

For **OCR**

F

GCSE (9–1) Mathematics

Paper 1 (Foundation Tier)

Churchill Paper 1A

Time allowed: 1 hour 30 minutes

You may use:

- A scientific or graphical calculator
- Geometrical instruments
- Tracing paper

Name

Class

INSTRUCTIONS

- Use black ink. You may use an HB pencil for graphs and diagrams.
- Write your name and class in the boxes above.
- Answer **all** the questions.
- Read each question carefully before you start your answer.
- Where appropriate, your answers should be supported with working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided.

INFORMATION

- The total mark for this paper is **100**.
- The marks for each question are shown in brackets [].
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.



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However, this paper is available as a sample that can be used without licence.

Answer **all** the questions

1

<i>Sweet Desires Menu</i>	
<i>Ice Cream</i>	<i>Drinks</i>
<i>30 flavours to choose from!</i>	
Cone £2.50	Bottled Water £2.00
Sundae £4.85	Fizzy £2.95
Banana Split £5.99	Mocktail £3.50

Millie and 6 of her friends go to *Sweet Desires* ice cream parlour.

They order 2 sundaes and 5 banana splits.
They also order 3 fizzy drinks and 4 mocktails.

Millie estimates how much the bill will be by working out $7 \times £9$.

(a) What does the £9 in Millie's calculation represent?

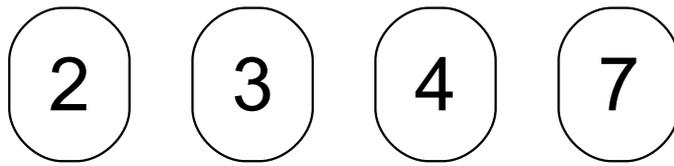
.....
..... [1]

(b) Work out how much Millie's estimate is out by.

State whether she underestimated or overestimated the total.

..... [4]

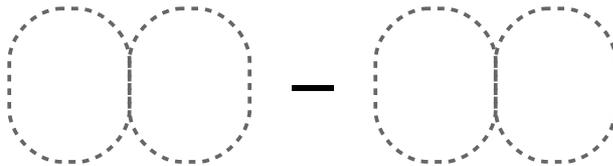
2 Here are four cards with numbers on.



Use the cards to answer each part of this question.

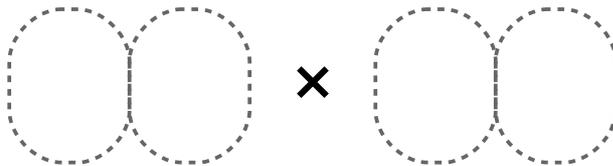
You only have one of each card.

(a) Complete this sum so that it has the smallest possible positive answer.



[2]

(b) Complete this sum so that it has the largest possible answer.



[2]

(c) List all the even numbers you can make that are greater than 4000.

.....
..... [3]

- 3** Kat has 4 times as much money as Gill.
Kat then spends £3.
Kat now has twice as much money as Gill.
Work out how much money Kat has now.

£ [4]

- 4 (a)** Ken has a large number of plants.
 $\frac{1}{4}$ of his plants do not flower.

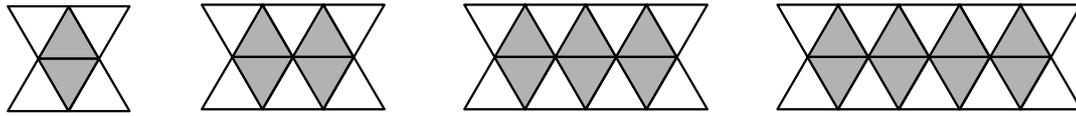
Write down the ratio of the number of flowering plants to the number of non-flowering plants Ken has.

(a) : [1]

- (b)** Divide 84 in the ratio 3 : 4

(b) and [3]

5 The diagram shows a sequence of patterns.



Pattern 1

Pattern 2

Pattern 3

Pattern 4

(a) Work out the number of grey triangles in Pattern 22.

(a) [2]

(b) Work out the number of white triangles in Pattern 40.

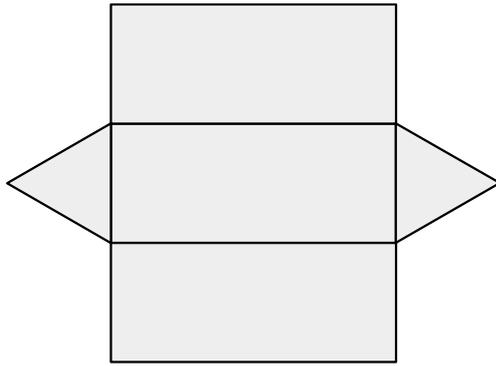
(b) [2]

(c) Complete this rule for the total number of triangles in a Pattern.

