

## P2- Introducing Averages and Range

OCR

**2** Wilfred runs in six races.  
These are his times, in seconds.

10.5      10.6      10.1      10.6      10.0      9.9

**(a)** Write down the mode of his times.

**(a)** ..... seconds **[1]**

**(b)** Work out the range of his times.

**(b)** ..... seconds **[1]**

**(c)** Work out the median of his times.

**(c)** ..... seconds **[2]**

~~10.1~~ ~~10.2~~ 10.3 ~~10.4~~ ~~10.5~~

2 Wilfred runs in six races.  
These are his times, in seconds.

10.5    10.6    ~~10.1~~    10.6    ~~10.0~~    ~~9.9~~

(a) Write down the mode of his times.

(a) ..... 10.6 ..... seconds [1]

(b) Work out the range of his times.

$$10.6 - 9.9$$

(b) ..... 0.7 ..... seconds [1]

(c) Work out the median of his times.

~~9.9~~, ~~10.0~~, 10.1, 10.5, ~~10.6~~, ~~10.6~~

$$\frac{10.1 + 10.5}{2} = \frac{20.6}{2}$$

(c) ..... 10.3 ..... seconds [2]

Here is a list of numbers.

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2    8    5    12    6

**(b)** Using the same list of numbers, work out

**(i)** the median,

**(b)(i)** ..... [1]

**(ii)** the range.

**(ii)** ..... [2]

Here is a list of numbers.

Created by W Neill

2 8 5 12 6

(b) Using the same list of numbers, work out

P2 (i) the median,

*middle*

~~2~~ ~~5~~ 6 ~~8~~ ~~12~~

(b)(i) ..... 6 ..... [1]

(ii) the range.

*Biggest - Smallest*      $12 - 2$

(ii) ..... 10 ..... [2]

4 These are the heights, in metres, of the players in a netball team.

1.30      1.13      1.20      1.23      1.22      1.24      1.15

(a) (i) Find the median height of the 7 players.

P2

(a)(i) ..... m [2]

(ii) Work out the range of the heights of the 7 players.

P2

(ii) ..... m [2]

4 These are the heights, in metres, of the players in a netball team.

- (a) (i) Find the median height of the 7 players.
- ~~1.30~~    ~~1.13~~    ~~1.20~~    ~~1.23~~    ~~1.22~~    ~~1.24~~    ~~1.15~~  
~~1.13~~    ~~1.15~~    ~~1.20~~    ~~1.22~~    ~~1.23~~    ~~1.24~~    ~~1.30~~

P2

(a)(i) ..... 1.22 ..... m [2]

(ii) Work out the range of the heights of the 7 players.

P2

$$\begin{array}{r}
 1.30 \\
 - 1.13 \\
 \hline
 0.17
 \end{array}$$

(ii) ..... 0.17 ..... m [2]



(iii) The sum of the heights of the 7 players is 8.47 m.

**P2** Calculate the mean height of the 7 players.

(iii) ..... m [2]

(iii) The sum of the heights of the 7 players is 8.47 m.

P2 Calculate the mean height of the 7 players.

$$\frac{8.47}{7}$$

$$7 \overline{) 8.47} \begin{array}{r} 1.21 \end{array}$$

(iii) ..... 1.21 ..... m [2]

- (b) The tallest player is replaced by a substitute.  
The median height of the players is unchanged.  
P2 The mean height of the players becomes smaller.

Write down a possible height for the substitute.

(b) ..... m [2]

- (b) The tallest player is replaced by a substitute.  
The median height of the players is unchanged.  
P2 The mean height of the players becomes smaller.

Write down a possible height for the substitute.

~~1.30~~   ~~1.13~~   ~~1.20~~   ~~1.23~~  
~~1.13~~   ~~1.15~~   ~~1.20~~   ~~1.22~~

~~1.22~~   ~~1.24~~   ~~1.15~~  
~~1.23~~   ~~1.24~~   ~~1.30~~

← smaller than  
→ off

1.22  
1.23  
.....  
1.29

(b) ..... 1.23 ✓ m [2]

Edexcel

5 Debra recorded the favourite colour of each of the 30 students in her class.

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The incomplete table shows some information about her results.

(a) Complete the table for Debra's results.

Colour	Number of students
red	7
green	6
yellow	5
blue	10
other	

(b) What is the modal colour?

.....  
(1)

Mark asked each student in a different class to name their favourite colour.

For this class,

the number of students who said blue is three times the number of students who said green.

(c) Write down the ratio of  
the number of students who said blue to the number of students who said green.

.....  
(1)

5 Debra recorded the favourite colour of each of the 30 students in her class.

Created by W Neill

The incomplete table shows some information about her results.

(a) Complete the table for Debra's results.

Colour	Number of students
red	7
green	6
yellow	5
blue	10
other	2

(b) What is the modal colour?

most  
blue ✓

.....  
(1)

Mark asked each student in a different class to name their favourite colour.

For this class,  
the number of students who said blue is three times the number of students who said green.

(c) Write down the ratio of  
the number of students who said blue to the number of students who said green.

B : G  
3 : 1 ✓

.....  
(1)

7 Here is a list of 10 numbers.

1    3    3    5    5    7    8    8    8    12

(a) Work out the range.

**P2**

.....  
(1)

(b) Find the mode.

**P2**

.....  
(1)

One of the 10 numbers is picked at random.

