OCR
Oxford Cambridge and RSA

GCSE

Applications of Mathematics (Pilot)

Unit **A381/01:** Foundation Tier

General Certificate of Secondary Education

Mark Scheme for June 2014

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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.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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Annotations used in the detailed Mark Scheme.

Annotation	Meaning
BP	Blank Page – this annotation **must** be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.
✓	Correct
×	Incorrect
BOD	Benefit of doubt
FT	Follow through
ISW	Ignore subsequent working (after correct answer obtained), provided method has been completed
M0	Method mark awarded 0
M1	Method mark awarded 1
M2	Method mark awarded 2
A1	Accuracy mark awarded 1
B1	Independent mark awarded 1
B2	Independent mark awarded 2
MR	Misread
SC	Special case
^	Omission sign

These should be used whenever appropriate during your marking.

The **M**, **A, B**, etc annotations must be used on your standardisation scripts for responses that are not awarded either 0 or full marks.
It is vital that you annotate these scripts to show how the marks have been awarded.
It is not mandatory to use annotations for any other marking, though you may wish to use them in some circumstances.

Subject-Specific Marking Instructions

M marks are for using a correct method and are not lost for purely numerical errors.
A marks are for an accurate answer and depend on preceding **M** (method) marks. Therefore **M0 A1** cannot be awarded.
B marks are independent of **M** (method) marks and are for a correct final answer, a partially correct answer, or a correct intermediate stage.
SC marks are for special cases that are worthy of some credit.

Unless the answer and marks columns of the mark scheme specify **M** and **A** marks etc, or the mark scheme is 'banded', then if the correct answer is clearly given and is not from wrong working **full marks** should be awarded.

Do not award the marks if the answer was obtained from an incorrect method, ie incorrect working is seen and the correct answer clearly follows from it.

Where follow through (**FT**) is indicated in the mark scheme, marks can be awarded where the candidate's work follows correctly from a previous answer whether or not it was correct.

Figures or expressions that are being followed through are sometimes encompassed by single quotation marks after the word *their* for clarity, eg FT 180 × (*their* '37' + 16), or FT 300 – $\sqrt{}$(*their* '$5^2 + 7^2$'). Answers to part questions which are being followed through are indicated by eg FT 3 × *their* (a).

For questions with FT available you must ensure that you refer back to the relevant previous answer. You may find it easier to mark these questions candidate by candidate rather than question by question.

Where dependent (**dep**) marks are indicated in the mark scheme, you must check that the candidate has met all the criteria specified for the mark to be awarded.

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

i. **figs 237**, for example, means any answer with only these digits. You should ignore leading or trailing zeros and any decimal point eg 237000, 2.37, 2.370, 0.00237 would be acceptable but 23070 or 2374 would not.
ii. **isw means ignore subsequent working (after correct answer obtained).**
iii. **nfww means not from wrong working.**
iv. **oe means or equivalent.**
v. **Rot means rounded or truncated.**
vi. **seen 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.**
vii. **soi** means **seen or implied**.

Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise, indicated for example by the instruction 'mark final answer'.

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).

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.

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.

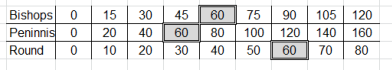
If the correct answer is seen in the body and the answer given in the answer space is a clear transcription error allow full marks unless the mark scheme says 'mark final answer' or 'cao'. Place the annotation ✓ next to the correct answer.

If the answer space is blank but the correct answer is seen in the body allow full marks. Place the annotation ✓ next to the correct answer.

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

For methods not provided for in the mark scheme give as far as possible equivalent marks for equivalent work. If in doubt, consult your Team Leader.

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.

Question			Answer	Marks	Part Marks and Guidance	
1	(a)	(i)	4 [m]	1		
		(ii)	30 to 40 [m]	1		Condone 95 feet to 130 feet, but feet/ft oe must be given
	(b)	(i)	(40.6, 58.7)	1		
		(ii)	Point correctly labelled	1	Use overlay	Within/touching circle on overlay on "fit to height" setting.
		(iii)	[0]48 to [0]52	2	**M1** 128 to 132 **or** straight line drawn linking the two lighthouses **or** [0]46,[0]47,[0]53,[0]54	Accept straight line drawn in the direction of the two lighthouses in question.
	(c)	(i)	Point with in overlay allowed region	1	Using overlay	Accept crosses, ship icon etc. condone on the line
		(ii)	60 [seconds] or 1 minute	3	**M1** for each string of at least 3 correct "terms" to a maximum of M2 or **B2** for correct response but no working	 not necessary to start at zero
	(d)	(i)	150 [m]	1		
		(ii)	1, 2 or 3 [metres]	1		
		(iii)	50 to 54 [km] **nfww**	4	**M1** A = $\sqrt{\text{"(1 to 3)"}} = 1$ to 1.7... **M1** B= $\sqrt{\text{"(150)"}} = 12.2$ ... **M1** 3.8×("A" + "B") oe _____ **or** _____ **M1** A x 3.8 = 3.8… to 6.58 …. **M1** B x 3.8 = 46.5 … **M1** Attempt at sum of above _____ Special case _____ **SC3** Figs 5 to 54 given as final answer **www**	**Full follow through** from parts **(i)** and **(ii)** Must clearly derive from above need both parts correct addition not sufficient. May need checking with calculator Result of converting (wrongly) into kilometres.

