OCR
Oxford Cambridge and RSA

Friday 19 May 2023 – Morning

GCSE (9–1) Mathematics

J560/01 Paper 1 (Foundation Tier)

Time allowed: 1 hour 30 minutes

F

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

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

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. You can use extra paper if you need to, but you must clearly show your candidate number, the centre number and the question numbers.
- 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 **20** pages.

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

Turn over

1 Here is a list of numbers.

8   11   19   26   39   49   65   114

From this list, write down

(a) an even number,

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

(b) a square number,

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

(c) a factor of 57.

(c) .... **[1]**

2 Kai has four differently numbered cards.

- The range of the numbers is 14.
- The median of the numbers is 9.
- All the numbers are prime numbers.
- The lowest number is 5.

Work out the numbers on the cards.
Write the numbers in order of size.

.... , ... , ... , ... **[3]**
 lowest

3 Here are the first four terms of a sequence.

5   12   19   26

(a) Write down the next term in the sequence.

(a) .... [1]

(b) Explain how you worked out your answer.

.... [1]

4 A fair six-sided dice, numbered 1 to 6, is rolled.

The diagram shows a probability scale.
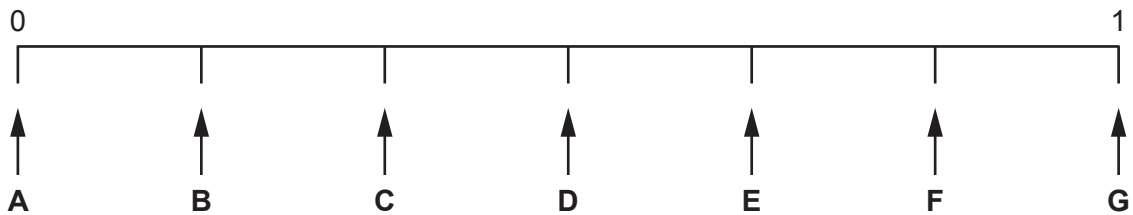
Which arrow shows the probability that the dice

(a) lands on 5,

(a) .... [1]

(b) lands on 7,

(b) .... [1]

(c) lands on a number greater than 2?

(c) .... [1]

Turn over

5 **(a)** Write 0.17 as a fraction.

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

(b) Write 0.04 as a percentage.

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

(c) Write $\dfrac{7}{8}$ as a decimal.

(c) .... **[1]**

6 Here is a function.

Input $\longrightarrow$ $\boxed{\times 4}$ $\longrightarrow$ $\boxed{+7}$ $\longrightarrow$ Output
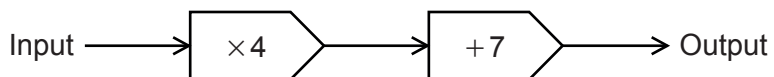
(a) Find the input when the output is 87.

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

(b) The input is *x* and the output is *y*.

Write an equation for *y* in terms of *x*.

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

7 (a) Work out.

(i) 3^5

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

(ii) $\sqrt[3]{2744}$

(ii) .... **[1]**

(b) Find the value of y.

$384 = 6 \times 4^y$

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

(c) Write 3^{-1} as a fraction.

(c) .... **[1]**

8 450 g of flour costs £1.44.

Work out the cost of 1 kg of this flour.

£ .... **[2]**

Turn over

9 A farmer keeps sheep in a rectangular field measuring 120 m by 180 m.
The farmer can keep up to 20 sheep per hectare in the field.
1 hectare is 10 000 square metres.

Work out the maximum number of sheep the farmer can keep in the field.

.... **[4]**

10 (a) Finley is asked to solve the equation $5x + 4 = 19$.

Finley's working is shown below.

$5x + 4 = 19$
$5x = 19 + 4$
$5x = 23$
$x = 4.6$

Write down the error that Finley has made.

....

