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# GCSE MATHEMATICS 8300/1H

Higher Tier Paper 1 Non-Calculator

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Mark scheme

June 2025

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Version: 1.0 Final



2 5 6 G 8 3 0 0 / 1 H / M S

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

No student should be disadvantaged on the basis of their gender identity and/or how they refer to the gender identity of others in their exam responses.

A consistent use of 'they/them' as a singular and pronouns beyond 'she/her' or 'he/him' will be credited in exam responses in line with existing mark scheme criteria.

Further copies of this mark scheme are available from [aqa.org.uk](https://www.aqa.org.uk)

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## Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt.

|                        |                                                                                                                                        |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>M</b>               | Method marks are awarded for a correct method which could lead to a correct answer.                                                    |
| <b>A</b>               | Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied. |
| <b>B</b>               | Marks awarded independent of method.                                                                                                   |
| <b>ft</b>              | Follow through marks. Marks awarded for correct working following a mistake in an earlier step.                                        |
| <b>SC</b>              | Special case. Marks awarded for a common misinterpretation which has some mathematical worth.                                          |
| <b>M dep</b>           | A method mark dependent on a previous method mark being awarded.                                                                       |
| <b>B dep</b>           | A mark that can only be awarded if a previous independent mark has been awarded.                                                       |
| <b>oe</b>              | Or equivalent. Accept answers that are equivalent.<br>eg accept 0.5 as well as $\frac{1}{2}$                                           |
| <b>[a, b]</b>          | Accept values between a and b inclusive.                                                                                               |
| <b>[a, b)</b>          | Accept values $a \leq \text{value} < b$                                                                                                |
| <b>3.14 ...</b>        | Accept answers which begin 3.14 eg 3.14, 3.142, 3.1416                                                                                 |
| <b>Use of brackets</b> | It is not necessary to see the bracketed work to award the marks.                                                                      |

Examiners should consistently apply the following principles.

**Diagrams**

Diagrams that have working on them should be treated like normal responses. If a diagram has been written on but the correct response is within the answer space, the work within the answer space should be marked. Working on diagrams that contradicts work within the answer space is not to be considered as choice but as working, and is not, therefore, penalised.

**Responses which appear to come from incorrect methods**

Whenever there is doubt as to whether a student has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the student. In cases where there is no doubt that the answer has come from incorrect working then the student should be penalised.

**Questions which ask students to show working**

Instructions on marking will be given but usually marks are not awarded to students who show no working.

**Questions which do not ask students to show working**

As a general principle, a correct response is awarded full marks.

**Misread or miscopy**

Students often copy values from a question incorrectly. If the examiner thinks that the student has made a genuine misread, then only the accuracy marks (A or B marks), up to a maximum of 2 marks are penalised. The method marks can still be awarded.

**Further work**

Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.

**Choice**

When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

**Work not replaced**

Erased or crossed out work that is still legible should be marked.

**Work replaced**

Erased or crossed out work that has been replaced is not awarded marks.

**Premature approximation**

Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

**Continental notation**

Accept a comma used instead of a decimal point (for example, in measurements or currency), provided that it is clear to the examiner that the student intended it to be a decimal point.

## MARK SCHEME – GCSE MATHEMATICS – 8300/1H – JUNE 2025

| Q | Answer                                                                                        | Mark  | Comments                                                                                                                 |
|---|-----------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------|
| 1 | Correct method to eliminate one variable                                                      | M1    | eg $5y - y = 18 - 6$<br>or $18 - 5y = 6 - y$<br>or $5 \times 2x - 2x = 5 \times 6 - 18$<br>or $\frac{18-2x}{5} = 6 - 2x$ |
|   | $4y = 12$ or $-4y = -12$ or $y = 3$<br>or<br>$8x = 12$ or $-8x = -12$ or $x = 1.5$            | M1dep | oe equation in form $ax = b$ or $cy = d$                                                                                 |
|   | $x = 1.5$ and $y = 3$                                                                         | A1    | oe                                                                                                                       |
|   | <b>Additional Guidance</b>                                                                    |       |                                                                                                                          |
|   | Intention to subtract is sufficient for M1<br>eg $2x + 5y = 18$<br>$\underline{2x + y = 6}$ – |       | M1                                                                                                                       |
|   | Correct values embedded in both equations                                                     |       | M2A0                                                                                                                     |
|   | Correct values embedded in one equation                                                       |       | M1M0A0                                                                                                                   |

| Q | Answer                                                                      | Mark | Comments              |
|---|-----------------------------------------------------------------------------|------|-----------------------|
| 2 | $1.07 \times 9$ or $9.6(3)$<br>or<br>$1.17 \times 9$ or $10.5(3)$           | M1   |                       |
|   | 10                                                                          | A1   | SC1 $\frac{10}{9}$ oe |
|   | <b>Additional Guidance</b>                                                  |      |                       |
|   | Answer 10                                                                   |      | M1A1                  |
|   | Answer $\frac{10}{9}$ or embedded answer eg $1.07 < \frac{10}{9} < 1.17$ oe |      | SC1                   |

