



Mark Scheme (Results)

Summer 2014

Pearson Edexcel International GCSE
Mathematics A (4MA0/1FR) Paper 1FR

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- **Types of mark**
 - M marks: method marks
 - A marks: accuracy marks
 - B marks: unconditional accuracy marks (independent of M marks)
- **Abbreviations**
 - cao – correct answer only
 - ft – follow through
 - isw – ignore subsequent working
 - SC - special case
 - oe – or equivalent (and appropriate)
 - dep – dependent
 - indep – independent
 - eeo – each error or omission

- **No working**

If no working is shown then correct answers normally score full marks

If no working is shown then incorrect (even though nearly correct) answers score no marks.

- **With working**

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If it is clear from the working that the “correct” answer has been obtained from incorrect working, award 0 marks.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

If there is no answer on the answer line then check the working for an obvious answer.

- **Ignoring subsequent work**

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: eg. Incorrect cancelling of a fraction that would otherwise be correct.

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

- **Parts of questions**

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

Apart from question 12c (where the mark scheme states otherwise) the correct answer, unless obtained from an incorrect method, should be taken to imply a correct method.

| Question | Working | Answer | Mark | Notes |
|----------|---------|---------------------------------|------|---|
| 1. (a) | | correct lines of symmetry drawn | 2 | B2 Both lines correct and no extra lines. Award B1 for either line correct with no extra lines. |
| (b) | | 2 | 1 | B1 cao |
| (c) | | 12 | 1 | B1 cao |
| | | | | Total 4 marks |

| Question | Working | Answer | Mark | Notes |
|----------|--------------|--------------------------------------|------|---|
| 2. (a) | | 5734 | 1 | B1 |
| (b) | | 0.896 | 1 | B1 Accept .896 |
| (c) (i) | 64700 + 5410 | | 3 | M1 for either 64700 or 5410 |
| | | 70110 | | A1 |
| (c) (ii) | | Seventy thousand one hundred and ten | | A1ft ft from (i), their answer from (i) stated correctly in words |
| | | | | Total 5 marks |

| Question | Working | Answer | Mark | Notes |
|----------|--|--------------------|------|--|
| 3. (a) | $1 \times 45, 3 \times 15, 5 \times 9$ | 1, 3, 5, 9, 15, 45 | 2 | B2 Award B1 for any two of 3, 5, 9, 15 with no incorrect values. Ignore repeats. |
| (b) | | 3 | 1 | B1 cao |
| | | | | Total 3 marks |

| Question | Working | Answer | Mark | Notes |
|----------|---------------------------|--------|------|--|
| 4. (a) | | 14 | 1 | B1 |
| (b) | | Add 3 | 1 | B1 Allow any correct and complete explanation. E.g. "Multiply number term by 3 then subtract 1" or "They go up in threes" or " $3n - 1$ " NB do not allow " $n + 3$ " |
| (c) | $56 - 50$ or 2×3 | | 2 | M1 for 56 and 50 or 2×3 or $2 \times (5 - 2)$ oe |
| | | 6 | | A1 cao |
| | | | | Total 4 marks |

| Question | Working | Answer | Mark | Notes |
|----------|---|-----------|------|--------------------------------|
| 5. (a) | | (3, 2) | 1 | B1 |
| (b) | | (-4, -2) | 1 | B1 |
| (c) | | trapezium | 1 | B1 |
| (d) | | 6.4 | 1 | B1 Allow 6.3 to 6.5 inclusive. |
| (e) | $2 + 4 + 7 + \text{"6.4"}$ | | 2 | M1 "6.4" denotes ft from (d) |
| | | 19.4 | | A1 ft from (d) |
| (f) | $\frac{1}{2}(2 + 7)4$ or $2 \times 4 + \frac{1}{2} \times 5 \times 4$ or $7 \times 4 - \frac{1}{2} \times 5 \times 4$ or $8 + 10$ | | 2 | M1 |
| | | 18 | | A1 cao |
| | | | | Total 8 marks |

