

Mark Scheme (Results)

June 2011

GCSE Mathematics (5384F)
Paper 11F (Non-Calculator)

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NOTES ON MARKING PRINCIPLES

1 Types of mark

M marks: method marks

A marks: accuracy marks

B marks: unconditional accuracy marks (independent of M marks)

2 Abbreviations

cao – correct answer only

ft – follow through

isw – ignore subsequent working

SC: special case

oe – or equivalent (and appropriate)

dep – dependent

indep - independent

3 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.

4 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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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 it is clear from the working that the “correct” answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.

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

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

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.

5 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

6 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: e.g. incorrect canceling 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 e.g. algebra.

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

7 Probability

Probability answers must be given as fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

8 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

9 Parts of questions

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

10 Money notation

Accepted with and without the “p” at the end.

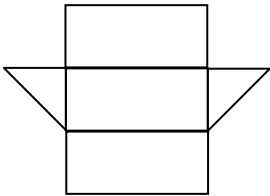
11 Range of answers

Unless otherwise stated, when any answer is given as a range (e.g. $3.5 - 4.2$) then this is inclusive of the end points (e.g. 3.5, 4.2) and includes all numbers within the range (e.g. 4, 4.1).

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|-----------|-----|-------------------|---------------------|------|---|
| Question | | Working | Answer | Mark | Notes |
| 1 | (a) | | 2.4 | 1 | B1 cao |
| | (b) | | 25.8 | 1 | B1 cao |
| | (c) | | 0.7 | 1 | B1 cao |
| | (d) | | 0.38 | 1 | B1 cao |
| 2 | (a) | | 3 | 1 | B1 cao |
| | (b) | | 2 lines of symmetry | 2 | <p>B2 for 2 correct lines of symmetry and no extra lines (B1 for 2 correct lines of symmetry and 1 incorrect or 1 correct line of symmetry and 0 or 1 incorrect)</p> <p>SC: B1 if the 2 cross diagonals drawn in addition to the 2 correct lines of symmetry</p> |
| 3 | (a) | 4×6.20 | 24.80 | 2 | <p>M1 for 4×6.2 or $6.2 + 6.2 + 6.2 + 6.2$ oe A1 for 24.8(0) (accept 24.80p)</p> |
| | (b) | $15.50 \div 6.20$ | 2.5 | 2 | <p>M1 for $15.5 \div 6.2$ or $15.5 - 6.2 - 6.2$ or $6.2 + 6.2 + '3.1'$ A1 for 2.5 or $2\frac{1}{2}$ or 2 h 30 (m) (condone 2:30 but do not accept 2.30)</p> |

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|-----------|-----|---|---------------|------|--|
| Question | | Working | Answer | Mark | Notes |
| 4 | (a) | $\begin{array}{r} 1485 \\ - 737 \\ \hline 748 \end{array}$ | 748 | 2 | M1 for decomposition or adding on or sight of 8 as units digit after subtraction. A1 cao |
| | (b) | $53 \times 5 = 265$ $246 + 13 = 259$ $265 - 259 =$ OR $246 + 13 = 259$ $53 \times 4 = 212$ $259 - 212 = 47$ $53 - 47 =$ | 6 | 3 | M1 for 53×5 or 265 seen M1 for “265” – (246 + 13) A1 cao OR M1 for $(246 + 13) - 53 \times 4$ or 47 seen M1 for $53 - “47”$ A1 cao SC: B2 for answer of 19 |
| 5 | (a) | | 48 | 1 | B1 for 48 (± 2) |
| | (b) | | Angle drawn | 1 | B1 for 150° angle drawn within guidelines (see overlay) |
| | (c) | | 60 | 1 | B1 cao |
| 6 | (a) | | 6 am | 1 | B1 cao |
| | (b) | $7 - (-3)$ | 10 | 1 | B1 for 10 (accept – 10) or ft from (a) |
| | (c) | | 2 pm and 6 pm | 1 | B1 cao |

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|-----------|-----|---------------------------|---------------------------|------|---|
| Question | | Working | Answer | Mark | Notes |
| 7 | | 12642 – 12478 164 × 40 | 65.60 | 4 | M1 for 12642 – 12478 oe or sight of 164 M1 for × 40 or × 0.4(0) M1 for conversion to £ (e.g. use of 0.4(0)) or conversion of “6560” to “65.6(0)” A1 for £65.6(0) SC: B2 for sight of digits 6560 |
| 8 | | | Square based pyramid | 1 | B1 for (square based) pyramid |
| 9 | | | Triangle drawn | 2 | B2 for correct triangle (see overlay) (B1 for angle of 40° drawn (±2°) or side of length 5.3 cm drawn (±0.2 cm)) |
| 10 | | | Output = 20 Input = 15 | 2 | B1 for 20 B1 for 15 |
| 11 | (a) | | 4 : 11 | 1 | B1 cao |
| | (b) | $8 \times 10000 \div 100$ | 800 | 2 | M1 for $8.0 (\pm 0.2) \times 10000$ or $78\,000 - 82\,000$ seen or $8.0 (\pm 0.2) \div 100$ or $0.078 - 0.082$ seen A1 for 780 – 820 |

