OCR
Oxford Cambridge and RSA

Monday 11 November 2024 – Morning

GCSE (9–1) Mathematics

J560/03 Paper 3 (Foundation Tier)

Time allowed: 1 hour 30 minutes

You must have:
- the Formulae Sheet for Foundation Tier (inside this document)

You can use:
- a scientific or graphical calculator
- geometrical instruments
- tracing paper

F

Please write clearly in black ink. **Do not write in the barcodes.**

Centre number | | | | | | Candidate number | | | | |

First name(s) _____

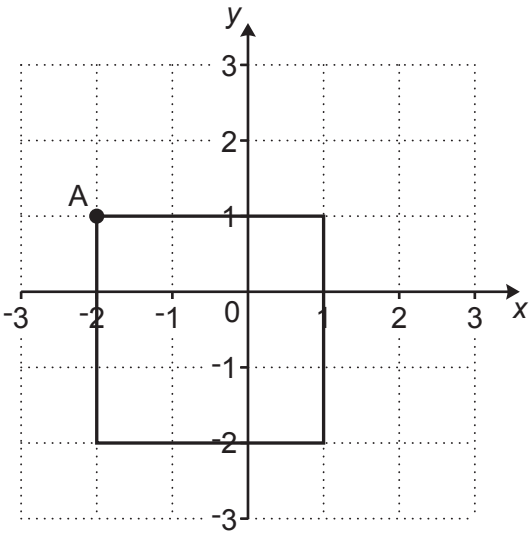
Last name _____

INSTRUCTIONS
- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. If you need extra space use the lined page at the end of this booklet. The question numbers must be clearly shown.
- Answer **all** the questions.
- Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.
- Use the π button on your calculator or take π to be 3.142 unless the question says something different.

INFORMATION
- The total mark for this paper is **100**.
- The marks for each question are shown in brackets **[ ]**.
- This document has **24** pages.

ADVICE
- Read each question carefully before you start your answer.

1 The diagram shows a square drawn on a one-centimetre square grid.



(a) Write down the coordinates of point A.

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

(b) Find the perimeter of the square.

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

2 **(a)** Write down all the factors of 15.

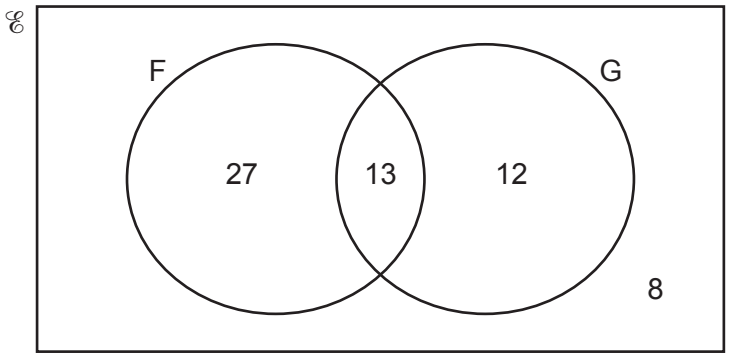
(a) ..... **[2]**

(b) Find the largest number that will divide exactly into 15 and 60.

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

3 60 people are asked if they have visited France (F) and if they have visited Greece (G).

The Venn diagram shows the results.



(a) How many of the 60 people have **not** visited either France or Greece?

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

(b) How many of the 60 people have visited Greece?

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

4 Ben thinks of a number.

Ben says,

When I square root my number and divide the result by 10 the answer is 1.3.

Find Ben's number.

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

5 These are the ingredients for making some scones.

Flour	360 g
Butter	90 g
Sugar	45 g
Milk	180 ml

10 ml of milk weighs 10.4 g.

Work out the **total** weight of all the ingredients.

..... g **[3]**

6 **(a)** By rounding each value to **one** significant figure, estimate the cost of 4.9 kg of carrots at 73p per kg.