(c) Write down the probability that this number is 7

**P21**

.....  
(1)



7 Here is a list of 10 numbers.

1    3    3    5    5    7    8    8    8    12

(a) Work out the range.

P2

$$12 - 1 =$$

$$\frac{11}{(1)}$$

(b) Find the mode.

P2

$$\frac{8}{(1)}$$

One of the 10 numbers is picked at random.

(c) Write down the probability that this number is 7

P21

$$\frac{1}{10} \frac{(1)}$$

6 Here is a list of numbers.

Video created by W Neill

12    15    14    17    22    19    13

Bridgit says,

“To work out the median you find the middle number,  
so the median of these numbers is 17”

Bridgit’s answer is **not** correct.

(a) What is wrong with Bridgit’s method?

.....  
.....  
(1)

(b) Work out the range of the numbers in the list.

(c) Work out the mean of the numbers in the list.

6 Here is a list of numbers.

Video created by W Neill

12 15 14 17 22 19 13

Bridgit says,

“To work out the median you find the middle number,  
so the median of these numbers is 17”

Bridgit’s answer is **not** correct.

(a) What is wrong with Bridgit’s method?

Numbers need to be in order

(1)

(b) Work out the range of the numbers in the list.

largest - Smallest  $22 - 12 = 10 \checkmark$

(c) Work out the mean of the numbers in the list.

$$\frac{112}{7} = 16$$

Rehan is asked to find the range of the numbers 3 1 8 7 5

Here is his working.

$$\text{Range} = 5 - 3 = 2$$

This is wrong.

(b) Explain why.

P2

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(1)

Rehan is asked to find the range of the numbers 3 1 8 7 5

Here is his working.

$$\text{Range} = 5 - 3 = 2$$

This is wrong.

(b) Explain why.

P2

Big - Smallest

$$8 - 1 = 7$$

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Rehan used first and last numbers in list

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(1)

AQA

12 Lee sells ice creams.

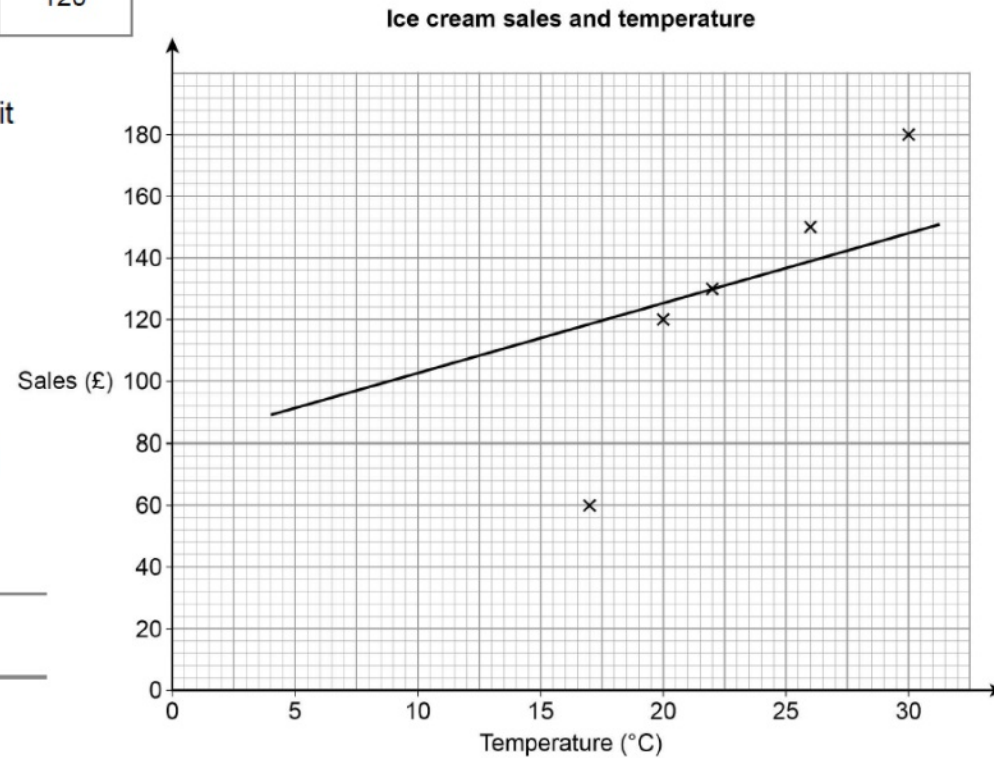
Video created by W Neill

The table shows the midday temperature and his sales for five days.

P12/P13

	Day 1	Day 2	Day 3	Day 4	Day 5
Temperature (°C)	30	26	17	22	20
Sales (£)	180	150	80	130	120

12 (a) He draws this scatter graph and line of best fit



Write down **two** mistakes he has made. [2 marks]

