Working with Averages

(Mean, Mode, Median & Range)

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1. Mean and median

(a) Look at these three numbers.

9	11	10

Show that the **mean** of the three numbers is **10**

9+11+10 = 30

30 ÷ 3 = 10

1 mark

Explain why the **median** of the three numbers is **10**

List in order: 9 , 10 , 11

Median is the middle number : 10

1 mark

(b) Four numbers have a mean of 10 and a median of 10, but **none** of the numbers is 10

What could the four numbers be?

Give an example.

9	9	11	11

1 mark

Or any solution which add to 40 and where the midpoint of the middle two numbers is 10.

2. (a) There are four people in Sita's family.

Their shoe sizes are 4, 5, 7 and 10

What is the **median** shoe size in Sita's family?

5+7=12; 12÷2=6

6 .....

1 mark

(b) There are **three** people in John's family.
The **range** of their shoe sizes is **4**

Two people in the family wear shoe size 6
John's shoe size is **not 6** and it is **not 10**

What is John's shoe size?

2 .....

1 mark

3. **Cycling**

Hannah went on a cycling holiday.

The table shows how far she cycled each day.

Monday	Tuesday	Wednesday	Thursday
32.3 km	38.7 km	43.5 km	45.1 km

Hannah says:

'On average, I cycled **over 40 km** a day'.

Show that Hannah is wrong.

32.3 + 38.7 + 43.5 + 45.1 = 159.6

159.6 ÷ 4 = 39.9, which is less than 40!

2 marks

4. Set of three

The **mean** of these number is **6**

10	1	7

Write three numbers that have a mean of **7**

11	2	8

(or any three numbers which add to give 21)

1 mark

5. Set of four

The **median** of these five numbers is **12**

5	5	12	13	20

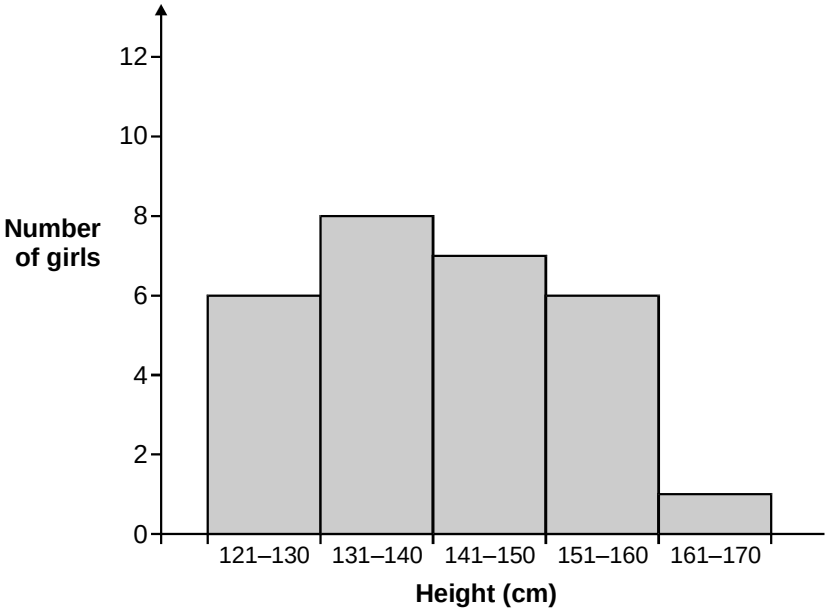
Write a set of **four** numbers that has a median of **12**

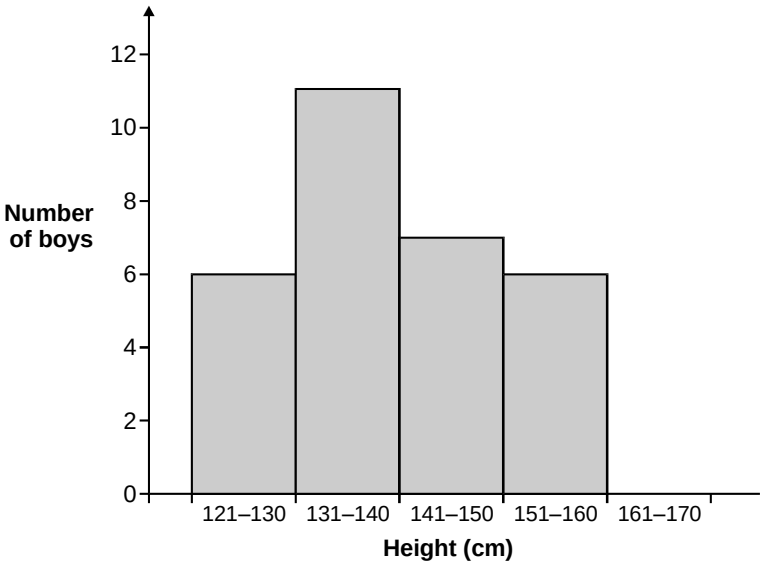
10	11	13	14

1 mark

6. Comparing heights

The two diagrams show the heights of some girls and boys.





(a) Use the diagrams to decide whether these statements are **true** or **false.**

Tick (✓) your answer.

There are **more girls** than boys.

True ☐ False ☑

Show calculations to explain how you know.

Girls: 6+8+7+6+1=28 | Boys: 6+11+7+6=30

1 mark

The **modal class** for girls is the same as the modal class for boys.

True ☑ False ☐

Explain how you know.

Modal (from Mode) means most popular.

1 mark

(b) The height of the shortest girl is the same as the height of the shortest boy.

Is the **range** of girls' heights greater than the range of boys' heights?

Yes ☑ No ☐

Explain how you know.

There is one girl in the 161-170 band.

1 mark

7. Mean and range

Which two numbers have a **mean** of **10** and a **range** of **8**?

The numbers are 6 and 14

2 marks

8. Scores

(a) Paula played four games in a competition.
In **three** games, Paula scored **8** points each time.
In the other game she scored **no** points.

What was Paula's **mean** score over the **four** games?

8+8+8+0=24 | 24 ÷ 4 =

6 points

1 mark

(b) Jessie only played **two** games.
Her **mean** score was **3** points.
Her **range** was **4** points.

What points did Jessie score in her two games?

1 and 5

1 mark

(c) Ali played **three** games.
His **mean** score was also **3** points.
His **range** was also **4** points.

What points might Ali have scored in his three games?
Show your working.

1 and 3 and 5

(or any 3 numbers that add to 9 with a range of 4)

2 marks