| Question | Working | Answer | Mark | Notes |
|----------|--|--------|------|--|
| 6. (a) | $\frac{20}{4}$ | | 2 | M1 |
| | | 5 | | A1 |
| (b) | 2.7×0.03 or $0.00135 + 0.07965$ | | 2 | M1 for 2.7 or 0.00135 and 0.07965 |
| | | 0.081 | | A1 |
| (c) | | 3.5 | 1 | B1 oe |
| | | | | Total 5 marks |

| Question | Working | Answer | Mark | Notes |
|----------|---------------------------------|-------------------|------|----------------------|
| 7. (a) | | 110 | 1 | B1 |
| (b) | | English | 1 | B1 Accept E |
| (c) | | Correct bar drawn | 1 | B1 |
| (d) | $\frac{23 \times 800}{100}$ oe | | 2 | M1 |
| | | 184 | | A1 cao |
| (e) | $\frac{304}{800} \times 100$ oe | | 2 | M1 |
| | | 38 | | A1 cao |
| | | | | Total 7 marks |

| Question | Working | Answer | Mark | Notes |
|----------|--------------|-------------------|------|-----------------------------------|
| 8. | 5×3 | | 3 | M1 |
| | | 15 cm^3 | | A1 for 15 B1 for cm^3 |
| | | | | Total 3 marks |

| Question | Working | Answer | Mark | Notes |
|---|---------|----------------------|------|---|
| Accept probabilities as fractions, percentages or decimals. If any other form is seen, penalise ONCE only in this question, the first time it occurs. | | | | |
| 9. (a) (i) | | $\frac{1}{3}$ | 2 | B1 Allow 0.33 (at least 2DP) |
| (a) (ii) | | 0 | | B1 Allow $\frac{0}{3}$ but no other fractions |
| (b) | | $\frac{2}{3}$ | 1 | B1 Allow 0.66 ... or 0.67 |
| (c) | | 5, 7 4, 6 7, 9 | 2 | B2 Award B1 for any three correct. |
| (d) (i) | | $\frac{1}{9}$ | 2 | B1 Allow 0.11 (at least 2DP) ft from their complete table. Isw if correct answer seen, unless contradicted. |
| (d) (ii) | | $\frac{4}{9}$ | | B1 Allow 0.44 (at least 2DP) ft from their complete table dependent on at least one more 5 or 7 present in table. |
| | | | | Total 7 marks |

| Question | Working | Answer | Mark | Notes |
|----------|---|--------|------|--|
| 10. (a) | | 335 | 1 | B1 cao |
| (b) | | 60 | 1 | B1 cao |
| (c) | $180 - \text{"60"}$ | 120 | 1 | B1 "60" denotes ft from (b) |
| (d) | $180 - 25 - \text{"120"}$ or $\text{"60"} = z + 25$ | | 2 | M1 "120" denotes ft from (c), "60" denotes ft from (b) |
| | | 35 | | A1 ft from (b) or (c) |
| | | | | Total 5 marks |

| Question | Working | Answer | Mark | Notes |
|----------|---|----------------|------|---|
| 11. (a) | | $\frac{6}{25}$ | 3 | B1 cao |
| (b) | $48 \div 150$ | | | M1 |
| | | 0.32 | | A1 |
| (c) | $\frac{12}{90}$ or $\frac{72}{540}$ or $\frac{72 \times 1}{90 \times 6}$ or $\frac{72 \div 6}{90}$ or $\frac{2}{15} \times \frac{2}{2}$ | | 2 | M1 for a correct single fraction, which need not be simplified, except $\frac{2}{15}$ |
| | | 4 | | A1 cao |
| | | | | Total 5 marks |