## MARK SCHEME – GCSE MATHEMATICS – 8300/1H – JUNE 2025

| Q | Answer          | Mark | Comments                                            |
|---|-----------------|------|-----------------------------------------------------|
| 3 | $11 \times 8.5$ | M1   | oe                                                  |
|   | 93.5            | A1   | oe accept 93 or 94 with 93.5 seen<br>SC1 digits 935 |

| Q | Answer                                          | Mark | Comments |
|---|-------------------------------------------------|------|----------|
| 4 | 10 or 26 used                                   | M1   |          |
|   | 16                                              | A1   |          |
|   | <b>Additional Guidance</b>                      |      |          |
|   | 10 from $12 - 2$ or $33 - 23$ does not score M1 |      |          |

| Q | Answer                                                                                        | Mark | Comments    |
|---|-----------------------------------------------------------------------------------------------|------|-------------|
| 5 | True<br>May be true<br>True                                                                   | B3   | B1 for each |
|   | <b>Additional Guidance</b>                                                                    |      |             |
|   | Any unambiguous indication, but if a tick and a cross are used in the same row, mark the tick |      |             |
|   | A row with more than one tick is incorrect for that row                                       |      |             |

## MARK SCHEME – GCSE MATHEMATICS – 8300/1H – JUNE 2025

| Q    | Answer                       | Mark | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------|------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6(a) | $6 \times 10^{-3}$           | B2   | condone extra zeros which do not affect the value eg $6.0 \times 10^{-3}$<br>B1 correct value not in standard form (allow value written as $a \times 10^n$ )<br>eg 0.006 or $0.6 \times 10^{-2}$<br><b>or</b><br>given calculation with 0.6 written as $6 \times 10^{-1}$ eg $6 \times 10^{-1} \div 100$<br><b>or</b><br>value whose only non-zero digit is 6 correctly converted to standard form answer<br>eg $0.0006 = 6 \times 10^{-4}$ |
|      | Additional Guidance          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|      | $6 \times 10^{-1} \div 10^2$ |      | B1                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Q    | Answer            | Mark | Comments                                                                                                                                                                                                                                                                                                                                       |
|------|-------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6(b) | $1.2 \times 10^8$ | B2   | condone extra zeros which do not affect the value eg $1.20 \times 10^8$<br>B1 120 000 000 or 120 million<br>or $12 \times 10^7$ or $120 \times 10^6$<br>or $1.2 \times 10^a \times 10^b$ where $a + b = 8$<br>or<br>value whose only non-zero digits are 12 correctly converted to standard form answer<br>eg $12\,000\,000 = 1.2 \times 10^7$ |

| Q | Answer                                                                                                                  | Mark | Comments        |
|---|-------------------------------------------------------------------------------------------------------------------------|------|-----------------|
| 7 | $330 \div (1 + 2)$ or 110 or 220                                                                                        | M1   | oe              |
|   | 110 in Year 10 and 220 in Year 11                                                                                       | A1   |                 |
|   | 52 in Year 10 Medal<br>and<br>73 in Year 11 Medal                                                                       | B1   |                 |
|   | Year 10 Medal + Year 10 No medal<br>= Year 10<br>and<br>Year 11 Medal + Year 11 No medal<br>= Year 11                   | B1ft | ft their values |
|   | <b>Additional Guidance</b>                                                                                              |      |                 |
|   | Diagram takes precedence                                                                                                |      |                 |
|   | If the values are given as probabilities, with the required value as the numerator, withhold the first A mark or B mark |      |                 |
|   |                                                                                                                         |      | M1A1B1B1        |

## MARK SCHEME – GCSE MATHEMATICS – 8300/1H – JUNE 2025

| Q | Answer                                                                                                        | Mark | Comments                                                          |
|---|---------------------------------------------------------------------------------------------------------------|------|-------------------------------------------------------------------|
| 8 | Correct method to divide by $\frac{1}{2}$                                                                     | M1   | implied by 0.4 or $\frac{2}{5}$ or $\frac{1}{2.5}$                |
|   | Correct method to add two fractions with different denominators                                               | M1   | implied by $\frac{7}{15}$                                         |
|   | $\frac{2}{3}$                                                                                                 | A1   | oe fraction eg $\frac{10}{15}$<br>SC2 $\frac{14}{15}$ oe fraction |
|   | <b>Additional Guidance</b>                                                                                    |      |                                                                   |
|   | SC2 is from $\left(\frac{4}{15} + \frac{1}{5}\right) \div \frac{1}{2}$                                        |      |                                                                   |
|   | Ignore incorrect simplification of a correct fraction to another fraction<br>eg $\frac{10}{15} = \frac{4}{5}$ |      | M1M1A1                                                            |
|   | Correct answer in working but answer given as a decimal                                                       |      | M1M1A0                                                            |