.... **[1]**

(b) Charlie is asked to use the formula

$v = u + at$

to find the initial velocity, when

- the acceleration is 5m/s^2
- the final velocity is 29m/s
- the time is 3 seconds.

Charlie's working is shown below.

$v = 29 + (5 \times 3)$
$v = 29 + 15$
$v = 44$

Write down the error that Charlie has made.

....

.... **[1]**

Turn over

11 Cookies are made using these ingredients.

```
Ingredients

Makes 24 cookies

240 g butter
360 g sugar
2 eggs
240 g flour
170 g cranberries
100 g white chocolate
```

(a) How many eggs are needed to make 48 cookies?

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

(b) How much sugar is needed to make 6 cookies?

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

(c) Ashley has 520 g of cranberries and plenty of the other ingredients.
Ashley thinks this is enough to make at least 80 cookies.

Is Ashley correct?
Show working to support your answer.

.... because ....

.... **[3]**

(d) Darcie makes 100 cookies.
They are put into packets, each holding 6 cookies.
Each packet of 6 cookies is sold for £1.35.
Darcie sells all of these packets.

Work out how much money Darcie receives.

(d) £ .... **[3]**

12 Work out the surface area of the cuboid.

5 cm

4 cm

6 cm

.... cm² **[3]**

Turn over
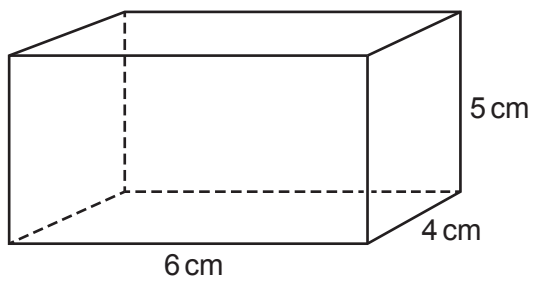
13 Kareem runs 2460 metres in 8 minutes.

(a) Calculate his average speed in metres per minute.

(a) .... m / min **[2]**

(b) Kareem says

This means I can run 6150 metres in 20 minutes.

Write down **one** assumption Kareem has made.

....

.... **[1]**

14 Show the inequality $x > {}^-2$ on this number line.

[2]

15 Finley has 72 sweets.
Finley gives

- 25% of the sweets to Alex

- $\frac{1}{6}$ of the sweets to Umi.

Show that Finley has $\frac{7}{12}$ of the sweets left. **[4]**

Turn over

16 The diagram shows a quadrilateral and an equilateral triangle.
The perimeter of the quadrilateral is equal to the perimeter of the equilateral triangle.

$5x + 4$

$x + 2$

$9x - 5$

$6x + 8$
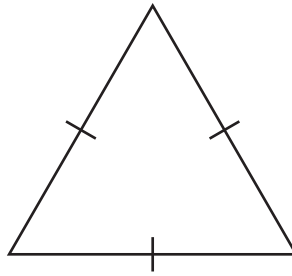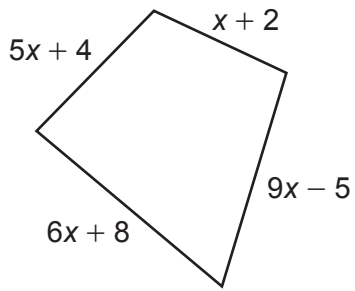
Not to scale

Find an expression for the length of one side of the equilateral triangle.
Give your answer in terms of x in its simplest form.