Mistake 1 \_\_\_\_\_

\_\_\_\_\_

Mistake 2 \_\_\_\_\_

\_\_\_\_\_

12 Lee sells ice creams.

Video created by W Neill

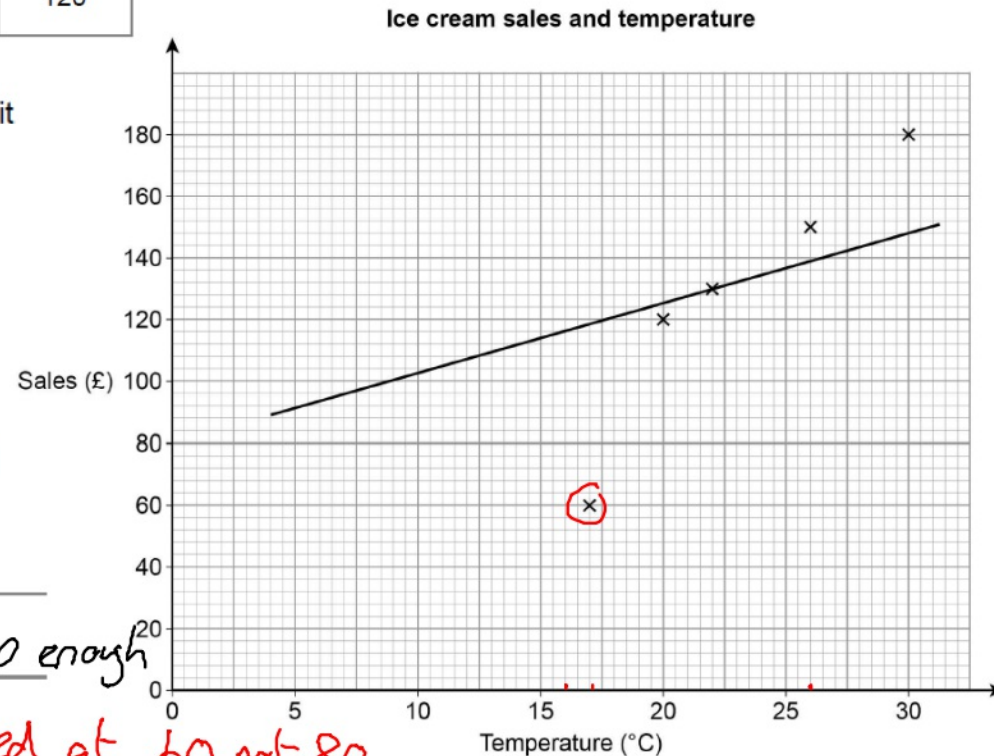
The table shows the midday temperature and his sales for five days.

P12/P13

	Day 1	Day 2	Day 3	Day 4	Day 5
Temperature (°C)	30	26	17	22	20
Sales (£)	180	150	80	130	120

Sales =

12 (a) He draws this scatter graph and line of best fit



Write down two mistakes he has made. [2 marks]

Mistake 1 LOBF is not going in correct direction, not steep enough

Mistake 2 Day 3 is incorrect, plotted at 60 not 80.



**12 (b)** Lee wants to work out the range of the five temperatures.

P2 His calculation is  $30 - 20 = 10$

Is his method correct?

Tick a box.

Yes  No

**[1 mark]**

Give a reason to support your answer.

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**12 (b)** Lee wants to work out the range of the five temperatures.

P2

His calculation is  $30 - 20 = 10$

Is his method correct?

Tick a box.

Yes

No

[1 mark]

Give a reason to support your answer.

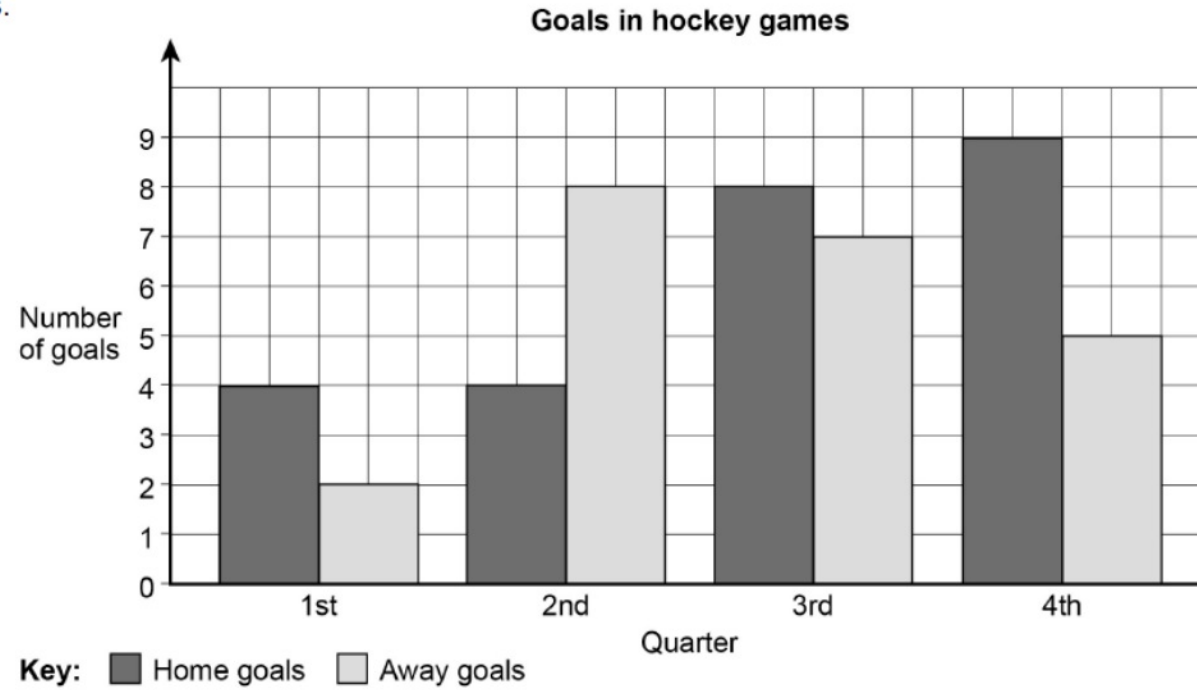
Should be  $30 - 17 = 13$  ✓

8

Here is information about the goals scored in some hockey games.

