

Mathematics A

General Certificate of Secondary Education

Unit **A501/01**: Mathematics A (Foundation Tier)

Mark Scheme for January 2011

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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Confidential marking instructions for examiners (January 2011)
A501/01 GCSE Mathematics A (J562)

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. Two additional situations may appear in the mark scheme allowing the award of **A** marks or independent (**B**) marks:
 - i. Correct answer with no working
 - ii. Follows correctly from a previous answer whether correct or not (“ft” on mark scheme and on the annotations tool).
6. 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).
7. 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.
8. Unless the question asks for an answer to a specific degree of accuracy, always mark at the greatest number of significant figures even if this is rounded or truncated on the answer line. For example, an answer in the 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.
9. 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 still be awarded.
10. Ranges of answers given in the mark scheme are always inclusive.

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

12. 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.


13. 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.

14. Anything in the mark scheme which is in square brackets [...] is not required for the mark to be earned, but if present it must be correct.

Abbreviations

The following abbreviations are commonly found in GCSE Mathematics mark schemes.

- 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 **rot** in the mark scheme it means **rounded or truncated**.
- 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.
- Where you see **figs 237**, for example, this means any answer with only these digits. You should ignore leading or trailing zeros and any decimal point e.g. 237000, 2·37, 2·370, 0·00237 would be acceptable but 23070 or 2374 would not.

1	(a)	12	1			
	(b)	6	1			
	(c)		1	2 and a quarter symbols drawn; mark intent	If last row of table blank, accept diagrams next to question.	
	(d)	Coffee	1			
2	(a)	20	1			
	(b)	6	1			
	(c)	17	1			
	(d)	34 and 16	1	Both required		
	(e)	16	1			
3	(a)	11.1 to 11.5 or 111 to 115 cm or mm as appropriate	1 1	Dep. on numerical value stated.	e.g. 12 cm scores 0,1 12 mm scores 0,0	
	(b)	35 to 39	1			
	(c)	Reflex	1			

4	(a)	(i) North or N	1	Or 'due North'	Condone misspellings etc. throughout if intention clear
		North-East or NE	1		
		(ii) Left or L Left or L Right or R	1	All three correct	
	(b)	(i) 5 and 8	1		
		(ii) 30	1FT		
		(iii) 6 bars of consistent width and consistent spacing	1	Condone no spacing between bars or accept a stick graph	Frequency polygon only loses this mark but can still score the next 2
		Correct heights	1FT	Condone one error in heights or one missing bar. FT from their (b)(i)	Accept not in given order provided clearly labelled
		Correct labels	1	Mark intent; condone misspellings	Accept slight misalignment
5		4 to 5.5	2	M1 for 1.6×3 or 3 times as high oe	

6	(a)	[Cost of 6 litres of water =] 30(p) [Total cost for 6.5 litres =] 2.95 + <i>their</i> cost of water <i>Their</i> total cost ÷ 6.5 50 or £0.50	M1 M1 M1 A1	Allow 3×10 (p) soi by 3.25 www M1 may be implied by correct final answer without wrong working After M0 M0 , allow for just $2.95 \div 6.5$ A0 for just 0.5(0)	E.g. allow 2 nd M1 for $2.95 + 60(p)$
	(b)	<u>Use of</u> 1000 ml = 1 litre $2.1(0) \div$ digits 75 or $210 \div$ digits 75 $2.8(0)$ or 280 2.30 or $230p$ or FT from <i>their</i> (a)	M1 M1 B1 B1	Allow $2.1(0) \div 3 \times 4$ for M1 M1 For FT units consistent with (a) and answer must be positive	E.g. 0.75 seen
	(c)	$6500 \div 300$ or $6.5 \div 0.3$ [= 21.6...] soi or 300×21 or 300×22 21	M2 A1	M1 for other digits $65 \div$ digit 3 with dp in wrong position Allow A1 for their answer rounded down to next integer if M1 earned B3 for 21 www	Repeated addition or subtraction methods must lead to answer of 21 to 22
7	(a)	52	1		
	(b)	$85 - 40$ or 45 soi $\times 60/15$ or $\times 4$ soi 180	M1 M1 A1	2 nd M1 independent of first B3 for 180 www	
8	(a)	3.8 or $3\frac{4}{5}$ or $\frac{19}{5}$	1		
	(b)	3.51	2	M1 for 3.509677... rot to 1 dp or more Or SC1 for 5.73	5.73 from $6.26 - 0.82 \div 1.55$ to 2 dps

9	(a)	(i) a^3	1		
		(ii) $7a + 2b$	2	1 for each term	
	(b)	25	2	M1 for $4 \times (-2.5)^2$ or better soi or for 6.25 seen Or SC1 for answers of -25 or 100	
	(c)	$10x - 35 [= 3]$ or $2x - 7 = 3/5$ $10x = 38$ or $2x = 7.6$ or FT [$x =$] 3.8 oe (accept 38/10 or better isw)	B1 M1FT M1FT	For dealing with brackets correctly For getting to form $ax = b$; FT <i>their</i> wrong first step for $a \neq 0$ or 1 and $b \neq 0$ FT <i>their</i> $ax = b$ with $a \neq 0$ or 1 or b and $b \neq 0$ B3 for 3.8 oe www	Allow FT at division step isw – does not need to be evaluated If division step not shown accept answer correct to 2 sf or better For second M1 allow correct embedded solution in original equation as final answer to score full marks i.e. $5(2 \times 3.8 - 7) = 3$
10	(a)	27[.00]	2	M1 for 45×0.6 oe or $45/5$ or 9	Condone 27.0, 27.00p
	(b)	3 : 8 or 0.375 oe : 1 or 1 : 2.6 or exact equivalent mark final answer	2	M1 for 6 : 16 or 1 : 2.6-2.7 or correct answer seen then spoiled After 0 scored allow SC1 for correct ratio but reversed e.g. 8:3	Condone £3 : £8 for 1 or 2 marks

11		<p>Number of matches \times frequency so e.g. 46×7, 47×18 etc or 322, 846, 672, 490, 50 or 2380</p> <p style="text-align: center;">$\div 50$</p> <p style="text-align: center;">47.6</p>	<p>M1</p> <p>M1</p> <p>A1</p>	<p>At least 3 correct products or values shown or total correct</p> <p>2nd M1 independent of first</p> <p>Allow A1 for 48 only if first M1 is earned and there is no wrong working or more accurate answer given as well B3 for 47.6 www</p>	<p>Beware $2380 / 5 = 476$ is incorrect and gets M1. Allow M1 implied for 476 as answer without working Could be implied</p> <p>Beware 48 without working scores 0</p>
12		<p>$(h^2 =) 2.8^2 \pm 2.5^2$ oe</p> <p style="text-align: center;">$\sqrt{2.8^2 - 2.5^2}$</p> <p>1.26(...) or 1.3</p> <p>3.36(...) or 3.4</p>	<p>M1</p> <p>M1</p> <p>A1</p> <p>A1</p>	<p>Implied by 3.36(...) or 3.4</p> <p>After A0, SC1 for 2.1 + <i>their</i> 1.26(...) or 1.3 after the first M1 earned Scale drawing alone scores 0 B4 for 3.36(...) or 3.4 www</p>	<p>Allow correct use of trig if angle EAD or ADE found first – M2 for correct explicit statement e.g. $AE = 2.5 \tan 26.7$ or M1 for correct implicit statement e.g. $AE/2.5 = \tan 26.7$ (angle EAD = 63.2...) (angle ADE = 26.7...)</p> <p>Can earn M1 M0 A0 SC1 but not M0 M0 A0 SC1</p>

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