OCR

Oxford Cambridge and RSA

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Tuesday 7 June 2022 – Morning

GCSE (9–1) Mathematics

J560/02 Paper 2 (Foundation Tier)

Time allowed: 1 hour 30 minutes

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

You can use:
* geometrical instruments
* tracing paper

Do not use:
* a calculator

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 pages 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.

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.

OCR is an exempt Charity

Turn over

Answer **all** the questions.

1 **(a)** Work out.

(i) $4 - 5$

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

(ii) $2 \times {}^-3$

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

(iii) $\frac{1}{7} + \frac{2}{7}$

(iii) .... **[1]**

(iv) $\frac{1}{2}$ of $1\frac{1}{2}$

(iv) .... **[1]**

(b) Write down the largest prime factor of 30.

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

2 (a) What fraction of this shape is shaded?

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

(b) What percentage of this shape is shaded?
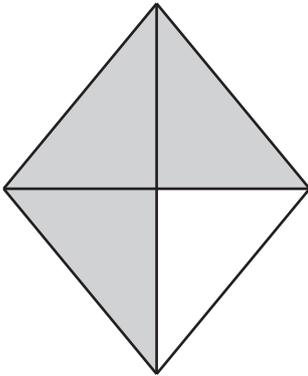
(b) .... % **[1]**

(c) Write 0.2 as a fraction.
Give your answer in its simplest form.

(c) .... **[2]**

(d) Work out 80% of 30.

(d) .... **[2]**

3 Bananas cost 25p each.

How many bananas can be bought for £2?

.... **[2]**

4 A student makes a fair 8-sided spinner.
They write the numbers 11, 12, 13, 14, 15, 16, 17 and 18 on the spinner.
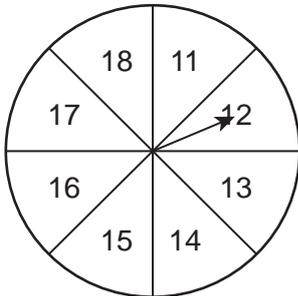
(a) Write down the probability of the student's spinner landing on a number which is less than 12.

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

(b) Find the probability of the student's spinner landing on a multiple of 3.

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

5 Write the ratio $5 : 7\frac{1}{2}$ in its simplest form.

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

Turn over

6 Taylor has collected data on the number of students who were absent from their school last week. The bar chart shows the results for the first four days.
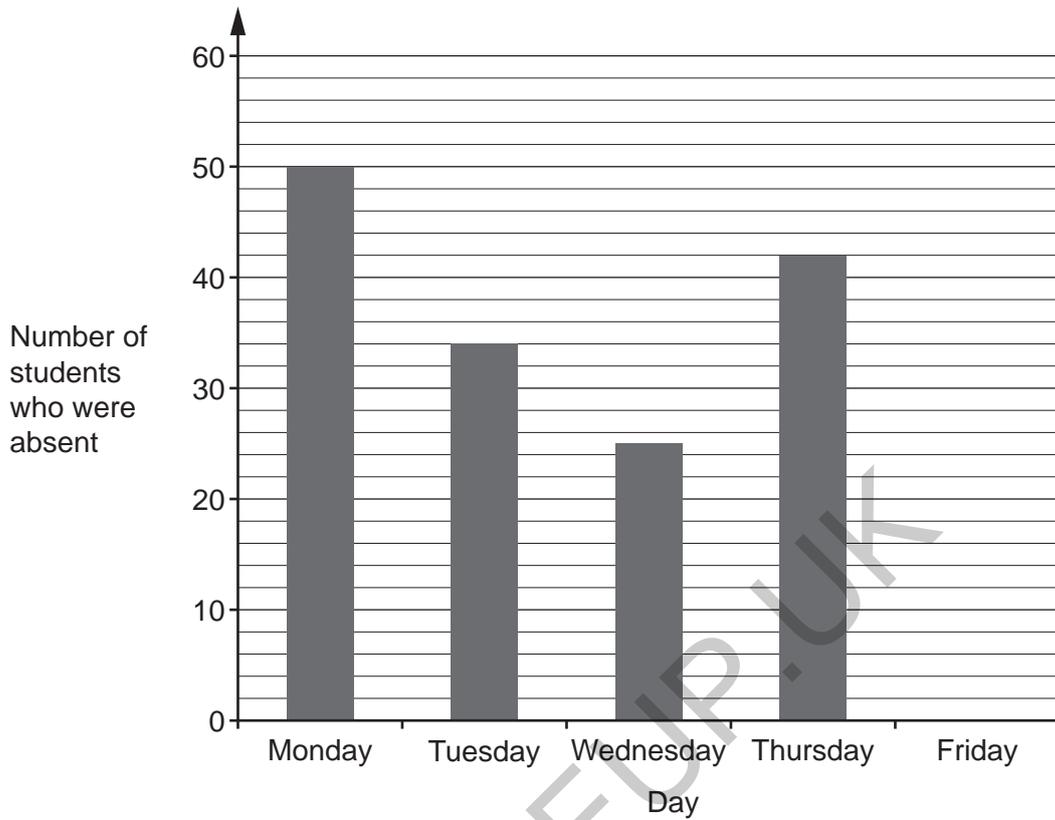
(a) On Friday there were 54 students who were absent from the school.