(a) £ ..... **[2]**

(b) A student works out an estimate for this calculation.

$$\frac{13.7 + 1.28}{5.099}$$

Their method is to:
- round each number correct to the same number of significant figures and
- work out the approximation.

The student writes

$$\frac{14 + 1}{5} = \frac{15}{5} = 3.$$

What error has the student made in using their method?

.....

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

7 **(a)** Rearrange this formula to make x the subject.

$y = x + 3$

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

(b) Rearrange this formula to make w the subject.

$p = 3w$

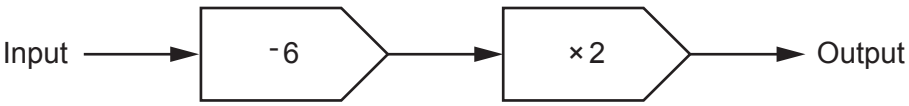
(b) ..... **[1]**

8 For each statement, tick (✓) whether the value of x is true or false.
The first one is done for you.

Statement	Value of x	True	False
$x > -1$	5	✓	
$x \leqslant -1$	-1		
$\frac{x}{10} = 0.7$	70		
$x - 2 \neq 5$	3		
$-1 < x < 0.7$	0		

[3]

9 This is a function machine.



(a) (i) Find the output when the input is 9.

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

(ii) Find the input when the output is 36.

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

(b) Complete this function machine to show the equation $y = 8 + 3x$.

[2]

10 100 students vote in a school election.

1 vote is spoiled and is not counted.
The remaining votes are for Jamal or Layla and are in the ratio 3 : 8.

How many **more** votes does Layla have than Jamal?

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

11 In a particular town last year:

- it rained on 17 of the 30 days in November
- it rained on 18 of the 31 days in December.

(a) Which month, November or December, had the highest proportion of rainy days? Show how you decide.

..... because .....

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

(b) Sam says,

I think the probability it will rain on December 25th next year is $\frac{18}{31}$.

What assumption has Sam made?

.....

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

12 The table shows some numbers each written as a power of 4.

Number	... as a power of 4		... as a power of 2	
4	4	4^1	2×2	2^2
16	4×4	4^2		
64	$4 \times 4 \times 4$	4^3		

(a) Complete the table to show 16 and 64 each written as a power of 2. **[2]**

(b) A number is written as 4^{20}.

Use a pattern in the table to help you write this number as a power of 2.

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

13 **(a)** Write 0.001 025 in standard form.

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

(b) A weather blogger writes:

- 1.655×10^{12} raindrops fall in a storm
- the mass of each raindrop is 6×10^{-5} grams.

Calculate the total mass of all of the raindrops that fall in the storm.
Give your answer in standard form in kilograms.

(b) ..... kilograms **[4]**

14 (a) Machine A makes enough lollipops to fill 300 packs.

There are 8 lollipops in each pack.

Show that 2400 lollipops are made by machine A. **[1]**

(b) Machine B makes 3600 lollipops in the same time it took by machine A to make 2400 lollipops.

Machine B makes lollipops one at a time and at a constant rate.

What fraction of the time needed to fill 300 packs is saved if machine B is used rather than machine A?
Give your answer in its simplest form.

(b) ..... **[3]**

15 Shop A and shop B have special offers on the same cupcakes.

Shop A	Shop B
	
£1.25 each or get 4 for the price of 3	£1.40 each or get 3 for the price of 2

(a) Show that the special offer cost of 6 cupcakes from Shop A is £6.25. **[1]**

(b) Gabi wants 25 cupcakes for a party.

Which shop will be cheapest and by how much?
Show how you decide.

(b) Shop ..... by .....p **[5]**

16 Sasha has these two sets of number cards.

Set A: 1 2 3 4 Set B: 8 9 10

One card is taken at random from each set.
Sasha adds the numbers on the two cards to get a total.

(a) Complete the table to show all the possible totals.

		Set A			
	Total	1	2	3	4
Set B	8		10	11	12
	9		11		13
	10	11	12		

[2]

(b) Find the probability that the total is a prime number.
Give your answer as a fraction.

