# GCSE
# MATHEMATICS

**NEW PRACTICE PAPER SET 2** Foundation Tier Paper 1
Mark Scheme (Published November 2015)

8300/1F

Version 1.0

In Spring 2015, students across the country took this set of practice papers as a Mock Examination. Principal Examiners have marked the papers and these mark schemes have, therefore, been through the normal process of standardisation. For some questions, Principal Examiners have written Additional Guidance based on responses seen.

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.

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.

| | |
|---|---|
| **M** | Method marks are awarded for a correct method which could lead to a correct answer. |
| **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. |
| **ft** | Follow through marks. Marks awarded for correct working following a mistake in an earlier step. |
| **SC** | Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth. |
| **M dep** | A method mark dependent on a previous method mark being awarded. |
| **B dep** | A mark that can only be awarded if a previous independent mark has been awarded. |
| **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. |
| **3.14 …** | Allow answers which begin 3.14 eg 3.14, 3.142, 3.1416 |
| **Use of brackets** | 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**

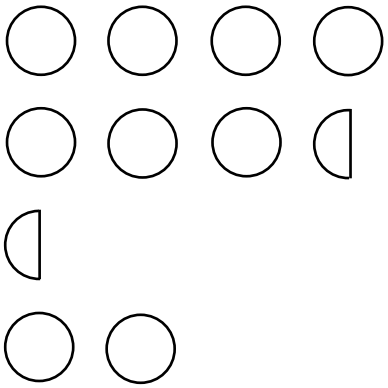
Erased or crossed out work that is still legible should be marked.

**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.

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **1** | 76 | B1 | |
| **2** | < | B1 | |
| **3** | $x = 63$ | B1 | |
| **4** | $2 \times y \times y$ | B1 | |
| **5** | Fully correct with circles left aligned  | B3 | B2 for 3 rows correct<br>B1 for 1 or 2 rows correct<br>SC1 for pictogram with symbols in correct ratio<br>eg 8 circles on 1st row, 7 circles on 2nd row, 1 circle on 3rd row and 4 circles on 4th row |
| | **Additional Guidance** | | |
| | Accept D for half circle | | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| 6(a) | 200 ÷ 5 or 40<br>or 200 × 3 or 600<br>or $\frac{3}{5}$ × 200<br>or 0.6 × 200 | M1 | |
| | 120 | A1 | |
| | **Additional Guidance** | | |
| | | | |
| 6(b) | Attempt to divide 12.6 by 2 or 6.3 | M1 | |
| | 32.1 | A1 | SC1 for 19.2 |
| | **Additional Guidance** | | |
| | | | |
| 7 | $10a + 3b$ | B2 | B1 for one term correct<br>Do **not** ignore further work for B2 |
| | **Additional Guidance** | | |
| | $10a + 3b = 13ab$ | | B1B0 |
| 8 | $\frac{3}{8}$ | B1 | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| 9(a) | 57 | B1 | |
| | **Additional Guidance** | | |
| | | | |
| 9(b) | 27 + 3 or 30 seen | M1 | |
| | 6 | A1 | SC1 for 150 or 4.8 |
| | **Additional Guidance** | | |
| | | | |
| 9(c) | $5x - 3$ | B1 | Allow $y = 5x - 3$ |
| | **Additional Guidance** | | |
| | Allow $x \times 5 - 3$ or $y = x \times 5 - 3$ | | B1 |
| | Do not allow $x = 5x - 3$ | | B0 |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| 10(a) | $12 \times 3$ or 36 and $3 \times -2$ or –6 | M1 | oe |
| | 30 | A1 | |
| | **Additional Guidance** | | |
| | | | |
| 10(b) | $\frac{16}{20}$ ($\times$ 100) | M1 | oe<br>eg $\frac{4}{5}$ |
| | 80 | A1 | |
| | **Additional Guidance** | | |
| | | | |
| 10(c) | 3 and –2 and –2 seen or implied | M1 | oe<br>eg 38, 36, 34<br>33, 31, 34<br>33, 36, 34 |
| | 1 correct<br>0 no attempt (accept if blank)<br>2 incorrect | A1 | Must interpret correctly |
| | **Additional Guidance** | | |
| | | | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **11(a)** | $2n + 2$ | B1 | |

