



Averages from Grouped Tables



REVISE THIS TOPIC

1 The table shows information about the heights of 25 students.

Height, h (cm)	Frequency
$130 < h \leq 140$	3
$140 < h \leq 150$	15
$150 < h \leq 160$	6
$160 < h \leq 170$	1

$$\begin{array}{r}
 135 = 405 \\
 145 = 2175 \\
 155 = 930 \\
 165 = 165 \\
 \hline
 3675
 \end{array}$$

$$\begin{array}{r}
 \hline
 25
 \end{array}$$

(a) Find the modal class.

$$\begin{array}{r}
 140 < h \leq 150 \\
 \hline
 (1)
 \end{array}$$

(b) Work out an estimate for the mean height of the students.

$$3675 \div 25 = 147$$

$$\begin{array}{r}
 147 \\
 \hline
 (3)
 \end{array}
 \text{ cm}$$

(Total for Question 1 is 4 marks)



2 The table shows information about the masses of 400 apples.

	Mass, m (grams)	Frequency	
62	$70 < m \leq 90$	62	\times
180	$90 < m \leq 110$	118	\times
374	$110 < m \leq 130$	194	\times
400	$130 < m \leq 150$	26	\times
		400	

$80 = 4960$
 $100 = 11800$
 $120 = 23280$
 $140 = 3460$

 43680

(a) Find the modal class.

$$\underline{110 < m \leq 130}$$

(1)

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

$$400 + 1 = 401$$

$$401 \div 2 = 200.5^{\text{th}}$$

$$\underline{110 < m \leq 130}$$

(1)

(c) Work out an estimate for the mean mass of the apples.

$$43680 \div 400 = 109.2$$

$$\underline{109.2} \text{ g}$$

(3)

(Total for Question 2 is 5 marks)



3 The table shows information about the speeds of some cars on a road.

Speed, s (mph)	Frequency
$30 < s \leq 40$	1
$40 < s \leq 50$	14
$50 < s \leq 60$	37
$60 < s \leq 70$	48

Handwritten calculations to the left of the table: 1, 15, 52, 100 (cumulative frequencies).
 Handwritten calculations to the right of the table: $35 = 35$, $45 = 630$, $55 = 2035$, $65 = 3120$.
 A red underline under the frequency column shows a total of 100. A red underline under the cumulative frequency column shows a total of 5820.

(a) Find the modal class.

$$\underline{60 < s \leq 70}$$

(1)

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

$$100 + 1 = 101$$

$$101 \div 2 = 50.5^{\text{th}}$$

$$\underline{50 < s \leq 60}$$

(1)

(c) Work out an estimate for the mean speed of the cars.

$$5820 \div 100$$

$$\underline{58.2} \text{ mph}$$

(3)

(Total for Question 3 is 5 marks)



4 The table shows information about the weekly pay of some workers.

	Weekly Pay, (£ w)	Frequency	
12	$400 < w \leq 500$	12	$450 = 5400$
23	$500 < w \leq 600$	11	$550 = 6050$
29	$600 < w \leq 700$	6	$650 = 3900$
34	$700 < w \leq 800$	5	$750 = 3750$
35	$800 < w \leq 900$	1	$850 = 850$
		<u>35</u>	<u>19950</u>

(a) Find the modal class.

$400 < w \leq 500$
 (1)

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

$35 + 1 = 36$
 $36 \div 2 = 18^{\text{th}}$

$500 < w \leq 600$
 (1)

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

$19950 \div 35$

$\pounds 570$
 (3)

(Total for Question 4 is 5 marks)



5 The table shows information about the race times of 50 runners.

	Time, t (minutes)	Frequency	
6	$15 < t \leq 16$	6	$15 \cdot 5 = 93$
16	$16 < t \leq 17$	10	$16 \cdot 5 = 165$
26	$17 < t \leq 18$	10	$17 \cdot 5 = 175$
47	$18 < t \leq 19$	21	$18 \cdot 5 = 388 \cdot 5$
50	$19 < t \leq 20$	3	$19 \cdot 5 = 58 \cdot 5$
		<u>50</u>	<u>880</u>

(a) Find the modal class.

$$\underline{18 < t \leq 19}$$

(1)

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

$$50 + 1 = 51$$

$$51 \div 2 = 25.5^{\text{th}}$$

$$\underline{17 < t \leq 18}$$

(1)

(c) Work out an estimate for the mean race time.
Give your answer in minutes and seconds

$$880 \div 50 = 17.6$$

$$0.6 \times 60 = 36 \text{ seconds}$$

$$\dots\dots\dots 17 \dots\dots\dots \text{minutes} \dots\dots\dots 36 \dots\dots\dots \text{seconds}$$

(4)

(Total for Question 5 is 6 marks)



6 The table shows information about the distances jumped by 11 athletes.

	Distance, d (metres)	Frequency	
6	$4 < d \leq 4.5$	6	$4 \cdot 25 = 25 \cdot 5$
7	$4.5 < d \leq 5$	1	$4 \cdot 75 = 4 \cdot 75$
9	$5 < d \leq 5.5$	2	$5 \cdot 25 = 10 \cdot 5$
11	$5.5 < d \leq 6$	2	$5 \cdot 75 = 11 \cdot 5$
		11	52.25

(a) Find the modal class.

$$\underline{4 < d \leq 4.5}$$

(1)

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

$$11 + 1 = 12$$

$$12 \div 2 = 6^{\text{th}}$$

$$\underline{4 < d \leq 4.5}$$

(1)

(c) Work out an estimate for the mean distance jumped.
Give your answer in centimetres.

$$52.25 \div 11 = 4.75$$

$$4.75 \times 100 = 475$$

$$\underline{475} \text{ cm}$$

(3)



Two more athletes jump and their distances are recorded.
Both athletes jump more than 4.5 metres.

The results for the two extra athletes are added to the table.

(d) How will the two extra athletes affect your answers to parts (a), (b) and (c).
For each statement below tick one box.

	Remains the same	Changes	Not possible to tell
Part (a) The modal class	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Part (b) The estimate of the mean	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Part (c) The interval containing the median	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

(3)

(e) Mo says: "The range of the jumps is 1.5 metres as $5.75 - 4.25 = 1.5$ "

Explain why Mo may not be correct.

We don't know the actual distances
 Mo has just used the midpoints
 but the max could be 5.8 and
 min 4.1 for example.

(1)

(Total for Question 6 is 9 marks)

