

8300

## GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

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Statistics

Calculating the mean

v1.0

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Name \_\_\_\_\_

### Materials

For this paper you must have:

- Mathematical instruments

### Information

- The marks for questions are shown in brackets

### Advice

- In all calculations, show clearly how you work out your answer

For questions 1 to 3 you must **NOT** use a calculator.



**Q1.**

The table shows information about water used in a household.  
The value for April is missing.

| Month    | Water used ( $\text{m}^3$ ) |
|----------|-----------------------------|
| January  | 16.2                        |
| February | 18.1                        |
| March    | 15.9                        |
| April    |                             |
| May      | 17.8                        |
| June     | 21.0                        |

The mean monthly water used for the six months is  $18 \text{ m}^3$   
Work out the value for April.

**(Total 3 marks)**

**Q2.**

A basketball team has five players and one reserve.  
Their names and heights are shown.

| Players                                                                             |                                                                                    |                                                                                     |                                                                                     |                                                                                     | Reserve                                                                               |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |  |  |
| Julie                                                                               | Angie                                                                              | Pearl                                                                               | Jane                                                                                | Judy                                                                                | Carol                                                                                 |
| 1.54 m                                                                              | 1.67 m                                                                             | 1.7 m                                                                               | 1.65 m                                                                              | 1.71 m                                                                              | 1.6 m                                                                                 |

- (a) Which girl is the second tallest?
- (b) One of the **five** players is picked at random.  
What is the probability her name begins with J?
- (c) The mean weight of the **five** players is 58 kg.  
The reserve weighs 64 kg.  
Work out the mean weight of all **six** team members.

**(1)**

**(1)**

**(3)**

**(Total 5 marks)**

**Q3.**

Sunita is  $x$  years old.  
Beth is one year younger than Sunita.  
Joel is double Sunita's age.  
The mean of their ages is 5  
How old is **Joel**?

**(Total 5 marks)**

For the rest of the questions, you may use a calculator.



Q4.

Here are the marks of a student in four exams.

65    80    76    69

The student takes a fifth exam.

His mean mark for the five exams is 70

Work out his mark in the **fifth** exam.

(Total 3 marks)

Q5.

Here is a set of data.

2.5                  1.7                  2.4                  1.6                  1.3

The mean is 1.9

(a) Each piece of data is increased by 15.

Work out the new mean.

(1)

(b) Each **new** piece of data is now doubled.

Work out the new mean.

(2)

(Total 3 marks)

Q6.

(a) The number of cakes sold in a shop on 5 days is shown.

| Day                  | Mon | Tue | Wed | Thu | Fri |
|----------------------|-----|-----|-----|-----|-----|
| Number of cakes sold | 44  | 38  | 48  | 55  | 60  |

Work out the mean number of cakes sold.

(3)

(b) On Saturday the shop had 60 cakes to sell.

41 cakes were sold.

The profit on each cake sold is 40 p.

The loss on each cake **not** sold is 10 p.

Work out the overall profit for these 60 cakes.

(4)

(Total 7 marks)

Q7.

These expressions represent three numbers.

$x$                    $x + 3$                    $4x$

Work out the mean in terms of  $x$ .

Give your answer in its simplest form.

(Total 3 marks)

Q8.

Four numbers have a mean of 10

Three of the numbers are    5    8    9

Work out the other number.

(Total 3 marks)

**Q9.**

A school play takes place each day from Monday to Friday.  
Here are the attendances on four of the days.

| Monday | Tuesday | Wednesday | Thursday |
|--------|---------|-----------|----------|
| 72     | 83      | 88        | 97       |

For all **five** days, the mean attendance is 90

Work out the attendance on Friday.

**(Total 3 marks)**

**Q10.**

In a band with 3 members, the mean age is 21 years old.

Ashley joins the band.

The mean age of **all** 4 members of the band is now 22 years old.