Total number of triangles = × Pattern number +

[2]

6 (a)

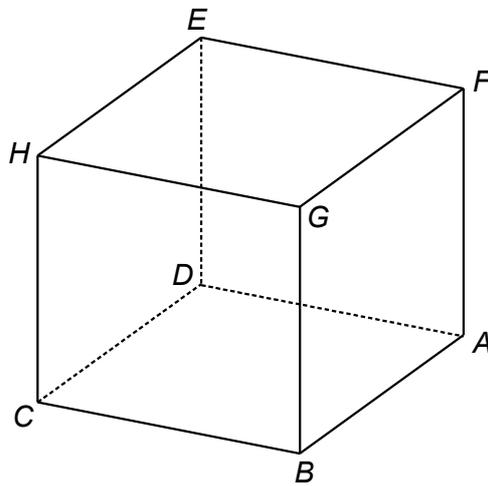


The diagram shows the net of a 3D shape.

Write down the name of the 3D shape.

(a) [1]

(b)



The diagram shows a cube, $ABCDEFGH$.

Write down the size of each of these angles.

Angle $ABC = \dots\dots\dots^\circ$

Angle $BHC = \dots\dots\dots^\circ$

Angle $CHF = \dots\dots\dots^\circ$

[3]

7 A bag contains only red beads, blue beads and green beads.

The table shows the probability of getting a red bead and the probability of getting a blue bead when a bead is picked at random from the bag.

Colour	red	blue	green
Probability	0.1	0.3	

(a) Write down the probability of picking a bead that is **not** blue.

(a) [1]

(b) Work out the probability of picking a bead that is green.

(b) [2]

Martin says

There must be at least 10 beads in the bag.

(c) Explain why Martin is correct.

.....
.....
..... [2]

A bead is picked at random from the bag.
The bead is then replaced in the bag.
Another bead is picked at random from the bag.

(d) Work out the probability that both of the beads picked out of the bag are blue.

(d) [2]

8 George, Verity and Siobhan are going to cook scrambled eggs.
The recipe they are using requires these ingredients to make two portions:

- 4 eggs
- 250 ml milk
- 30 g butter

(a) How many eggs does George need to make three portions of scrambled eggs?

(a) [1]

(b) Verity is going to use 75 g of butter.

How much milk will she need to use?

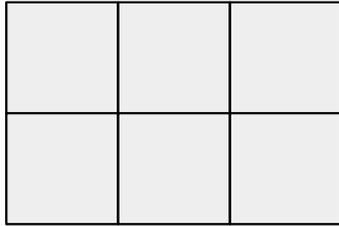
(b) ml [2]

(c) Siobhan has 20 eggs, 2 litres of milk and 500 g of butter.

Work out the maximum number of portions of scrambled eggs she can make.

(c) portions [3]

9



Not to scale

Six identical squares are arranged to form a rectangle as shown.

The perimeter of the rectangle is 35 cm.

Show that the area of the rectangle is 73.5 cm^2 .

[4]



Scale: 1 cm represents 5 km

The map shows three towns, Mortle, Numby and Otton.

Lisa drives from Mortle to Numby and then on to Otton.
She leaves Mortle at 11.30 am and arrives at Otton at 12.50 pm.

(a) Work out an estimate for Lisa's average speed on the journey.

Give your answer in kilometres per hour.

(a) km/h [5]

(b) State whether your answer to part (a) is likely to be an underestimate or an overestimate and explain why.

.....

.....

..... [2]

11 (a) The number of boys in a room is $\frac{5}{8}$ of the number of girls in the room.

What is the smallest number of children in the room?

(a) [3]

(b) The number of lorries in a car park is 60% more than the number of vans.

What is the smallest number of lorries in the car park?

(b) [2]

