

Edexcel GCSE

Mathematics B 1388

Paper 5536/16

November 2007

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Mark Scheme

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 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.

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

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: 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.
- 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.

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No.	Working	Ans.	Mark	Notes																																					
1(a)		9	1	B1 cao																																					
(b)		5 9 7 21 4 7 8 19 9 16 15 40	3	B3 for all correct (B2 for 4 or 5 correct) (B1 for 1 or 2 or 3 correct)																																					
2	$\begin{array}{r} 375 \\ \underline{24 \times} \\ 1500 \\ \underline{7500} \\ 9000 \end{array}$ <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">7</td> <td style="text-align: center;">5</td> <td></td> </tr> <tr> <td></td> <td style="border: 1px solid black; padding: 2px;">6</td> <td style="border: 1px solid black; padding: 2px;">1</td> <td style="border: 1px solid black; padding: 2px;">1</td> <td style="padding-left: 5px;">2</td> </tr> <tr> <td></td> <td style="border: 1px solid black; padding: 2px;">1</td> <td style="border: 1px solid black; padding: 2px;">2</td> <td style="border: 1px solid black; padding: 2px;">2</td> <td style="padding-left: 5px;">4</td> </tr> <tr> <td style="padding-right: 5px;">9</td> <td style="border: 1px solid black; padding: 2px;">2</td> <td style="border: 1px solid black; padding: 2px;">8</td> <td style="border: 1px solid black; padding: 2px;">0</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td></td> </tr> </table> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="text-align: center;">300</td> <td style="text-align: center;">70</td> <td style="text-align: center;">5</td> <td></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">6000</td> <td style="border: 1px solid black; padding: 2px;">1400</td> <td style="border: 1px solid black; padding: 2px;">100</td> <td style="padding-left: 5px;">20</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">1200</td> <td style="border: 1px solid black; padding: 2px;">280</td> <td style="border: 1px solid black; padding: 2px;">20</td> <td style="padding-left: 5px;">4</td> </tr> </table> $6000 + 1400 + 100 + 1200 + 280 + 20 = 9000$		3	7	5			6	1	1	2		1	2	2	4	9	2	8	0			0	0	0		300	70	5		6000	1400	100	20	1200	280	20	4	90.00	3	M1 for a complete method with relative place value correct, condone 1 multiplication error, addition not necessary A1 for 9000 A1 (dep on M1) for correct conversion of their total into £s OR M1 for a completed grid with not more than 1 multiplication error, addition not necessary A1 for 9000 A1 (dep on M1) for correct conversion of their total into £s OR M1 for sight of a complete partitioning method, condone 1 multiplication error, final addition not necessary A1 for 9000 A1 (dep on M1) for correct conversion of their total into £s OR M1 for repeated addition (condone 23 or 25) must be an attempt to add A1 for 9000 A1 (dep on M1) for correct conversion of their total into £s
	3	7	5																																						
	6	1	1	2																																					
	1	2	2	4																																					
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No.	Working	Ans.	Mark	Notes
3(a)	$\frac{3}{4} = \frac{9}{12}, \frac{5}{6} = \frac{10}{12},$ $\frac{2}{3} = \frac{8}{12}, \frac{7}{12} = \frac{7}{12}$	$\frac{7}{12}, \frac{2}{3}, \frac{3}{4}, \frac{5}{6}$	2	M1 for attempt to use a common denominator or attempting to convert all fractions to decimals, rounded or truncated to at least 1 dp A1 for correct order Special case B2 for fully correct order (B1 for 3 correctly ordered fractions or largest first and in order)
(b)	$\frac{9}{12} + \frac{2}{12} = \frac{11}{12}$	$\frac{11}{12}$	2	M1 for using a suitable common denominator, at least one or two fractions correct A1 for $\frac{11}{12}$ oe OR Attempt to use decimals must use at least 2dp M1 for $0.75 + 0.16$ (or 0.17) A1 for 0.916 (recurring)
4 (a)	$4\ 5\ 6\ 7\ 8$ $5\ 6\ 7\ 8\ 9$ $6\ 7\ 8\ 9\ 10$		2	B2 if fully correct (B1 for 1 row correct or 2 columns correct)
(b)	(1,4); (2,3); (3,2); (4,1)		2	B2 if fully correct (B1 for either (2,3) or (3,2))
5(a)(i) (ii)	Angle $x = 63$ (Corresponding angles)	63° and reason	2	B1 for 63° (B1 for corresponding or alternate angles mentioned) Accept Z angles or F angles
(b)	Angle $y = 117^\circ$	117°	1	B1 for 117° cao

