OCR
Oxford Cambridge and RSA

# Wednesday 4 June 2025 – Morning

## GCSE (9–1) Mathematics

**J560/05** Paper 5 (Higher Tier)

**Time allowed: 1 hour 30 minutes**

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

**You can use:**
- geometrical instruments
- tracing paper

**Do not use:**
- a calculator

**H**

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.

**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.



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**1** Work out.

**(a)** $^{-}3.5 \times {}^{-}4$

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

**(b)** $0.1 \div 0.4$

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

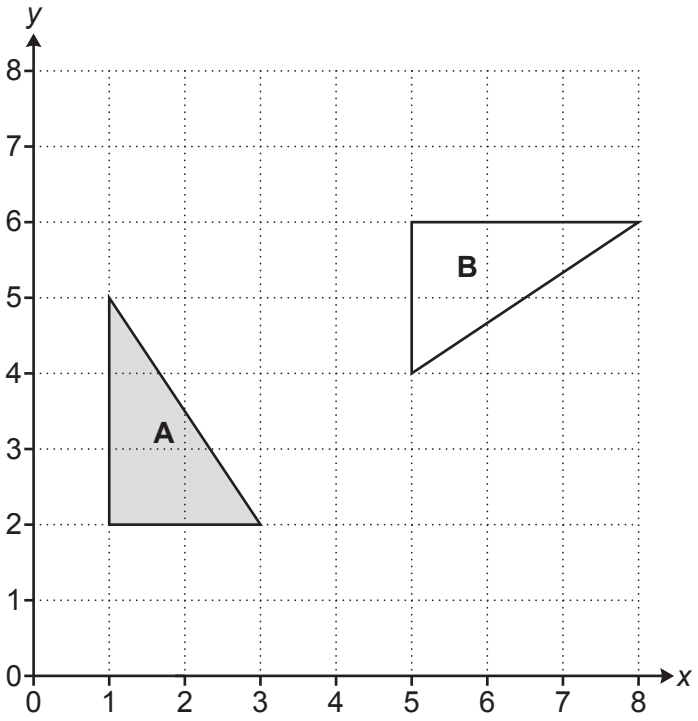
**2** An examination has two parts.
A student scores 10 out of 15 marks on Part 1.
They score 4 out of 10 marks on Part 2.

To pass the examination the student needs to score 54% of the total marks.

Show that the student passes the examination. **[3]**

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**3** Triangle **A** and triangle **B** are drawn on the coordinate grid.




Describe fully the **single** transformation that maps triangle **A** onto triangle **B**.

.....

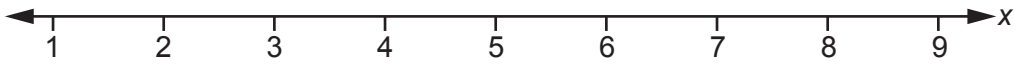
..... **[3]**

**4** **(a)** Solve.

$4x \leqslant 20$

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

**(b)** Show your solution to part **(a)** on the number line.




**[2]**

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**5** $1\frac{1}{5}+\frac{22}{d}=1\frac{3}{4}$

Find the value of $d$.

$d =$ ..... **[3]**

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**6** Sara and Tom both make a sequence of numbers.
The first term in both sequences is 10.

The term-to-term rule for Sara's sequence is add 14.
The term-to-term rule for Tom's sequence is add 35.

Each sequence stops when a term reaches or goes above 500.