Show this information on the bar chart. **[1]**

(b) Taylor says

On Monday 150% of the students were absent from my school.

Could this be true?
Explain how you decide.

....

....

.... **[1]**

(c) There are 600 students in Taylor's school.
Find the percentage of students who were absent from Taylor's school on Thursday.

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

7 **(a)** Multiply out.

$5(x+2)$

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

(b) Rearrange this formula to make *r* the subject.

$p = 3r - 5$

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

Turn over

8 **(a)** Work out.

    (i) 3.08 + 0.82

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

    (ii) 7.7 ÷ 11

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

(b) Work out.

$(2.1 - \frac{3}{5}) \times 0.3$

Give your answer as a decimal.

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

9   A local theatre is putting on a show.
50 child tickets are sold.
The ratio of the number of child tickets sold to the number of adult tickets sold is 5 : 2.

The cost of a child ticket is £2.50.
The cost of an adult ticket is £5.00.

Work out the **total** amount paid for the tickets.

£ .... **[4]**

Turn over

10 The diagram shows Kai's garden.
   It is in the shape of a right-angled triangle.

Not to scale

15 m

20 m
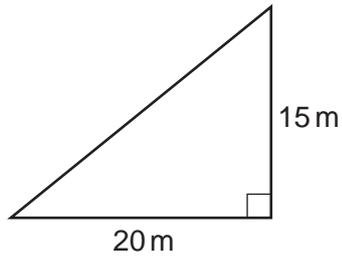
Kai is going to spread grass seed on the garden.

- A bag of grass seed covers an area of 35 m^2.
- Each bag of grass seed costs £8.99.

Kai can only buy whole bags of grass seed.
Kai buys the least number of bags needed for the garden.

Calculate the cost of buying the bags of grass seed that Kai needs.
You must show your working.

£ .... **[6]**

11 Some students were asked how they travel to school.
Each student gave one answer.
The pie chart shows the proportion who travel by bus, by train or walk.
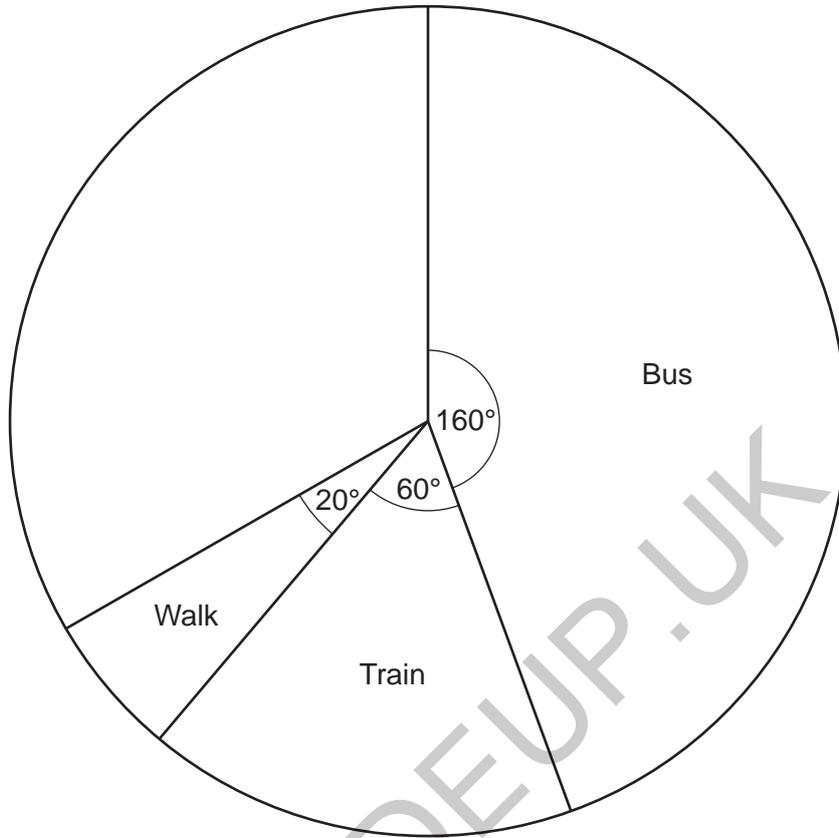
(a) All of the remaining students travel to school either by bike or by car.
The ratio of the number who travel by bike to the number who travel by car is 2 : 3.

