

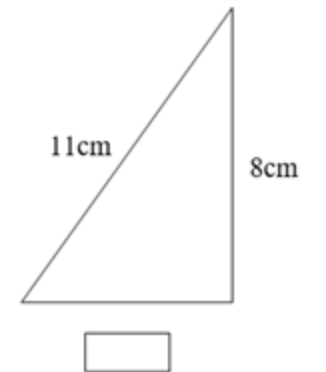
Averages

- To be able to find values for the mean, median, mode & range.
- To be able to calculate the estimated mean of grouped data

Recap

Recap

What is the area of the triangle?



Finding the Mean

Add up all of the values to find the total

Divide the total by the number of values you added together

$$2 + 2 + 3 + 5 + 5 + 7 + 8 = 32$$

There are 7 values

Divide the total by 7

$$32 \div 7 = 4.57$$

The mean is 4.57

Finding the Median

Put all the values in order

The Median is the middle value

If there are two middle values and they are different, find the mean of the two values

2, 2, 3, **5**, 5, 7, 8

The mean is 5

2, 2, 3, **4**, **5**, 7, 8, 8

The mean is 4.5

$$4+5=9$$

$$9 \div 2 = 4.5$$

Finding the Mode

The Mode is the most frequent number

Count how many of each value are there

The Mode is the value that appears the most

You can have more than one mode

2, 2, 3, 5, 5, 7, 8



The modes are 2 and 5

Finding the Range

The Range is the difference between the highest and the lowest value

Find the lowest and highest value

Subtract the lowest from the highest

2, 2, 3, 5, 5, 7, **8**
Lowest Highest

$$8 - 2 = 6$$

The range is 6

Find the Mean, Median, Mode and Range of these numbers

1) 5, 3, 4, 2, 5, 8, 9, 7, 2, 4, 8

2) 5, 7, 3, 7, 8, 4, 2, 7, 3, 6, 5, 3

3) 3, 5, 5, 6, 6, 8, 4, 3

Finding the Mean from a table

$$\text{MEAN} = \frac{\text{fx total}}{\text{f total}}$$

EXAMPLES

1) Work out the mean from the frequency tables below:

(a)

No. of pets		Frequency	fx
1	X	6	6
2	X	10	20
3	X	5	15
4	X	3	12
5	X	2	10
6	X	1	6

TOTAL = 27 69

$$\text{MEAN} = \frac{\text{fx total}}{\text{f total}} = \frac{69}{27} = 2.6 \text{ (1d.p)}$$

(b)

Number of detentions	0	1	2	3	4	5	
	X	X	X	X	X	X	TOTAL
Frequency	8	5	3	2	1	1	20
fx	0	5	6	6	4	5	26

$$\text{MEAN} = \frac{\text{fx total}}{\text{f total}} = \frac{26}{20} = 1.3$$

Practice

In a test, the mean level for the girls is 10% higher than the mean level for the boys.
The levels for the **boys** are shown.

Boys

Level	Frequency
3	19
4	8
5	7
6	6

Calculate the mean level for the **girls**.

Estimated Mean

$$\text{Estimated Mean} = \frac{\text{Frequency} \times \text{Midpoint}}{\text{Total Frequency}}$$

EXAMPLE

1) Work out the estimated mean from the grouped frequency tables below:

Minutes late (L)	Frequency (F)	Midpoint (MP)	FxMP
0 < L ≤ 10	2	5	10
10 < L ≤ 20	4	15	60
20 < L ≤ 30	8	25	200
30 < L ≤ 40	8	35	280
40 < L ≤ 50	10	45	450
F TOTAL = 32		F x MP TOTAL = 1000	

$$\text{Estimated Mean} = \frac{\text{Frequency} \times \text{Midpoint}}{\text{Total Frequency}}$$

$$\frac{1000}{32} = 31.25$$

Estimated Mean

The table below shows the length of 100 fish from a local river.

Length, L, cm	Frequency		
$0 < L \leq 10$	21		
$10 < L \leq 20$	11		
$20 < L \leq 30$	31		
$30 < L \leq 40$	12		
$40 < L \leq 50$	25		

Calculate an estimated mean length of the fish.

Exam questions

What name is given to the **most frequent** item in a list?

Circle your answer.

[1 mark]

mean

median

mode

range

Exam questions

Here is a list of numbers

21 17 23 21 29 32 21 25 36

Work out the Median

(2marks)

Answer _____

Exam questions

Here is a list of numbers

5 6 1 3 5 5 8 4 2 2

Work out the mean

(2marks)

Answer _____

Adam and six other men ran a race.

The times, in seconds, of the six other men are shown.

9.75

9.79

9.80

9.88

9.94

9.98

The mean time for **all** seven men was 9.83 seconds.