| Q | Answer        | Mark | Comments |
|---|---------------|------|----------|
| 9 | $\frac{2}{5}$ | B1   |          |

| Q  | Answer                                                                                                                                                                                                                          | Mark  | Comments                                                                                                                                                                                                                                  |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10 | $x^2 + 2x - 5x - 10$                                                                                                                                                                                                            | M1    | oe with brackets expanded<br>four terms in any order with three correct<br>from $x^2$ (+)2x -5x -10<br>terms may be seen in a grid<br>implied by $x^2 - 3x + k$ ( $k \neq 0$ )<br>or $ax^2 - 3x - 10$ ( $a \neq 0$ )                      |
|    | $x^2 - 3x - 130 (= 0)$                                                                                                                                                                                                          | M1dep | oe expression/equation with brackets expanded<br>eg $x^2 + 2x - 5x - 10 = 120$                                                                                                                                                            |
|    | For their three-term quadratic,<br><br>correctly factorises<br><br>or correctly substitutes into the quadratic formula<br><br>or correctly completes the square to the form $x = \dots$ for their quadratic<br>or<br>-10 and 13 | M1    | do not accept $x^2 - 3x - 10 (= 0)$ as their three-term quadratic<br>eg $(x + 10)(x - 13) (= 0)$<br>eg $\frac{- -3 \pm \sqrt{(-3)^2 - 4 \times 1 \times -130}}{2 \times 1}$<br>eg $(x =) 1.5 \pm \sqrt{\left(\frac{3}{2}\right)^2 + 130}$ |
|    | 13                                                                                                                                                                                                                              | A1    | SC1 31.5 oe                                                                                                                                                                                                                               |
|    | <b>Additional Guidance</b>                                                                                                                                                                                                      |       |                                                                                                                                                                                                                                           |
|    | The first and third marks may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts                                                                                    |       |                                                                                                                                                                                                                                           |
|    | SC1 is for using the perimeter                                                                                                                                                                                                  |       |                                                                                                                                                                                                                                           |
|    | Trial and improvement is 0, 3 (for -10 and 13) or 4 marks                                                                                                                                                                       |       |                                                                                                                                                                                                                                           |

| Q     | Answer                                  | Mark | Comments                                                                  |
|-------|-----------------------------------------|------|---------------------------------------------------------------------------|
| 11(a) | $\begin{pmatrix} 6 \\ -2 \end{pmatrix}$ | B1   | condone $\begin{pmatrix} +6 \\ -2 \end{pmatrix}$ or written as a fraction |

| Q     | Answer                                                                                                                                            | Mark | Comments                                                                                                                                                            |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11(b) | <b>Alternative method 1: rotation 180°</b>                                                                                                        |      |                                                                                                                                                                     |
|       | 180°<br>or $\frac{1}{2}$ turn<br><b>and</b><br>(0, 3)                                                                                             | B2   | ignore clockwise or anticlockwise<br>B1 180°<br>or $\frac{1}{2}$ turn<br><b>or</b><br>(0, 3) with incorrect rotation                                                |
|       | <b>Alternative method 2: rotation 90° clockwise</b>                                                                                               |      |                                                                                                                                                                     |
|       | 90° clockwise<br>or 270° anticlockwise<br>or $\frac{1}{4}$ turn clockwise<br>or $\frac{3}{4}$ turn anticlockwise<br><b>and</b><br>(–1, 0)         | B2   | B1 90° clockwise<br>or 270° anticlockwise<br>or $\frac{1}{4}$ turn clockwise<br>or $\frac{3}{4}$ turn anticlockwise<br><b>or</b><br>(–1, 0) with incorrect rotation |
|       | <b>Alternative method 3: rotation 90° anticlockwise</b>                                                                                           |      |                                                                                                                                                                     |
|       | 90° anticlockwise<br>or 270° clockwise<br>or $\frac{1}{4}$ turn anticlockwise<br>or $\frac{3}{4}$ turn clockwise<br><b>and</b><br>(1, 6)          | B2   | B1 90° anticlockwise<br>or 270° clockwise<br>or $\frac{1}{4}$ turn anticlockwise<br>or $\frac{3}{4}$ turn clockwise<br><b>or</b><br>(1, 6) with incorrect rotation  |
|       | <b>Additional Guidance</b>                                                                                                                        |      |                                                                                                                                                                     |
|       | Accept counterclockwise for anticlockwise                                                                                                         |      |                                                                                                                                                                     |
|       | For the centre of rotation, condone missing brackets on coordinates, but not written as a vector                                                  |      |                                                                                                                                                                     |
|       | Other or compound transformation stated or implied<br>eg 'about the line' or 'scale factor' or 'moved by $\begin{pmatrix} 0 \\ 3 \end{pmatrix}$ ' |      | B0                                                                                                                                                                  |