(b) ..... **[2]**

17 The price of a holiday increases from £320 to £340.

Work out the percentage increase in the price of the holiday.

..... % **[3]**

18 Darcie invests £x at a rate of 1.5% per year simple interest for 5 years.
Ivan also invests £x but at a rate of 1.1% per year simple interest for 6 years.

Darcie earns £108 more interest than Ivan.

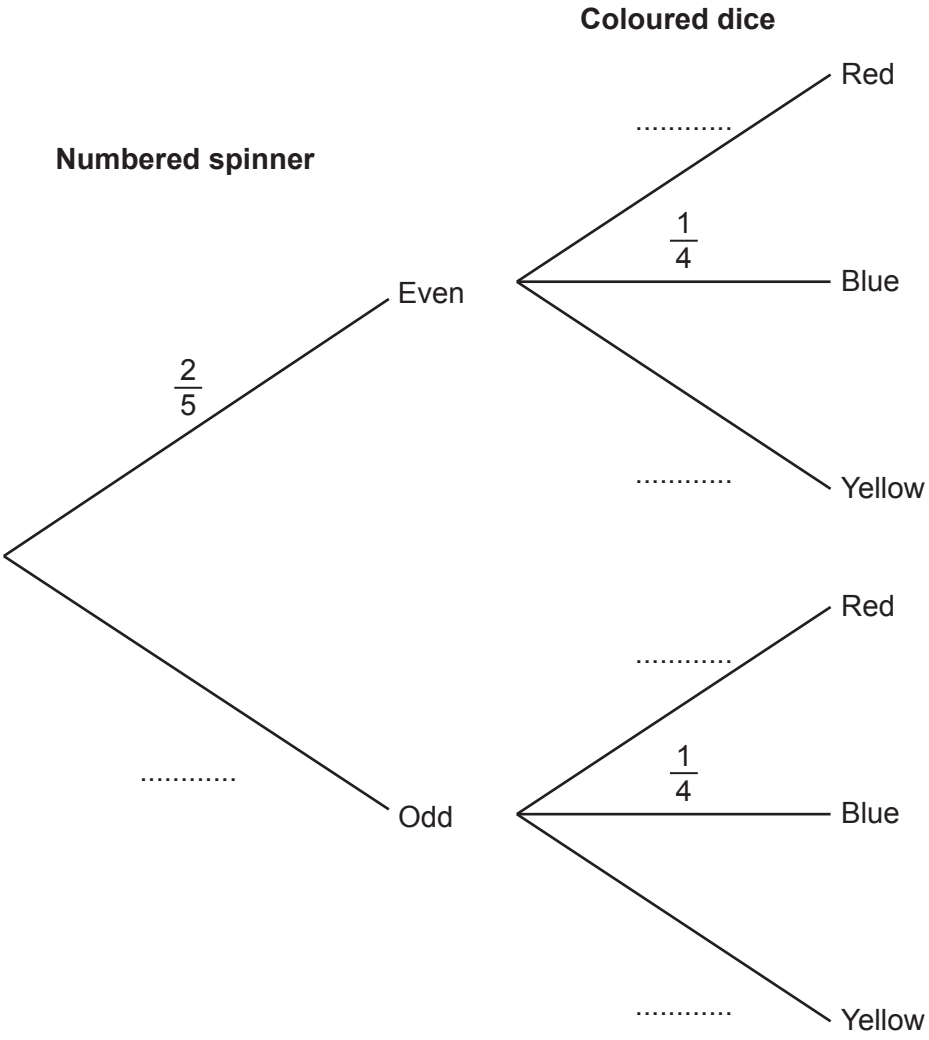
Work out the value of x.
You must show your working.

$x =$ ..... **[6]**

19 Kai spins a fair five-sided spinner.
The sectors of the spinner are numbered 1, 2, 3, 4 and 5.

Kai also throws a fair four-sided dice.
Two of the dice faces are red, one is blue, and one is yellow.