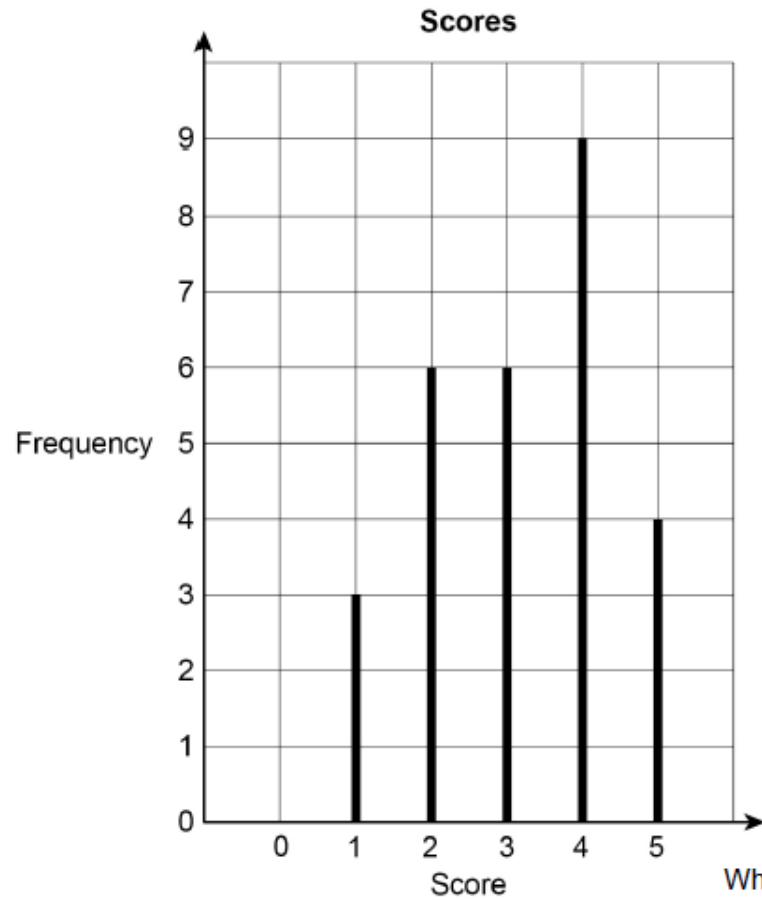
Did Adam win the race?

You **must** show your working.

[3 marks]

Exam questions

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



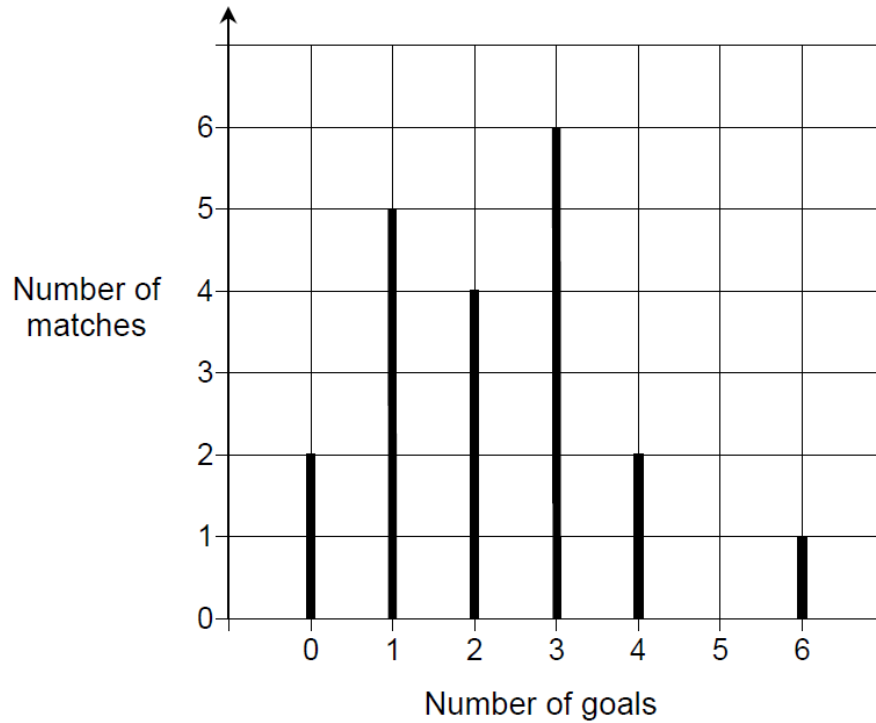
Which score was the mode?

[1 mark]

Nov 2017 paper 1

Answer _____

The line graph shows the number of goals scored by a hockey team.



(a) Which number of goals is the mode? **[1 mark]**

(b) How many matches did the hockey team play altogether? **[2 marks]**

(c) In one of the matches, this team won by 5 goals.
What was the score in that match? **[1 mark]**

The table shows information about the marks of 30 students in a test.

Mark	Frequency
14	2
15	10
16	2
17	3
18	13
	Total = 30

Students who scored less than the mean mark have to retake the test.

How many students have to retake the test?

You **must** show your working.

[3 marks]

In a sport, injury time is added time played at the end of a match.
The table shows the injury time, t (minutes) played in 380 matches.

Injury time, t (minutes)	Frequency
$0 < t \leq 2$	59
$2 < t \leq 4$	158
$4 < t \leq 6$	106
$6 < t \leq 8$	45
$8 < t \leq 10$	12

- (a) Circle the **two** words that describe the data.

[1 mark]

continuous discrete grouped ungrouped

- (b) Which class interval contains the median?
You **must** show your working.

[2 marks]

A charity collection was made.

Information about the amounts given by men is shown in the table.

Amount, x (£)	Midpoint	Number of men	
$0 \leq x < 5$		11	
$5 \leq x < 10$		7	
$10 \leq x < 15$		2	
		Total = 20	

The mean amount given by **women** was £6.30 per person.

Compare the mean amounts given by men and women.

[4 marks]

Plenary

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

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

Work out the largest number

(3marks)

Answer _____