Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/63**

Paper 6 (Extended) **May/June 2017**

MARK SCHEME

Maximum Mark: 40

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

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MARK SCHEME NOTES

The following notes are intended to aid interpretation of mark schemes in general, but individual mark schemes may include marks awarded for specific reasons outside the scope of these notes.

Types of mark

M Method marks, awarded for a valid method applied to the problem.

A Accuracy mark, awarded for a correct answer or intermediate step correctly obtained. For accuracy marks to be given, the associated Method mark must be earned or implied.

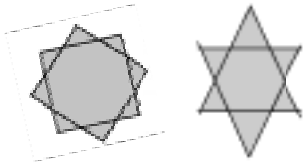
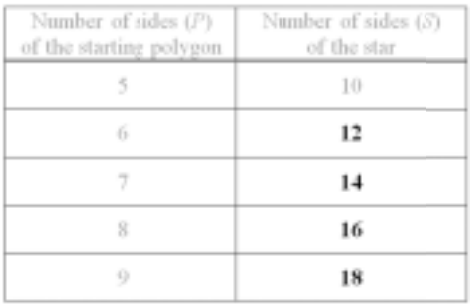
B Mark for a correct result or statement independent of Method marks.

When a part of a question has two or more 'method' steps, the M marks are in principle independent unless the scheme specifically says otherwise; and similarly where there are several B marks allocated. The notation '**dep**' is used to indicate that a particular M or B mark is dependent on an earlier mark in the scheme.

Abbreviations

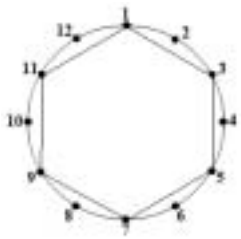
awrt	answers which round to
cao	correct answer only
dep	dependent
FT	follow through after error
isw	ignore subsequent working
nfww	not from wrong working
oe	or equivalent
rot	rounded or truncated
SC	Special Case
soi	seen or implied

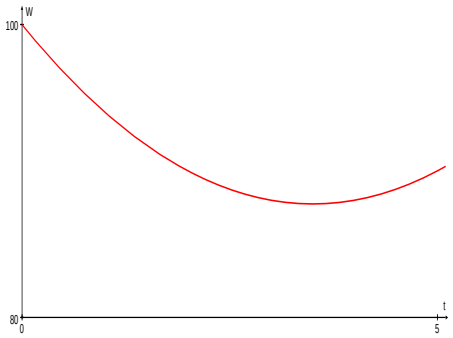
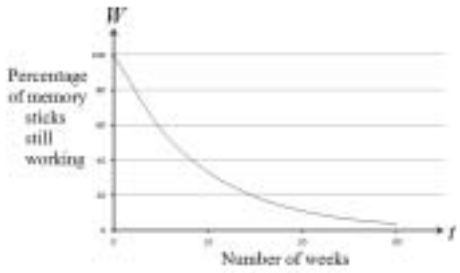
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Question	Answers	Marks	Partial Marks
A	**INVESTIGATION STARS**		
1(a)		**1**	Allow one incorrect extension
1(b)(i)		**1**	
1(b)(ii)	$S = 2P$ oe	**1**	
1(c)(i)	900	**1**	C opportunity
1(c)(ii)	Not possible oe and 1450 is not a multiple of 180 oe	**1**	
1(d)(i)	540 ÷ 5 or 108 or 72 seen	**1**	
	36	**1**	**B0** if from 180 ÷ 5 C opportunity
1(d)(ii)	$2b - a = 180$ oe	**2**	**M1** for $2(180 - b) + a = 180$ oe or $180 - b = \frac{180 - a}{2}$ oe
2(a)		**1**	

Number of sides (P) of the starting polygon	Number of sides (S) of the star
5	10
6	**12**
7	**14**
8	**16**
9	**18**

Number of equally spaced dots	Number of points on the star
5	5
6	3
7	**7**
8	**4**
9	**9**
10	**5**
11	**11**

Question	Answers	Marks	Partial Marks
2(b)	• Odd number of dots gives the same number of points • Even number of dots gives half the number of points oe or a regular polygon	**2**	**B1** for each
3(a)		**1**	
3(b)	$n = 4$ with code $1 \rightarrow 5 \rightarrow 9 \rightarrow 1$ $n = 6$ with code $1 \rightarrow 7 \rightarrow 1$	**1**	
3(c)(i)	It is a factor [of d] $n \neq 1$ or $n \neq d$	**2**	**B1** for each
3(c)(ii)	$\frac{d-1}{2}$ oe	**1**	
3(d)(i)	121	**1**	C opportunity
3(d)(ii)	121	**1**	**FT** *their* 3(d)(i) C opportunity
Communication: Seen in one of the following questions		**1**	
1(c)(i)	Difference shown or 720 + 180		
1(d)(i)	At least two of 180 – 108 = 72 180 – 2 × 72 = 36 oe or 180 – 144 = 36 108 – 72 = 36 2 × 72 = 144 oe 3 × 108 = 326 360 – 326 =36		
3(d)(i)	114 + 8 = 122 or 114 + 8 – 1 or 114 + 8 → 1 so 114 + 7 → 0		
3(d)(ii)	Common factor of 8 and *their* 121 May be implied by 8 and 121 have no common factor.		

Question	Answers	Marks	Partial Marks
B	**MODELLING RELIABILITY**		
1(a)	80	**1**	
1(b)	USB3 and 15	**1**	
1(c)	Negative after 7 weeks oe	**1**	
1(d)(i)	Correct sketch 	**1**	Minimum point must be to the right and between 85 and 95. Graph starts at 100.
1(d)(ii)	Starts increasing oe	**1**	
1(e)	–10	**1**	
2(a)(i)	Correct sketch 	**1**	Must start at *W*-axis and end before *t*-axis and close to it. C opportunity
2(a)(ii)	awrt 6.3	**1**	
2(b)	5.75	**2**	**B1** for [m =] 20 seen C opportunity
2(c)	$\frac{1}{3}$ oe	**1**	C opportunity
2(d)	5680 or 5684[. ... weeks]	**2**	**B1** for $99 = 100 \times 3^{\frac{-52}{m}}$ or better or $99 = 100 \times 3^{\frac{-1}{m}}$ if using years C opportunity

Question	Answers	Marks	Partial Marks
3(a)	$\left(1-\frac{x}{100}\right)$ is the probability of x sticks working [after one week] probabilities are multiplied oe ×100 to change to a percentage oe	**2**	**B2** for 2 or 3 correct or **B1** for 1 correct.
3(b)(i)	awrt 95.1	**2**	Allow 95 only if $\left(1-\frac{1}{100}\right)^5$ or better seen **M1** for $1-\frac{1}{100}$ oe
3(b)(ii)	m = 100 Models are similar oe or differences increase as t increases oe	**2**	**B1** for each May be implied from graphs C opportunity
Communication: Seen in one of the following questions		**1**	
2a(i)	Scales on both axes (0→100 and 0→30)		
2(b)	$\frac{10\times 8}{4}$		
2(c)	3^{-1} seen in the calculation		
2(d)	Two relevant intersecting graphs or $\log 0.99 = -\frac{52}{m}\log 3$ oe involving logs in a common base		
3(b)(ii)	Sketch of both graphs unless awarded in the question 