GCE 2004
June Series

ASSESSMENT and QUALIFICATIONS ALLIANCE

Mark Scheme

Applying Mathematics 1
(UOM4/1)

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

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' 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:

Publications Department, Aldon House, 39, Heald Grove, Rusholme, Manchester, M14 4NA
Tel: 0161 953 1170

or

download from the AQA website: www.aqa.org.uk

Set and published by the Assessment and Qualifications Alliance.

The Assessment and Qualifications Alliance (AQA) is a company limited by guarantee registered in England and Wales 3644723 and a registered charity number 1073334.
Registered address AQA, Devas Street, Manchester, M15 6EX. *Dr. Michael Cresswell Director General*

Key to Mark Scheme

M	mark is for	method
m	mark is dependent on one or more M marks and is for	method
A	mark is dependent on M or m mark and is for	accuracy
B	mark is independent of M or m and is for	method and accuracy
E	mark is for	explanation
√ **or ft**		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
sf		significant figure(s)
dp		decimal place(s)
A2,1		2 or 1 (or 0) accuracy marks
– *x* ee		deduct *x* marks for each error

Abbreviations used in marking

MC – *x*	deducted *x* marks for mis-copy
MR – *x*	deducted *x* marks for mis-read
isw	ignored subsequent working
bod	gave benefit of doubt
wr	work replaced by candidate

Application of mark scheme

Correct answer without working	**mark as in scheme**
Incorrect answer without working	**zero marks unless specified**

Award method and accuracy marks as appropriate to an alternative solution using a correct method **or partially correct method.**

GCE Use of Mathematics
Advanced Subsidiary: Applying Mathematics Paper 1 (UOM4/1)
June 2004

Answers and Marking Scheme

Question 1

(a)	Earth turns 360° in 24×60(=1440) minutes $\therefore$ turns through $360° \div 1440 = 0.25° = \frac{1}{4}°$ in each minute Alternatively $\div 24$, $\div 60$	B1 B1 B1, B1	(or reverse process ie $1440 \times \frac{1}{4} = 360°$) any order – leading to correct answers
(b)	Uniform rate of rotation (about axis)	B1	
	TOTAL	**3**	

Question 2

(a)	Graph indicates –4.5 minutes ($-5 \le$ reading ≤ -4) therefore 11.56 to 11.55 am $11.55 \le$ time ≤ 11.56	M1 A1√	Answer in range 12.04 – 12.05 scores M1 ie $12.04 \le$ time ≤ 12.05 Method may be implied by correct answer
(b)	$E = 9.87\sin(1.97 \times 90 - 160)°$ $-7.68\sin(0.986 \times 90 - 2)$ $= 2.935 - 7.668$ $= -4.73$	M1 A1 A1	Substituting $N = 90$ First A1 for one substitution carried out correctly
	TOTAL	**5**	

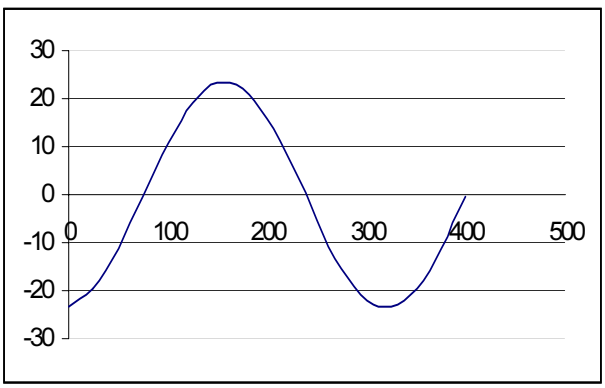
Question 3

	108 ± 3 days (on 30th March $N = 90$ – given) 17th April ± 3 days	M1 M1 A1	 or other reasonable attempt using no. of days in months
	TOTAL	**3**	

Question 4

(a)	Stretch in the vertical direction (allow *y*-direction) Scale factor approximately 4	B1 B1	Allow reverse description if clear eg *V* is a squash of *E* in vertical direction Allow factor in range 3.5 to 4.5
	TOTAL	**2**	

Question 5

(a)	$\theta = 90 - 90 + 23.57 \sin (0.986N - 80)$ $= 23.57 \sin (0.986N - 80)$	 B1	
(b)		B1 B1 B1	General shape Wavelength approx 360° Indication of approx ±23°
(c)	Over the first 3 months of the year the sun is below the horizon – there is no daylight. The sun is visible each day over the middle six months of the year. Over the final 3 months of the year the sun is below the horizon – there is no daylight.	B1 B1 B1	Can gain full marks by describing. Can refer to daylight or sun and horizon. Sun is not always visible above horizon at noon B1 When sun is and is not visible perhaps with reference to graph B2
	TOTAL	**7**	

Question 6

(a)(i) (ii)	D N	B1 B1	
(b)	4	B2	
	TOTAL	**4**	
	TOTAL MARK FOR PAPER	**24**	