| Question | Working | Answer | Mark | Notes |
|----------|--|--------|------|--|
| 12. (a) | | 18 | 1 | B1 cao |
| (b) | $5y = 39 - 4$ or $5y = 35$ or $y = \frac{39-4}{5}$ or $y + \frac{4}{5} = \frac{39}{5}$ | | 2 | M1 |
| | | 7 | | A1 |
| (c) | $6z - 15 = 4z + 11$ | | 3 | M1 for $6z - 15$ |
| | $6z - 4z = 11 + 15$ or $2z = 11 + 15$ or $6z - 4z = 26$ or $2z = 26$ or $-11 - 15 = 4z - 6z$ or $-26 = -2z$ | | | M1 For correctly collecting terms in z on one side and numbers on the other of an equation. |
| | | 13 | | A1 dep on at least one M mark awarded |
| | | | | Total 6 marks |

| Question | Working | Answer | Mark | Notes |
|----------|--|------------|------|------------------------------|
| 13. (a) | $5 : 10\ 000$ or $0.005 : 10$ | | 2 | M1 ignore any units shown |
| | | $1 : 2000$ | | A1 |
| (b) | $\frac{96}{10} \times 5$ or $\frac{1}{"2000"} \times 96(\times 1000)$ oe | | 2 | M1 |
| | | 48 | | A1 |
| | | | | Total 4 marks |

| Question | Working | Answer | Mark | Notes |
|----------|----------------------|-----------------|------|--|
| 14. (a) | | $6a - 9b$ | 2 | B1 for $6a$ B1 for $-9b$ |
| (b) | | $d(7g - 9e)$ | 2 | B2 Award B1 for d (sum or difference of any other two terms not including d which when multiplied out would give one term correct) |
| (c) | $x^2 + 2x + 5x + 10$ | | 2 | M1 For 3 correct terms out of a maximum of 4 Or for 4 correct terms ignoring signs Or for $x^2 + 7x + k$ for any non-zero value of k Or for $\dots + 7x + 10$ |
| | | $x^2 + 7x + 10$ | | A1 cao |
| | | | | Total 6 marks |

| Question | Working | Answer | Mark | Notes |
|----------|---|--------|------|--|
| 15. (a) | $\frac{1}{2} \times 8 \times 9$ or $\frac{1}{2} \times 5 \times 14$ or 36 or 35 | | 4 | M1 Correct expression for area of RQB or PQA . |
| | $\frac{1}{2} \times 4 \times 6$ or 12 | | | M1 Correct expression for area of ABS . |
| | $9 \times 14 - \frac{1}{2} \times 4 \times 6 - \frac{1}{2} \times 8 \times 9 - \frac{1}{2} \times 5 \times 14$ or $126 - 12 - 36 - 35$ | | | M1 Area of rectangle – their three triangles |
| | | 43 | | A1 |
| | Alternative: | | | |
| | $AB = \sqrt{52}$, $BQ = \sqrt{145}$, $AQ = \sqrt{221}$ | | 4 | M1 A correct method to find all 3 sides of triangle ABQ |
| | $ABQ = 97.9434\dots$ or $BQA = 28.7126\dots$ or $BAQ = 53.3438\dots$ | | | M1 A correct method to find an angle in ABQ (cosine rule or 180° — use of trig in 2 smaller triangles) |
| | $\frac{1}{2}(\sqrt{52})(\sqrt{145})\sin(97.9\dots)$ or $\frac{1}{2}(\sqrt{145})(\sqrt{221})\sin(28.7\dots)$ or $\frac{1}{2}(\sqrt{52})(\sqrt{221})\sin(53.3\dots)$ oe | | | M1 Correct use of formula $\frac{1}{2}ab\sin C$ to find area of ABQ |
| | | 43 | | A1 Must be exact answer – not from rounding. |
| | Alternative: | | | |
| | | | 4 | M2 For a correct method to find 2 sides and the correct included angle (by use of trig and angles on a straight line). |
| | | | | M1 Correct use of formula $\frac{1}{2}ab\sin C$ to find area of ABQ (see above) |
| | | 43 | | A1 Must be exact answer – not from rounding. |
| (b) | $5^2 + 14^2$ or $25 + 196$ or 221 | | 3 | M1 For squaring and adding |
| | $\sqrt{5^2 + 14^2}$ or $\sqrt{25 + 196}$ or $\sqrt{221}$ | | | M1 dep for square root |
| | | 14.9 | | A1 For answer rounding to 14.9 |
| | | | | Total 7 marks |

