Averages from a Frequency Table - Worksheet

Skill

Group A - Mode

Write down the mode of the following frequency tables:

1)

X	Frequency
1	3
2	9
3	4
4	2
5	1

2)

X	Frequency
5	5
6	11
7	3
8	2
9	2

3)

X	Frequency
10	4
11	5
12	6
13	9
14	3

Group B - Median

Find the median from the following frequency tables:

1)

X	Frequency
1	3
2	9
3	4
4	2
5	1

2)

X	Frequency
5	5
6	11
7	3
8	2
9	2

3)

X	Frequency
10	4
11	5
12	6
13	9
14	3

Group C - Mean

Work out the mean from the following frequency tables (giving answer to 3 SF):

1)

X	Frequency
1	3
2	9
3	4
4	2
5	1

2)

X	Frequency
5	5
6	11
7	3
8	2
9	2

3)

X	Frequency
10	4
11	5
12	6
13	9
14	3

Averages from a Frequency Table - Worksheet

Group D - Modal class

Write down the modal class interval of the following grouped frequency tables:

1)

X	Frequency
0 ≤ x < 20	1
20 ≤ x < 40	2
40 ≤ x < 60	4
60 ≤ x < 80	3
80 ≤ x < 100	1

2)

X	Frequency
0 ≤ x < 10	4
10 ≤ x < 20	6
20 ≤ x < 30	7
30 ≤ x < 40	10
40 ≤ x < 50	3
50 ≤ x < 60	1

3)

X	Frequency
0 ≤ x < 5	12
5 ≤ x < 10	10
10 ≤ x < 15	5
15 ≤ x < 20	6
20 ≤ x < 25	4
25 ≤ x < 30	2

Group E - Class containing the median

Find the class interval containing the median from the following grouped frequency tables:

1)

X	Frequency
0 ≤ x < 20	1
20 ≤ x < 40	2
40 ≤ x < 60	4
60 ≤ x < 80	3
80 ≤ x < 100	1

2)

X	Frequency
0 ≤ x < 10	4
10 ≤ x < 20	6
20 ≤ x < 30	7
30 ≤ x < 40	10
40 ≤ x < 50	3
50 ≤ x < 60	1

3)

X	Frequency
0 ≤ x < 5	12
5 ≤ x < 10	10
10 ≤ x < 15	5
15 ≤ x < 20	6
20 ≤ x < 25	4
25 ≤ x < 30	2

Group F - Estimated mean

Work out the estimated mean from the following grouped frequency tables (giving answer to 3 SF):

1)

X	Frequency
0 ≤ x < 20	1
20 ≤ x < 40	2
40 ≤ x < 60	4
60 ≤ x < 80	3
80 ≤ x < 100	1

2)

X	Frequency
0 ≤ x < 10	4
10 ≤ x < 20	6
20 ≤ x < 30	7
30 ≤ x < 40	10
40 ≤ x < 50	3
50 ≤ x < 60	1

3)

X	Frequency
0 ≤ x < 5	12
5 ≤ x < 10	10
10 ≤ x < 15	5
15 ≤ x < 20	6
20 ≤ x < 25	4
25 ≤ x < 30	2

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Averages from a Frequency Table - Worksheet

Applied

1) **(a)** Here is a frequency table showing the ages of 25 people in the U21s rugby club.

Alex thinks the data is bimodal.

Is she correct? Explain your answer.

Age	Frequency
16	2
17	5
18	7
19	7
20	4

(b) Here is a frequency table showing the ages of 30 people in the U21s football club.

Mia thinks the mode is 8.

Is she correct? Explain your answer.

Age	Frequency
16	8
17	4
18	8
19	7
20	8

2) **(a)** Here is a frequency table showing the number of people in 20 cars

Find the median number of occupants.

Number of people	Frequency
1	5
2	6
3	4
4	4
5	1

(b) Here is a frequency table showing the number of eggs in 20 nests in a survey on a local river.

Find the median number of eggs.

Number of eggs	Frequency
1	1
2	2
3	7
4	6
5	4

Averages from a Frequency Table - Worksheet

3) **(a)** Here is a grouped frequency table showing the number of people who are members of 25 clubs in a town.

Estimate the mean number of people.

Number of people	Frequency
1-10	6
11-20	10
21-30	4
31-40	5

(b) Here is a grouped frequency table showing the number of people on 45 buses.

Estimate the mean number of people.

Give your answer to 1 decimal place.

Number of people	Frequency
0 to 9	20
10 to 19	6
20 to 29	5
30 to 39	8
40 to 49	6

Averages from a Frequency Table - Exam Questions

1)   The frequency table shows the number of siblings of 25 students.