Video created by W Neill

Each game has four quarters.



8 (b) There were 10 games.

P2 Work out the mean number of goals per game.

[2 marks]

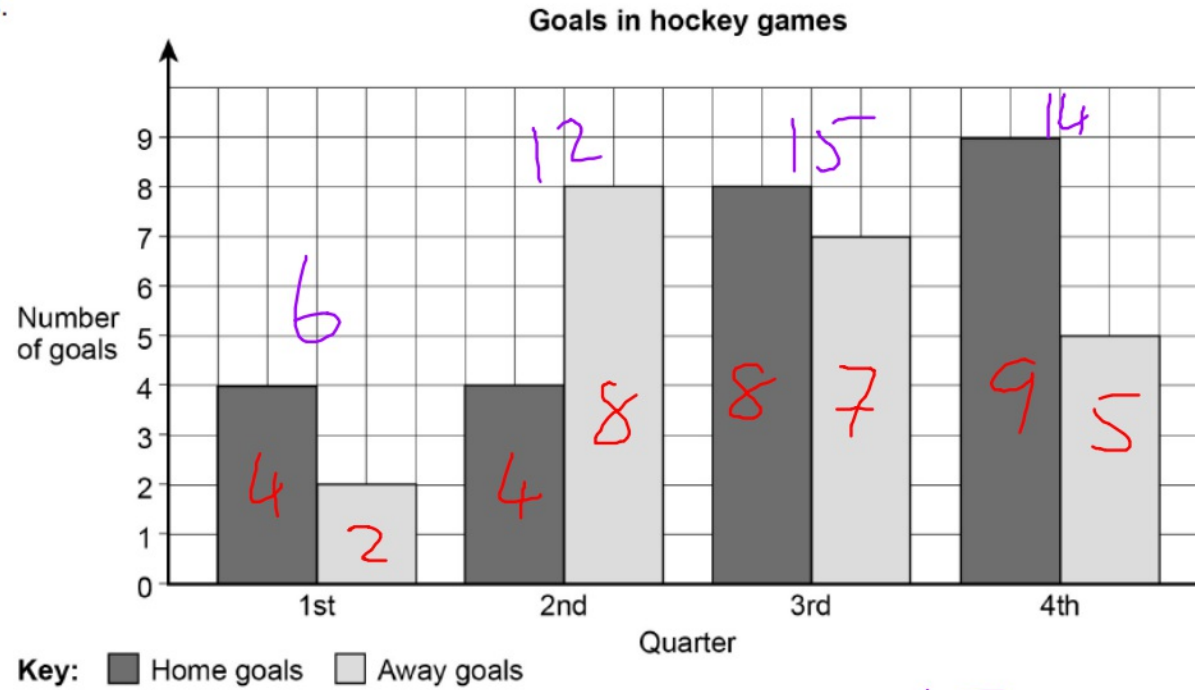
Answer \_\_\_\_\_

8

Here is information about the goals scored in some hockey games.

Video created by W Neill

Each game has four quarters.



8 (b) There were 10 games.

P2

Work out the mean number of goals per game.

$$\frac{\text{Total goals}}{10}$$

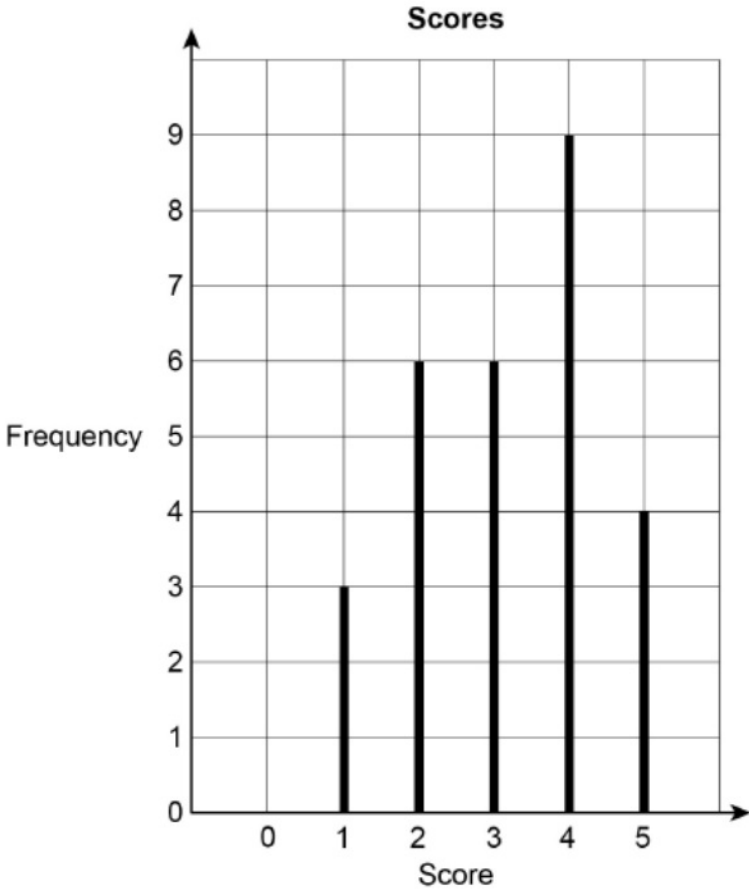
[2 marks]

$$\frac{47}{10}$$

Answer \_\_\_\_\_

4.7 goals ✓

7 The diagram shows the scores given by judges during a television show.



7 (a) Which score was the mode? [1 mark]