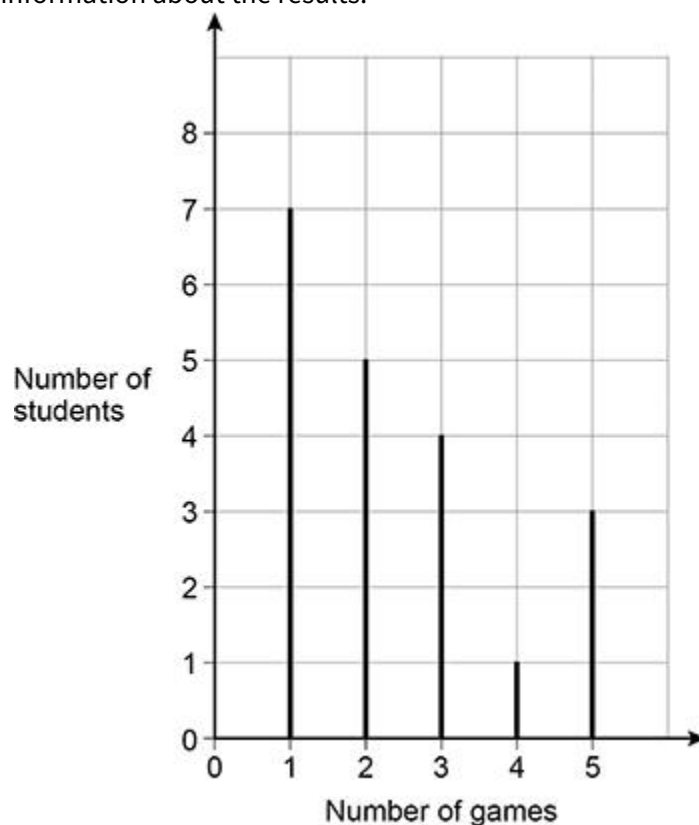
Work out the age of Ashley.

**(Total 4 marks)**

**Q11.**

20 students are asked how many video games they played last month.

The chart shows information about the results.



(a) How many students played **more** than 2 games?

**(1)**

(b) Work out the mean number of games played.  
Give your answer as a decimal.

**(3)**

**(Total 4 marks)**

**Q12.**

102 boys and 85 girls took a test.

The table shows information about the mean marks.

|                    | Boys | Girls |
|--------------------|------|-------|
| Number of students | 102  | 85    |
| Mean mark          | 68.5 | 72.4  |

The pass mark for the test was 70

Was the mean mark for **all** of these students greater than the pass mark?

You **must** show your working.

**(Total 3 marks)**

**Q13.**

Fatimah and four other women threw javelins in a competition.

The distances, in metres, of the four other women are shown.

15.2      15.9      16.1      16.8

The mean distance for **all** five women was 16.04 metres.

Did Fatimah throw the javelin the furthest?

You **must** show your working.

Yes

☐

No

☐

**(Total 3 marks)**

**Q14.**

Here are five cards.

|   |   |   |   |    |
|---|---|---|---|----|
| 1 | 5 | 7 | 9 | 11 |
|---|---|---|---|----|

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.

**(Total 3 marks)**

**Q15.**

At a nursery, the mean age of 4 children is 31 months.

Katy joins the nursery.

The mean age of **all** 5 children is now 30 months.

Work out the age of Katy.

**(Total 4 marks)**

**Q16.**

In a class of 28 students

the mean height of the 12 boys is 1.58 metres

the mean height of all 28 students is 1.52 metres.

Work out the mean height of the girls.

**(Total 4 marks)**

**Q17.**

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.

**(Total 3 marks)**

**Q18.**

Ten discs numbered 1 to 10 are in a bag.  
Two discs are taken out.  
The mean value of the remaining discs is 5.  
Which two discs could have been taken out?  
Work out **one** possible answer.

**(Total 4 marks)**

**Q19.**

The mean mass of a squad of 19 hockey players is 82 kg  
A player of mass 93 kg joins the squad.  
Work out the mean mass of the squad now.

**(Total 3 marks)**

**Q20.**

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.

**(Total 4 marks)**

**Q21.**

Alex and Bev sat six tests, each with 50 marks.  
The table shows their mean percentages after five tests.

|      |     |
|------|-----|
| Alex | 60% |
| Bev  | 52% |

After all six tests, their mean percentages were equal.  
In the sixth test, Alex scored 24 out of 50  
Work out Bev's score, out of 50, in the sixth test.

**(Total 4 marks)**

**Q22.**

Here are two sets of numbers, A and B.

| Set A |     |
|-------|-----|
| 200   | 160 |
| 104   | 100 |

| Set B |     |     |
|-------|-----|-----|
| 270   | 400 | 483 |
| 300   |     | $x$ |

mean of Set A : mean of Set B = 3 : 8  
Work out the value of  $x$ .