Number of siblings	Frequency
0	9
1	7
2	5
3	3
4	1

(a) Write down the mode.

....

(1)

(b) Find the median.

....

(1)

(b) Calculate the mean.

....

(2)

(4 marks)

---

2)   The grouped frequency table shows the number of passengers on 100 trains.

Number of passengers, x	Frequency
0 ≤ x < 20	12
20 ≤ x < 40	17
40 ≤ x < 60	26
60 ≤ x < 80	29
80 ≤ x < 100	16

(a) Write down the modal class.

....

(1)

Averages from a Frequency Table - Exam Questions

(b) Estimate the mean.

....
(3)
(4 marks)

---

3) The frequency table shows the number of people in 39 swimming sessions at the local swimming pool.

Number of people, x	Frequency
x < 15	0
15 ≤ x < 20	2
20 ≤ x < 25	15
25 ≤ x < 30	13
30 ≤ x < 35	9

(a) Write down the modal class interval.

....
(1)

(b) Find the class interval containing the median.

....
(1)

(c) Estimate the mean. Give your answer to 1 decimal place.

....
(4)
(6 marks)

Averages from a Frequency Table - Answers

	Question	Answer
	Skill Questions	
Group A	Write down the mode of the following frequency tables:	

1)

X	Frequency
1	3
2	9
3	4
4	2
5	1

1) 2

2)

X	Frequency
5	5
6	11
7	3
8	2
9	2

2) 6

3)

X	Frequency
10	4
11	5
12	6
13	9
14	3

3) 13

Group B Find the median from the following frequency tables:

1)

X	Frequency
1	3
2	9
3	4
4	2
5	1

1) 2

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Averages from a Frequency Table - Answers

Group B contd	**2)**	X	Frequency	**2)** 6
		5	5	
		6	11	
		7	3	
		8	2	
		9	2	

	3)	X	Frequency	**3)** 12
		10	4	
		11	5	
		12	6	
		13	9	
		14	3	

Group C

Work out the mean from the following frequency tables (giving answer to 3 SF):

	1)	X	Frequency	**1)** 2.42 (to 3 sf)
		1	3	
		2	9	
		3	4	
		4	2	
		5	1	

	2)	X	Frequency	**2)** 6.35 (to 3 sf)
		5	5	
		6	11	
		7	3	
		8	2	
		9	2	

	3)	X	Frequency	**3)** 12.1 (to 3 sf)
		10	4	
		11	5	
		12	6	
		13	9	
		14	3	

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Averages from a Frequency Table - Answers

Group D	Write down the modal class interval of the following grouped frequency tables:	
	1)	**1)** $40 \leq x < 60$

X	Frequency
0 ≤ x < 20	1
20 ≤ x < 40	2
40 ≤ x < 60	4
60 ≤ x < 80	3
80 ≤ x < 100	1

2)

2) $30 \leq x < 40$

X	Frequency
0 ≤ x < 10	4
10 ≤ x < 20	6
20 ≤ x < 30	7
30 ≤ x < 40	10
40 ≤ x < 50	3
50 ≤ x < 60	1

3)

3) $0 \leq x < 5$

X	Frequency
0 ≤ x < 5	12
5 ≤ x < 10	10
10 ≤ x < 15	5
15 ≤ x < 20	6
20 ≤ x < 25	4
25 ≤ x < 30	2

Group E	Find the class interval containing the median from the following grouped frequency tables:	
	1)	**1)** $40 \leq x < 60$

X	Frequency
0 ≤ x < 20	1
20 ≤ x < 40	2
40 ≤ x < 60	4
60 ≤ x < 80	3
80 ≤ x < 100	1

2)

2) $20 \leq x < 30$

X	Frequency
0 ≤ x < 10	4
10 ≤ x < 20	6
20 ≤ x < 30	7
30 ≤ x < 40	10
40 ≤ x < 50	3
50 ≤ x < 60	1

Averages from a Frequency Table - Answers

Group E contd	3)				3) $5 \leq x < 10$

X	Frequency
0 ≤ x < 5	12
5 ≤ x < 10	10
10 ≤ x < 15	5
15 ≤ x < 20	6
20 ≤ x < 25	4
25 ≤ x < 30	2

Group F	Work out the estimated mean from the following grouped frequency tables (giving answer to 3 SF):	

1)

X	Frequency
0 ≤ x < 20	1
20 ≤ x < 40	2
40 ≤ x < 60	4
60 ≤ x < 80	3
80 ≤ x < 100	1

1) 51.8 (to 3 sf)

2)

X	Frequency
0 ≤ x < 10	4
10 ≤ x < 20	6
20 ≤ x < 30	7
30 ≤ x < 40	10
40 ≤ x < 50	3
50 ≤ x < 60	1