Complete the pie chart.
You must show your working. **[6]**

(b) Which way of travelling to school is the mode?

.... **[1]**

Turn over

12 Dinosaurs first appeared on Earth 2.4×10^{8} years ago.
Dinosaurs became extinct on Earth 7×10^{7} years ago.

(a) Explain why it is appropriate to use standard form for these numbers.

....

....

.... **[1]**

(b) Use the given information to work out how long dinosaurs existed on Earth.
Give your answer in standard form.

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

13 (a) Complete this statement by writing the missing power in the box.

$$784 = 2^{\boxed{}} \times 7^2$$

[1]

(b) Use your answer to part **(a)** to find the value of $\sqrt{784}$.

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

Turn over

14 Rectangle **A** and rectangle **B** are drawn on the coordinate grid.
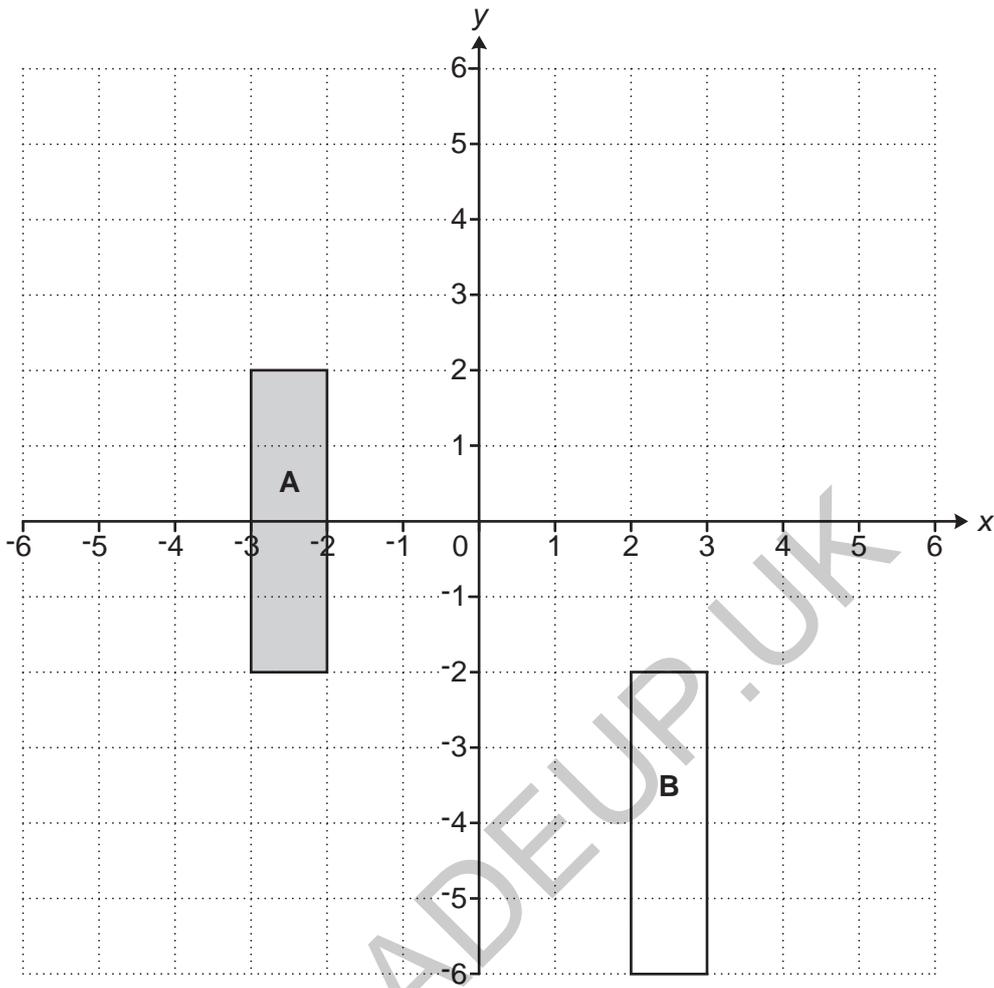
Describe fully **two** different **single** transformations that map rectangle **A** onto rectangle **B**.