.... **[4]**

17 Multiply out and simplify.

$(3x + y)(x + 2y)$

.... **[3]**

18 Triangle **T** is drawn on a coordinate grid.
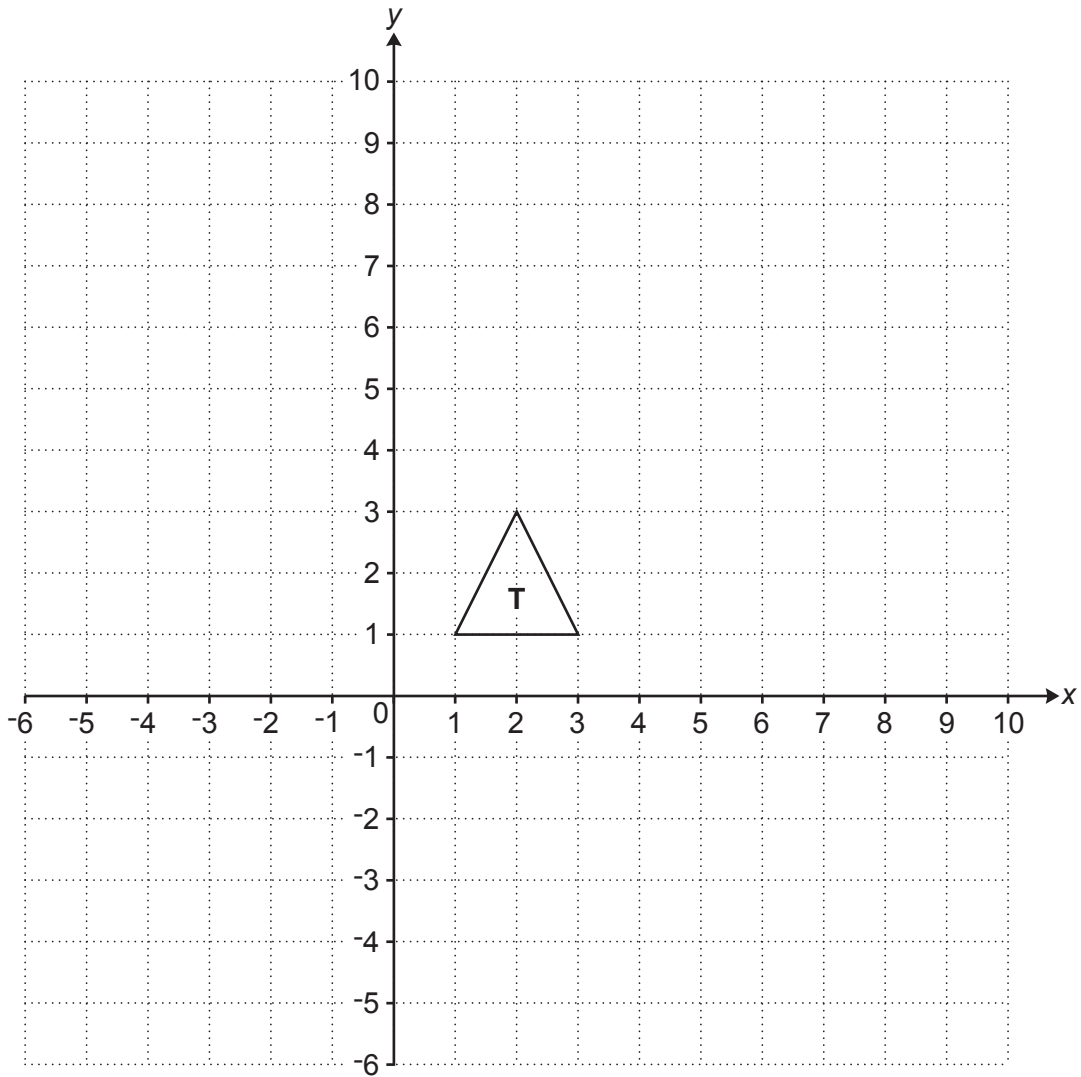
(a) Triangle **A** is translated by $\begin{pmatrix} 6 \\ -3 \end{pmatrix}$ to give triangle **T**.

Draw and label triangle **A** on the grid. **[2]**

(b) Triangle **T** is rotated through 90° anticlockwise about (0, 0) to give triangle **B**.

Draw and label triangle **B** on the grid. **[2]**

(c) Triangle **T** is reflected in the line $y = {}^-1$ to give triangle **C**.