P2

Answer \_\_\_\_\_

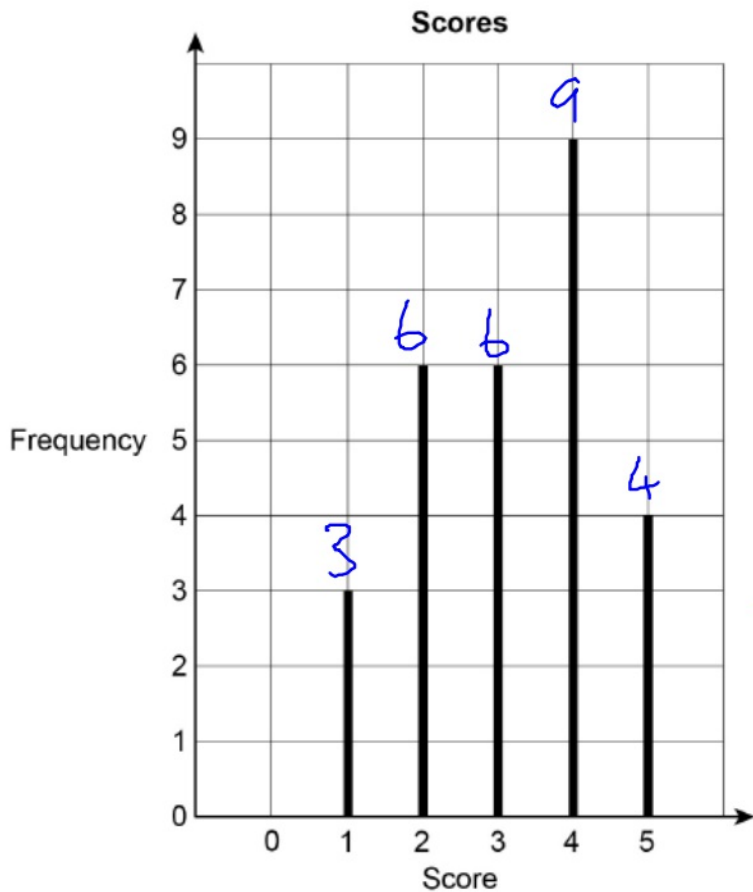
7 (b) There were 4 judges.  
Each judge gave one score in each round.

P7

How many rounds were there? [3 marks]

Answer \_\_\_\_\_

7 The diagram shows the scores given by judges during a television show.



7 (a) Which score was the mode? [1 mark]

P2

most

Answer 4

7 (b) There were 4 judges.

P7

Each judge gave one score in each round.

How many rounds were there? [3 marks]

Total scores = 28 scores

$$\frac{28 \text{ scores}}{4 \text{ judges}} = 7 \text{ rounds} \checkmark$$

Answer \_\_\_\_\_

**25** Circle the expression for the range of  $n$  consecutive integers.

**[1 mark]**

A6

P2

$$\frac{n+1}{2}$$

$$n-1$$

$$n$$

$$n+1$$

25 Circle the expression for the range of  $n$  consecutive integers.

[1 mark]

A6  
P2

$$\frac{n+1}{2}$$

$4 - 1 = 3$  ✓  
 $n - 1$

$$\frac{4}{n}$$

$$\frac{4+1}{n+1} = 5$$

$\frac{4+1}{2} = \frac{5}{2} = 2\frac{1}{2}$  ✗

2, 3, 4, 5 .....  $n = 4$  (numbers)

Range =  $5 - 2 = 3$  ✓



Video created by W Neill

18 Here are five cards.

P2  
P17



One of the cards is removed.

The mean of the numbers on the remaining four cards is 6

Which card was removed?

You **must** show your working.

**[3 marks]**

Answer \_\_\_\_\_

18 Here are five cards.

P2  
P17

$$\boxed{1} + \boxed{5} + \boxed{7} + \boxed{\cancel{9}} + \boxed{11} = 33$$

24 ← - 9

One of the cards is removed.

The mean of the numbers on the remaining four cards is 6

Which card was removed?

You **must** show your working.

$$\frac{24}{4} = 6$$

Total

[3 marks]

Answer

9

**10** Here is a list of numbers.

5 6 1 3 5 5 8 4 2 2

**10 (a)** Work out the median.

**[2 marks]**

P2

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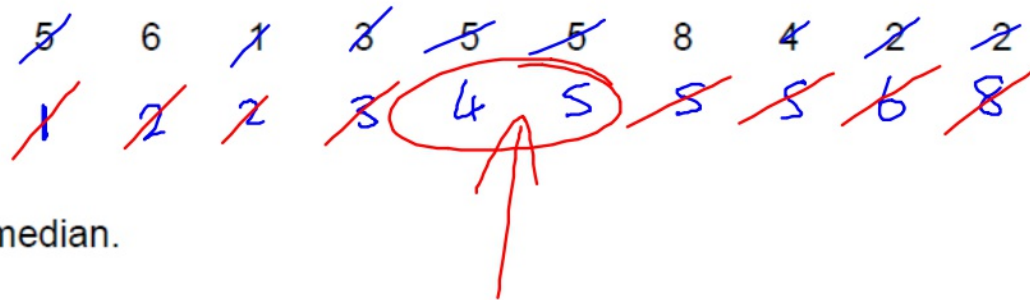
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Answer \_\_\_\_\_

10 Here is a list of numbers.



10 (a) Work out the median.

