# Mark Scheme (Results)

# Summer 2013

International GCSE Mathematics (4MA0) Paper 2F

Level 1/Level 2 Certificate in Mathematics (KMA0) Paper 2F

PEARSON

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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**
    - awrt – answers which round to....
    - cao – correct answer only
    - ft – follow through
    - isw – ignore subsequent working
    - SC - special case
    - oe – or equivalent (and appropriate)
    - dep – dependent

- o indep – independent
- o 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.

| Question Number | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| 1 (a) (i) | | 30 | 1 | B1 |
| (a) (ii) | 1 – a(i) | 70 | 1 | B1 ft   ft if 0 < ans to a(i)< 100 |
| (b) | | 6 petals shaded | 1 | B1 |
| | | | | **Total 3 marks** |

| Question Number | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| 2 (a) | | 5.7 | 1 | B1     accept trailing zeros (eg 5.70) |
| (b) (i) | | Arrow at 6 marks beyond 3.7 | 1 | B1     accept any mark (eg arrow, cross...etc) in correct position |
| (ii) | | 4 | 1 | B1     accept trailing zeros |
| (iii) | | 7/10 | 1 | B1     accept  1/10, tenth(s), (0).7, 0.70 |
| (c) | | 3.765 | 1 | B1     accept trailing zeros (eg 3.7650) |
| | | | | **Total 5 marks** |

| Question Number | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| 3 (i) | | Label A at 1 | 1 | B1 |
| (ii) | | Label B at 1cm to 2.5 cm from 0 | 1 | B1 |
| (iii) | | Label C at 0.5 | 1 | B1 |
| | | | | **Total 3 marks** |

| Question Number | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| 4 (a) | | Thursday | 1 | B1 |
| (b) (i) | | 8 | 1 | B1 |
| (b)(ii) | | 40 | 1 | B1 cao |
| (b)(iii) | | 26 | 1 | B1 cao |
| (c) | 10/24 | | | M1 |
| | | 5/12 | 2 | A1 |
| | | | | **Total 6 marks** |

| Question Number | Working | Answer | Mark | Notes |
|---|---|---|---|---|
| 5 (a) | | 5.8 to 6.0 inc | 1 | B1 |
| (b) | | 26° to 30° inc | 1 | B1 |
| (c) (i) | | radius | 1 | B1 |
| (c) (ii) | | segment | 1 | B1 |
| | | | | **Total 4 marks** |

**Apart from Questions 10bii and 18 (where the mark scheme states otherwise) the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.**

| 6 (a) | |  | 1 | B1 | |
|---|---|---|---|---|---|
| (b) | 6 x 5 +1 | 31 | 2 | M1<br>A1 | |
| (c) | (61 – 1) ÷ 5 | 12 | 2 | M1 brackets not necessary<br>A1 | |
| | | | | | **Total 5 marks** |

| 7 (a) | | Cardiff | 1 | B1 | |
|---|---|---|---|---|---|
| (b) | −3 −5 or −3 + −5 | −8 | 2 | M1<br>A1 | |
| | | | | | **Total 3 marks** |

| 8 (a) | 25 ÷ 3.95 (=6.3…..) | 6 | 2 | M1<br>A1 cao | |
|---|---|---|---|---|---|
| (b) | 25 – "6" x 3.95 | 1.30 | 2 | M1 25 – total cost of the plants<br>A1 with correct money notation. Allow £1.30p | |
| | | | | | **Total 4 marks** |

| 9 (a) | | correct lines marked | 1 | B1 | |
|---|---|---|---|---|---|
| (b) | | correct angle marked | 1 | B1 Marked internally at (1,4) or internally at (1,1)<br>or externally at (1,3) | |
| (c) | | (−3,1) | 1 | B1 | |
| (d) | | $y = 1$ | 1 | B1 | |
| (e) | | 12<br><br>cm$^2$ | 3 | B2 B2 for 11≤ area ≤13<br>B1 for 9≤ area <11 or 13< area ≤15<br>B1indep accept sq cms etc | |
| | | | | | **Total 7 marks** |

| 10 (a) (i) | | $3t$ | 1 | B1 | accept $t3$ |
|---|---|---|---|---|---|
| (ii) | | $5ab$ | 1 | B1 | any combination but do NOT accept multiplication signs |
| (b) (i) | $8x = 9 + 3$ | | | M1 | or $9+3 \div 8$ with or without brackets |
| | | 1.5 oe | 2 | A1 | |
| (ii) | $5y = 14$ or $7y - 2y = 14$ or $5y = 8 + 6$ <br> or $5y - 14 = 0$ | | 3 | M2 | for correct rearrangement with $y$ terms on one side and numbers on the other AND correct collection of terms on at least one side or for correct collection of to 2 terms <br><br> M1 for correct rearrangement with $y$ terms on one side and numbers on the other eg $7y - 2y = 8 + 6$ <br> **or** <br><br> correct collection and simplification of either numbers or $y$ terms eg. $5y - 6 = 8$ or $5y = a$ or $by = 14$ <br><br> A1 2.8 oe dependent on at least one M1 |
| | | 2.8 | | | |
| (c) | $x^2 - 6x + 9x - 54$ | | | M1 | 4 correct terms ignoring signs or for 3 correct terms out of 4 terms with signs |
| | | $x^2 + 3x - 54$ | 2 | A1 | |
| | | | | | **Total 9 marks** |

