Name ANSWERS	Class

MATHS TEACHER HUB

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Averages

(9 – 1) Topic booklet

Foundation

These questions have been collated from previous years GCSE Mathematics papers.

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.	Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- If the question is a **1F** question you are not allowed to use a calculator.
- If the question is a **2F** or a **3F** question, you may use a calculator to help you answer.

Information

- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer ALL questions
Write your answers in the space provided.
You must write down all the stages in your working.

1 Here is a list of numbers.

2 4 4 7 8

Work out the range of these numbers.

8-2 = 6

6

November 2023 – Paper 1F **(Total for Question 1 is 1 mark)**

3 Here is a list of numbers.

3 3 3 3 4 4 5 7 8

Write down the mode of the numbers.

3

June 2022 – Paper 2F **(Total for Question 3 is 1 mark)**

6 Here is a list of numbers.

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?

The numbers need to be in order first.

(1)

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

22 - 12

10

(2)

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

$\frac{112}{7}$

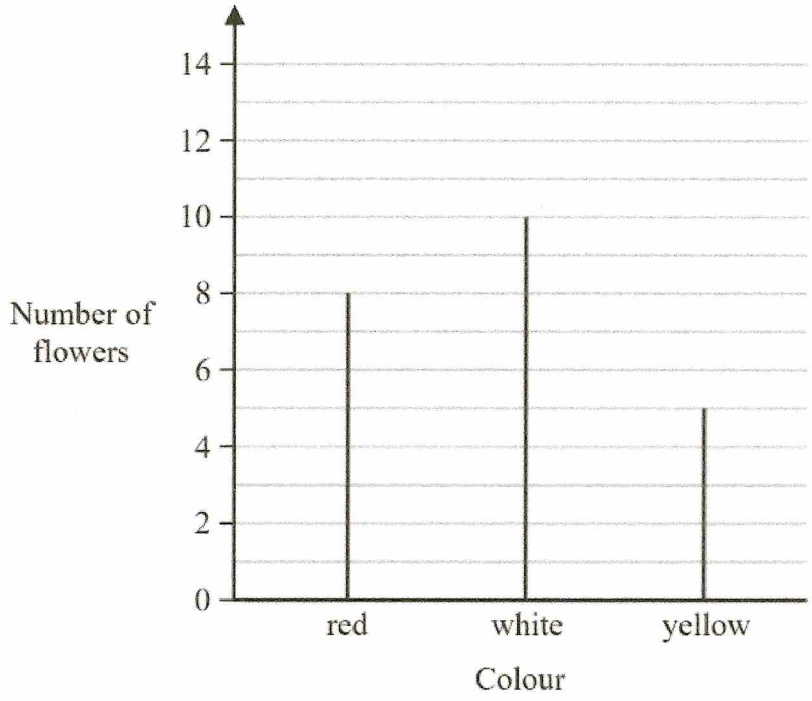
16

(2)

(Total for Question 6 is 5 marks)

7 In Adam's garden, the flowers are only red or white or yellow or blue.

The chart shows the number of red flowers, the number of white flowers and the number of yellow flowers.



The total number of flowers is 30

(a) Work out the number of blue flowers.

$8 + 10 + 5 = 23$

$30 - 23 = 7$

7

(2)

(b) Write down the mode.

White

(1)

(Total for Question 7 is 3 marks)

7 Here is a list of 8 letters.

B C A A A A B A

(a) Write down the mode.

A

(1)

November 2022 – 1F

(Total for Question 7 is 1 mark)

8 Four students play a game.
The table shows the number of points each student has.

Student	Ali	Barbara	Calliope	Danesh
Number of points	143	121	45	19

Barbara has more points than Danesh.

(a) How many more?

$$\begin{array}{r} 121 \\ -\ 19 \\ \hline 102 \end{array}$$

102

(1)

(b) Work out the mean number of points.

$$\frac{328}{4}$$

82

(2)

November 2022 – 3F

(Total for Question 8 is 3 marks)

9 Here is a list of numbers.

6 4 8 9 4 3

(a) Work out the median.

5

(2)

Aisha picks at random one of the numbers.

(b) What is the probability that she picks an odd number?

$\frac{2}{6} = \frac{1}{3}$

(2)

Clara has five cards.
There is a number on each card.
Two of the numbers are hidden.

3	?	8	5	?

3 6

= 25

The mode of the five numbers is 3
The mean of the five numbers is 5

(c) Work out the two numbers that are hidden.

3 , 6

(2)

(Total for Question 9 is 6 marks)

12 Here are 6 numbers.

13 5 4 9 3 8

Work out the mean.

$\frac{42}{6} = 7$

7

(Total for Question 12 is 2 marks)

14 Here is the shoe size of each of 12 boys in a class.

4 5 6 6 6 7 7 8 8 8 8 9

(a) Find the median.

7

(1)

(b) Work out the range.

9 - 4

5

(1)

For the shoe sizes of each of 12 girls in the class,

the median size is 6
the range is 3

(c) Compare the distribution of the shoe sizes of the boys with the distribution of the shoe sizes of the girls.

The boys have a greater median size of shoe.

The girls shoe sizes are closer together.