| Q  | Answer                                                                                                                            | Mark  | Comments                                     |
|----|-----------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------|
| 12 | <b>Alternative method 1: works out the value of one share</b>                                                                     |       |                                              |
|    | $27 \div (8 - 5)$ or $27 \div 3$ or 9                                                                                             | M1    | oe<br>implied by 72 or 45 identified or used |
|    | their $9 \times 8$ + their $9 \times 5$<br>or $72 + 45$<br>or<br>their $9 \times (8 + 5)$ or their $9 \times 13$                  | M1dep | oe                                           |
|    | 117                                                                                                                               | A1    | SC1 43.81 or 43.87 or 43.88 or 43.94         |
|    | <b>Alternative method 2: sets up and solves an equation</b>                                                                       |       |                                              |
|    | $\frac{8}{5} = \frac{x+27}{x}$ or $x = 45$<br>or<br>$\frac{8}{5} = \frac{y}{y-27}$ or $y = 72$<br>or<br>$\frac{(8-5)w}{8+5} = 27$ | M1    | oe equation<br>any letter                    |
|    | their $45 +$ their $45 + 27$<br>or<br>their $72 +$ their $72 - 27$<br>or<br>$27 \times (8 + 5) \div (8 - 5)$                      | M1dep | oe                                           |
|    | 117                                                                                                                               | A1    | SC1 43.81 or 43.87 or 43.88 or 43.94         |

The mark scheme for question 12 continues on the next page

|                    |                                                                                     |       |                                                                                                                        |
|--------------------|-------------------------------------------------------------------------------------|-------|------------------------------------------------------------------------------------------------------------------------|
| <b>12<br/>cont</b> | <b>Alternative method 3: trial and improvement with values in the correct ratio</b> |       |                                                                                                                        |
|                    | 8, 16, 24, 32, 40, 48, 56, 64, 72...<br>and<br>5, 10, 15, 20, 25, 30, 35, 40, 45... | M1    | repeated multiples of 8 and 5 until the difference is 27<br>if the lists continue, 72 or 45 must be identified or used |
|                    | 72 + 45                                                                             | M1dep | oe                                                                                                                     |
|                    | 117                                                                                 | A1    | SC1 43.81 or 43.87 or 43.88 or 43.94                                                                                   |
|                    | <b>Additional Guidance</b>                                                          |       |                                                                                                                        |
|                    | SC1 is for thinking Oscar has £27, with rounding at different stages                |       |                                                                                                                        |

| <b>Q</b>  | <b>Answer</b> | <b>Mark</b> | <b>Comments</b>                                                                                                                                                                                                                            |
|-----------|---------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>13</b> | 61            | B2          | B1 ( $c =$ ) $4^3$ oe or ( $c =$ ) 64<br>and ( $d =$ ) $5^3$ oe or ( $d =$ ) 125<br><b>or</b><br>their answer comes from $x^3 - (x - 1)^3$ correctly calculated, where $x$ is an integer $\neq 5$ eg answer 91 from $216 - 125$<br>SC1 –61 |
|           |               |             | <b>Additional Guidance</b>                                                                                                                                                                                                                 |
|           |               |             | SC1 is for $c - d$                                                                                                                                                                                                                         |
|           |               |             | Do not allow 64 or 125 seen in a list if not identified or used                                                                                                                                                                            |

| Q                   | Answer                                                                                                                                                                                                                                                                                                                   | Mark  | Comments |     |     |     |     |     |       |     |     |     |     |    |                           |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|----|---------------------------|
| 14(a)               | <table><tr><td><math>x</math></td><td><math>-1</math></td><td><math>0</math></td><td><math>1</math></td><td><math>2</math></td><td><math>3</math></td></tr><tr><td><math>y</math></td><td><math>0.5</math></td><td><math>1</math></td><td><math>2</math></td><td><math>4</math></td><td><math>8</math></td></tr></table> | $x$   | $-1$     | $0$ | $1$ | $2$ | $3$ | $y$ | $0.5$ | $1$ | $2$ | $4$ | $8$ | B2 | oe<br>B1 2 correct values |
|                     | $x$                                                                                                                                                                                                                                                                                                                      | $-1$  | $0$      | $1$ | $2$ | $3$ |     |     |       |     |     |     |     |    |                           |
|                     | $y$                                                                                                                                                                                                                                                                                                                      | $0.5$ | $1$      | $2$ | $4$ | $8$ |     |     |       |     |     |     |     |    |                           |
| Additional Guidance |                                                                                                                                                                                                                                                                                                                          |       |          |     |     |     |     |     |       |     |     |     |     |    |                           |
| Mark the table only |                                                                                                                                                                                                                                                                                                                          |       |          |     |     |     |     |     |       |     |     |     |     |    |                           |

