# Mark Scheme (Results)

## Summer 2017

## Pearson Edexcel International GCSE In Mathematics A (4MA0) Paper 1F

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  If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

**International GCSE Maths:** Apart from Question 21, where the mark scheme states otherwise, the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.

| Q | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| **1** (a) | | 16 | 1 | B1 |
| (b) | | 26 | 1 | B1 |
| (c) | | 2 | 1 | B1 |
| (d) | | 2 correct lines drawn with no incorrect lines | 2 | B2 If not B2 then award B1 for one correct line (ignore any incorrect lines and any lines that may been drawn to assist with counting squares in (a)) |
| | | | | **Total 5 marks** |

| | | | | |
|---|---|---|---|---|
| **2** (a) | | elephant | 1 | B1 |
| (b) | | Two thousand five hundred and six | 1 | B1 Accept mis-spellings if meaning is clear |
| (c) | | 70 | 1 | B1 Accept seventy, tens, 10s |
| (d) | | 1200 | 1 | B1 |
| (e) | | 785 | 1 | B1 |
| (f) | | 540 | 1 | B1 |
| | | | | **Total 6 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **3** | (a) | | 38,45 | 2 | B2 | B1 for 38 shown as sixth term<br>B1 for 45 shown as seventh term<br>ft from their "38" + 7 |
| | (b) | | added 7 | 1 | B1 | for correct explanation<br>E.g. +7, 7 more, jumped forward by 7 oe<br>**or** $7n - 4$ |
| | (c) | $3 + 17 \times 7$ **or** $7 \times 18 - 4$ **or** $7n - 4$<br>**or**<br>3, 10, 17, 24, 31, 38, 45, 52, 59, 66, 73, 80, 87, 94, 101, 108, 115, 122<br>**or** E.g. $45 + 11 \times 7$ | | | M1 | NB: If a list is given then must show a clear intention of adding 7 with at least 4 terms after 45 (condone 1 arithmetic error)<br>E.g. 45, 52, 59, 66, 73<br>E.g. 38, 45, 52, 59, 66, 73 |
| | | | 122 | 2 | A1 | SC : B1 for answer of 115 or 129 |
| | (d) | | 234 | 1 | B1 | |
| | | | | | | **Total 6 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **4** | (a) | | 7 | 1 | B1 | |
| | (b) | | Bar with height 13 drawn | 1 | B1 | |
| | (c) | | Correct explanation | 1 | B1 | Eg $\frac{1}{4}$ of 20 is 5 (not 4); $4 \times 4 = 16$ ( MU scored 20 ); should be $\frac{1}{5}$ (not $\frac{1}{4}$ ) |
| | (d) | 20 : 2 | | | M1 | for 20 : 2 **or** an answer of 1 : 10 **or** 1 and 10 with incorrect notation |
| | | | 10:1 | 2 | A1 | allow 1 : 0.1 **or** 1 : $\frac{1}{10}$ |
| | | | | | | **Total 5 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **5** | (a) | Numbers in order 4, 8, 13, 16, 22, 36, 40, 55, 89 | | | M1 | for ascending or descending order. (condone 1 omission) |
| | | | 22 | 2 | A1 | |
| | (b) | 89 – 4 | | | M1 | or for 4 and 89 seen together E.g. 4 to 89 **or** 89 – $n$ **or** $m$ – 4 |
| | | | 85 | 2 | A1 | |
| | | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **6** | (a) | | Yellowknife | 1 | B1 | |
| | (b) | $25 - -5$ **or** $25 + 5$ **or** $-5 - 25$ | | | M1 | working may be seen on a number line |
| | | | 30 | 2 | A1 | accept $-30$ |
| | (c) | $-11 - 6$ | | | M1 | or for an answer of 17<br>working may be seen on a number line |
| | | | $-17$ | 2 | A1 | |
| | | | | | | **Total 5 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **7** | (a) | | 2 triangles shaded | 1 | B1 | |
| | (b) | | 0.4 | 1 | B1 | |
| | (c) | $6 \times 3.2 - 3 \times -4$ oe | | | M1 | for a correct substitution **or**<br>for 19.2 and (−)12 **or**<br>an answer of 7.2 |
| | | | 31.2 | 2 | A1 | |
| | | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **8** | i | | 30 | 1 | B1 | |
| | ii | | 32 | 1 | B1 | |
| | iii | | 31 or 37 | 1 | B1 | for 31 **or** 37 **or** both |
| | | | | | | **Total 3 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **9** | (a)(i) | | radius | 1 | B1 | |
| | (a)(ii) | | 28 | 1 | B1 | accept 26 – 30 |
| | (b)(i) | | 30 | 1 | B1 | |