| 11 (a) | $450 \times 1.4(0)$ | | | M1 | |
|---|---|---|---|---|---|
| | | 630 | 2 | A1 | |
| (b) | $840 \div 1.4(0)$ | | | M1 | |
| | | 600 | 2 | A1 | |
| (c) | $100 \div 1.4(0)$ (=71.4...) | | | M1 | or $1 \div 1.4(0)$ |
| | | 71 | 2 | A1 | awrt 71 |
| | | | | | **Total 6 marks** |

| 12 | $0.8 \times 0.3 \times$ "depth" $= 108 \div 1000$ <br> ("depth"=) $0.108 \div 0.24$ oe | | | M1 <br> M1 | M1 for $0.8 \times 0.3$ or $0.24$ or $108 \div 1000$ |
|---|---|---|---|---|---|
| | | 0.45 | 3 | A1 | |
| | | | | | **Total 3 marks** |

| 13 | (a) | 80 x 195 ÷ 30 oe<br>or 6 x 80 + 40 oe | | | | M2 | M1 for 195 ÷ 30 or 30 ÷ 195<br>or 80 ÷ 30 or 30 ÷ 80 |
|---|---|---|---|---|---|---|---|
| | | | | 520 | 3 | A1 | |
| | (b) | 120/800 x 360 oe | | | | M1 | |
| | | | | 54 | 2 | A1 | |
| | | | | | | | **Total 5 marks** |

| 14 | (a) | | | Shape in correct position | 2 | B2 | B1 for reflection in line $x$ =k where (k≤2) tolerance of ½ sq |
|---|---|---|---|---|---|---|---|
| | (b) | | | Rotation<br>90° or quarter turn anticlockwise<br>(0,0) or *O* or origin | 3 | B1<br>B1<br>B1 | accept 90° or – 270°<br><br>**Answers that give multiple transformations score zero** |
| | | | | | | | **Total 5 marks** |

| 15 | | 3/5 x 15 or 15 ÷ 5 × 3 | | | | M1 | M1 for 3/5 or 15 ÷ 5 × 3 |
|---|---|---|---|---|---|---|---|
| | | | | 9 | 2 | A1 | |
| | | | | | | | **Total 2 marks** |

| 16 | (a) | 1 – (0.15 + 0.4 + 0.35) | | | | M1 | |
|---|---|---|---|---|---|---|---|
| | | | | 0.1 | 2 | A1 | |
| | (b) | 0.15 + 0.4 | | | | M1 | |
| | | | | 0.55 | 2 | A1 | |
| | | | | | | | **Total 4 marks** |

| 17 | | 7800 ÷ 9.75 or 7800 ÷ 585 x 60 | | | | M2 | M1 for 7800 ÷ 9.45 or 7800 ÷ 585 or 13.3(…. |
|---|---|---|---|---|---|---|---|
| | | | | 800 | 3 | A1 | |
| | | | | | | | **Total 3 marks** |

| 18 (a) | 21/24 – 20/24 | | 2 | B2 | for both fractions written correctly with a common denominator, followed , if necessary, by cancelling to 1/24 |
|---|---|---|---|---|---|
| | | | | B1 | for 1 correct fraction with denominator of a multiple of 24 |
| (b) | 5/8 x 12/7  or<br>15/24  ÷ 14/24 | | 2 | M1 | leaving first fraction unchanged, changing ÷ to x and inverting the second fraction<br>**or**<br>converting each fraction with a common denominator of 24 oe with ÷ sign |
| | | 60/56 | | A1 | 60/56 from the x or 15/14 from the ÷ |
| | | | | **Total 4 marks** | |

| 19 | 10 x 24, 30 x 20,  50 x 9,70 x 12,  90 x 15<br><br>10 x 24 + 30 x 20 + 50 x 9 + 70 x 12 + 90 x 15<br>240 + 600 + 450 + 840  +1350 | 3480 | 3 | M1 | at least 4 products *fx x* used  consistently within interval (inc end points)<br>M1(dep)  for ∑*fx*  with use of at least 4 correct ½ way values<br><br>A1 |
|---|---|---|---|---|---|
| | | | | **Total 3 marks** | |

| 20 (a) | | ( 4.5 , 3 ) | 2 | B1 B1 | |
|---|---|---|---|---|---|
| (b) | Identifies 2 & 7 as sides<br>"2"² + "7"²<br>√("2"² + "7"²) | | | B1<br>M1   "2" & "7" must be identified as sides<br>M1 dep | |
| | | 7.28 | 4 | A1   awrt 7.28 | |
| | | | | **Total 6 marks** | |

| 21 | Factor tree or repeated division with 2 or more correct prime factors (2, 2, 3, 17) | | | M1 | condone 1s factors  must multiply to          204 |
| | | | | | |
| | Fully correct factor tree or repeated division or 2, 2, 3, 17 | | | M1 | condone 1s |
| | | 2 x 2 x 3 x 17 | 3 | A1 | |
| | | | | | **Total 3 marks** |

| 22. | 22 x 25000 (=550000) "550000" ÷100000 | | | M1 M1 A1 | or 25000 cm = 0.25km or 22 ÷100000 or 22 x 0.25 or "0.00022" × 25000 |
| | | 5.5 | 3 | | |
| | | | | | **Total 3 marks** |

| 23. (a) | −6/3 ≤  x  < 9/3 | | | M1 A1 | M1 for −6/3 ≤  x  or  x < 9/3 SC B1 for −2 <  x  < 3 |
| | | −2 ≤  x  < 3 | 2 | | |
| (b) | | −2,  −1 , 0, 1, 2 | 2 | B2 | B1 for five correct values and one wrong value or  four correct values with no wrong value |
| | | | | | **Total 4 marks** |

| | | | | | **TOTAL FOR PAPER:  100** |

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