| Question | Working | Answer | Mark | Notes |
|----------|--|-------------------|------|--|
| 16. (a) | | 10 to 14 | 1 | B1 |
| (b) | $2 \times 2 + 6 \times 7 + 20 \times 12 + 13 \times 17 + 8 \times 22 + 3 \times 27$ or $4 + 42 + 240 + 221 + 176 + 81$ or 764 | | 4 | M2 Freq x all correct midpoint values stated or evaluated with intention to add (condone any one error). If not M2 then award M1 for all products $t \times f$ (and t is consistently within the interval, including end values) and intention to add (condone any one error) |
| | "764" \div 52 | M1 | | M1 (dep on at least M1) for division by 52. Accept their 52 if addition shown. |
| | | 14.7 | | A1 for answer rounding to 14.7 Accept 15 with working (15 without working gains NO marks). |
| (c) | $\frac{13+8+3}{52}$ | | 2 | M1 for $13 + 8 + 3$ or 24 or $\frac{a}{52}$ where $a < 52$ |
| | $\frac{24}{52}$ | $\frac{6}{13}$ oe | | A1 Accept 0.46 ... (at least 2DP) |
| | | | | Total 7 marks |

| Question | Working | Answer | Mark | Notes |
|----------|---|--------|------|--------------------------------------|
| 17. | $133.3 - 87.3$ or 46 or $\frac{133.3}{87.3}(\times 100)$ | | 3 | M1 Difference for two given years |
| | $\frac{133.3 - 87.3}{87.3}(\times 100)$ or $\frac{46}{87.3}(\times 100)$ or $\left[\frac{133.3}{87.3} - 1 \right](\times 100)$ or 0.527 | | | M1 for difference divided by 87.3 |
| | | 52.7 | | A1 for answer rounding to 52.7 |
| | | | | Total 3 marks |

| Question | Working | Answer | Mark | Notes |
|----------------|--|------------|------|---|
| 18. (a) | e.g. There are no numbers which are in both A and B . e.g. A is odd, B is even. | | 1 | B1 for a statement which indicates correct meanings of intersection and empty set. |
| (b) | | 9 | 1 | B1 |
| (c) | | 3, 7, 8, 9 | 2 | B2 Award B1 for any three correct with no extras or all four correct with only one extra. Allow in any order, with or without brackets, ignore repeats. |
| | | | | Total 4 marks |

| Question | Working | Answer | Mark | Notes |
|------------|-------------------------------|--------|------|--|
| 19. | 12π | | 3 | M1 for circumference accept value which rounds to 37.7 |
| | $30 \times 12\pi$ or 360π | | | M1 correct expression for surface area |
| | | 1130 | | A1 accept awrt 1130 (3SF) e.g. 1131 If full Surface Area given, then award 2 marks as long as you see oe in working (M1 for 12π oe). Do not isw. |
| | | | | Total 3 marks |

| Question | Working | Answer | Mark | Notes |
|----------------|---|--------------------------------|------|---|
| 20. (a) | | 4, 0, (-2) , -2 , 0, (4) | 2 | B2 Award B1 for any 2 correct. |
| (b) | $(0, 4)$, $(1, 0)$, $(2, -2)$, $(3, -2)$, $(4, 0)$, $(5, 4)$ | | 2 | M1 Plot points correctly (half square tolerance). ft their table |
| | | correct curve | | A1 Correct curve through correct points. Do not allow straight lines joining points. |
| | | | | Total 4 marks |

