

GCSE

Applications of Mathematics (Pilot)

General Certificate of Secondary Education

Unit A381/01: Foundation Tier

Mark Scheme for June 2011

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of pupils of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support which keep pace with the changing needs of today's society.

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.

© OCR 2011

Any enquiries about publications should be addressed to:

OCR Publications PO Box 5050 Annesley NOTTINGHAM NG15 0DL

Telephone:0870 770 6622Facsimile:01223 552610E-mail:publications@ocr.org.uk

A381/01

Subject-Specific Marking Instructions

- M marks are for <u>using a correct method</u> and are not lost for purely numerical errors.
 A marks are for an <u>accurate</u> answer and depend on preceding M (method) marks. Therefore M0 A1 cannot be awarded.
 B marks are <u>independent</u> of M (method) marks and are awarded for a correct final answer or a correct intermediate stage.
 SC marks are for <u>special cases</u> that are worthy of some credit.
- 2. 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 <u>not from wrong working</u> **full marks** should be awarded.

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

3. 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.

- 4. 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.
- 5. The following abbreviations are commonly found in GCSE Mathematics mark schemes.
 - cao means correct answer only.
 - **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.
 - isw means ignore subsequent working (after correct answer obtained).
 - nfww means not from wrong working.
 - oe means or equivalent.
 - rot means rounded or truncated.
 - **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.
 - soi means seen or implied.

A381/01

Mark Scheme

- 6. 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'.
- 7. 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).
- 8. 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.
- 9. 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.
- 10. 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 \checkmark next to the correct answer.

If the correct answer is seen in the 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. Use the M0, M1, M2 annotations as appropriate and place the annotation × next to the wrong answer.

- 11. Ranges of answers given in the mark scheme are always inclusive.
- 12. 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.
- 13. 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.

Q	Question		Answer	Marks	Part n	narks and guidance
1	(a)		0 0 3	2	-1 each error (minimum zero)	Condone blank as "0", reflection lines
						line
			8 2 3	2	-1 each error (minimum zero)	Condone blank as "0".
	(b)	(i)	7800	1		
		(::)	2	4		
		(11)	3	1		
2	(2)		46	1		
_	(4)					
	(b)	(i)	9560	1		
		(ii)	97000	1		
	(c)		9	2	18	9
	X = 7		<u>-</u> 16		M1 for $\frac{10}{32}$ seen	$\frac{1}{16}$ must be seen as final answer to gain 2
			10		32	marks.
	(d)	(i)	T = a + 10u + 100m	2	B1 for 10 <i>u</i> or 100 <i>m</i> seen	Condone <i>a</i> 1 + <i>u</i> 10 + <i>m</i> 100
		(ii)	19 aliens + (0) UFO	1		
		()	9 aliens + 1 UFO	1		
	(e)	(i)	75 (%)	1		
		(::)	120 (accords)	1		Condono 2 minutos statad
		(11)				

Question		n	Answer	Marks	Part m	narks and guidance						
3	(a)		(115 to 145) cm or (1.15 to 1.45) m	1+1		2 nd units mark dependent on number in range (90 to 170) or (0.9 to 1.7).					in	
	(b)		67 to 73	1								
	(c)	(i)	Gold:Wu or12.31Silver:Guilhermina or12.4(0)Bronze:Santos or12.99	2	B1 for gold or bronze correct	Need all three for full credit.						
		(ii)	Comparison of both times by athletes (halving or doubling the appropriate ones, or subtraction) at least 2 comparisons and statement agreeing with Balvinder.	3	 B2 for at least 1 comparison and explicit agreement with Balvinder or 2 comparisons and no explicit agreement stated or incorrect comment. or B1 for 1 comparison seen, but with no explicit or incorrect comment. 	Athlete Santos Hinton Kantza Suaraez Minton 100m (s) 12.99 13.18 13.20 13.21 12 200m (s) 26.99 26.68 26.87 27.61 25 200 - 100 14.00 13.50 13.67 14.40 13 200 - 100 14.00 13.50 13.67 14.40 13 2 x 100m 25.980 26.360 26.400 26.420 24 0.5 x 200m 13.495 13.340 13.435 13.805 12 100m/200m 0.481 0.494 0.491 0.478 0. 200m/100m 2.078 2.024 2.036 2.090 2.			Wu 12.31 25.40 13.09 24.620 12.700 0.485 2.063 d times nird te table			
	(d)		20	2	B1 for figs 202 (miles per hour)							