| | (b)(ii) | | angles on a straight line add to 180° | 1 | B1 | dep on B1 in (bi)<br>**or** angles at a point add to 360°<br>(and vertically opposite angles are equal) |
| | (c)(i) | | 150 | 1 | B1 | |
| | (c)(ii) | | corresponding angles are equal | 1 | B1 | dep on B1 in (ci) |
| | | | | | | **Total 6 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **10** | (a)(i) | | Cross marked and labelled at 1 | 1 | B1 | |
| | (a)(ii) | | Cross marked and labelled at $\frac{1}{2}$ | 1 | B1 | |
| | (b) | $1 - (0.3 + 0.25)$ | | | M1 | for a complete method **or** digits 45 |
| | | | 0.45 oe | 2 | A1 | SC : B1 for an answer of 0.72 oe |
| | | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **11** (a) | | $3x^2$ | 1 | B1 | |
| (b) | | | | M1 | for $-2e$ or $9f$ |
| | | $-2e + 9f$ oe | 2 | A1 | |
| (c) | | $8ab$ | 1 | B1 | |
| (d) | | 48 | 1 | B1 | |
| (e) | E.g.<br>$5y = 14 - 2$ **or** $-5y = 2 - 14$ **or**<br>$y + \frac{2}{5} = \frac{14}{5}$ | | | M1 | for a correct first step |
| | | $\frac{12}{5}$ oe | 2 | A1 | for $\frac{12}{5}$ oe E.g. $2\frac{2}{5}$ or 2.4 |
| | | | | | **Total 7 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **12** | 120 ÷ 6 oe **or** 20 | | | M1 | for $\frac{1}{6}$ × 120 oe or 20<br>accept use of 0.16(6…) rounded or truncated to 2 or more sig figs |
| | $\frac{35}{100}\times 120$ oe **or** 42 | | | M1 | (indep)<br>for 0.35 × 120 oe or 42 |
| | 120 − ("20" + "42") | | | M1 | (dep on M2)<br>for 120 − ("20" + "42") |
| | | 58 | 4 | A1 | SC: If answer is not 58 then award<br>B3 for an answer of 57.6 − 58.8 |
| | **Alternative method**<br>16.6..(%) + 35(%) (=51.6..(%)) **or**<br>$\frac{1}{6}+\frac{35}{100}\left(=\frac{31}{60}\right)$ | | | M1 | NB. Could work in percentages or fractions or decimals;<br>throughout accept 16.6… (and other decimals) rounded or truncated to 2 or more sig figs |
| | "0.516…" × 120 oe (=62) **or**<br>1 – "0.516"… (=0.483…) **or**<br>100(%) – "51.6…"(%) = 48.3…(%) **or**<br>$1-"\frac{31}{60}"=\frac{29}{60}$ | | | M1 | |
| | 120 – "62" **or**<br>"0.483.." × 120 oe **or**<br>$"\frac{29}{60}"\times 120$ | | | M1 | |
| | | 58 | | A1 | SC: If answer is not 58 then award<br>B3 for an answer of 57.6 − 58.8 |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **13** (a) | | 18 07 | 1 | B1 | |
| (b) | 60 + (35 − 7) **or** 53 + 35 **or**<br>1 h(our) 28 m(inutes) **or** 1 : 28 | | | M1 | or for clear evidence of working from 6:07 to 7:35 e.g. use of a diagram |
| | | 88 | 2 | A1 | |
| (c) | | | | M1 | for 3 35 **or** 8 17 **or** 15 77 **or** 3 77 **or**<br>for clear attempt to add 8 h 42 min onto 7 35 |
| | | 4 17 am | 2 | A1 | SC: B1 for 04 17 **or** 4 17 **or** 4 17 pm **or** 16 17 |
| | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **14** (a) | | $5(2a + 5)$ | 1 | B1 | |
| (b) | | $w(7w - 4)$ | 1 | B1 | |
| (c) | | | | M1 | for $p^3$ or $(-)5p^2$ |
| | | $p^3 - 5p^2$ | 2 | A1 | |
| (d) | $x^2 + 7x - 3x - 21$ | | | M1 | for 3 correct terms **or**<br>4 correct terms ignoring signs **or**<br>$x^2 + 4x +$ c **or**<br>.... + $4x - 21$ |
| | | $x^2 + 4x - 21$ | 2 | A1 | |
| | | | | | **Total 6 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **15** (a) | | Vertices at $(-5, 3)$ $(-5, 9)$ $(-3, 9)$ $(-3, 5)$ $(-1, 5)$ $(-1, 3)$ | 2 | B2 | If not B2 then award<br>B1 for shape of correct size and orientation in incorrect position **or** 4 out of 6 vertices correct |
| (b) | | Vertices at $(7, -1)$ $(7, -3)$ $(4, -3)$ $(4, -2)$ $(6, -2)$ $(6, -1)$ | 2 | B2 | If not B2 then award<br>B1 for correct orientation but incorrect position or<br>B1 for rotation 90°clockwise about (7, 3) |
| | | | | | **Total 4 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **16** (a) | E.g. $\frac{300}{4} \times 10$ | | | M1 | for a correct scale factor or a correct first step<br>E.g. $\frac{300}{4}$ or 75 or $\frac{10}{4}$ or 2.5 or 300 ÷ 4 (=75) |