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|-----------|---|--|-------------------|--|--|
| Question | Working | Answer | Mark | Notes | |
| 12 | $1 - \left(\frac{30}{80} + \frac{40}{100} \right)$ $= 1 - \left(\frac{300}{800} + \frac{320}{800} \right)$ $= 1 - \frac{620}{800}$ $= \frac{180}{800}$ <p>OR</p> <p>e.g. $N = 80$</p> $\frac{3}{8} \times 80 = 30; \quad \frac{40}{100} \times 80 = 32$ $80 - 30 - 32 = 18$ $\text{ans} = \frac{18}{80}$ | $\frac{9}{40}$ | 3 | <p>M1 for $3 \div 8$ or 0.375 or 37.5(%) or $\frac{40}{100}$ oe or 0.4 seen</p> <p>M1(dep) for $1 - \frac{3}{8} - \frac{40}{100}$ or $1 - \text{"0.375"} - \text{"0.4"}$ or $100(\%) - 40(\%) - \text{"37.5"}(\%)$</p> <p>A1 for $\frac{9}{40}$ oe or 22.5% or 0.225</p> <p>OR</p> <p>M1 for $\frac{3}{8} \times N$ and $\frac{40}{100} \times N$ where $N =$ their total</p> <p>M1(dep) for $N - \frac{3}{8} \times N - \frac{40}{100} \times N$</p> <p>A1 for $\frac{9}{40}$ oe or 22.5% or 0.225</p> | |
| 13 | <p>(a)</p>  <p>(b)</p> | <p>Net drawn</p> <p>Perpendicular bisector drawn</p> | <p>2</p> <p>2</p> | <p>B2 for fully complete and correct sketch (B1 for sketch of net with 3 or 4 correct faces).</p> <p>B2 for correct line with 2 valid pairs of intersecting arcs (B1 for line within guidelines or 2 valid pairs of intersecting arcs shown)</p> | |

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|-----------|-----|--------------------------------|--------------|------|---|
| Question | | Working | Answer | Mark | Notes |
| 14 | (a) | $2 \times 5 + 3 \times -1$ | 7 | 2 | M1 for 2×5 and 3×-1 or 10 and -3 seen A1 cao |
| | (b) | $3 \times -4 \times -4$ | 48 | 2 | M1 for $3 \times (-4)^2$ or $3 \times -4 \times -4$ or 3×16 or 3×-16 or -12×-4 or -48 A1 cao |
| | (c) | $3y = x + 2$ | $x = 3y - 2$ | 2 | M1 for attempting to multiply both sides by 3 or for a correct step which may follow an incorrect first step A1 cao |
| 15 | (a) | $2 \times 2 \times 2 \times 2$ | 16 | 1 | B1 cao |
| | (b) | | t^3 | 1 | B1 cao |
| | (c) | $\frac{n^9}{n^5}$ | n^4 | 2 | B2 cao (B1 for $n^3 \times n^2 = n^5$ or $\frac{n^9}{n^5}$ or $n^9 \div n^3 = n^6$ or $\frac{n^6}{n^2}$ or $n^9 \div n^2 = n^7$ or $\frac{n^7}{n^3}$ or for a correct second step following an incorrect first step e.g. $\frac{n^9}{n^6} = n^3$) |

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|-----------|-----|---------|---|------|---|
| Question | | Working | Answer | Mark | Notes |
| 16 | (a) | | Reflection | 2 | B2 for shape with vertices at $(-3, 2)$, $(-3, 3)$, $(-5, 3)$, $(-6, 2.5)$, $(-5, 2)$ (B1 for a reflection in any vertical or horizontal line) |
| | (b) | | Translation $\begin{pmatrix} -6 \\ -1 \end{pmatrix}$ | 2 | B1 for translation B1 for $\begin{pmatrix} -6 \\ -1 \end{pmatrix}$ or 6 left and 1 down Note: B0 if more than one transformation given |

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|-----------|--|--|--------------------------|------|--|
| Question | | Working | Answer | Mark | Notes |
| 17 | | <p>$P : T : B = 1 : 3 : 6$</p> <p>$\frac{54}{10} \times 6$</p> <p>OR</p> <p>e.g. $T = 3P$ $B = 2T$ So, $B = 2(3P) = 6P$ $P + T + B = P + 3P + 6P = 10P$ $P = \frac{54}{10} = £5.40$ $B = 6 \times £5.40$</p> | 32.40 | 3 | <p>M1 for 1 : 3 : 6 or any 3 numbers, in any order, in the ratio 1 : 3 : 6 M1 for $54 \div (1 + 3 + 6) \times 6$ A1 for 32.4(0)</p> <p>OR</p> <p>M1 for 1 : 3 : 6 oe or $P + 3P + 6P (= 10P)$ oe e.g. $\frac{T}{3} + T + 2T (= \frac{10T}{3})$ e.g. $\frac{B}{6} + \frac{B}{2} + B (= \frac{10B}{6})$ or 5.4(0) or 16.2(0) seen M1 for $\frac{54}{10} \times 6$ or $54 \div \frac{10}{3} \times 2$ or $54 \div \frac{10}{6}$ oe A1 for 32.4(0)</p> <p>OR</p> <p>M1 for a partial decomposition of £54 in ratio 1 : 3 : 6, e.g. (£)5 + (£)15 + (£)30 (=£50) M1 for a decomposition of the remaining amount, e.g. 40(p) + 120(p) + 240(p) (=400p) A1 for 32.4(0)</p> |
| 18 | | <p>$1 \text{ m}^2 = 100 \times 100 \text{ cm}^2$ $4 \text{ m}^2 = 40\,000 \text{ cm}^2$</p> | Decision and explanation | 2 | <p>B2 for stating Callum is not correct with full correct explanation (B1 for 100×100 or 10 000 seen or 200×200 or 40 000 seen or 0.01×0.01 or 0.0001 seen or 0.04 seen)</p> |

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