| Q     | Answer                                                                                                                                            | Mark | Comments                                                                                                             |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------------------------------------------------------------------------------------------------------------|
| 14(b) | 4 or 5 points plotted correctly                                                                                                                   | M1   | correct or fit their table in (a)<br>$\pm \frac{1}{2}$ square<br>points may be implied by graph passing through them |
|       | Correct smooth curve                                                                                                                              | A1   | $\pm \frac{1}{2}$ square for the five correct points                                                                 |
|       | Additional Guidance                                                                                                                               |      |                                                                                                                      |
|       | Ignore extra points plotted with different x-coordinates                                                                                          |      |                                                                                                                      |
|       | Two points with the same integer x-coordinate, with the curve going through neither, is choice for plotting of that point and therefore incorrect |      |                                                                                                                      |
|       | Ignore the curve drawn outside $(-1, 0.5)$ and $(3, 8)$                                                                                           |      |                                                                                                                      |
|       | For tolerance, $\pm \frac{1}{2}$ square can be vertically or horizontally                                                                         |      |                                                                                                                      |
|       | Ruled straight lines                                                                                                                              |      | A0                                                                                                                   |

| Q  | Answer                                                                                                                                                              | Mark  | Comments |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------|
| 15 | <b>Alternative method 1: from triangle ADC</b>                                                                                                                      |       |          |
|    | $CAB = 20$                                                                                                                                                          | M1    |          |
|    | $ACB = 180 - 20 - 20$<br>or $ACB = 140$ or $ACD = 40$                                                                                                               | M1dep | oe       |
|    | $ADC = 90$ or $ADB = 90$                                                                                                                                            | M1    |          |
|    | 50                                                                                                                                                                  | A1    |          |
|    | <b>Alternative method 2: from triangle ADB</b>                                                                                                                      |       |          |
|    | $ADC = 90$ or $ADB = 90$                                                                                                                                            | M1    |          |
|    | $DAB = 180 - 90 - 20$<br>or $DAB = 70$                                                                                                                              | M1dep | oe       |
|    | $CAB = 20$                                                                                                                                                          | M1    |          |
|    | 50                                                                                                                                                                  | A1    |          |
|    | <b>Additional Guidance</b>                                                                                                                                          |       |          |
|    | Angles may be seen on the diagram throughout                                                                                                                        |       |          |
|    | For an incomplete method, for angles not marked in the correct position on the diagram the correct 3-letter codes must be given, but condone $D$ for $ADC$ or $ADB$ |       |          |
|    | $ADC = 90$ or $ADB = 90$ may be designated by a square at the angle                                                                                                 |       |          |

| Q  | Answer                                   | Mark | Comments                         |
|----|------------------------------------------|------|----------------------------------|
| 16 | All three correct                        | B3   | B2 two correct<br>B1 one correct |
|    | <b>Additional Guidance</b>               |      |                                  |
|    |                                          |      | B3                               |
|    | Two lines from a left-hand box is choice |      |                                  |

## MARK SCHEME – GCSE MATHEMATICS – 8300/1H – JUNE 2025

| Q     | Answer                                                                                         | Mark | Comments                                                                                                                                                             |
|-------|------------------------------------------------------------------------------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17(a) | $\frac{5}{6}$ Raining No<br>and<br>$\frac{4}{13}$ Raining Yes, Bus on time Yes                 | B1   |                                                                                                                                                                      |
|       | $\frac{8}{13}$ Raining No, Bus on time Yes<br>and<br>$\frac{5}{13}$ Raining No, Bus on time No | B1ft | both correct<br><b>or</b><br>ft $2 \times \text{their } \frac{4}{13}$<br>and $1 - (2 \times \text{their } \frac{4}{13})$<br>where their $\frac{4}{13} < \frac{1}{2}$ |
|       | <b>Additional Guidance</b>                                                                     |      |                                                                                                                                                                      |
|       | oe fractions, decimals or percentages throughout                                               |      |                                                                                                                                                                      |

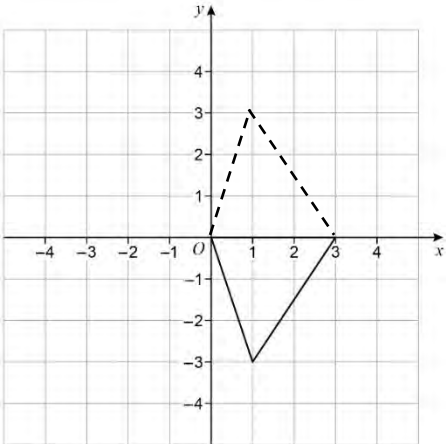
| Q     | Answer                                                              | Mark | Comments                           |
|-------|---------------------------------------------------------------------|------|------------------------------------|
| 17(b) | $\frac{1}{6} \times \frac{9}{13}$                                   | M1   | oe<br>may be seen on tree diagram  |
|       | $\frac{9}{78}$ or $\frac{3}{26}$                                    | A1   | oe fraction, decimal or percentage |
|       | <b>Additional Guidance</b>                                          |      |                                    |
|       | Ignore any attempt to simplify or convert after correct answer seen |      |                                    |
|       | There is no follow through for incorrect values                     |      |                                    |