12 Before going to France, Wasim changed £500 into Euros.
He got an exchange rate of £1 = €1.38

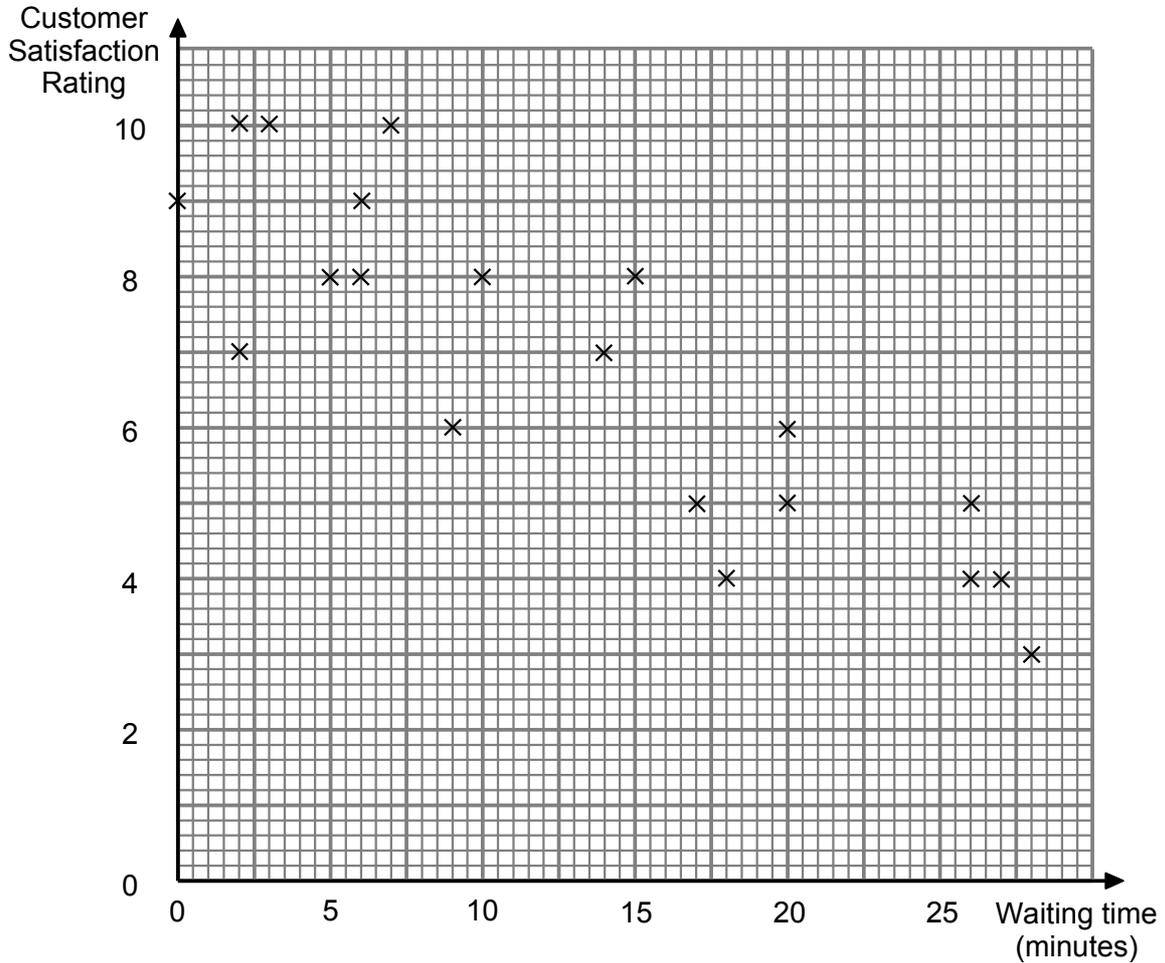
Whilst in France Wasim spent €465.

When he returned, he changed his remaining Euros into pounds.
This time he got an exchange rate of £1 = €1.31

Work out how much he got back in pounds.

£ [3]

- 13 A company has a customer support telephone line. The company records how long each customer waits for their call to be answered. At the end of each call, the customer is asked to rate their satisfaction on a scale of 1 to 10. The scatter graph shows this information for 20 calls to its support line, selected at random.



- (a) Calculate the percentage of these callers who gave a rating of 8 or more.

(a) % [2]

- (b) Another caller waited 23 minutes for their call to be answered.

Use a line of best fit to estimate the satisfaction rating this customer gave.

(b) [2]

- (c) Explain why the line of best fit used in part (b) could not be used to estimate the satisfaction rating for a customer who waited 50 minutes for their call to be answered.

.....
..... [1]

- 14 A ladder is leaning against a vertical wall.

The top of the ladder is 2 m above the ground.

The base of the ladder is 50 cm from the base of the wall.

Work out the length of the ladder.

..... cm [4]

15 (a) Find out how many multiples of 17 there are between 0 and 100.

(a) [2]

(b) The difference between two square numbers is 20.

Find the sum of the two square numbers.

(b) [2]

(c) The sum of **all** the factors of a number is 15.

What is the number.