(a) Complete this tree diagram.

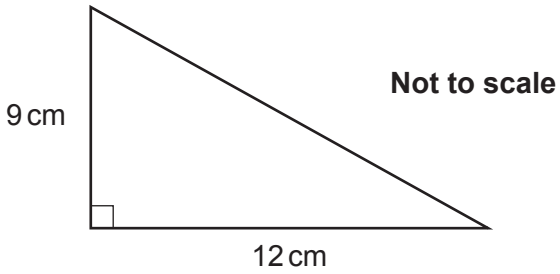


[3]

(b) Calculate the probability that Kai gets an even number on the spinner and a blue face on the dice.

(b) ..... **[2]**

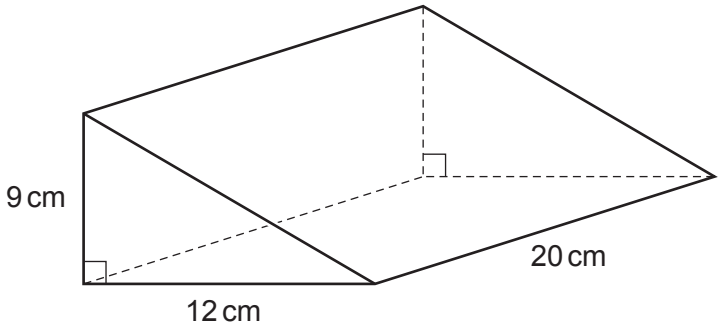
20 **(a)** The diagram shows the cross-section of a triangular prism.



Work out the area of the cross-section.

(a) ..... cm^2 **[2]**

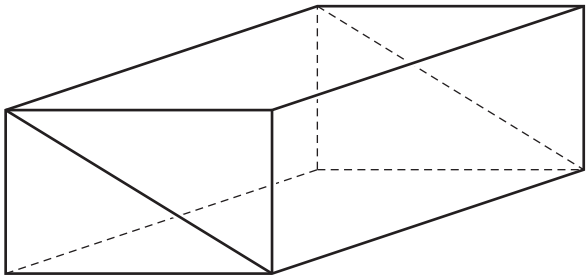
(b) This diagram shows the triangular prism.



Work out the total surface area of the triangular prism.
You must show your working.

(b) ..... cm^2 **[5]**

(c) Two of these triangular prisms are joined to make a new prism.

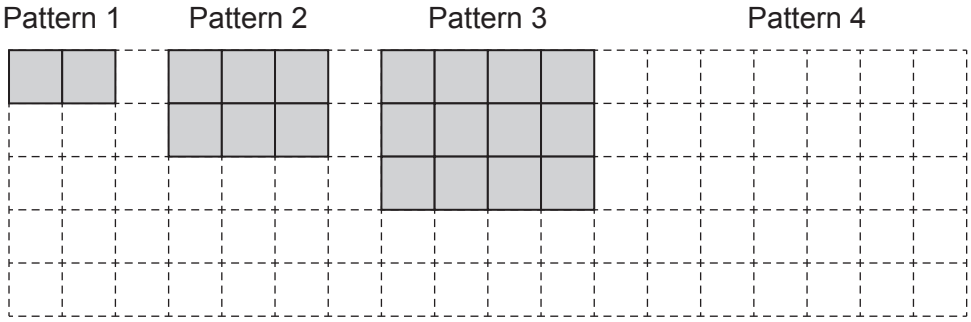


Give a reason why the total surface area of this prism is **not** two times your answer in **part (b)**.

.....

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

21 Here are the first three tile patterns of a sequence.



(a) Draw Pattern 4 in the space above. **[1]**

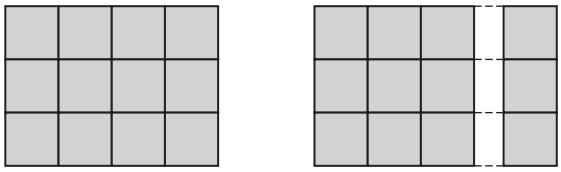
(b) Complete this table.

