GCSE

Mathematics Syllabus A

General Certificate of Secondary Education **J512/01**

Paper 1

Mark Scheme for June 2010

Marking Instructions & Abbreviations

Marking instructions

1   Mark strictly to the mark scheme.

2   Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.

3   Work crossed out but not replaced should be marked.

4   **M** (method) marks are not lost for purely numerical errors.
     A (accuracy) marks depend on preceding **M** (method) marks. Therefore **M0 A1** cannot be awarded.
     B marks are independent of **M** (method) marks and are awarded for a correct final answer or a correct intermediate stage.

5   As a general principle, if two or more methods are offered, mark only the method that leads to the answer on the answer line. If two (or more) answers are offered, mark the poorer (poorest).

6   When the data of a question is consistently misread in such a way as not to alter the nature or difficulty of the question, please follow the candidate's work and allow follow through for **A** and **B** marks. Deduct 1 mark from any **A** or **B** marks earned and record this by using the **MR** annotation. **M** marks are not deducted for misreads.

7   If the correct answer is seen in the body and the answer given in the answer space is a clear transcription error allow full marks unless the mark scheme says 'mark final answer' or cao. If the answer is missing, but the correct answer is seen in the body allow full marks. If the correct answer is seen in working but a completely different answer is seen in the answer space, then accuracy marks for the answer are lost. Method marks would normally be given.

8   For methods not provided for in the mark scheme give as far as possible equivalent marks for equivalent work.

9   For answers scoring no marks, you must either award NR (no response) or 0, as follows:

     Award NR (no response) if:
     - Nothing is written at all in the answer space
     - There is any comment which does not in any way relate to the question being asked ("can't do", "don't know", etc.)
     - There is any sort of mark that is not an attempt at the question (a dash, a question mark, etc.)

     Award 0 if:
     - There is any attempt that earns no credit. This could, for example, include the candidate copying all or some of the question, or any working that does not earn any marks, whether crossed out or not.

10   Where a follow through mark is indicated on the mark scheme for a particular part question, you must ensure that you refer back to the answer of the previous part question.

11   Unless the question asks for an answer to a specific degree of accuracy, always mark at the greatest number of significant figures seen. E.g. answer on mark scheme is 15.75 which is seen in the working. The candidate then rounds or truncates this to 15.8, 15 or 16 on the answer line. Allow full marks for the 15.75.

12   Anything in the mark scheme which is in brackets (…) is not required for the mark to be earned, but if present it must be correct.

13   Ranges of answers given in the mark scheme are always inclusive.

14   Annotating scripts. The following annotations are available:

     ✓and ✖
     BOD - Benefit of doubt
     FT - Follow through
     ISW - Ignore subsequent working
     M0, M1, M2 - Method mark awarded 0, 1, 2
     A1 - Accuracy mark awarded
     B1, B2 - Workless mark awarded 1, 2
     MR - Misread
     SC - Special case
     ∧ - Omission sign
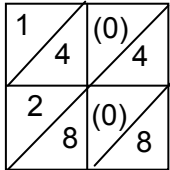
     These should be used whenever appropriate during your marking.

Abbreviations

- Where you see **oe** in the mark scheme it means **or equivalent.**

- Where you see **isw** in the mark scheme it means **ignore subsequent working** (after correct answer obtained), provided the method has been completed**.**

- Where you see **cao** in the mark scheme it means **correct answer only.**

- Where you see **soi** in the mark scheme it means **seen or implied.**

- Where you see **www** in the mark scheme it means **without wrong working.**

- Where you see **seen** in the mark scheme it means that you should award the mark if that number / expression is seen anywhere in the answer space, including the answer line, even if it is not in the method leading to the final answer.

- Figs: for example **figs 237** means any answer with just these digits with leading or trailing zeros disregarding any decimal point. E.g. 237000, 2.37, 2.370, 0.00237 but not 23070 or 2374.

1	(a)	Circle	1	
	(b)	Hexagon	1	
	(c)	Rhombus	1	
	(d)	Trapezium	1	
	(e)	Cylinder	1	
2	(a)	2389, 12 000, 25 490, 100 000	1	
	(b)	57	1	
	(c)	(i) 218 112	1	Condone £ in answers
		(ii) 173 900	1	Condone £ in answers
		(iii) Four thousand (and) seventy seven	1	
3	(a)	7, 4, 4, 11, 4 in frequency column	2	**B1** for 3 or 4 correct frequencies in frequency column **Or SC1** for all tallies correct **or** all correct frequencies in tally column **or** if poor notation eg $\frac{7}{30}$, 7:30 etc
	(b)	6 cao	1	
	(c)	6 ft	1	Correct or ft *their* (b)
4	(a)	Any three, of 2, 4, 6, 8 or 10	1	
	(b)	Even, even, odd	3	**1** for each correct response
	(c)	(i) 9 cao	1	
		(ii) 25 cao	1	
		(iii) 9 cao	2	**B1** for 81 seen
5	(a)	½ oe	1	
	(b)	0.75 cao	1	
	(c)	25 cao	1	
	(d)	3/25 final answer	2	Allow **M1** for 12/100 oe
6		8.50	4	**B1** for (adults) = 13 **and B1** for (children) = 13.5(0) **and M1** for *their* [13 + 13.50] – 18 *Misreads of numbers of adults and/or children in this question would not score the respective B marks.*
7	(a)	os, ok, ac, as, ak, fc, fs, fk and no incorrect combinations	2	**1** for 6 or more correct (ignore further incorrect)