| | | | |
|---|---|---|---|
| **11(b)** | Yes and valid reason | B1 | eg $2(n + 1)$<br>$2n + 2$ is a multiple of 2<br>$2n + 2$ is divisible by 2<br>It is the 2 times table<br>It is a multiple of 2<br>It starts even and then add 2 each time |
| | **Additional Guidance** | | |
| | Even + even = even | | B1 |
| | Even + 2 = even | | B1 |
| | Because you add 2 all the time | | B0 |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **12** | 50 ÷ 12 or 4.1… 4 r 2 or 4<br>or 12, 24, 36, 48 and 60 seen | M1 | oe |
| | 32 ÷ 15 or 2.1… 2 r 2 or 2<br>or 15, 30 and 45 seen | M1 | oe |
| | 5 or 3 | A1 | From either M1 |
| | 8 | A1 | |
| | **Additional Guidance** | | |
| | | | |
| **13** | $4x + 2x + 90 = 180$ | M1 | oe<br>60 and/or 30 in correct place on diagram |
| | $4x + 2x = 180 - 90$<br>or $6x = 90$<br>or $4x = 60$<br>or $2x = 30$ | M1dep | oe<br>Collecting terms |
| | 15 | A1 | |
| | **Additional Guidance** | | |
| | | | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| 14(a) | 144 and 36 | B2 | Any order<br>B1 for two square numbers with a total greater than 100<br>or<br>for 12 and 6 seen<br>or $12^2$ and $6^2$ |
| | **Additional Guidance** | | |
| | | | |
| 14(b) | No and two square numbers correctly added to give an odd number | B1 | eg No and 4 + 9 = 13<br>No and $2^2 + 3^2 = 13$ |
| | **Additional Guidance** | | |
| | Even square + odd square = odd number (correctly evaluated) with No | | B1 |
| | 4 + 9 = 13 (Not stated No) | | B0 |
| 15(a) | 1993 | B1 | |
| 15(b) | 2021 | B1 | |
| | **Additional Guidance** | | |
| | | | |
| 15(c) | Valid reason | B1 | eg<br>2009 + multiple of 4 can never be a multiple of 4<br>Always 1 year after a leap year<br>Always in an odd year |
| | **Additional Guidance** | | |
| | 09 is not a leap year and every 4 years | | B1 |
| | 09 is not divisible by 4 | | B0 |
| | Always between leap years | | B0 |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| 16 | **Alternative method 1** | | |
| | 16 or –9 or 7 | M1 | |
| | 28 | A1 | |
| | **Alternative method 2** | | |
| | $8x + 12y$<br>or 64 or –36 | M1 | |
| | 28 | A1 | |
| | **Additional Guidance** | | |
| | | | |
| 17 | $5(3x + 7y - 8z)$ | B1 | |
| | **Additional Guidance** | | |
| | | | |

| Q | Answer | Mark | Comments |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 18(a) | $\frac{1}{5}$ | B1 | oe |
| | **Additional Guidance** | | |
| | | | |