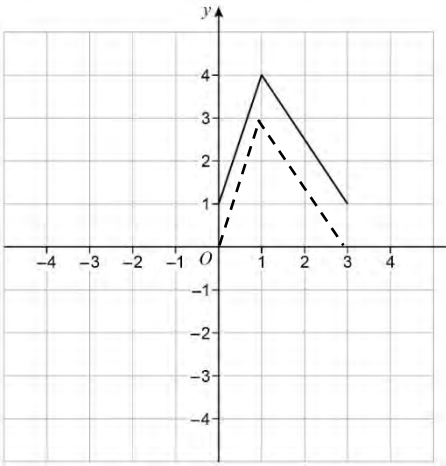
| Q  | Answer                                                                                                                                                                       | Mark | Comments                                                                                                                                                                                                                                                                                                     |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 18 | $\sin 30 = \frac{1}{2}$<br>and<br>$\cos 45 = \frac{1}{\sqrt{2}}$ or $\frac{\sqrt{2}}{2}$<br>and<br>$\tan 60 = \sqrt{3}$                                                      | M2   | oe<br>eg $\frac{1}{2} \times \frac{1}{\sqrt{2}}$ or $\frac{1}{2} \times \frac{\sqrt{2}}{2}$ or $\frac{1}{2\sqrt{6}}$<br>may be seen in a table<br>implied by position in a calculation<br>eg $\frac{1}{2} \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{3}}$ is correct for M2<br>M1 1 or 2 correct values |
|    | $\frac{\sqrt{6}}{12}$ with all three correct values<br>seen                                                                                                                  | A1   | oe in the form $\frac{\sqrt{a}}{b}$ eg $\frac{\sqrt{24}}{24}$<br>condone $a = 6$ and $b = 12$ with all three correct values seen                                                                                                                                                                             |
|    | <b>Additional Guidance</b>                                                                                                                                                   |      |                                                                                                                                                                                                                                                                                                              |
|    | Allow $\sqrt{1}$ for 1 throughout                                                                                                                                            |      |                                                                                                                                                                                                                                                                                                              |
|    | Allow, eg $\frac{\sqrt{3}/2}{1/2}$ for tan 60                                                                                                                                |      |                                                                                                                                                                                                                                                                                                              |
|    | Correct answer from $\frac{1}{\sqrt{2}} \times \frac{1}{2}$ scores only M1 for tan 60 unless the correct values are attributed to sin 30 and cos 45 elsewhere in the working |      |                                                                                                                                                                                                                                                                                                              |
|    | Do not allow further work eg $\frac{\sqrt{6}}{12} = \frac{\sqrt{1}}{2}$ (with all three correct values seen)                                                                 | M2A0 |                                                                                                                                                                                                                                                                                                              |

| Q     | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                 | Mark | Comments                                                                                                                                                                                                                                                                         |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 19(a) | $\frac{64}{27}$ or $2\frac{10}{27}$                                                                                                                                                                                                                                                                                                                                                                                                    | B3   | B2<br>shows understanding of at least two of <ul style="list-style-type: none"> <li>a negative index means reciprocal</li> <li>an index of <math>\frac{1}{2}</math> means square root</li> <li>an index of 3 means cube</li> </ul> B1<br>shows understanding of one of the above |
|       | <b>Additional Guidance</b>                                                                                                                                                                                                                                                                                                                                                                                                             |      |                                                                                                                                                                                                                                                                                  |
|       | Condone missing brackets                                                                                                                                                                                                                                                                                                                                                                                                               |      |                                                                                                                                                                                                                                                                                  |
|       | Allow equivalent decimals, fractions or mixed numbers throughout                                                                                                                                                                                                                                                                                                                                                                       |      |                                                                                                                                                                                                                                                                                  |
|       | Ignore any attempt to simplify, change to a mixed number or convert to a decimal after a correct answer is seen<br>eg $\frac{64}{27} = 2\frac{20}{27}$                                                                                                                                                                                                                                                                                 |      | B3                                                                                                                                                                                                                                                                               |
|       | Understanding can be shown in expressions which are not equivalent to the original<br>eg $\frac{27}{64}$ implies understanding of square root and cubing, but not reciprocal                                                                                                                                                                                                                                                           |      | B2                                                                                                                                                                                                                                                                               |
|       | Example B2 expressions: $\left(\frac{1/\sqrt{9}}{1/\sqrt{16}}\right)^3$ or $\left(\frac{4096}{729}\right)^{\frac{1}{2}}$ or $\left(\frac{27}{64}\right)^{-1}$                                                                                                                                                                                                                                                                          |      | B2                                                                                                                                                                                                                                                                               |
|       | Example B1 expressions: $\left(\frac{16}{9}\right)$ or $\left(\frac{3}{4}\right)^{-3}$ or $\left(\frac{729}{4096}\right)^{-\frac{1}{2}}$                                                                                                                                                                                                                                                                                               |      | B1                                                                                                                                                                                                                                                                               |
|       | To show understanding, correct method or value for calculation of a cube is required, but calculation of a square root is not required<br>eg1 $\left(\frac{\sqrt{9}}{\sqrt{16}}\right)^3$ only shows understanding of the square root<br>eg2 $\left(\frac{\sqrt{9}}{\sqrt{16}}\right) \times \left(\frac{\sqrt{9}}{\sqrt{16}}\right) \times \left(\frac{\sqrt{9}}{\sqrt{16}}\right)$ shows understanding of the square root and cubing |      | B1<br><br>B2                                                                                                                                                                                                                                                                     |