**(a)** Find the **number of terms** that are the same in both Sara's and Tom's sequence.
You must show your working.

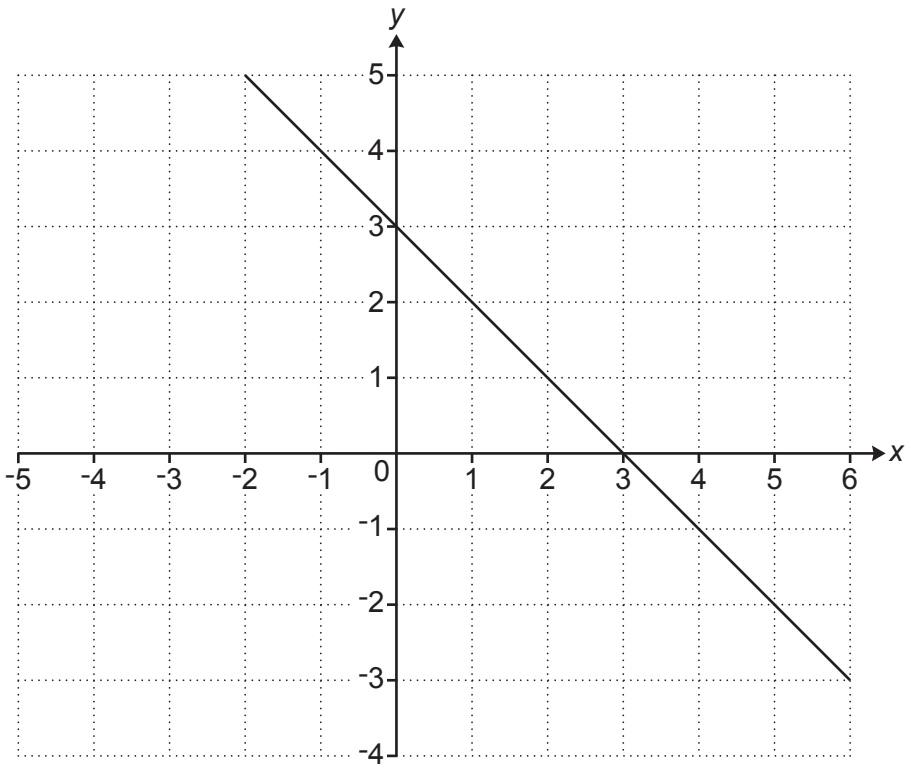
**(a)** ..... **[4]**

**(b)** Find an expression for the $n$th term of Sara's sequence.

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

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**7** The graph of the line $x + y = 3$ is shown on this grid.




**(a)** By drawing a suitable line on the grid, solve these simultaneous equations.

$x + y = 3$ and $y = 2x - 3$

**(a)** $x =$ .....

$y =$ .....

**[4]**

**(b)** Umi says,

The simultaneous equations $y = 2x + 3$ and $2y - 4x = 7$ will have no solutions.

Is Umi correct?
Explain how you decide.

Umi is ..... because .....

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

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**8** Three lengths of wood are in the ratio 2 : 5 : 7.
The difference in size between two of the lengths of wood is 30 cm.

Kofi says,

The sum of the three lengths of wood **must be** at least 120 cm.

Is Kofi correct?
Show how you decide.

Kofi is ..... because .....

..... **[5]**

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**9** A school has three terms, Autumn, Spring and Summer.

In class A there were 90 absences in the Autumn term, 120 absences in the Spring term and 40 absences in the Summer term.

Compared to class A, class B had:

- $\frac{3}{10}$ fewer absences in the Autumn term
- 5% more absences in the Spring term
- 7 more absences in the Summer term.

Design and complete a two-way table to show this information. **[6]**

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**10** Heidi is $x$ years old.
Finley is 5 years younger than Heidi.
Zayn is 4 times Finley's age.

Find an expression in terms of $x$ for the **total** age of Heidi, Finley and Zayn.
Write your answer as simply as possible.

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

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**11** A solid steel cube has a mass of 1.05 kg.
The density of the steel is 7.9 g/cm$^3$.

Orla says,

The length of one side of the cube is approximately 10 cm.

Use estimation to decide if Orla's statement is reasonable.
Show how you decide.

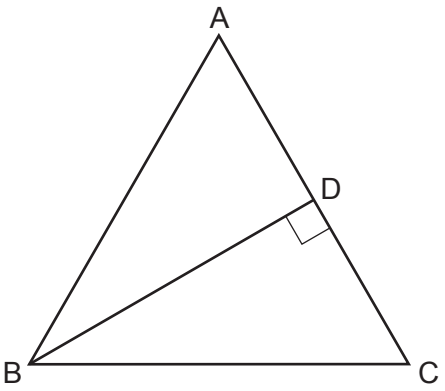
Orla's statement is ..... because .....

.....

..... **[5]**

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**12**




**Not to scale**

ABC is an equilateral triangle.
BD is perpendicular to AC.

Prove that triangle ABD is congruent to triangle CBD.

.....

.....

.....

.....

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

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**13** $p$ is directly proportional to the square root of $m$.
$p = 15$ when $m = 25$.

Find the value of $p$ when $m = 81$.

$p =$ ..... **[3]**

**14** **(a)** Find the value of $4^{\frac{5}{2}}$.

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

**(b)** Simplify.

$(3x^2)^{-3} \times 9x^8$

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

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**15** **(a)** Write $x^2 - 6x + 5$ in the form $(x - a)^2 - b$.