(2)

(Total for Question 14 is 4 marks)

15 Jenny is asked to find the value of $12 - 2 \times 4$

Here is her working.

$$12 - 2 \times 4 = 10 \times 4 = 40$$

Jenny's answer is wrong.

(a) Explain what Jenny has done wrong.

She should have done the multiply first

(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.

The largest = 8 8-1 = 7 range.
the smallest = 1

(1)

May 2018 – Paper 3F **(Total for Question 15 is 2 marks)**

17 There are 3 cinemas **A**, **B** and **C**.

The mean number of seats per cinema is 380

$380 \times 3 = 1140$

There are 350 seats in cinema **A**.
There are 250 seats in cinema **B**.

Work out the number of seats in cinema **C**.

$350 + 250 + \square = 1140$

$\square = 540$

540

(Total for Question 17 is 4 marks)

18 This sign was in a doctor's waiting room.

> 115 appointments were missed last month.
>
> These missed appointments were a total of 25.3 hours.

Work out the mean length of time for each missed appointment.
Give your answer in minutes.

25 hours = 1500 minutes

0·3 hours = 0·3 × 60 = 18 minutes

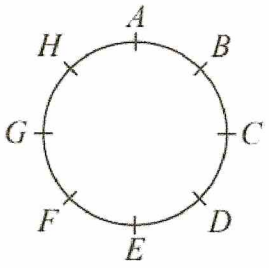
$= \frac{1518 \text{ minutes}}{115}$

$= 13.2$

13·2 ..... minutes

(Total for Question 18 is 3 marks)

18 Hasmeet walks once round a circle with diameter 80 metres.



There are 8 points equally spaced on the circumference of the circle.

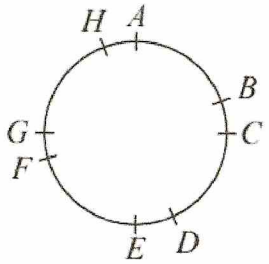
(a) Find the distance Hasmeet walks between one point and the next point.

$\frac{\pi \times 80}{8}$

31.4159 m

(2)

Four of the points are moved, as shown in the diagram below.



Hasmeet walks once round the circle again.

(b) Has the mean distance that Hasmeet walks between one point and the next point changed? You must give a reason for your answer.

The total distance hasn't changed, the number of points hasn't changed so the mean is still the same.

(1)

(Total for Question 18 is 3 marks)

20 Akhtar, Ben and Carl each have some money.

Akhtar has £65
Ben has £100
Carl has three £5 notes, one £20 note and some £10 notes.

The mean amount of money per person is £80

How many £10 notes does Carl have?

100
65
15
+ 20
200

£80 × 3 = £240 in total

240 - 200 = £40 in ten pound notes

4

(Total for Question 20 is 4 marks)

21 The mean length of 5 sticks is 4.2 cm.

Nawal measured the length of one of the sticks as 7 cm.

(a) Work out the mean length of the other 4 sticks.

$5 \times 4.2 = 21\text{cm}$

$21 - 7 = 14\text{cm}$

$\frac{14}{4} = \frac{7}{2} = 3.5$

3.5 cm

(3)

Nawal made a mistake.
The stick was not 7 cm long.
It was 17 cm long.

(b) How does this affect your answer to part (a)?

The other sticks will be shorter

(1)

(Total for Question 21 is 4 marks)

24 Festival A will be in a rectangular field with an area of 80 000 m^2
The greatest number of people allowed to attend Festival A is 425

Festival B will be in a rectangular field 700 m by 2000 m.
The greatest number of people allowed to attend Festival B is 6750

The area per person allowed for Festival B is greater than the area per person allowed for Festival A.

(a) How much greater?
Give your answer correct to the nearest whole number.

$700 \times 2000 = 1400000$

(A) $\frac{80000}{425} = 188.2$

(B) $\frac{1400000}{6750} = 207.4$

$207.4 - 188.2 = 19.2$

$= 19$

19 m^2

(4)

Callum says,

"300 cm^2 is the same as 3 m^2 because there are 100 cm in 1 m so you divide by 100"

Callum's method is wrong.

(b) Explain why.

$1m^2 = 100cm \times 100cm$

$1m^2 = 10000cm^2$

$3m^2 = 300000cm^2$ not $300cm^2$

(1)

(Total for Question 24 is 5 marks)

25 4 red bricks have a mean weight of 5 kg.
5 blue bricks have a mean weight of 9 kg.
1 green brick has a weight of 6 kg.

Donna says,

"The mean weight of the 10 bricks is less than 7 kg."

Is Donna correct?
You must show how you get your answer.

Red $4 \times 5 = 20$kg total

Blue $5 \times 9 = 45$kg total

Green $1 \times 6 = 6$kg total

71kg

$\frac{71\text{ kg}}{10} = 7.1$kg

Donna is wrong, the mean weight is more than 7kg

(Total for Question 25 is 3 marks)

28 There are 30 women and 20 men at a gym.

The mean height of all 50 people is 167.6 cm
The mean height of the 20 men is 182 cm

Work out the mean height of the 30 women.

$50 \times 167.6\text{cm} = 8380\text{cm}$

Men $20 \times 182\text{cm} = 3640\text{cm}$

$8380 - 3640 = 4740$

Women $\frac{4740}{30} = 158$

158 cm

(Total for Question 28 is 3 marks)