Bishops	0	15	30	45	60	75	90	105	120
Peninnis	0	20	40	60	80	100	120	140	160
Round	0	10	20	30	40	50	60	70	80

Question			Answer	Marks	Part Marks and Guidance	
2	(a)		<table><tr><td>Week</td><td>1st</td><td>2nd</td><td>3rd</td><td>4th</td></tr><tr><td>Number of acts</td><td>16</td><td>8</td><td>4</td><td>2</td></tr></table>	1		Both needed
	(b)	(i)	0.8 [million]	1		Condone 800 000 **oe**
		(ii)	(Week) 2 to (week) 3 oe	1	Allow 4.2 and 2.1 (both)	2nd and 3rd
		(iii)	No, viewers going down + 4.2 to 2.1 [million] or 2.1 to 0.8 [million]	1	"No" + numbers from the table or based on a difference from the table. But do not allow just "figures went down" – question does demand numbers. However allow "dropped by half from 2nd to 3rd week".	Must have at least one set of figures to support the "no". If only last figure (0.8) given it must be qualified with "only" or an equivalent qualifier.
	(c)		6 [shows]	2	**M1** 32 **seen**	

Question			Answer	Marks	Part Marks and Guidance	
	(d)*		Each audition takes about (2 to 20) minutes. So total time is (40 000 to 400 000). This is (28 to 280) days 24-hours a day, which is impossible.	**3**	**3** States auditions take (2 to 20) minutes, so total time is (2 – 20) × 20 000 minutes and compare with 5 weeks in same units which is impossible **or** **2** States auditions take (2 to 20) minutes, so total time is (2 – 20) × 20 000 minutes **or** 571. … auditions per day stated **or** calculating time per audition isw **or** **1** States length of audition **or** how many auditions per week (4 000) **or** figs 571 **or** attempt to calculate time per audition **or** states (20 to 200) auditions per day (the equivalent of reasonable length of an audition) _____ special case _____ Candidate mis-read and assume 20 000 in the show format (HAG) **1** Evidence of at least two halving of 20 000 (at least 10 000 and 5 000) **1** Showing/stating that 5 weeks only gets down to 625.	For 12-hour day…… 47.58 auditions an hour 1.26 minutes per audition
3	**(a)**		F 2 [cm^2]	**1** **1**	**FT Strict follow through** on first part	A=8, B=9, C=4, D=9, E= 6, G=3, H=4, I=3
	(b)		C H	**1**		Need both
	(c)		A E F	**1**		All three needed, if extras gain zero
	(d)		I G	**1**		Both needed, if extras gain zero

Question			Answer	Marks	Part Marks and Guidance	
	(e)		[*r* =] 60° [*s* =] 30° or *r*/2	**1** **1**	**FT**	Following through on "r".
4	**(a)**	**(i)**	239 [metres]	**1**		
		(ii)	D(haulagiri) and Man(aslu 1)	**1**	Condone obvious mis-spellings and 8163 , 8167	
		(iii)	90 [%]	**1**		
		(iv)	All/10 of them + some working **nfww**	**2**	**M1** no working and correct response **or** **M1** for one correct conversion 5.5(3125) 5.3(81875) 5.3(6625) 5.3(225) 5.2(89375) 5.1(25625) 5.1(04375) 5.1(01875) 5.0(78125) 5.0(56875) **or** 8000 (m) seen	miles→metres or metres→miles
		(v)	29000 seems to nearest 1000 feet or 29002 is nearest foot **oe**	**1**	Words "rounded" or "estimate" used in a correct contex	See LIST after SSU
		(vi)	200 [years] **nfww**	**2**	**M1** 1000 **or** 0.005 **seen** used **or** figs 2 as answer	
	(b)		1400 to 1600 [metres] **nfww**	**3**	**M1** For either of these seen 750 or 900 **M1** For either of these seen 2500 or 1000	May be indicated on the pressure axis of the chart **or** cross on the graph line May be indicated on the height axis of the chart **or** cross on the graph line
	(c)	**(i)**	3540 **nfww**	**2**	**M1** 12 **or** "number" × 295 **seen** used in working **or** figs 354	
		(ii)	3500	**1**	**FT** from **(i)**	
	(d)	**(i)**	Ja[nuary]	**1**		Condone -36
		(ii)	16 [°C or degrees or degrees C]	**1**		-16 gains no credit
	(e)^{c}	**(i)**	21 **or** 10^{21}	**1**	**Seen** as 10^{21}	
		(ii)	4 [10^{4}]	**1**	**Seen** as 10^{4}	
		(iii)	10 [km]	**2**	**B1** 10 000 oe as answer	

Question			Answer	Marks	Part Marks and Guidance	
	(f)^{c}		14	**2**	**M1** for $\frac{800}{200}$ **oe soi**	e.g. 4 seen
5	**(a)**	**(i)**	30 21	**1**	Allow 29.5 to 30.0 20.7 to 21.2	Need both Condone in wrong order
		(ii)	0.295 to 0.3 0.207 to 0.212	**1**	Allow **FT** from part **(i)**	Need both
	(b)*		Weight of 50.4 g, supported by an area of 0.063(m^2), 10 page booklet **soi** 0.63 × 80 **soi**	**4**	**M1** Area of page (0.061 … to 0.063…) **or** FT on 5(a)(ii) ("their length x their width") (process only seen sufficient) **or** (610 to 636) **M1** "Area of page" x 10 (=Total area) soi **M1** Total weight = "Total area" x 80 **or** **B2** figs 488 to 508	0.61… to 0.63… 48.85 … to 50.88 … Iff on 5(a)(ii) Working in cm This will cover candidates who assume 1 page booklet For candidates with magnified answer booklets follow through on the "real" dimensions of these.

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