**(a)** ..... **[3]**

**(b)** Write down the coordinates of the turning point of $y = x^2 - 6x + 5$.

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

**16** Rearrange this formula to make $a$ the subject.

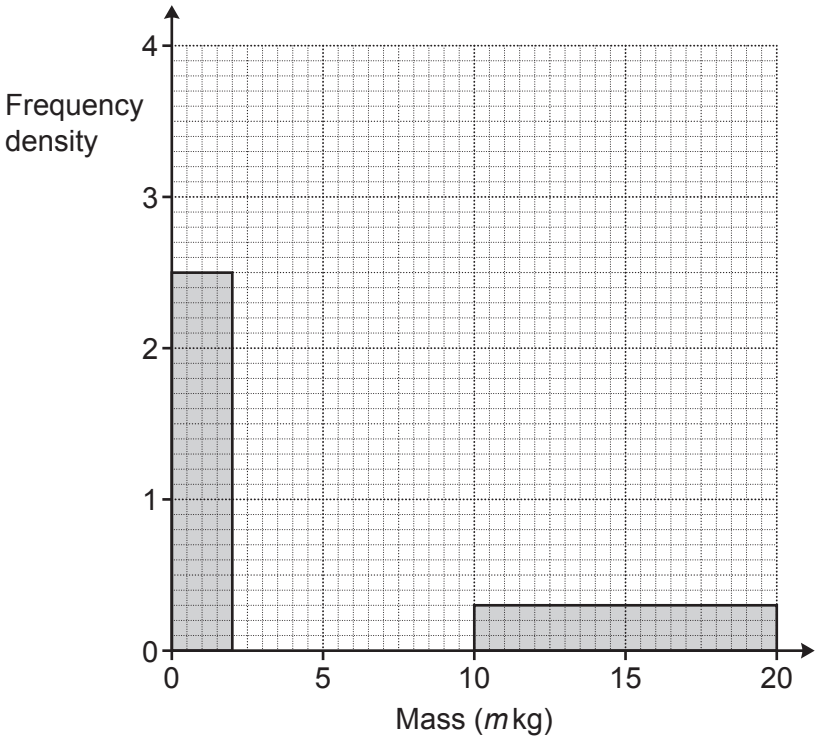
$$p = \frac{a + 2b}{3 - a}$$

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

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**17** The mass of some parcels are recorded.
The table and the histogram each show part of this information.

| **Mass (*m* kg)** | $0 < m \leqslant 2$ | $2 < m \leqslant 5$ | $5 < m \leqslant 10$ | $10 < m \leqslant 20$ |
|---|---|---|---|---|
| **Frequency** | | 12 | 18 | |




**(a)** Complete the table and the histogram. **[4]**

**(b)** The heaviest parcel is 19.5 kg.

Complete the inequality to represent the range, R kg, of the masses of the parcels.

**(b)** ..... $\leqslant$ R $<$ ..... **[2]**

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**18** Work out.

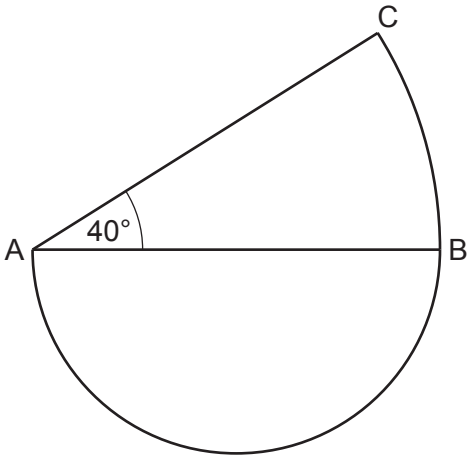
$1.4\dot{2} \div 0.\dot{2}$

Give your answer as a mixed number in its simplest form.
You must show your working.

..... **[5]**

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**19** The diagram shows a shape formed by a semicircle joined to a sector of a circle, BAC, along a common length AB.




**Not to scale**

The area of the sector BAC is $16\pi$ cm$^2$.

Work out the total area of the shape.
Give your answer in terms of $\pi$.
You must show your working.

..... cm$^2$ **[5]**

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**20** Simplify.

$$\frac{x^2 - 36}{x^2 - x - 42}$$

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

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**21** There are 10 sweets in a bag.
4 of the sweets are red, 4 are green and 2 are yellow.

**(a)** Charlie says,

The probability of picking the two yellow sweets at random from the bag can be found by working out $\frac{2}{10} \times \frac{2}{10}$.

Write down the assumption that Charlie has made.

.....

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

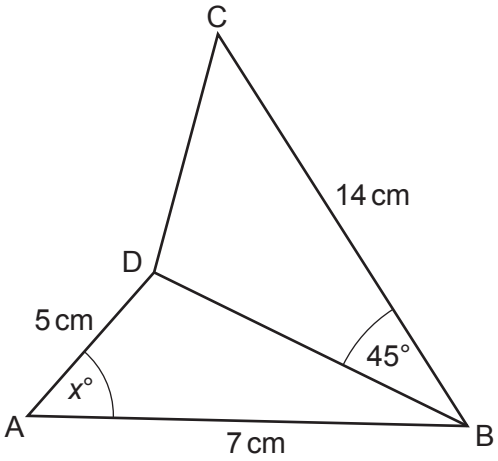
**(b)** Mia takes one of the 10 sweets from the bag at random and eats it.
Ben then takes a sweet from the bag and eats it.

Find the probability that the bag now holds more red sweets than green sweets.
You must show your working.

..... **[5]**

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**22** The diagram shows a quadrilateral ABCD.
DB is a diagonal of the quadrilateral.




**Not to scale**

AD = 5 cm, AB = 7 cm and BC = 14 cm.
Angle DAB = $x°$ and angle DBC = 45°.

cos $x°$ = 0.8 and sin $x°$ = 0.6.

Work out the area of triangle BDC.
You must show your working.

..... $cm^2$ **[6]**

**END OF QUESTION PAPER**

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