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Mark Scheme (Results)

Summer 2010

GCSE

GCSE Mathematics (2381)
Calculator Paper 12F

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Publications Code UG024458

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
isw – ignore subsequent working
oe – or equivalent (and appropriate)
indep - independent
ft – follow through
SC: special case
dep – dependent

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

Unless otherwise stated, when an 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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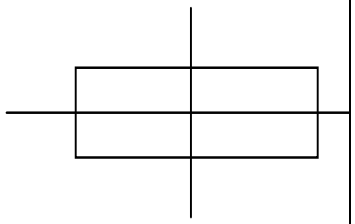
Question	**Working**	**Answer**	**Marks**	**Notes**
1 (a)		A and D	1	B1 for both, either way around
(b)		B	1	B1 cao
2		Correct Reflection	1	B1 cao tol ± 1/2 sq
3	$6 \times 2 = 12, 4 \times 2 = 8$	12, 8	2	M1 any enlargement, or for 12 or 8 correctly inserted A1 both answers correctly inserted on the diagram SC B1 for 12 and 8 the wrong way round
4 (i)		cuboid	3	B1 accept rectangular prism
(ii)		sphere		B1 cao
(iii)		pyramid		B1 accept tetrahedron
5		53, 10	2	B1 for 53 cao B1 for 10 cao

Question	Working	Answer	Marks	Notes
6		Circle drawn with radius 5 cm±2 mm	1	B1 for correct circle with radius 5 cm ±2 mm (overlay)
7 (a)		75	1	B1 cao
(b)	$60 \div 10,\ 10/100 \times 60$ oe	6	2	M1 for $60 \div 10$ or $\frac{10}{100} \times 60$ or $60 \div 100 \times 10$ A1 cao
(c)	$40 \div 5 \times 3$	24	2	M1 for $40 \div 5$ or 40×3 or 40×0.6 oe or 8 or 120 seen A1 cao
8 (a)		–3	1	B1 for –3; accept 6 am
(b)		5	1	B1 for 5 or –5
(c)		–4	1	B1 cao

Question	Working	Answer	Marks	Notes
9 (a)			2	B1 for each correct line of symmetry drawn within tolerance of overlay [−1 for each extra line drawn] [SC: B1 for both diagonals drawn in addition to the correct lines of symmetry]
(b)		5	1	B1 cao
(c)		3	1	B1 cao
10 (a)	$2000 \div 85 = 23.529...$	23	2	M1 for $2000 \div 85$ or $20 \div 0.85$ or sight of digits 235 A1 for 23 OR M1 for a build up method with an attempt to find the cost of at least 21 tulips. A1 for 23 SC B1 24 with or without working
(b)	$2000 - 85 \times 23$	45	2	M1 for 2000 − "23" × 85 or 20−"23"×0.85 or difference between £20 and "23"×85 p, consistent units A1 45 or £0.45, ft from "23" providing 20≤ "23" < 24

Question	Working	Answer	Marks	Notes
11 (a)		E	1	B1 for E (accept 07 45 or 09 59)
(b)	09 04 − 07 30 (or 30 + 60 + 4)	94	2	M1 for a clear method of finding the duration of the journey between 09 04 and 07 30 (eg 30 + 60 + 4) or 30 + 1 hr + 4) or sight of 174 or 1.74 or 1:74 or 1hr 74 or 134 or 1.34 or 1:34 or 1hr 34 or 9.04 – 7.30 A1 cao
(c)		C	1	B1 for C (accept 07 15 or 08 48)
12 (a)	$20 + 5\times6 =$	50	2	M1 for $20+5\times6$ or $20+30$ A1 cao SC: B1 for 150 seen
(b)	$65-20=45$ $45\div5=$	9	3	M1 for 65 – 20 or 45 seen M1 (dep) for "45" ÷ 5 A1 for 9 cao SC B2 for 3 as the final answer
13		Correct triangle	2	M1 for 5.5 line ±2mm or 45° angle drawn ±2° A1 triangle complete and drawn within tolerances given on overlay

Question	Working	Answer	Marks	Notes
14 (a)	$8x = 17 + 3$	2.5	2	M1 $8x$=17+ 3 or $8x$ -3 + 3 = 17 + 3 or $\frac{8x}{8} - \frac{3}{8} = \frac{17}{8}$ or (17 + '3') ÷ 8 A1 for 2.5 or $\frac{20}{8}$ oe NB embedded answer of 2.5 must be clearly indicated in the equation and gets SC B1
(b)	$x = 9 \times 3 \div 2$	13.5	2	M1 for intent to multiply both sides by 3 or $\frac{3}{2}$ or divide both sides by 2, or $9 \div \left(\frac{2}{3}\right)$, or $9 \times \frac{3}{2}$ A1 for $\frac{27}{2}$ or 13.5 oe NB embedded answer of 13.5 must be clearly indicated in the equation and gets SC B1
15 (a)	$4 \div 12 =$	1 : 3	2	M1 for 4:12 or 2 : 6 seen A1 cao SC: B1 for 3:1 SC B1 for 1 to 3
(b)	$400 - (400 \times 0.15)$ or oe 400×0.85	340	2	M1 for 400×0.15 or 400×0.85 or 40+20 or 60 or $400 \times \frac{15}{100}$ or $400 \times \frac{85}{100}$ A1 cao

Question	Working	Answer	Marks	Notes
16 (a)	1.25×620	775	2	M1 for 1.25×620 oe A1 cao
(b)	$50 \div 1.25 = 40$ $42 - 40$	2	3	M1 for $50 \div 1.25$ (= 40) oe M1 (dep) for 42 – "40" or "40" - 42 A1 cao OR M1 42x1.25 (= 52.5(0)) oe M1 (dep) "52.5(0)" – 50 or 50 – "52.5(0)" A1 cao Note 2.5(0) without working gets no marks SC B2 for -2 as the answer with no working.
17	$x = 1$ gives 11 $x = 2$ gives 28 $x = 1.5$, gives 18.(3..) $x = 1.6$, gives 20.(0..) $x = 1.7$, gives 21.(9..) $x = 1.8$, gives 23.(8..) $x = 1.9$, gives 25.(8..) $x = 1.85$ gives 24.8(31..) $x = 1.86$ gives 25.(03..) $x = 1.87$ gives 25.2(3..) $x = 1.88$ gives 25.4(4..) $x = 1.89$ gives 25.6(5..)	1.9	4	B2 for a trial between 1.8 and 1.9 inclusive evaluated (B1 for a trial between 1 and 2 inclusive) evaluated B1 for a different trial between $1.85 \leq x < 1.9$ evaluated B1 (dep on at least one previous B1) for 1.9 NB: No working scores ZERO marks even if answer is correct. Accept trial correct nearest whole number (rounded or truncated) if the value of x is to 1 d.p., but correct to 1 d.p. (rounded or truncated) if the value of x is to 2 d.p.

Question	Working	Answer	Marks	Notes
18	$\pi \times 12$	37.7	2	M1 for $\pi \times 12$ or $3.1((4..) \times 12$ or $2\pi \times 6$ A1 for an answer in the range 37.6 to 37.8 or 12π on the answer line
19	$\sqrt{6^2 + 14^2} = \sqrt{232}$	15.23	3	M1 for $6^2 + 14^2$ or 36+196 or 232 M1 for $\sqrt{232}$ or $\sqrt{36+196}$ A1 for answer in the range 15.2 to 15.3

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Order Code UG024458
June 2010

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