[2 marks]

P2

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Answer 4.5

Video created by W Neill

Here is a list of numbers.

5 6 1 3 5 5 8 4 2 2

10 (b) Work out the mean.

[2 marks]

P2

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Answer \_\_\_\_\_

Here is a list of numbers.

5 6 1 3 5 5 8 4 2 2

10 (b)

Work out the mean.

$$\frac{\text{Total}}{\text{how many}} = \frac{41}{10}$$

[2 marks]

P2

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Answer

4.1 ✓

29 The range of a set of numbers is  $15\frac{1}{4}$

P2 The smallest number is  $-2\frac{7}{8}$

N38 Work out the largest number.

**[3 marks]**

Answer \_\_\_\_\_

29

The range of a set of numbers is  $15\frac{1}{4}$   $15\frac{2}{8}$

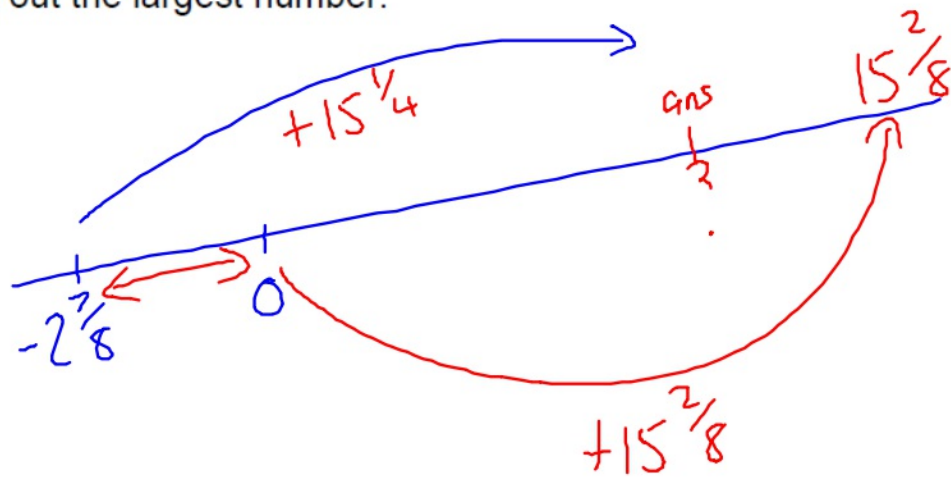
P2

The smallest number is  $-2\frac{7}{8}$

N38

Work out the largest number.

[3 marks]



$$15\frac{2}{8} - 2\frac{7}{8}$$

$$\frac{122}{8} - \frac{23}{8}$$

$$= \frac{99}{8} \checkmark$$

$$12\frac{3}{8} \checkmark$$

Answer

\_\_\_\_\_



- 6** Gemma has four groups of friends on a social media site.  
The table shows the number of friends in each group.

<b>Group</b>	<b>Number of friends</b>
Family	8
Netball	8
School	26
Guides	11

- 6 (a)** Which group is the mode? **[1 mark]**

P2

Answer \_\_\_\_\_

- 6** Gemma has four groups of friends on a social media site.  
The table shows the number of friends in each group.

Group	Number of friends
Family	8
Netball	8
School	26
Guides	11

- 6 (a)** Which group is the mode? <sup>most</sup> [1 mark]

P2

Answer School

**2** What does the longest bar in a bar chart represent?

Circle your answer.

**P2**

**[1 mark]**

mean

median

mode

range

most

2

What does the longest bar in a bar chart represent?

Circle your answer.

P2

[1 mark]

mean

median

mode

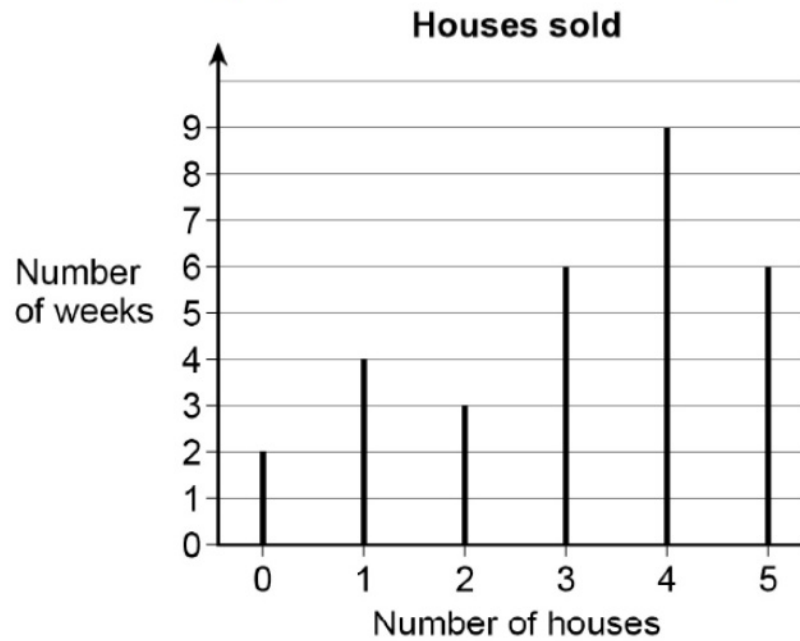
range

9

A company sells houses.