| Q     | Answer                                 | Mark | Comments                                                                                                                                            |
|-------|----------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 19(b) | 1.5 or $\frac{3}{2}$ or $1\frac{1}{2}$ | B2   | B1 $125^{\frac{1}{2}}$ or $(5^3)^{\frac{1}{2}}$ or $(5^{\frac{1}{2}})^3$ or $5^{\frac{3}{2}}$<br>or<br>$125 = 5^{2n}$ or $5^3 = 5^{2n}$ or $2n = 3$ |

| Q  | Answer                                         | Mark | Comments                         |
|----|------------------------------------------------|------|----------------------------------|
| 20 | $2\sqrt{11}$ and $3\sqrt{11}$ and $5\sqrt{11}$ | M2   | M1 any one or two correct values |
|    | $10\sqrt{11}$                                  | A1   | condone $a = 10$ and $n = 11$    |

| Q     | Answer                                                                                                       | Mark | Comments                                                                                                                          |
|-------|--------------------------------------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------|
| 21(a) | <p>Fully correct graph</p>  | B1   | <p>mark intention</p> <p>accept horizontal line drawn joining the two lines</p> <p>condone dashed lines</p> <p>ignore shading</p> |

| Q     | Answer                                                                                                        | Mark | Comments                                                                                                                          |
|-------|---------------------------------------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------|
| 21(b) | <p>Fully correct graph</p>  | B1   | <p>mark intention</p> <p>accept horizontal line drawn joining the two lines</p> <p>condone dashed lines</p> <p>ignore shading</p> |

| Q  | Answer                                                                                                                                                               | Mark  | Comments                                                                                |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------------|
| 22 | Correct method for finding the difference between the $x$ or $y$ coordinates for the points $E$ and $G$ (positive or negative differences)                           | M1    | eg $6 - (-18)$ or $24$<br>or<br>$3 - 9$ or $-6$<br>implied by gradient $= -\frac{1}{4}$ |
|    | Correct method for finding the difference between the $x$ or $y$ coordinates for the points $E$ and $F$ or the points $F$ and $G$ (positive or negative differences) | M1dep | eg $\frac{-18-6}{3}$ or $-8$ or $-16$<br>or<br>$\frac{9-3}{3}$ or $2$ or $4$            |
|    | $(-10, 7)$                                                                                                                                                           | A1    | SC1 $(-2, 5)$ or $(-12, 7.5)$ oe                                                        |
|    | <b>Additional Guidance</b>                                                                                                                                           |       |                                                                                         |
|    | SC1 $(-2, 5)$ is for $EF = \frac{2}{3}EG$                                                                                                                            |       |                                                                                         |
|    | SC1 $(-12, 7.5)$ is for $EF = \frac{1}{3}FG$                                                                                                                         |       |                                                                                         |
|    | Working may be seen on the diagram                                                                                                                                   |       |                                                                                         |
|    | $(-10, \dots)$ or $(\dots, 7)$                                                                                                                                       |       | M1M1                                                                                    |

| Q     | Answer                                                                            | Mark | Comments                                                                         |
|-------|-----------------------------------------------------------------------------------|------|----------------------------------------------------------------------------------|
| 23(a) | $(x + 6)^2 \dots$ or $(x + 6)(x + 6) \dots$                                       | M1   | accept $\left(x + \frac{12}{2}\right)^2$<br>implied by grid for $(x + 6)(x + 6)$ |
|       | $(x + 6)^2 + 14$                                                                  | A1   | condone $a = 6$ and $b = 14$                                                     |
|       | <b>Additional Guidance</b>                                                        |      |                                                                                  |
|       | $(x + 6)^2$ may be $(x + 6)(x + 6)$ or $(6 + x)^2$ or $(x + 6)(6 + x)$ throughout |      |                                                                                  |

| Q     | Answer      | Mark | Comments               |
|-------|-------------|------|------------------------|
| 23(b) | $(+ )3, -8$ | B2   | B1 for each coordinate |