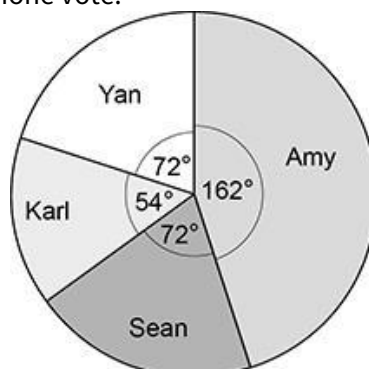
**(Total 4 marks)**

**Q23.**

Four people are taking part in a television talent show.  
Here are Amy's marks from the 6 judges.

|   |   |   |   |   |    |
|---|---|---|---|---|----|
| 8 | 9 | 9 | 6 | 9 | 10 |
|---|---|---|---|---|----|

The pie chart represents the phone vote.



Amy's total score is found by

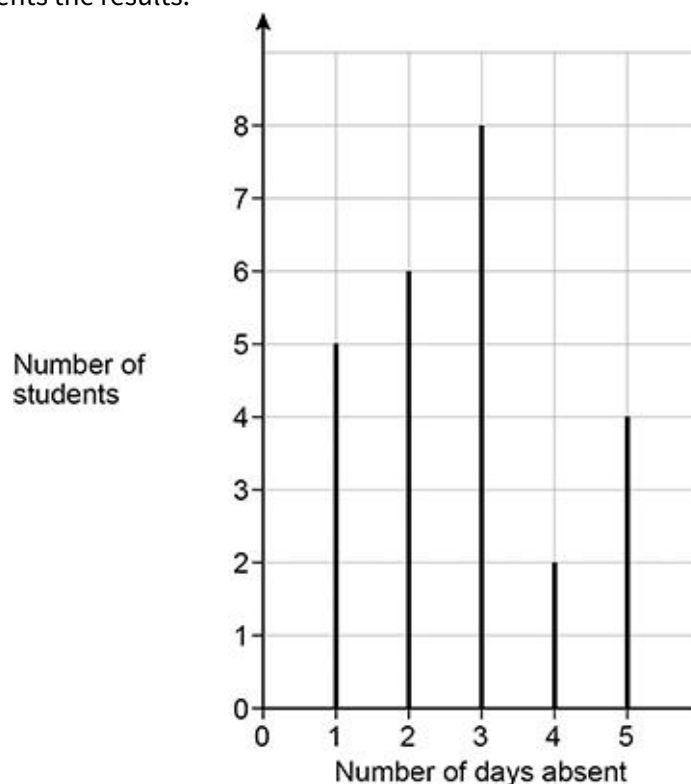
|                                                                                       |
|---------------------------------------------------------------------------------------|
| $4 \times \text{the mean of her marks}$ $+$ $\text{her percentage of the phone vote}$ |
|---------------------------------------------------------------------------------------|

Work out Amy's total score.

**(Total 4 marks)**

**Q24.**

A record was kept of the number of days that 25 students were absent one term.  
The chart represents the results.



(a) Work out the mean number of days absent.

**(3)**

(b) One of the students is chosen at random.

Work out the probability that the student was absent for **less than** 4 days.

**(2)**

**(Total 5 marks)**

**Q25.**

Here is some information about the members of a basketball club.

|        | Number of members | Mean height of members |
|--------|-------------------|------------------------|
| Junior | 30                | 1.6 m                  |
| Senior | 20                | 2.05 m                 |

Work out the mean height of all 50 members of the club.

Give your answer as a decimal.

**(Total 3 marks)**

Questions 26 and 27 are **higher** tier only.

**Q26.**

200 people recorded the time they spent on social media one day.

The table shows the results.

| Time, $t$ (mins) | Frequency | Midpoint |  |
|------------------|-----------|----------|--|
| $0 \leq t < 30$  | 24        |          |  |
| $30 \leq t < 50$ | 76        |          |  |
| $50 \leq t < 60$ | 52        |          |  |
| $60 \leq t < 90$ | 48        |          |  |
| Total = 200      |           |          |  |