| | | 750 | 2 | A1 | |
| (b) | E.g. $\frac{920}{115} \times 4$ | | | M1 | for a correct scale factor or a correct first step<br>E.g. $\frac{920}{115}$ or 8 or $\frac{115}{4}$ or 28.75 |
| | | 32 | 2 | A1 | |
| | | | | | **Total 4 marks** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **17** | (a) | | $3 < L \leq 4$ | 1 | B1 | Accept $3 - 4$ |
| | (b) | Eg $0.5\ 4 + 1.5\times5 + 2.5\times11 + 3.5\times14 + 4.5\times6$<br><br>or $2 + 7.5 + 27.5 + 49 + 27$<br><br>or 113 | | | M2 | $f \times d$ for at least 4 products with correct mid- interval values **and** intention to add.<br><br>If not M2 then award M1 for<br>$d$ used consistently for at least 4 products within interval (including end points) **and** intention to add<br>**or**<br>for at least 4 correct products with correct mid-interval values with no intention to add |
| | | $(0.5 \times 4 + 1.5 \times 5 + 2.5 \times 11 + 3.5 \times 14 + 4.5 \times 6) \div 40$<br>or $113 \div 40$ | | | M1 | dep on M1 (ft their products)<br>NB: accept their 40 if addition of frequencies is shown |
| | | | 2.8 | 4 | A1 | Allow 2.82, 2.83 or 2.825 |
| | | | | | | **Total 5 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **18** | (a) | | | | M1 for $\frac{47}{32}$ **or** 1.46875 **or** $\frac{121}{25}$ **or** 4.84 **or** $\frac{5047}{800}$ **or** 6.30875 truncated or rounded to at least 1 dp |
| | | | 6.30875 | 2 | A1 |
| | (b) | | 6.31 | 1 | B1 ft from (a) provided answer to (a) has more than 3 sig figs |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **19** | (−3, −2) (−2, 0) (−1, 2) (0, 4) (1, 6) (2, 8) (3, 10) | Correct line between $x = -3$ and $x = 3$ | 3 | B3 | for a correct line between $x = -3$ and $x = 3$ (inclusive)<br><br>If not B3 then award B2 for<br>a correct line through at least 3 of<br>(−3, −2) (−2, 0) (−1, 2) (0, 4) (1, 6) (2, 8) (3, 10) **or**<br>for all above points plotted correctly but not joined<br><br>If not B2 then award B1 for<br>any 2 correct points stated (could be in a table) or plotted **or**<br>may be seen in working e.g. 2 × 1 + 4 = 6 **or**<br>for a line with a positive gradient through (0, 4) **or**<br>for a line with gradient 2 |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **20** | $\cos 22 = \frac{14.9}{AC}$ **or**<br>$\sin(90-22) = \frac{14.9}{AC}$ **or**<br>$\frac{AC}{\sin 90} = \frac{14.9}{\sin(90-22)}$ oe **or** | | | M1 | M1 for<br>$BC = 14.9 \times \tan 22$ oe (= 6.019 – 6.02)<br>**AND**<br>$(AC^2 =)\ 14.9^2 + 6.019\ldots^2$ |
| | $(AC =)\ \frac{14.9}{\cos 22}$ **or**<br>$\left(AC =\right)\frac{14.9}{\sin 68}$ ( × sin 90) | | | M1 | M1 for $(AC) = \sqrt{14.9^2 + 6.019...^2}$ |
| | | 16.1 | 3 | A1 Accept 16.07 − 16.1 | |
| | | | | | **Total 3 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **21** | Arc centre $Q$ cutting $QP$ and $QR$ at $A$ and $B$ with $AQ = BQ$ **and** arcs with same radius centre $A$ and $B$ intersecting in guidelines | | | M1 | for a relevant pair of intersecting arcs within guidelines |
| | | Correct angle bisector | 2 | A1 | dep on M1<br><br>SC: B1 for line within guidelines |
| | | | | | **Total 2 marks** |

| | | | | | |
|---|---|---|---|---|---|
| **22** (a) | $668.8 - 640$ **or** $28.8$ | | | M1 | M2 for $\frac{668.8}{640}(\times 100)$ **or** $1.045$ **or** $104.5$ |
| | "28.8" ÷ 640 (×100) **or** 0.045 | | | M1 dep | |
| | | 4.5 | 3 | A1 | |
| (b) | $\frac{668.8}{95}\times 100$ oe **or** $\frac{668.8}{0.95}$ **oe** | | | M2 for a complete method<br>If not M2 then award M1 for $\frac{668.8}{95}$ (=7.04) **or** $0.95x = 668.8$ oe | |
| | | 704 | 3 | A1 | |
| | | | | | **Total 6 marks** |

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