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No.	Working	Ans.	Mark	Notes
6(a)	$\frac{3}{2+3+5}$	$\frac{3}{10}$	2	M1 for $3/(2+3+5)$ A1 for $\frac{3}{10}$ oe
(b)	$60 \div 5 = 12$ $12 \times 2 =$ Alternative: Total sum = $60 \times 2 = 120$ Lillian = $\frac{2}{10}$ of 120 $= 120 \times 2 \div 10$	24	3	M1 for $60 \div 5$ M1 for “12” $\times 2$ A1 for 24 cao Alternative: M1 for 60×2 or 120 seen M1 for $120 \times 2 \div 10$ A1 cao SC B2 for 24, 36 and 60 SC B1 for 36 on answer line
7(a)	Continue sequence by +3	11	1	B1 cao
(b)		$3n - 7$	2	B2 for $3n - 7$ (B1 for $3n + k, k \neq -7; n = 3n - 7$) (B0 for $n = 3n + k, k \neq -7$)
8(a)			2	B2 for trapezium (base 5cm, ht 2cm & top 3cm) (B1 for a trapezium with exactly two right angles)
(b)			2	B2 for rectangle with length 5 cm and width 2 cm and a line at 3 cm from one edge (B1 for rectangle of length 5 cm or width 2 cm or for a rectangle with an interior line parallel to the shorter sides do not accept a square) (B0 for nets) Note: orientation must be correct in (a), ignore in (b) Do not accept extra lines in (a) or (b)

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No.	Working	Ans.	Mark	Notes
9(a)		m^9	1	B1 accept m^{6+3}
(b)		p^6	1	B1 p^{8-2}
(c)		$6x^2y^3$	2	B2 cao [B1 for two correct terms in a product]
(d)		t^6	1	B1 accept $t^{3 \times 2}$
(e)		3	2	M1 for $3(1-x)$ A1 for 3
10	Rotation 90° clockwise centre $(-2, 3)$		3	B1 for rotation B1 for 90° clockwise accept -90° , $+270^\circ$, $1/4$ turn clockwise, $3/4$ turn anticlockwise B1 for $(-2, 3)$ N.B. combination of transformations gets B0
11(a)		$x(x-5)$	2	B2 for $x(x-5)$ (B1 for x (linear expression in x))
(b)		$3a(a-2)$	2	B2 for $3a(a-2)$ (B1 for $3(a^2-2a)$ or $a(3a-6)$) or $3a$ (linear expression in a)
(c)		$\frac{1}{2}(P-10)$	2	M1 for correctly isolating $2q$ or $-2q$ or for correctly dividing both sides by 2 or for correct second step which may follow from an incorrect first step A1 for $\frac{1}{2}(P-10)$ oe

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No.	Working	Ans.	Mark	Notes
12(a)	$[(2 + 4)/2, (7 + 3)/2]$	(3, 5)	2	M1 for $[(2 + 4)/2, (7 + 3)/2]$ A1 cao Alternative: B2 for (3, 5) [B1 for (3, y) or (x, 5)] or a right-angle triangle drawn on the diagram with vertical height 4 units and base 2 units
(b)	$\frac{7-3}{4-2}$	2	2	M1 for $\frac{7-3}{4-2}$ oe A1 cao
13(a)(i)		7.9×10^3	2	B1 cao
(ii)		3.5×10^{-4}		B1 cao
(b)	$4 \div 8 = 0.5$ $10^3 \div 10^{-5} = 10^8$	5×10^7	2	M1 for $4 \div 8 = 0.5$ or $10^3 \div 10^{-5} = 10^8$ or for $4000 \div 0.00008$ or 5×10^x where $x \neq 7$ A1 for 5×10^7 cao
14(i)		73	3	B1 for 72 to 74 inclusive
(ii)	$80 - 65$	15		M1 for identifying 30 and 90 (check lines on diagram) A1 for 14 – 17
15(a)	$\frac{PQ}{2} = \frac{12}{3}$	8	2	M1 for $\frac{12}{3}$ or $\frac{3}{12}$ or $\frac{1}{4}$ or 4 A1 for 8
(b)	$PQ = \frac{12 \times 2}{3}$ $\frac{BC}{3} = \frac{10}{12}$ $BC = \frac{10 \times 3}{12} = 2.5$	12.5	3	M1 for $\frac{10}{4}$ or $\frac{4}{12}$ or $10 \div 4$ or 0.4 A1 for 2.5 A1 ft for “2.5” + 10 (dep on M1 awarded)