQUENCY
 22 (2)
- (b) Work out the mean number of cups of coffee drunk.
 DRAW 3rd COLUMN
 4.59 (2dp) (3)
- (5 marks)

4. 20 students scored goals for the school hockey team last month. The table gives information about the number of goals they scored.

Goals scored	Number of students	Goals x students
1	9	9
2	3	6
3	5	15
4	3	12

42 TOTAL

- (a) Write down the modal number of goals scored.
 GROUP WITH HIGHEST FREQ
 1 (1)
- (b) Work out the range of the number of goals scored.
 4-1
 3 (1)
- (c) Work out the mean number of goals scored.
 42 ÷ 20
 2.1 (3)
- (5 marks)

5. Bob asked each of 40 friends how many minutes they took to get to work.

The table shows some information about his results.

Time taken (m minutes)	Frequency	Midpoint	freq x Mid
$0 < m \leq 10$	3	5	15
$10 < m \leq 20$	8	15	120
$20 < m \leq 30$	11	25	275
$30 < m \leq 40$	9	35	315
$40 < m \leq 50$	9	45	405

a) Work out an estimate for the mean time taken.

⁴⁰
since data is grouped

1130

$$1130 \div 40$$

..... 28.25 minutes (4)

b) State the modal class interval

Group with Highest Freq = 11 \rightarrow $20 < m \leq 30$

..... 20 < m \leq 30 (1)

c) Find the group containing the median

40 people \rightarrow median between 20 and 21
start adding up frequencies

$$3 + 8 = 11 \text{ (not enough)}$$

$$11 + 11 = 22 \text{ (past 20 and 21 so median in there!)}$$

..... 20 < m \leq 30 (2)

(7 marks)

6. The table shows information about the numbers of hours 40 children watched television one evening.

Number of hours (h)	Frequency	Mid	$M \times F$
$0 \leq h < 1$	3	0.5	1.5
$1 \leq h < 2$	8	1.5	12
$2 \leq h < 3$	7	2.5	17.5
$3 \leq h < 4$	10	3.5	35
$4 \leq h < 5$	12	4.5	54
	40		120

- (a) Find the class interval that contains the median.

40 children \rightarrow median between 20 and 21
 Adding up frequencies...

$$3 + 8 = 11$$

$$11 + 7 = 18$$

$$18 + 10 = 28 \text{ (median in here)}$$

$$3 \leq h < 4$$

- (b) Work out an estimate for the mean number of hours.

$$120 \div 40$$

3

..... hours
 (5 marks)

7. 80 people work in Jenny's factory.

The table shows some information about the annual pay of these 80 workers.

Annual pay (£x)	Number of workers	Mid	M x F
$10\ 000 < x \leq 14\ 000$	32	12000	384000
$14\ 000 < x \leq 16\ 000$	24	15000	360000
$16\ 000 < x \leq 18\ 000$	16	17000	272000
$18\ 000 < x \leq 20\ 000$	6	19000	114000
$20\ 000 < x \leq 40\ 000$	2	30000	60000
	80		1190000

Groups not equal
BE CAREFUL

(a) Write down the modal class interval.

group with highest freq

$$\underline{10000 < x \leq 14000}$$

(1)

(b) Find the class interval that contains the median.

80 workers \rightarrow median between 40 and 41
 $32 + 24 = 56$ (median in here)

$$\underline{14000 < x \leq 16000}$$

(2)

(c) Work out an estimate for the mean annual pay.

$$1190\ 000 \div 80$$

$$\underline{14,875}$$

(3)

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

Since the individual pay amounts have been grouped, we don't know actual values and so use the midpoint of each group to estimate.

(1)
(7 marks)

8. Caleb measured the heights of 30 plants.

The table gives some information about the heights, h cm, of the plants.

Height (h cm) of plants	Frequency	Midpoint	$f \times m$
$0 < h \leq 10$	2	5	10
$10 < h \leq 20$	8	15	120
$20 < h \leq 30$	9	25	225
$30 < h \leq 40$	7	35	245
$40 < h \leq 50$	4	45	180
	<u>30</u>		<u>780</u>

(a) Work out an estimate for the mean height of a plant.

$$780 \div 30$$

26

(3)

(b) Write down the modal class interval.

group with highest freq

$20 < h \leq 30$

(1)

(c) Find the class interval that contains the median.

30 plants \rightarrow median between 15 and 16

$$2 + 8 = 10$$

$$10 + 9 = 19 \text{ (median in here)}$$

$20 < h \leq 30$

(2)

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

We don't know actual plant heights as data is grouped

(1)

(7 marks)

9. Marcus collected some pebbles.
He weighed each pebble.

The grouped frequency table gives some information about weights.

Weight (w grams)	Frequency	Midpoint	$F \times M$
$50 \leq w < 60$	5	55	275
$60 \leq w < 70$	9	65	585
$70 \leq w < 80$	22	75	1650
$80 \leq w < 90$	27	85	2295
$90 \leq w < 100$	17	95	1615

- (a) Work out an estimate for the mean weight of the pebbles.

$$\frac{6420}{80}$$

$$\underline{\underline{80.25g}} \quad (3)$$

- (b) Write down the modal class interval.

group with highest freq

$$\underline{\underline{80 \leq w < 90}} \quad (1)$$

- (c) Find the class interval that contains the median.

80 → median between 40 and 41

$$5 + 9 = 16$$

$$16 + 22 = 38$$

$$38 + 27 = 65 \text{ (median in here)}$$

$$\underline{\underline{80 \leq w < 90}} \quad (2)$$

- (d) Why is your answer to part (a) and estimate?

Data is grouped and so we don't know actual values

(1)
(7 marks)