Level 1/2 Certificate in Use of Mathematics

Mathematics

43503H – Higher Core Unit
Mark scheme

4350
June 2015

Version/Stage: Version 1.0: Final

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this Mark Scheme are available from aqa.org.uk

Key to mark scheme abbreviations

M	mark is for method
m or dM	mark is dependent on one or more M marks and is for method
A	mark is dependent on M or m marks and is for accuracy
B	mark is independent of M or m marks and is for method and accuracy
E	mark is for explanation
√or ft or F	follow through from previous incorrect result
CAO	correct answer only
CSO	correct solution only
AWFW	anything which falls within
AWRT	anything which rounds to
ACF	any correct form
AG	answer given
SC	special case
OE	or equivalent
A2,1	2 or 1 (or 0) accuracy marks
–*x* EE	deduct *x* marks for each error
NMS	no method shown
PI	possibly implied
SCA	substantially correct approach
c	candidate
sf	significant figure(s)
dp	decimal place(s)

No Method Shown

Where the question specifically requires a particular method to be used, we must usually see evidence of use of this method for any marks to be awarded.

Where the answer can be reasonably obtained without showing working and it is very unlikely that the correct answer can be obtained by using an incorrect method, we must award **full marks**. However, the obvious penalty to candidates showing no working is that incorrect answers, however close, earn **no marks**.

Where a question asks the candidate to state or write down a result, no method need be shown for full marks.

Where the permitted calculator has functions which reasonably allow the solution of the question directly, the correct answer without working earns **full marks**, unless it is given to less than the degree of accuracy accepted in the mark scheme, when it gains **no marks**.

Otherwise we require evidence of a correct method for any marks to be awarded.

Q	Solution	Mark	Total	Comment
1(a)(i)	19 43	B1	1	7:43pm = B1
1(a)(ii)	1	B1	1	
1(a)(iii)	1 hr 6 min + 36 (min) 1 (hr) 42 (min)	M1 A1	2	Or clear equivalents 1.7 hrs / 102 minutes
1(a)(iv)	$49 \div 14$ oe 3.5	M1 A1	2	45.5 = SC1 3.479 to less than 3.5 = SC1
1(b)	$11.69 \times \frac{4.4}{100}$ $11.69 +$ their (0).51 £12.20	M1 M1 A1	3	11.69 X 0.044 (=0.514…) = M1 11.69×1.044 = M2 12.21 or 12.2 = SC2 12.20p = A0
	Total		**9**	
2(a)(i)	8	B1	1	Not -8
2(a)(ii)	$5 + -1 + -3 + 3 + 5 + 4 + 2$ Their $15 \div 7$ 2.1(4 ...)	M1 M1(dep) A1	3	15 13.2 to 13.3 = SC1
2(b)(i)	All correct $\pm\frac{1}{2}$ square	B2	2	1 error = B1
2(b)(ii)	Suitable (straight) line drawn extending to at least 4.6 and 13.8 on the horizontal axis	B1ft	1	Freehand allowed FT to their endpoints for line length
2(b)(iii)	16 to 17	B1ft	1	Strict ft from their positive sloping straight line to $\pm\frac{1}{2}$ square
	Total		**8**	
3	$25 = \frac{5}{9}(F - 32)$ and one correct step seen $45 + 32$ 77	M1 M1(dep) A1	3	If ÷ by 5 seen then need evidence that $\frac{1}{9}$ oe remains 44.6 to 45.45 seen = M1 Embedded 77 =SC2
	Total		**3**	

Q	Solution	Mark	Total	Comment
4	$t+10$	B1		$t \times 3$ or $3 \times t$ but not $t3$
	$3t-12$	B1		
	their $t+10=$ their $3t-12$ oe	M1		11 embedded at this line = SC1 11 embedded at this line = SC2
	$2t-12=10$ OR $t+22=3t$ oe	M1		one correct step towards solution
	11	A1	5	Ft from their $t+10$ and $3t-12$ = M2 possible 11 on its own, no working = no marks
	Total		**5**	
5(a)	2.4×1.2	M1		
	2.88	A1	2	Not 2.8
5(b)	$1.8\div1.2$	M1		Embedded '1.5' = SC1 Allow 1:1.5 but not 1.5:1 Ignore units if included
	1.5	A1	2	FW after 1.5 = A0
5(c)	$\pi\times30\times30$ OR $\pi\times24\times24$	M1		
	their 2827.4 – their 1809.6	DM1		
	1017 to 1018	A1		
	1020	B1ft	4	ft from their 1017 to 1018 (from at least 4 digits)
5(d)	54^2-27^2	M1		
	$\sqrt{\text{their } 2187}$	M1		
	46.7 to 46.8	A1		
	$\frac{1}{2}\times$ their 46.77×54 oe	M1		Allow 60.37 and 1630 to 1630.8 for SC1
	1260.9 to 1263.6	A1	5	Accept full marks for $27\sqrt{3}$ and $729\sqrt{3}$
5(e)	$\frac{\pi\times8}{64}\times(63\times24+65\times8)$	M1		Complete and accurate substitution seen seen OR $0.39(2...)\times2032$
	797.56 to 798	A1	2	Accept 254π
	Total		**15**	

Q	Solution	Mark	Total	Comment
6(a)(i)	5	B1	1	
6(a)(ii)	14	B1	1	
6(a)(iii)	$21 = 40^2 \times a +$ their (a)(i) oe $21 -$ their(a)(i) $= 1600 \times a$ 0.01 oe	M1 M1 A1	3	If $21 = 40 \times a +$ their(a)(i) $=$ correct (0.4) = SC2 40^2 evaluated AND one correct step minimum for 2nd M1
6(b)(i)	Correct ruled line and drawn between (0,6) and (60,26) $\pm\frac{1}{2}$ square at endpoints	B4	4	A short ruled line that would otherwise be correct and which is drawn across at least 30 miles horizontally = B3 At least 2 correct points plotted $\pm\frac{1}{2}$ square, but with straight and ruled line out of tolerance at (0,6) and/or (60,26) =B3 At least 2 correct points plotted but line not straight, or not ruled, or not drawn =B2 1 correct point seen and/or plotted or correct value for C (from sub) =B1 Individual points cannot be implied from incorrect line segments. Ignore extra incorrect points if 'correct' line is seen. Ignore any extra plotted points that a line does not pass through
6(b)(ii)	35 to 37	B1ft	1	Strict FT to $\pm\frac{1}{2}$ square. Must have a line or curve drawn.
	Total		**10**	