AQA Qualifications

# GCSE
# MATHEMATICS

## Unit 2 43602F
## Mark scheme

43602F
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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 Assessment Writer.

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.

Further copies of this Mark Scheme are available from aqa.org.uk

# 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.

| | |
|---|---|
| **M** | Method marks are awarded for a correct method which could lead to a correct answer. |
| **M dep** | A method mark dependent on a previous method mark being awarded. |
| **A** | 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** | Marks awarded independent of method. |
| **B dep** | A mark that can only be awarded if a previous independent mark has been awarded. |
| **ft** | Follow through marks. Marks awarded following a mistake in an earlier step. |
| **SC** | Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth. |
| **oe** | Or equivalent. Accept answers that are equivalent.<br>eg, accept 0.5 as well as $\frac{1}{2}$ |
| **[*a*, *b*]** | Accept values between *a* and *b* inclusive. |

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

**Questions which ask candidates to show working**

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

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

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

**Misread or miscopy**

Candidates often copy values from a question incorrectly. If the examiner thinks that the candidate 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.

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **1(a)** | 1600 ÷ 300<br>or<br>5.(…)<br>or<br>300 × 5 or 1500<br>or<br>300, 600, 900, 1200, 1500<br>or<br>1600, 1300, 1000, 700, 400, 100 | M1 | oe<br><br>oe mixed number<br><br>oe<br><br>allow one error in adding or subtracting 300 |
| | 5 | A1 | |
| **1(b)** | 100 | B1ft | ft only for answer in part (a) **not 5** and correct evaluation of 1600 – their 1500 from part (a) if 1300 < their 1500 ≤ 1600 |
| **2(a)** | 30 016 | B1 | condone 30,016 or 30‘016 |
| **2(b)** | zero point four three<br>or<br>nought point four three<br>or<br>point four three<br>or<br>forty three hundredths | B1 | |
| **2(c)** | (nine) hundred(s) or 900 or 100(s) | B1 | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **3** | 3 × 80 or 240<br>or<br>3 × 0.8(0) or 2.4(0) | M1 | oe |
| | 10 × 50 or 500<br>or<br>10 × 0.5(0) or 5(.00) | M1 | oe |
| | 7.40 | Q1ft | Strand (i) correct money notation<br>ft only if M1M0 or M0M1 awarded and a correct total of two amounts given in money notation as a multiple of 10p |
| **4(a)** | 120, 150 and 180 with none incorrect | B2 | any order<br>B1 Two correct multiples in range with at most one incorrect<br>or all three correct with any other multiples of 30<br>or another group of exactly three multiples of 30 |
| **4(b)** | 8 | B1 | |
| **5(a)** | 35 and 65 | B1 | |
| **5(b)** | 34 and 76 | B1 | |
| **5(c)** | 76 | B1 | |
| **5(d)** | 21 | B1 | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **6(a)** | $8 \times 5 - 2 \times 4^2$ (=) 8 | B2 | B1 $8 \times 5 - 2 \times 4^2$ or 8 |
| **6(b)** | 19 | B1 | |
| **6(c)** | $2n^2 + 2n - 2n^2$ or $2n(n + 1 - n)$ | B1 | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| 7 | **Alternative method 1** | | |
| | 25 × 4 or 100<br>or<br>25 × 12 or 300 | M1 | oe |
| | their 100 × 12<br>or<br>their 300 × 4<br>or<br>1200 | M1 | oe |
| | 2600 ÷ 2 or 1300 | M1 | oe |
| | 1200 and 1300 | A1 | |
| | No and 1200 and 1300 | Q1ft | Strand (iii)<br>at least M2 scored and correct decision for their values |
| | **Alternative method 2** | | |
| | 2600 ÷ 2 or 1300<br>or<br>2600 ÷ 4 or 650 | M1 | oe |
| | their 1300 ÷ 4<br>or<br>their 650 ÷ 2<br>or<br>325 | M1 | oe |
| | 25 × 12 or 300 | M1 | oe |
| | 300 and 325 | A1 | |
| | No and 300 and 325 | Q1ft | Strand (iii)<br>at least M2 scored and correct decision for their values |
| | **Alternative method 3 and 4 (next page)** | | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **Q7 continued** | **Alternative method 3** | | |
| | 2600 ÷ 2 or 1300<br>or<br>2600 ÷ 4 or 650 | M1 | oe |
| | their 1300 ÷ 4<br>or<br>their 650 ÷ 2 or 325 | M1 | oe |
| | their 325 ÷ 12 | M1 | oe |
| | 27.(…) | A1 | |
| | No and 27.(…) | Q1ft | Strand (iii)<br>at least M2 scored and correct decision for their 27.(…) |
| | **Alternative method 4** | | |
| | 2 × 25 or 50<br>or<br>4 × 25 or 100 | M1 | oe |
| | their 50 × 4<br>or<br>their 100 × 2<br>or<br>200 | M1 | oe |
| | their 200 × 12 or 8 × 25 × 12 | M1 | oe |
| | 2400 | A1 | |