(c) [2]

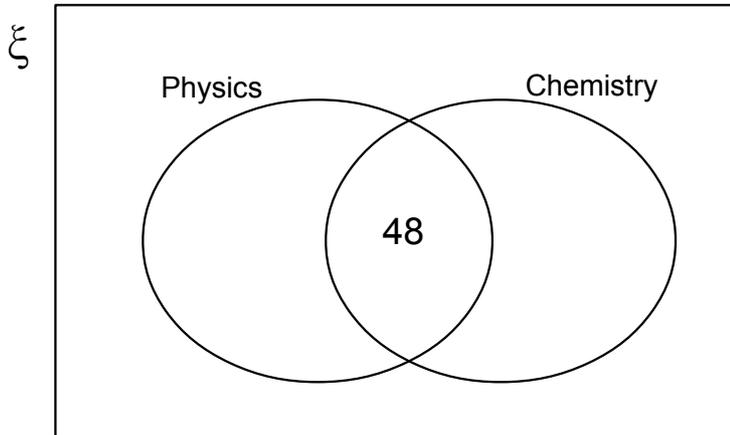
16 200 students at a school are studying for A levels.

78 of the students study Physics.

60 of the students study Chemistry.

48 of the students study both Physics and Chemistry.

(a) Complete this Venn diagram representing this information.



[2]

(b) One of these 200 students is chosen at random.

Work out the probability that they don't study Physics or Chemistry.

(b) **[1]**

- 17 31 pupils were given a short times tables test.
The table shows information about how long it took them to complete the test.

Time taken (seconds)	Number of pupils
$20 < N \leq 25$	6
$25 < N \leq 30$	10
$30 < N \leq 35$	3
$35 < N \leq 40$	4
$40 < N \leq 50$	3
$50 < N \leq 70$	5

- (a) In which class interval is the median time taken?

(a) [2]

- (b) Joe says

There are 19 pupils in the classes up to 35 and only 12 in those above 35,
so the mean must be less than 35.

Joe is not correct. Explain why.

.....

 [1]

18 On Thursday, John pays £4.20 to travel 2.3 km by taxi.

On Sunday, all taxi journeys cost 50% more than on weekdays.

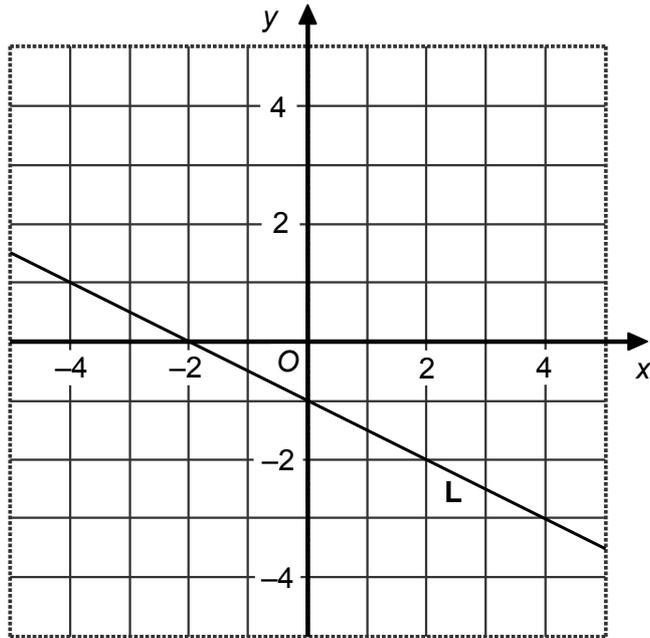
(a) Estimate how much it costs John to travel 6.1 km by taxi on Sunday.

(a) £ [4]

(b) State an assumption you have made in your calculation in part **(a)**.

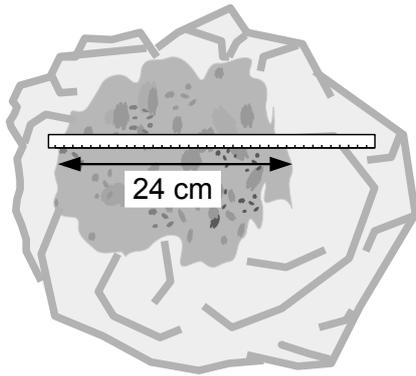
.....
.....
..... [1]

19



Find the equation of the straight line **L** in the form $y = mx + c$.

..... [3]



Not to scale

The sketch shows a growth of lichen on a rock.

A scientist wants to find the area covered by the lichen. She measures the distance across the area of lichen and records it as 24 cm. She then estimates the area using this calculation:

$$\text{Area} \approx 3 \times 12^2 = 3 \times 144 = 432 \text{ cm}^2$$

- (a) The scientist has approximated the value of π by rounding it to 3.

Explain what effect this has had on her estimate.

.....
 [1]

- (b) Write down an assumption the scientist has made about the shape of the lichen.

Explain how this may have affected her estimate.

.....

 [2]

21 (a) Expand and simplify

$$(x - 2)(x - 5)$$

(a) [2]

(b) Solve the equation

$$(y - 7)(y + 9) = 0$$

(b) [2]

(c) Solve the equation

$$z^2 + 7z + 6 = 0$$

(c) [2]