	(b)	1/9, 2/18, 0.11(1…) or 11(.1…)%	**1**	Ignore extra words e.g. 'unlikely' No ft from an incorrect (a)
	(c)	They are not equally likely to be chosen	**1**	
8	(a)	(i) 8e	**1**	
		(ii) 5c + 2d	**2**	**1** for one term correct seen
		(iii) g^4	**1**	
	(b)	(i) 5	**1**	Condone 9×5 seen
		(ii) 21	**1**	Condone $21 \div 7$ or $\dfrac{21}{7}$ seen
9	(a)	1 correct line drawn any length	**1**	If >1 line 0 marks
	(b)	H drawn with exactly 2 correct lines	**2**	**B1** for H drawn **Or SC1** for any letter with two lines of symmetry correctly drawn
	(c)	S or H	**1**	Allow I, Z, N, some Xs and some Os
10	(a)	81	**1**	
	(b)	4	**1**	
	(c)	15 or 15/1	**2**	**M1** for 40/8 (= 5)
	(d)	21	**2**	**M1** for 70/10
	(e)	1728 with working seen	**3**	**SC2** if correct and no working
				M1 for 144(0) + 288 or 168(0) + 48 (at least 1 term correct **and** addition attempted) **And A1** if all non-zero digits are correct in their part sums
				Or M1 for 1400 + 40 + 280 + 8 (i.e. 4 values added at least two terms correct) **And A1** for all non-zero digits correct, and 3 terms correct
				Or if grid ('Chinese' method) used **M1** complete grid, 2 products correct **A1** whole grid correct
	(f)	1008	**2**	Allow **1** for 1000 or 8 seen

11	(a)	30 minutes oe	1	
	(b)	One or more Xs marked on (or slightly above/below) horizontal section	1	Condone Xs marked at either end of horizontal section
	(c)	(i) 12km	1	
		(ii) 36 or (*their* 12) × 3	2	**M1** for attempt to use $s = d/t$
	(d)	Steeper at start	1	OR More time taken (at end) to cover **same** distance
12	(a)	16	1	
	(b)	23	1	
	(c)	38	2	**M1** for attempt at (61 or 60) – (23 or 28)
	(d)	42	2	**M1** for sight of 41 and/or 43
	(e)	35 32	3	**SC2** for answers reversed **1** for (old) mode = 35 **and 1** for new mode = 32 **and 1** for teacher aged 35 left **and 1** for teacher aged 32 started to a maximum of 2 marks **OR** **SC1** for any 2 integer values n, $n – 3$
	(f)	0.17 oe	1	
13	(a)	*In (a) mark the best part of the answer* (i) E.g. Answer should be negative	1	Soi e.g. -16.65 NOT after wrong operation e.g. 3.7 + -4.5 = -0.8
		(ii) E.g. Answer > 8 **or** √64 = 8	1	Soi e.g. 7^2 = 49 **or** answer is too small
		(iii) E.g. Answer should be 7(.0) or 6 ÷ 1 = 6	1	Soi e.g. 70 × 0.9 = 63 or 63 ÷ 9 = 7 **BUT** withhold mark if their answer to 6.3 ÷ 0.9 is incorrect
	(b)	(i) 7	1	
		(ii) 22	1	
	(c)	44 – 26 – (3 + 8) = 7 cao	1	
14	(a)	-6	2	**B1** for 4 or -10 seen
	(b)	2 ¾ or 2.75 or 11/4 cao	2	**B1** for ¼ or 0.25 or 2½ or 2.5 or 5/2 seen
15		(½ ×) 3 × 4^2 24 www feet^2 or ft^2 or f^2 or sq(uare) feet	M1 A1 1	

5

16	(a)	90° cao	**1**	
	(b)	Translation cao	**1**	Must be a <u>single</u> transformation
		1 right, 7 up or $\begin{pmatrix} 1 \\ 7 \end{pmatrix}$	**2**	**B1** for 1 right **or** 7 up
				Or **B1** for $\begin{pmatrix} n \\ 7 \end{pmatrix}$ or $\begin{pmatrix} 1 \\ n \end{pmatrix}$
				Or **SC1** for 1 left, 7 down; (1,7); $\begin{pmatrix} -1 \\ -7 \end{pmatrix}$; $\begin{pmatrix} 7 \\ 1 \end{pmatrix}$
				<u>**OR Alternatively**</u> **B1** for reflection cao **AND B2** for $y = -1/7x$ Or **B1** for line drawn (approx. correct)
17	(a)	48	**3**	<u>**If adding areas**</u> **B1** for width = 4 soi **And M1** for 2 × (6 × *their* 4) <u>**OR If subtracting areas**</u> **B1** for top of foot of L = 2 soi **And M1** for 10 × 6 – (6 × *their* 2)
	(b)	32	**3**	**M1** for 10 + 6 + four other lengths oe **And A1** for 10 + 6 + 4 + 2 + 6 + 4 After 0, **SC1** for answer of 40 or 36 or 30
18		Compass arc 6cm ± 2mm from A Ruled perpendicular bisector drawn	**M1** **B2**	Any length **M1** for at least one pair of crossing compass arcs (not just touching) equal radius from B and C
		2 points **only**, clearly identified as their solution, between boundaries and 6cm ± 2mm from A	**B2**	**B1** for one point **only**, clearly identified as their solution, between boundaries and 6cm ± 2mm from A