| Q  | Answer                                                                                                                                     | Mark  | Comments                                                                                                                                                                                                                           |
|----|--------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 24 | Partially or fully factorises numerator                                                                                                    | M1    | eg $15x(4x^3 - x)$ or $x^2(60x^2 - 15)$<br>or $15x^2(2x - 1)(2x + 1)$                                                                                                                                                              |
|    | Factorises at least one denominator<br>or<br>correct multiplication of the denominators                                                    | M1    | eg $-(2x + 1)$ and/or $3(2x - 1)$<br><br>eg $-12x^2 + (6x - 6x +) 3$<br>may be in a grid                                                                                                                                           |
|    | Converts numerators and denominators into terms which can be fully cancelled                                                               | M1dep | dep on M1M1<br>eg $\frac{15x^2(2x-1)(2x+1)}{-(2x+1)3(2x-1)}$<br>or $\frac{15x^2(2x-1)(2x+1)}{-(2x+1)} \times \frac{1}{3(2x-1)}$<br>or $\frac{5x^2(12x^2-3)}{-(12x^2-3)}$<br><br>factorisation and cancelling may be done in stages |
|    | $\frac{15x^2}{-3}$ or $-5x^2$ with M3 awarded<br>and<br>explanation that $x^2$ cannot be negative                                          | A1    | oe with full cancelling of algebraic terms<br><br>condone explanation that $x^2$ must be positive                                                                                                                                  |
|    | <b>Additional Guidance</b>                                                                                                                 |       |                                                                                                                                                                                                                                    |
|    | $\frac{20x^4 - 5x^2}{(-2x-1)(2x-1)}$ or $\frac{20x^4 - 5x^2}{-4x^2 + 1}$ implies M1M1 as 3 has been cancelled from both                    |       | M1M1                                                                                                                                                                                                                               |
|    | $\frac{5x^2(2x+1)}{-(2x+1)}$ implies complete factorisation of numerator and denominator as 3 and $(2x - 1)$ have been cancelled from both |       | M1M1M1                                                                                                                                                                                                                             |

| Q  | Answer                                                                                                                                                                                                                                                                                                                   | Mark  | Comments                                                                                                                                 |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------------------------------------------------------------------------------------------------------------------|
| 25 | $\frac{6}{n}$ or $\frac{5}{n-1}$                                                                                                                                                                                                                                                                                         | M1    | may be seen on a tree diagram                                                                                                            |
|    | $\frac{6}{n} \times \frac{5}{n-1} = \frac{1}{8}$                                                                                                                                                                                                                                                                         | M1dep | oe eg $n(n-1) = 240$                                                                                                                     |
|    | Correctly rearranges their equation, which must be correct or of the form $\frac{6}{n} \times \frac{a}{n+b} = \frac{1}{8}$ , where $a$ and $b$ are integers, into a quadratic equation with brackets expanded and no unknowns in denominators                                                                            | M1dep | dep on 1st M1<br>$n^2 - n = 240$ or $n^2 - n - 240 = 0$<br>implies M1M1M1                                                                |
|    | For their three-term quadratic, correctly factorises<br><br>or correctly substitutes into the quadratic formula<br><br>or correctly completes the square to the form $n = \dots$ for their quadratic<br>or<br>-15 and 16                                                                                                 | M1    | eg $(n+15)(n-16) (= 0)$<br>eg $\frac{- -1 \pm \sqrt{(-1)^2 - 4 \times 1 \times -240}}{2 \times 1}$<br>eg $\frac{1}{2} \pm \sqrt{240.25}$ |
|    | 16 with at least the first two marks awarded                                                                                                                                                                                                                                                                             | A1    | SC1 16 with no other marks awarded and not from incorrect working                                                                        |
|    | <b>Additional Guidance</b>                                                                                                                                                                                                                                                                                               |       |                                                                                                                                          |
|    | Accept the use of any letter throughout                                                                                                                                                                                                                                                                                  |       |                                                                                                                                          |
|    | 16 from trial and improvement, or without working                                                                                                                                                                                                                                                                        |       | SC1                                                                                                                                      |
|    | $\frac{6}{n} \times \frac{5}{n} = \frac{1}{8}$ , $n^2 = 240$ , $n = 4\sqrt{15}$                                                                                                                                                                                                                                          |       | M1M0M1<br>M0A0                                                                                                                           |
|    | The second mark may be awarded for work done in stages<br>eg $\frac{6}{n} \times \frac{5}{n-1} = \frac{36}{n(n-1)}$ then $\frac{36}{n(n-1)} = \frac{1}{8}$ implies $\frac{6}{n} \times \frac{5}{n-1} = \frac{1}{8}$<br><br>(36 should be 30, which does not affect these marks but means they cannot get the third mark) |       | M1M1                                                                                                                                     |