Video created by W Neil

The line graph shows the number sold per week for 30 weeks.



9 (a) Work out the range of the number of houses sold per week.

[2 marks]

P2

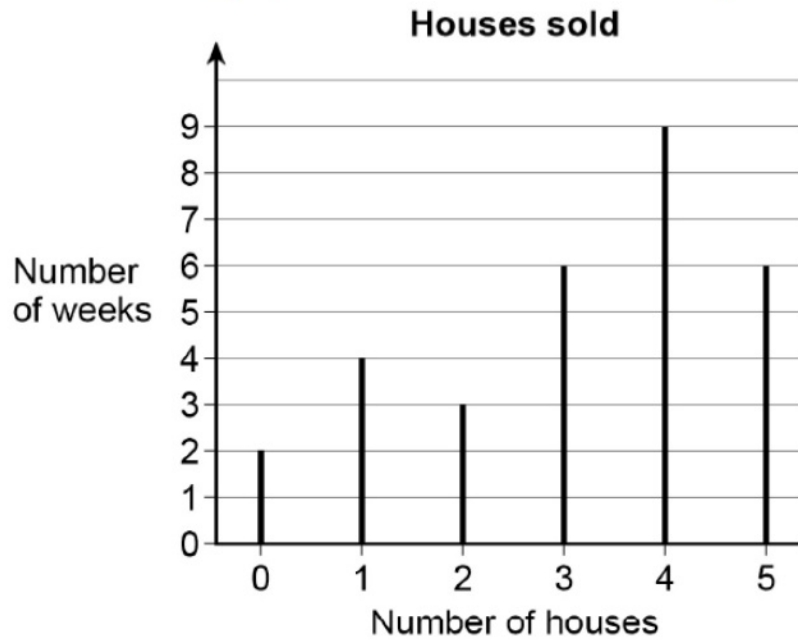
Answer \_\_\_\_\_

9

A company sells houses.

Video created by W Neill

The line graph shows the number sold per week for 30 weeks.



9 (a) Work out the range of the number of houses sold per week.

[2 marks]

P2

$$5 - 0$$

Answer

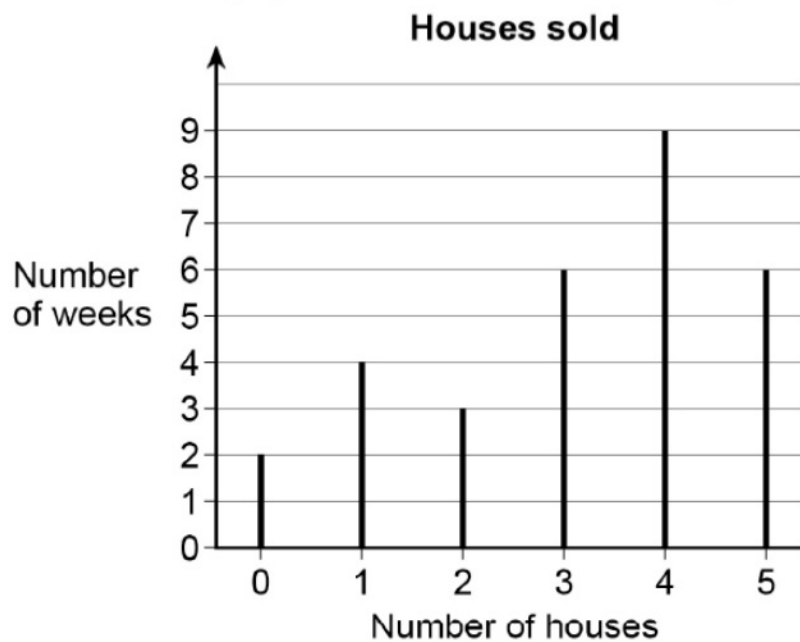
S ✓

9

A company sells houses.

Video created by W Neil

The line graph shows the number sold per week for 30 weeks.



9 (b) Work out the median number of houses sold per week.

[2 marks]