2) 26.6 (to 3 sf)

3)

X	Frequency
0 ≤ x < 5	12
5 ≤ x < 10	10
10 ≤ x < 15	5
15 ≤ x < 20	6
20 ≤ x < 25	4
25 ≤ x < 30	2

3) 10.7 (to 3 sf)

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Averages from a Frequency Table - Answers

	Question	Answer
	Applied Questions	
1)	**a)** Here is a frequency table showing the ages of 25 people in the U21s rugby club. | Age	Frequency
---	---
16	2
17	5
18	7
19	7
20	4 | Alex thinks the data is bimodal. Is she correct? Explain your answer.	**a)** Yes. The highest frequency is 7 and it occurs twice. The data is bimodal. The modal age is 18 & 19.
	b) Here is a frequency table showing the ages of 30 people in the U21s football club. | Age	Frequency
---	---
16	8
17	4
18	8
19	7
20	8 | Mia thinks the mode is 8. Is she correct? Explain your answer.	**b)** No. 8 can not be the mode as it is not one of the possible ages. 8 is the highest frequency and it occurs three times. You can not have three modes.
2)	**a)** Here is a frequency table showing the number of people in 20 cars | Number of people	Frequency
---	---
1	5
2	6
3	4
4	4
5	1 | Find the median number of occupants.	**a)** $10^{th} = 2$, $11^{th} = 2$ Median $=$ 2

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Averages from a Frequency Table - Answers

	b) Here is a frequency table showing the number of eggs in 20 nests in a survey on a local river.	**b)**	$10^{th} = 3, 11^{th} = 4$ Median $= 3.5$

Number of eggs	Frequency
1	1
2	2
3	7
4	6
5	4

Find the median number of eggs.

3)

a) Here is a frequency table showing the number of people who are members of 25 clubs in a town.

Number of people	Frequency
1-10	6
11-20	10
21-30	4
31-40	5

Estimate the mean number of people.

a) Using midpoints:
$5.5, 15.5, 25.5$ and 35.5.
Estimated mean $= 18.7$

b) Here is a frequency table showing the number of people on 45 buses.

Number of people	Frequency
0 to 9	20
10 to 19	6
20 to 29	5
30 to 39	8
40 to 49	6

Estimate the mean number of people.
Give your answer to 1 decimal place.

b) Using midpoints:
$4.5, 14.5, 24.5$ and $34.5, 44.5$
Estimated mean $= 18.7$

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Averages from a Frequency Table - Mark Scheme

	Question	Answer	
	Exam Questions		
1) (a)	The frequency table shows the number of siblings of 25 students. 	**(a)** Mode = 0	**(1)**

Number of siblings	Frequency
0	9
1	7
2	5
3	3
4	1

Write down the mode:

	Question	Answer	
(b)	Find the median:	**(b)** Median = 1	**(1)**
(c)	Calculate the mean:	**(c)** $\frac{(0\times9)+(1\times7)+(2\times5)+(3\times3)+(4\times1)}{25}$ Mean = 1.2	**(1)** **(1)**
2) (a)	The grouped frequency table shows the number of passengers on 100 trains.	**(a)** $60 \leq x < 80$	**(1)**

Number of passengers, x	Frequency
$0 \leq x < 20$	12
$20 \leq x < 40$	17
$40 \leq x < 60$	26
$60 \leq x < 80$	29
$80 \leq x < 100$	16

Write down the modal class:

	Question	Answer	
(b)	Estimate the mean:	**(b)** Midpoints 10, 30, 50, 70, 90 $\frac{(12\times10)+(17\times30)+(26\times50)+(29\times70)+(16\times90)}{100}$ = 54	**(1)** **(1)** **(1)**

Averages from a Frequency Table - Mark Scheme

3) (a)	The frequency table shows the number of people in 39 swimming sessions at the local swimming pool.	**(a)**	$20 \leq x < 25$	**(1)**

Number of people, x	Frequency
x < 15	0
15 ≤ x < 20	2
20 ≤ x < 25	15
25 ≤ x < 30	13
30 ≤ x < 35	9

Write down the modal class interval:

(b)	Find the class interval containing the median:	**(b)**	$20^{th} item$ $25 \leq x < 30$	**(1)**
(c)	Estimate the mean: Give your answer to 1 decimal place.	**(c)**	Midpoints - 17.5, 22.5, 27.5, 32.5	**(1)**
			$(2 \times 17.5) + (15 \times 22.5)$ $+ (13 \times 27.5) + (9 \times 32.5)$	**(1)**
			$1022.5 \div 39$	**(1)**
			$= 26.21794872...$ $= 26.2 (1dp)$	**(1)**