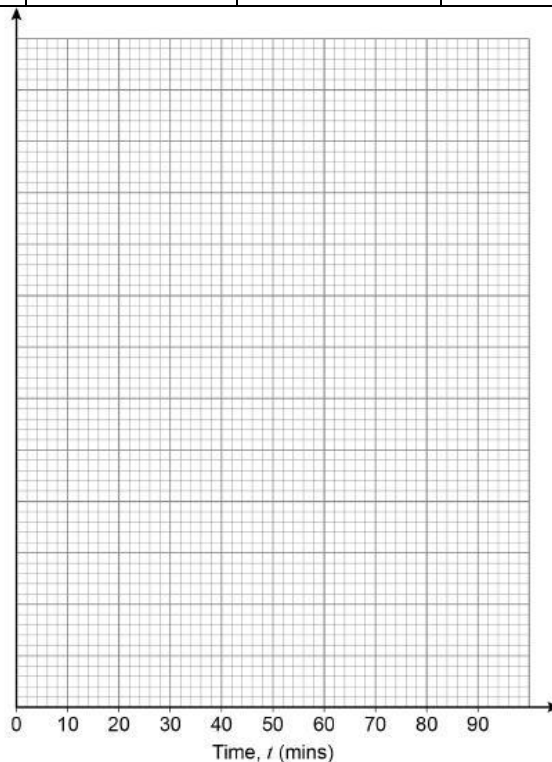
(a) Work out an estimate of the mean time.

**(3)**

(b) Draw a histogram to represent the results.

| Time, $t$ (mins) | Frequency | Class width |  |
|------------------|-----------|-------------|--|
| $0 \leq t < 30$  | 24        |             |  |
| $30 \leq t < 50$ | 76        |             |  |
| $50 \leq t < 60$ | 52        |             |  |
| $60 \leq t < 90$ | 48        |             |  |

Frequency  
density

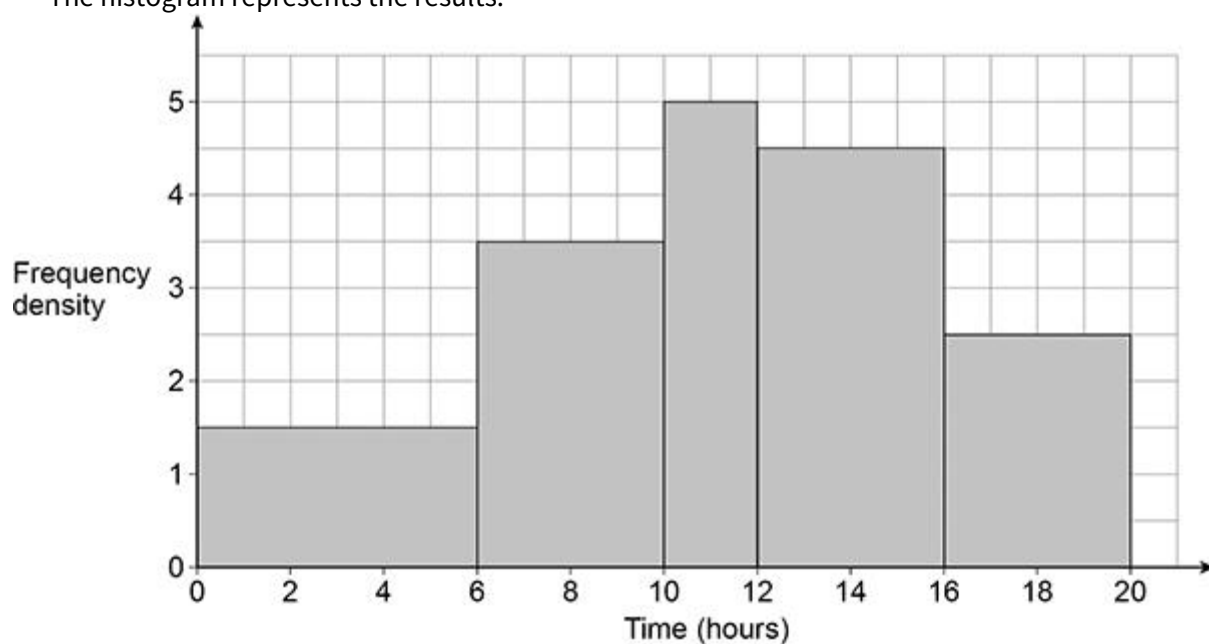


**(4)**

**(Total 7 marks)**

**Q27.**

61 students recorded how many hours they spent revising for a test.  
The histogram represents the results.



- (a) Work out an estimate of the mean time the 61 students spent revising.  
You may use the table to help you.

| Time, $x$<br>(hours) | Frequency | Midpoint |  |
|----------------------|-----------|----------|--|
| $0 \leq x < 6$       |           |          |  |
| $6 \leq x < 10$      |           |          |  |
| $10 \leq x < 12$     |           |          |  |
| $12 \leq x < 16$     |           |          |  |
| $16 \leq x < 20$     |           |          |  |

**(4)**

- (b) Give a reason why the answer to part (a) is an estimate.

**(1)**

**(Total 5 marks)**