1 ....

....

....

2 ....

....

....

[6]

15 y is inversely proportional to x.
$y = 20$ when $x = 3$.

Find the value of y when $x = 12$.

$y =$ .... **[3]**

16 A town square has a fountain (F) at the centre.
There is also a bell tower (B) and a statue (S).

The bearing of the statue from the fountain is $x°$.

North

Not to scale

• S

$x°$

F •

B •
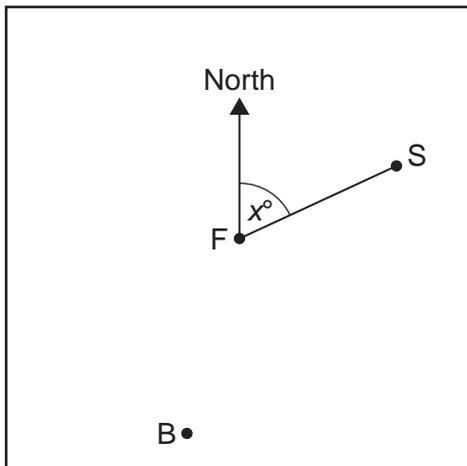
(a) The bearing of the bell tower from the fountain is 140° more than the bearing of the statue from the fountain.

Write down, in terms of x, the bearing of the bell tower from the fountain.

(a) ....° **[1]**

(b) The bearing of the bell tower from the fountain is also three times the bearing of the statue from the fountain.

Work out the bearing of the bell tower from the fountain.

(b) ....° **[4]**

17 Morgan is playing a computer game.
They can score 0, 1, 2 or 3 points on each turn.
They record their scores for 100 turns.
The table shows the relative frequencies of their scores.

Score	0	1	2	3
Relative frequency	0.08	0.42	0.38	

(a) Complete the table. **[2]**

(b) Morgan says

I scored more than 160 points **in total** in my 100 turns.

Is Morgan correct?
Show how you decide.

.... **[4]**

Turn over

18 A bag only contains red marbles, blue marbles and yellow marbles.

- The probability of picking a red marble is $\frac{2}{5}$.
- There are nine yellow marbles.
- The probability of picking a blue marble is three times as likely as picking a yellow marble.

Work out the **total** number of marbles in the bag.
You must show your working.

.... **[5]**

19 (a) Circle the value of sin 30°.

$$\frac{1}{2} \qquad \frac{\sqrt{3}}{2} \qquad \frac{1}{3} \qquad \frac{\sqrt{3}}{3} \qquad \frac{1}{4}$$

[1]

(b) Here is a right-angled triangle.
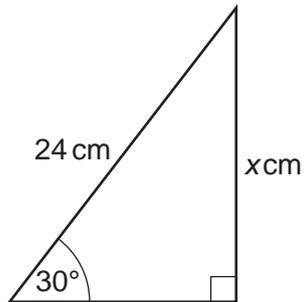
Not to scale

Work out the value of *x*.