Draw and label triangle **C** on the grid. **[2]**

19 Calculate.

$$\sqrt{5.2^2 - 4.8 \times {}^-6.3}$$

Give your answer correct to **3** significant figures.

.... **[2]**

20 The price of petrol decreases from £1.32 per litre to £1.02 per litre.

Calculate the percentage decrease in the price.

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

21 Trams to the airport leave every 50 minutes.
Trams to the beach leave every 35 minutes.
A tram to the airport and a tram to the beach leave together at 9:30 am.

When is the next time that two of these trams leave together?

.... **[4]**

22 Hiro and Taylor are both electricians.
Hiro **does not** charge to visit a house but charges a fixed rate per hour for the work needed.

This graph shows the relationship between the hours worked and the total charge made by Hiro.
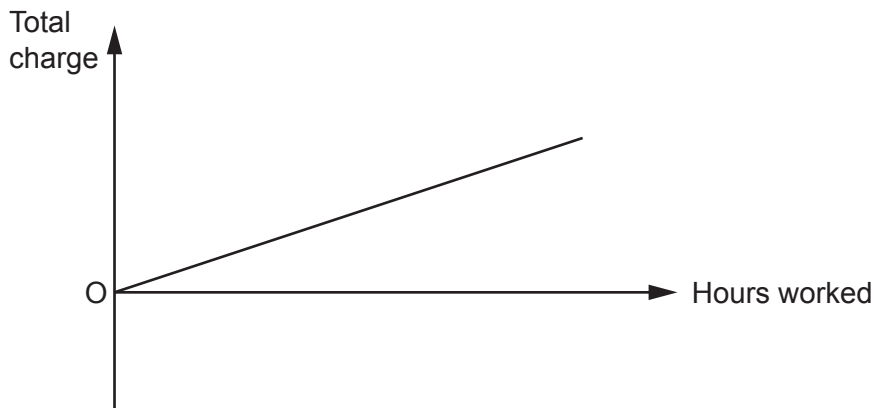
(a) Explain how this graph shows that Hiro's total charge is directly proportional to the hours worked.

....

.... **[2]**

(b) Taylor **does** charge to visit a house and charges the same fixed rate per hour as Hiro for the work needed.

On the axes above, draw a graph to show the relationship between the hours worked and the total charge made by Taylor. **[2]**

23 (a) Eve, Jack and Ling share some money in the ratio 2 : 3 : 4.
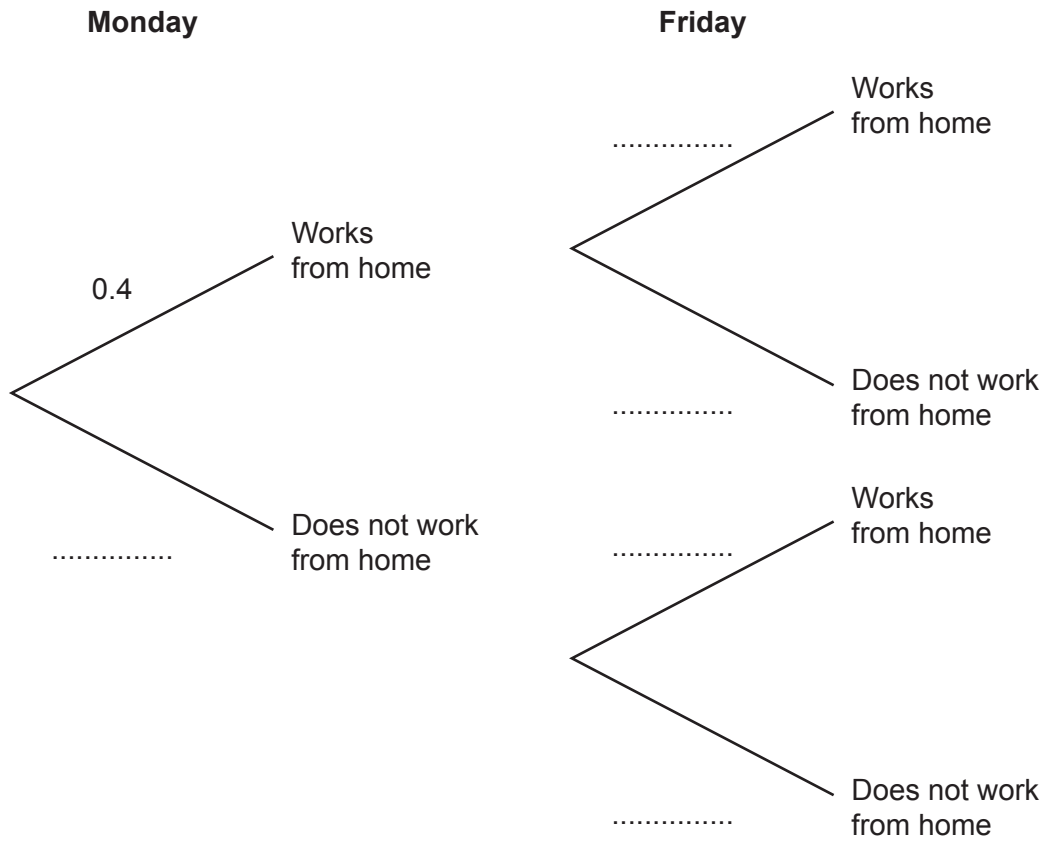Jack gets £720.