Question		n	Answer	Marks	Part m	arks and guidance				
	(e)*		Correct grant or outlay calculated for all 3 cases, clearly stated, explicit statement of maximum (best) grant or least outlay and clear statement to the effect that C is the best option or equivalent.	5-4	For lower mark - two grants or outlays correctly calculated and labelled/indicated and consistent statement (following through on the third value). or all three correct (all grants or all outlays) but incorrect or no	Grant Actual cost to Jezz A: (£) 586.5(0) or (£) 1759.5(0) B: (£) 567.3(0) or (£) 1778.7(0) C: (£) 625.6(0) or (£) 1720.4(0) "C (is the largest grant / cheapest)"				
			Two correctly calculated grants or outlays (may be both or either of grant or outlay) but no/incorrect summary or reference to the original question.	or 3-2	For lower mark one correctly calculated grant or outlay and consistent statement about cheapest of at least two.					
			One correct grant or actual outlay seen not necessarily labelled as such, no/incorrect comment or 3 clear sums of money shown and the smallest chosen as the cheapest deal for Jezz	or 1						
4	(a)		4x + 4 or $4(x + 1)$	1						
	(b)	(i)	(<i>x</i> =) 8	1		Only allow fully embedded answer i.e. $2 \times 8 = 16$				
		(ii)	(<i>x</i> =) 6	1		Only allow fully embedded answer i.e. 6 + 4 = 10				

A381/01

Question		n	Answer	Marks	Part marks and guidance					
5	(a)		С	1						
	(b)		D	1						
	(c)		4	3	 B2 for 16 seen. or B1 for one of following areas seen either in text or on diagram 1 or 3 or 4. 	For full credit the 4 must clearly be the intended final answer (not on answer line). Full credit for correct drawn solution on grid – does not require numbers i.e. can be a drawing of a 4 by 4 square (internal structure not required).				
6	(a)		125° 30° 25°	2	B1 for additions or subtractions involving 180 clearly seen.	Clearly indicated as the answer.				
	(b)		155° 155° 25° 25°	2	B1 for choice involving two equal angles or two angles that sum to 180°.					
7	(a)		5 and 13	1		Allow 5 × 13				
	(b)		3 and 7	1		Allow 3 × 7				
	(c)		3	1		Allow 3 \times 3 \times 3 or 3 ³				
	(d)		13	1		Allow 13 \times 13 or 13 ²				
	(e)		"Ends in 4" or "It's even" or "2 goes into it"	1		Or sensible equivalent.				

Question		n	Answer	Marks	Part m	narks and guidance						
	(f)		Does not work for	3	Clear negative statement and		n	p		n	р	
			$4 \rightarrow 25 \text{ or}$		a value of <i>n</i> and its generated		1	7		11	67	
			$14 \rightarrow 85 \text{ or}$		non-prime		2	13		12	73	
			$15 \rightarrow 91$ etc.		B2 for two or more prime or		3	19		13	79	
					non-prime numbers generated		4	25		14	85	
					from Anna's formula (other		6	27		15	01	
					or		7	12		16	07	
					B1 for one prime or non-prime		/	45		17	102	
					number generated from Anna's formula (other than 5 giving 31)		8	49		1/	103	
							9	55		18	109	
							10	61		19	115	
					SC1 Stated value of <i>n</i> combined with negative statement but value of non-prime not stated.	non-prime						
	(g)	(i)	9 369 319	1								
		(ii)	115 119 486 943	1								
8	(a)	(i)	7(m) – 2x oe	1	Accept 5(m) – 2x, oe	Condone either dimension						
		(ii)	24(m) – 8 <i>x</i>	2	M1 for $2(5 - 2x) + 2(their (i))$ or $2(7 - 2x) + 2(their (i))$ if reversed or $2(7 + 5) - 8x$	Accept equivalent expressions SC1 for $8x - 24$						
	(b)		6 m by 4 m nfww	3	M2 FT for $x = \frac{1}{2}$ or 0.5 oe or M1 FT for $8x = 24 - 20$ or -8x = 20 - 24	FT <i>their</i> expression in a(ii)						

OCR (Oxford Cambridge and RSA Examinations) 1 Hills Road Cambridge CB1 2EU

OCR Customer Contact Centre

14 – 19 Qualifications (General)

Telephone: 01223 553998 Facsimile: 01223 552627 Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

Oxford Cambridge and RSA Examinations is a Company Limited by Guarantee Registered in England Registered Office; 1 Hills Road, Cambridge, CB1 2EU Registered Company Number: 3484466 OCR is an exempt Charity

OCR (Oxford Cambridge and RSA Examinations) Head office Telephone: 01223 552552 Facsimile: 01223 552553



© OCR 2011