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

Turn over

20 The graph shows a parallelogram ABCD.

Not to scale
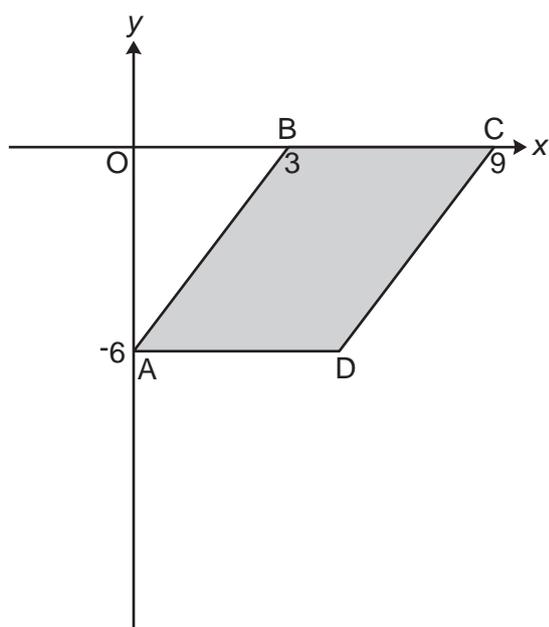
A has coordinates (0, ⁻6), B has coordinates (3, 0) and C has coordinates (9, 0).

Find the equation of the line that passes through the points C and D, giving your answer in the form $y = mx + c$.
You must show your working.

.... **[5]**

21 (a)

$$(x+4)(x+3) = x^2 + 7x + 12$$

Darcy says that the statement in the box is an equation.
Ellis says that the statement in the box is an identity.
One of them is correct.

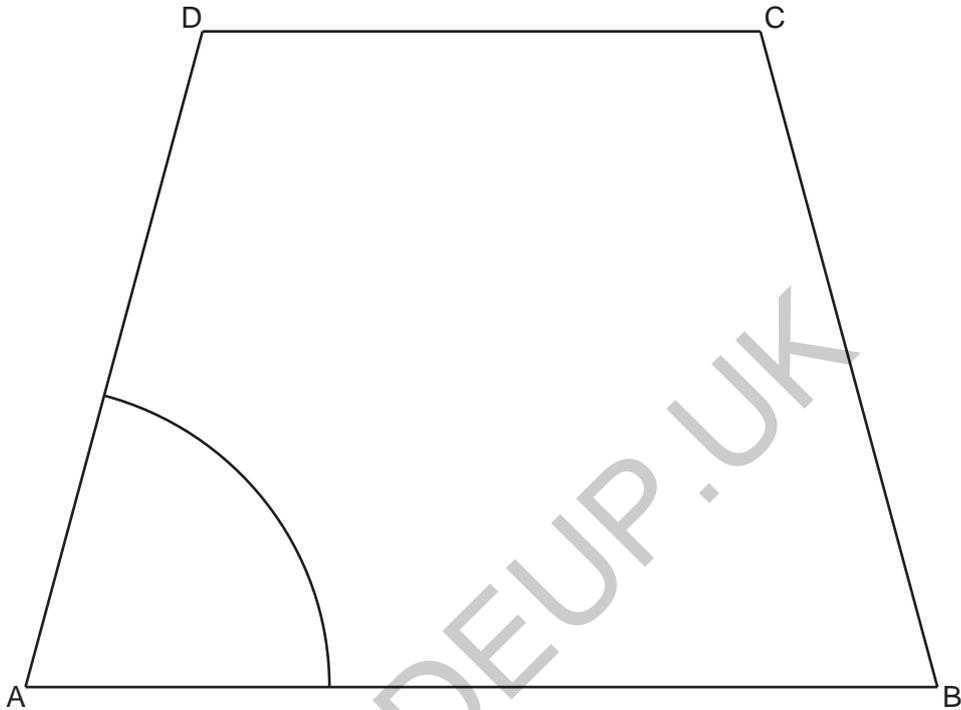Explain which one of Darcy or Ellis is correct.

.... is correct because ....

....

....

.... **[2]**

(b) Solve by factorising.

$$x^2 + 4x - 12 = 0$$

(b) $x =$ .... or $x =$ .... **[3]**

Turn over

22 The diagram shows the scale drawing of a sandpit, ABCD.
It also shows the arc of all points in the sandpit that are 80 cm from corner A.

   Scale: 1 cm represents 20 cm

A game is played by throwing a ball into the sandpit.
Points may be scored when the ball lands in the sandpit.

- 1 point if the ball lands within 80 cm of corner A,
  and
- 1 point if the ball is closer to side AB than side AD,
  and
- 1 point if the ball is closer to corner A than corner B.

By completing the construction, find and shade the regions where 2 points can be scored.
Show all your construction lines. **[6]**

END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

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