Pattern	Calculation	Number of tiles
1	1×2	2
2	2×3	6
3	3×4	12
4		
5		
10		
n		$n^2 + n$

[4]

(c) Each pattern in the sequence can be split into a square of tiles and a single column of tiles.

For example, Pattern 3:



The square in Pattern *n* contains 4096 tiles.

Work out how many tiles are in Pattern *n*.

(c) ..... **[3]**

22 A bag contains only blue, green and red counters in the ratio 7 : 3 : 2.
There are 76 more blue counters than green counters in the bag.

Work out the **total** number of counters in the bag.

..... **[4]**

23 A farmer has 60 pear trees.
The table shows the heights, h metres, of the pear trees.

Height (h metres)	**Frequency**		
$1 < h \leqslant 2$	5		
$2 < h \leqslant 3$	8		
$3 < h \leqslant 4$	32		
$4 < h \leqslant 5$	15		

(a) Calculate an estimate of the mean height of the 60 pear trees.

(a) ..... m **[4]**

(b) Explain why it is not possible to use the information from this table to calculate the **exact** value of the mean height.

.....

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

24 $\overrightarrow{AB} = \begin{pmatrix} 3 \\ -1 \end{pmatrix}$ and $\overrightarrow{BC} = \begin{pmatrix} 2 \\ 6 \end{pmatrix}$.

(a) On the grid below, draw $\overrightarrow{AB}$.

[2]

(b) Work out $\overrightarrow{AC}$.

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ **[2]**

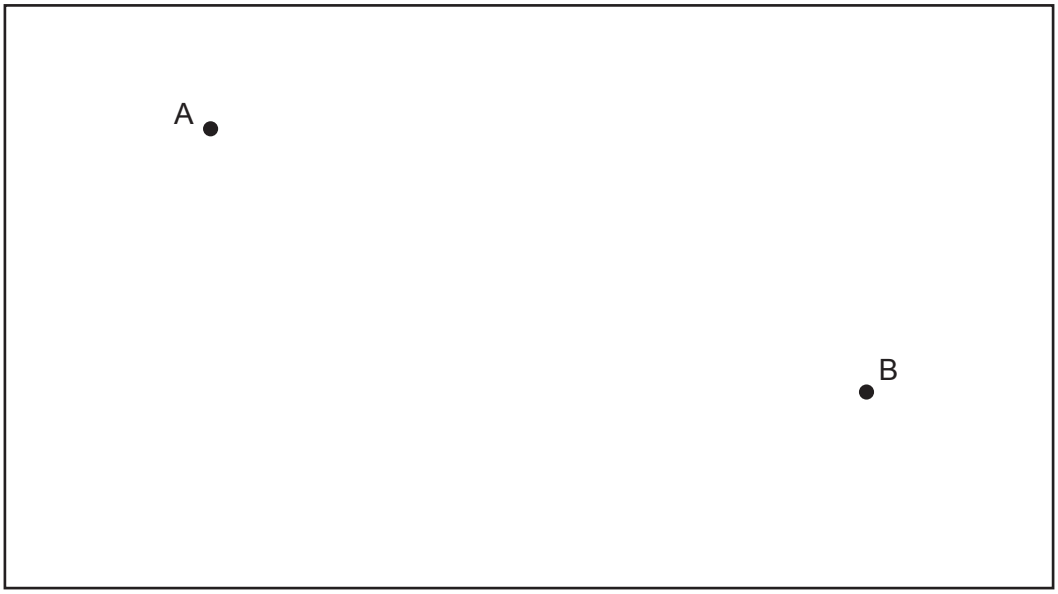
(c) Write down $\overrightarrow{BA}$.

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ **[1]**

25 The diagram represents a rectangular field.
A and B are two trees.

A straight path goes across the field.
The path is always the same distance from A and B.

Construct the route followed by the path.
Show all your construction lines.



[2]

END OF QUESTION PAPER