Work out how much Ling gets.

(a)   £.. **[2]**

(b) Amir, Beth and Casey share some money in the ratio 3 : 5 : c.
Casey's share is $\frac{2}{3}$ of the total.

Find the value of c.

(b) $c =$.. **[3]**

24 The probability that Sam works from home on Monday is 0.4.
The probability that Sam works from home on Friday is 0.2.

Monday   **Friday**

                                                         .... Works
                                                                         from home

                          0.4   Works
                                   from home

                                                         .... Does not work
                                                                         from home

                                                         .... Works
                                                                         from home
                          Does not work
               ....   from home

                                                         .... Does not work
                                                                         from home

(a) Complete the tree diagram. **[2]**

(b) Work out the probability that Sam works from home on Monday but does not work from home on Friday.

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

Turn over

25 A six-sided numbered spinner is thrown 50 times.
The score for each throw is recorded.
Some of the results are shown in the table.

An 8 was thrown f times.
An unknown number on the spinner is represented by n.

Score	Frequency
1	12
3	2
5	9
6	16
8	f
n	4
Total	50

The mean score of the 50 throws is 5.5 .
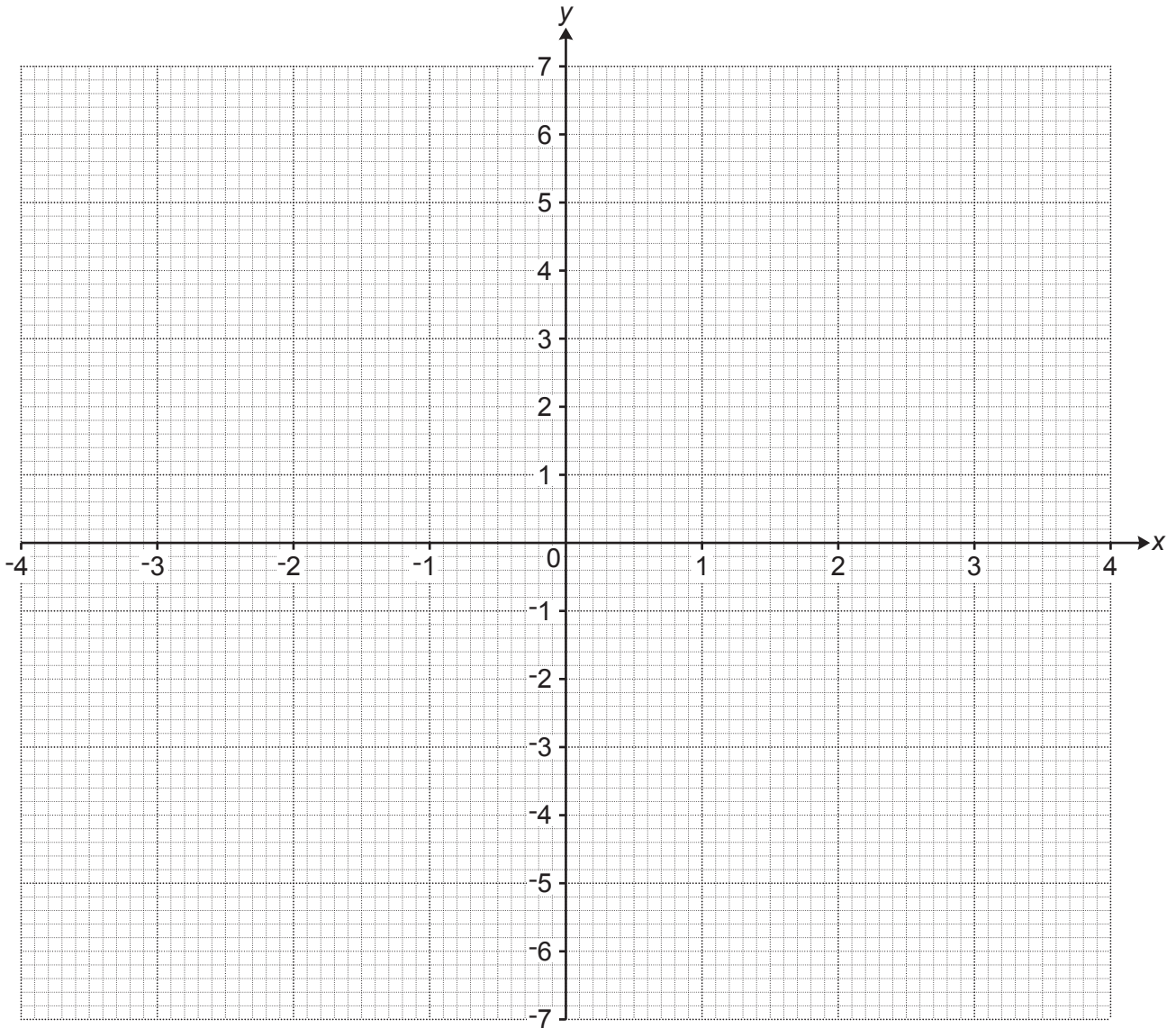
Find the value of f and the value of n.

$f =$..

$n =$..

[4]

26 Here is a table of values for $y = \dfrac{6}{x} - 2x$.

x	$^-4$	$^-3$	$^-2$	$^-1$	1	2	3	4
y	6.5	4	1	$^-4$	4	$^-1$	$^-4$	$^-6.5$

(a) Draw the graph of $y = \dfrac{6}{x} - 2x$ for $^-4 \leqslant x \leqslant 4$, $x \neq 0$.

[3]

(b) Use your graph to find the positive solution of $\dfrac{6}{x} - 2x = 0$.

Give your answer to **1** decimal place.

(b) $x =$ .... **[1]**

TURN OVER FOR QUESTION 27

Turn over

27 The diagram shows a circle inside a square of side 12 cm.

12 cm
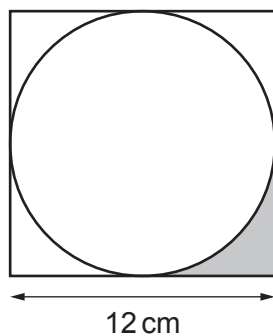
Work out the percentage of the square that is shaded.
You must show your working.

.... % **[6]**

END OF QUESTION PAPER