| | | | |
|---|---|---|---|
| 18(b) | **Alternative method 1** | | |
| | 25 outcomes for 2 spins | M1 | Implied by a probability with denominator 25 or by a 5 by 5 possibility space diagram |
| | All 6 ways of getting a total of 4 identified. | M1 | eg in a possibility space diagram or in a list |
| | $\frac{6}{25}$ | A1 | oe<br>No incorrect totals should be seen for this mark. |
| | **Alternative method 2** | | |
| | $\frac{2}{5} \times \frac{2}{5}$ or $\frac{1}{5} \times \frac{1}{5}$ | M1 | oe |
| | $\frac{2}{5} \times \frac{2}{5} + \frac{1}{5} \times \frac{1}{5} + \frac{1}{5} \times \frac{1}{5}$ | M1 | oe |
| | $\frac{6}{25}$ | A1 | oe |
| | **Additional Guidance** | | |
| | | | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **19(a)** | 145 + 220 (–10)<br>or 365 (–10)<br>or 355<br>or 175 + 10 or 185 | M1 | |
| | 145 + 220 – 175 (– 10)<br>or 365 – 175 (–10)<br>or 365 – 185<br>or 355 – 175<br>or 190 (–10) | M1dep | oe<br>175 + $x$ + 10 = 145 + 220 oe |
| | 180 | A1 | SC1 for 200 |
| | **Additional Guidance** | | |
| | | | |
| **19(b)** | 130 – 25 or 105 | M1 | |
| | 25 ÷ 50<br>or 0.5 or 30 minutes | M1 | oe |
| | their 105 ÷ 70 or 1.5 or<br>1 hour 30 minutes or 90 minutes | M1dep | Dependent on 1st M1 or subtracting 25 from their distance<br>oe |
| | 2 hours or 120 minutes | A1 | |
| | **Additional Guidance** | | |
| | | | |
| **19(c)** | (The journey will) take longer | B1 | oe |
| | **Additional Guidance** | | |
| | More time | | B1 |
| | (The journey will) be slower | | B0 |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| 20(a) | Both Geography and History | B1 | oe<br>eg 7 do both |
| | **Additional Guidance** | | |
| | They are in both sets | | B1 |
| 20(b) | 20 Geography only | B1 | |
| | 12 History only | B1 | |
| | 11 Neither | B1ft | Must ft from their Geography and History |
| | **Additional Guidance** | | |
| | 20, 19, 4 | | B1B0B1 |
| 21(a) | 450 ÷ (2 + 7) or 50 | M1 | oe |
| | 100 | A1 | |
| | **Additional Guidance** | | |
| | | | |
| 21(b) | 210 ÷ 7 or 30<br>or 7 ÷ 2 or 3.5<br>or 80 ÷ 2 or 40 | M1 | |
| | their 30 × 2<br>or 210 ÷ 3.5 or 60<br>or 9 × their 30<br>or their 40 × 7 or 280 | M1dep | |
| | 270 ml | A1 | SC1 for 360 |
| | **Additional Guidance** | | |
| | | | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| 22 | **Alternative method 1** | | |
| | radius = 12 ÷ 4 or 3<br>or diameter = 12 ÷ 2 or 6<br>or 12 × 12 or 144 | M1 | |
| | $\pi \times$ their $3^2$ or $9\pi$ | M1 | |
| | $4 \times \pi \times$ their $3^2$ or $36\pi$ | M1dep | |
| | $144 - 36\pi$ | A1 | Ignore attempts at factorisation<br>Do not ignore further work |
| | **Alternative method 2** | | |
| | radius = 12 ÷ 4 or 3<br>or diameter = 12 ÷ 2 or 6<br>or 6 × 6 or 36 | M1 | |
| | $\pi \times$ their $3^2$ or $9\pi$ | M1 | |
| | $36 - 9\pi$ | M1dep | |
| | $4(36 - 9\pi)$ | A1 | Ignore attempts at expansion<br>Do not ignore further work |
| | **Additional Guidance** | | |
| | $144 - 36\pi = 108\pi$ | | M1M1M1A0 |
| | $144 - 36\pi = 12(12 - 4\pi)$ (error in factorisation) | | M1M1M1A1 |
| | Accept 3.14 or better for $\pi$ for method marks | | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **23** | $\frac{10}{30}$ or $\frac{8}{20}$ seen | B1 | oe<br>0.33(…) or 0.4<br>or 33(…)% or 40% |
| | A correct probability from each bag, with attempt at a comparable form, with at least one correct | M1 | eg<br>$\frac{20}{60}$ and $\frac{24}{60}$<br>or 0.33(…) and 0.4<br>or 33(…)% and 40% |
| | No and both probabilities correct and in the same format | A1 | eg<br>Incorrect and $\frac{20}{60}$ and $\frac{24}{60}$ seen<br>No and 0.33(…) and 0.4<br>No and 33(…)% and 40% |
| | **Additional Guidance** | | |
| | | | |
| **24** | $61.6 \times 10^3$ | B1 | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| **25** | $\sqrt{98.5} < 10$ | B1 | oe May be implied by numerator is negative |
| | negative ÷ negative = positive<br>and No | B1 | |
| | **Additional Guidance** | | |
| | | | |
| **26** | $\frac{20}{100} \times 50$ or 10 | M1 | oe |
| | 2 | A1 | SC1 for 32 |
| | **Additional Guidance** | | |
| | | | |
| **27** | A pair of intersecting arcs of equal radii from ends of line with two intersections | M1 | oe |
| | Perpendicular line drawn through points of intersection | A1 | 1 mm tolerance |
| | | | |
| | **Additional Guidance** | | |
| | | | |

| Q | Answer | Mark | Comments |
|---|---|---|---|
| 28 | **Alternative method 1** | | |
| | $6^2 + 6^2$<br>or $36 + 36$<br>or $72$ | M1 | |
| | $\sqrt{6^2 + 6^2}$ or $\sqrt{72}$ | M1dep | oe |
| | $\sqrt{72} < 10$ | A1 | oe<br>eg $\sqrt{72}$ is between 8 and 9 |
| | | | |
| | **Alternative method 2** | | |
| | $3^2 + 3^2$<br>or $9 + 9$<br>or $18$ | M1 | |
| | $\sqrt{3^2 + 3^2}$ or $\sqrt{18}$ | M1dep | oe |
| | $\sqrt{18} < 5$ | A1 | oe<br>eg $\sqrt{18}$ is between 4 and 5 |
| | **Additional Guidance** | | |
| | | | |

SP/03/15