| | No and 2400 | Q1ft | Strand (iii)<br>at least M2 scored and correct decision for their 2400 |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **8** | Correct order **and** all four correct values seen in same format<br>3, 3.15, 3.25, 3.5(0)<br>or 3, $3\frac{15}{100}$ , $3\frac{25}{100}$ , $3\frac{50}{100}$<br>or 3, $3\frac{3}{20}$ , $3\frac{1}{4}$ , $3\frac{1}{2}$<br>or 300(%), 315(%), 325(%), 350(%)<br>or $\sqrt{9}$ , 3.15, $\frac{13}{4}$ , $3\frac{1}{2}$ after values seen in same format | B3 | oe<br>B2 all four correct values in same format<br>or<br>three correct values in same format and correct order for their values<br>B1 three correct values in same format<br>SC1 $\sqrt{9}$ , 3.15, $\frac{13}{4}$ , $3\frac{1}{2}$ with no working |
| **9(a)** | 90 | B1 | |
| **9(b)** | 240 | B1 | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| 9(c) | **Alternative method 1** | | |
| | 410 | B1 | |
| | 150 + 6 × 50 or 450 | M1 | oe<br>450 – 410 is B1M1 |
| | A and 40 | A1ft | ft their 410 (value indicated for law firm A)<br>A and 40 is B1M1A1 |
| | **Alternative method 2** | | |
| | 410 | B1 | |
| | Line from (90, 150) to (270, 450) | M1 | |
| | A and 40 | A1ft | ft their 410 (value indicated for law firm A)<br>A and 40 is B1M1A1 |
| 10 | 3 × coin value<br>or 3(p) or 6(p) or 15(p) or 30(p) or 60(p) or 150(p) or (£)1.50 | M1 | coin value = 1p, 2p, 5p, 10p, 20p, 50p |
| | (£) 2.(00) – their 3 × coin value<br>or 197(p) or 194(p) or 185(p) or 170(p) or 140(p) or 50(p) | M1 | oe in pounds |
| | their (200 – their 3 × coin value) ÷ 4 | M1 dep | dependent on second M1 |
| | 35<br>or 49.25 or 48.5 or 46.25 or 42.5 or 12.5 | A1 | ignore truncation or rounding after correct value seen<br>SC1 any correct trial: chooses cost of one orange and works out change for four oranges |
| 11 | $\frac{1}{2} \times \frac{1}{3}$ | M1 | oe |
| | $\frac{1}{6}$ | A1 | oe |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **12** | **Alternative method 1** | | |
| | (8$x$ =) 30 + 10 or (8$x$ =) 40 | M1 | |
| | 5 | A1 | SC1 2.5 or $\frac{20}{8}$ oe |
| | **Alternative method 2** | | |
| | $x - \frac{10}{8} = \frac{30}{8}$<br>or $x = \frac{30}{8} + \frac{10}{8}$<br>or their (30 + 10) ÷ 8 | M1 | |
| | 5 | A1 | SC1 2.5 or $\frac{20}{8}$ oe |
| **13** | =<br>><br>> | B1<br>B1<br>B1 | |
| **14(a)** | $x$ = 2 | B1 | |
| **14(b)** | Correct straight line drawn | B1 | at least 3 diagonal squares long |
| **14(c)** | 2, 2 | B1ft | ft their intersection with line A only if B0 in part (b) |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| 15 | **Alternative method 1** | | |
| | 2476 ÷ (3 + 1) or 619 | M1 | oe |
| | their 619 × (3 – 1) or their 619 × 2<br>or<br>2476 ÷ (3 – 1) or 2476 ÷ 2<br>or<br>their 619 × 3 – their 619<br>or<br>(2476 – their 619) – their 619<br>or<br>1857 – 619 | M1 | oe |
| | 1238 | A1 | |
| | **Alternative method 2** | | |
| | (3 + 1) ÷ (3 – 1) or 4 ÷ 2<br>or<br>(3 – 1) ÷ (3 + 1) or 2 ÷ 4 | M1 | oe |
| | 2476 ÷ their 2<br>or 2476 × their $\frac{1}{2}$ | M1 | oe |
| | 1238 | A1 | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **16** | $\frac{170}{100}\times 20$ or $\frac{170}{10}\times 2$ or $17 \times 2$ or $34$<br>or<br>$\frac{170}{100}\times 80$ or $\frac{170}{10}\times 8$ | M1 | oe<br>(Tablet World) |
| | 136 | A1 | |
| | $180 \div 4$ or $45$<br>or<br>$180\times\frac{3}{4}$ | M1 | oe<br>(IT Supplies) |
| | 135 | A1 | |
| | 138 | B1 | (PC Heaven) |
| | IT Supplies | Q1ft | Strand (iii)<br>ft for correct decision based on their values, must have both method marks and a total for PC Heaven |
| **17(a)** | $a - 6b$ or $-6b + a$ | B2 | B1 (1)a or – 6b |
| **17(b)** | $m(m - 2)$<br>or $m \times (m - 2)$<br>or $(m - 2)m$<br>or $(m - 2) \times m$ | B1 | |
| **17(c)** | $5x^2 - 15x$<br>or $-15x + 5x^2$ | B2 | B1 $5x^2$ or $-15x$ |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **18** | 23, 25 and 29 | B2 | any order<br>B1 three correct and one incorrect<br>or two correct and none or one incorrect<br>SC1<br>any three or all four of 21, 22, 26 and 27 with no other number |
| **19** | A correct pair of fractions meeting all conditions<br>eg $\frac{1}{9}$ and $\frac{2}{9}$ or $\frac{1}{12}$ and $\frac{1}{4}$ | B3 | B2<br>a pair of fractions which add to $\frac{1}{3}$ but which do not satisfy all conditions<br>eg, $\frac{1}{6}$ and $\frac{1}{6}$ or $\frac{2}{3}$ and $-\frac{1}{3}$<br>or $\frac{1}{3}$ – any fraction less than $\frac{1}{3}$ correctly changed to common denominator with at least one numerator correct<br><br>B1<br>$\frac{1}{3}$ changed to any equivalent fraction<br>$\frac{2}{6}, \frac{3}{9}, \frac{4}{12}, \ldots$<br>or<br>$\frac{1}{3}$ – any fraction less than $\frac{1}{3}$ |