P2

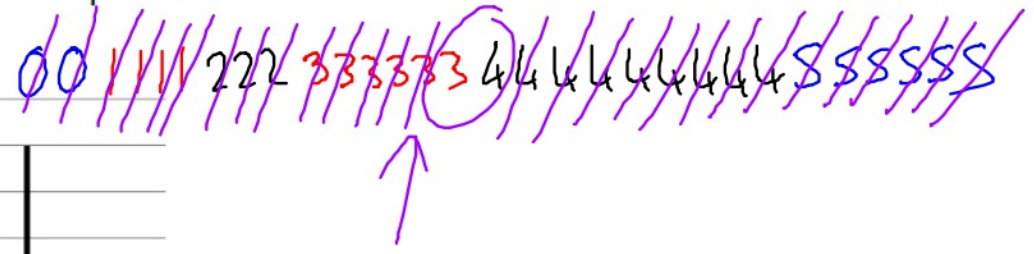
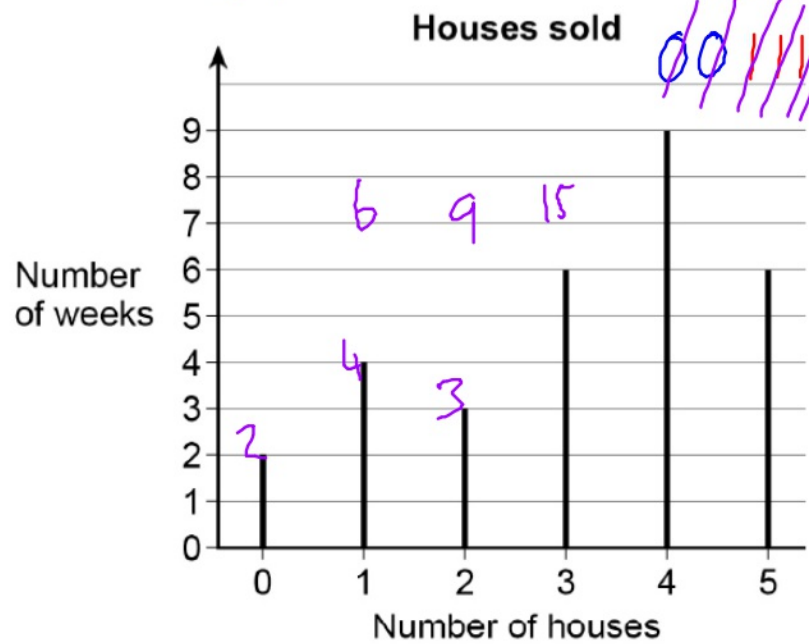
Answer \_\_\_\_\_

9

A company sells houses.

Video created by W Neill

The line graph shows the number sold per week for 30 weeks.



$$\frac{30+1}{2} = 15.5^{\text{th}} \text{ house}$$

9 (b) Work out the median number of houses sold per week.

[2 marks]

P2

Answer 3.5



**18** Four friends all give each other presents.

**P2**

The total cost of the presents is £83.40

Work out the mean cost of a present.

**[3 marks]**

Answer £ \_\_\_\_\_

18 Four friends all give each other presents.

P2

The total cost of the presents is £83.40

Work out the mean cost of a present.

[3 marks]

A	B	C	D
3	3	3	3

$$\frac{83.40}{12}$$

12 presents

Answer £ 6.95 ✓

20

In one month, the number of hours of exercise taken by 10 people are

Video created by W Neill

P2

4 7 2 8 6 5 1 82 3 9

Which is the appropriate average to use in this situation?

Tick a box.

Mean

Median

Mode

Give one reason for each of the other two averages as to why they are **not** appropriate.

**[2 marks]**

Reason 1

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Reason 2

---

---

20

In one month, the number of hours of exercise taken by 10 people are

Video created by W Neill

P2

4 7 2 8 6 5 1 82 3 9

Which is the appropriate average to use in this situation?

Tick a box.

Mean

Median

Mode

Give one reason for each of the other two averages as to why they are **not** appropriate.

[2 marks]

Reason 1

Mode ... There is no mode

Reason 2

Mean ... 82 is going to pull up the mean  
this would not be the case with the median ✓

9 The range of a set of numbers is  $15\frac{1}{4}$

P2 The smallest number is  $-2\frac{7}{8}$

N38

Work out the largest number.

**[3 marks]**

Answer \_\_\_\_\_

9

The range of a set of numbers is  $15\frac{1}{4}$   $15\frac{2}{8}$

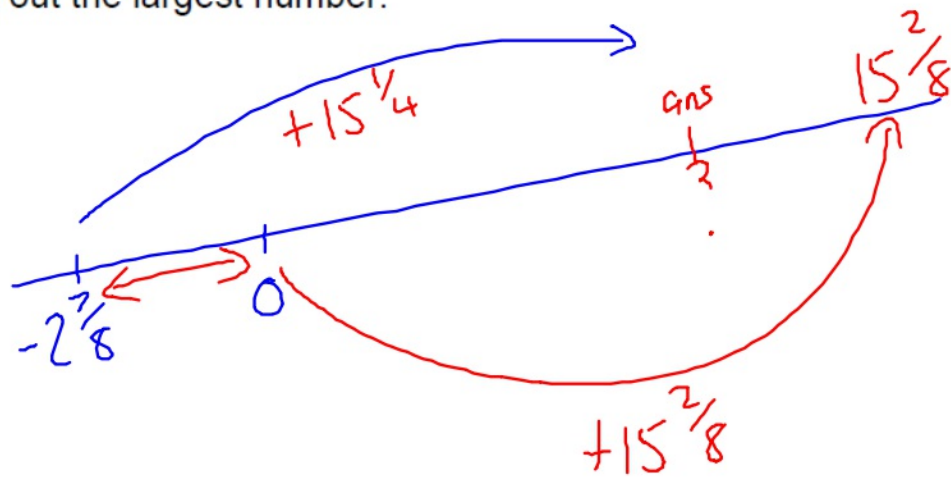
P2

The smallest number is  $-2\frac{7}{8}$

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Work out the largest number.

[3 marks]



$$15\frac{2}{8} - 2\frac{7}{8}$$

$$\frac{122}{8} - \frac{23}{8}$$

$$= \frac{99}{8} \checkmark$$

$$12\frac{3}{8} \checkmark$$

Answer

\_\_\_\_\_