OCR
RECOGNISING ACHIEVEMENT

GCSE

Mathematics A

General Certificate of Secondary

Unit **A502/01:** Mathematics B (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.

Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annesley
NOTTINGHAM
NG15 0DL

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

Subject-Specific Marking Instructions

1. **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.

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 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.

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 – √(*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**.

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 ✓ 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.

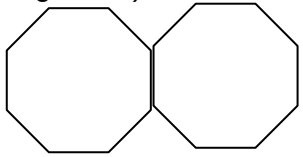
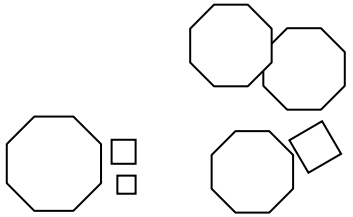
12. For methods not provided for in the mark scheme give as far as possible equivalent marks for equivalent work. If in doubt, consult your Team Leader.

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.

1	**(a)**	6	**1**		
	(b)	32.1	**2**	**M1** for 35.9 or 31.2 seen or a number – 3.8 with decimals correctly aligned or a number + 0.9 with decimals correctly aligned	Answer does not need to be correct
	(c)	**10** = = **67.2** **67.2** ÷ 2 = 33.6 = **33.6**	**1** **1** **1**	67.2 seen	Mark numbers in "working" but if none look elsewhere. Award mark for 67.2 once only in either place.
2	**(a)**	$\frac{1}{8}$ oe	**1**		
	(b)	(i) (£)4	**2**	**M1** for 10 ÷ 5 or 10 x 2 or 10 x 0.4 or £2 or £20 seen	
		(ii) $\frac{3}{5}$ oe	**1**	Accept any equivalent but must be fraction EG $\frac{6}{10}$	
3	**(a)**	(–3, 2)	**1**		Penalise reversed coordinates first time only
	(b)	40 to 44	**1**	Accept 4(.0)**cm** to 4.4**cm**	Units must be written if cm **B0** for 4.2mm
	(c)	D indicated (0, –1)	**1** **1**	Condone unambiguous indication of position of D **1** for their coordinates after wrong D on diagram If **0** **M1** for indication of line parallel to BC through A or AB through C	Point at ((0, -1) or lines crossing at (0, -1)
	(d)	Obtuse	**1**	Condone "interior"	

4	**(a)**	175	**2**	**B1** for figs 175 **or** **M1** for figs 325 – figs15 attempted	Includes counting on
	(b)	3(.00) 70p or £(0).70 25(.00) 2.5(0) 27.5(0)	**1** **1** **1FT** **1FT** **1FT**	 FT *their* £3 FT *their* cost of all items FT *their* 25 + 2.5	 Penalise missing 0 at end of money once only
5	**(a)**	4*d*	**1**	Condone 4 x *d* or *d* x 4 or *d*4 or *d* + *d* + *d* + *d* **SC1** for d^2	Penalise incorrect notation once only in question 5 EG 4^d scores 0 **0** for "four times *d*" Ignore *p* = but not *d* =
	(b)	10*d*	**2**	Condone 10 x *d* or *d* x 10 or *d*10 **B1** for *d* + *d* + *d* + …+ *d* or any other equivalent of 10*d* **SC1** for 16*d* or 13*d* or **SC2 dep** on **SC1** for **(a)** for $4d^2$	10^d scores 2 after 4^d penalised in (a) EG 4*d* + *d* + 4*d* + *d* Ignore *p* = but not *d* =
	(c)	7 (squares)	**2**	**M1** for diagram showing more than 4 squares joined in a row or Attempt to add *d*s which would give a total beyond 10d **SC1** for 4 from 16*d* in **(b)**	

6	**(a)**	27	**2**	**M1** for 90 – 63 or 180 – 153	EG 90 + 63 + *a* = 180 or 63 + *a* = 90 Condone embedded 27
	(b)	131 Angles at a point (add up to) 360^o	**1** **1**	Condone "in a circle" for "at a point"	
	(c)	(i) 360 ÷ 8 or 45 180 – *their* 45 or 135 + 45 = 180 soi	**1** **1**	**Alternative method for second mark** (Finding angles in isosceles triangles) $2 \times \frac{180 - 45}{2}$ **Alternative method** (Finding interior angle sum) **M1** 180 x 6 or 1080 (from 6 triangles) **M1** *their* 1080 ÷ 8 **Alternative method** (Assuming interior = 135) **M1** 180 -135 or 45 **M1** *their* 45 x 8	NB diagram illustrates answer so if working contradicted by diagram follow working

6	(c)	(ii) Fully correct answer that link all of • Sum of 2 × 135 and 90 = 360. • Angles at a point = 360 • All edge lengths the same • No gaps oe Evidence may be explicitly shown on a (freehand) sketch with octagons and square(s) meeting at a point	**4-3**	Answer that includes at least 3 correct with attempt to link from • Sum of 2 × 135 and 90 = 360. • Angles at a point = 360 • All edge lengths the same • No gaps oe Evidence may be explicitly shown on a (freehand) sketch with octagons and square(s) meeting at a point	Gap is square = no gaps
		Answer that includes 2 correct with attempt to link or 3 correct with no linking from • (Freehand) sketch with octagons and square(s) meeting at a point • Sum of 2 × 135 and 90 = 360. • Angles at a point = 360 • All edge lengths the same • No gaps oe Look for explicit evidence on diagram.	**2-1**	One valid piece of evidence from • Rough sketch of octagon(s) joining along one side, matching length side (by eye) • Sum of 2 × 135 and 90 = 360. • Angles at a point = 360 • All edge lengths the same • No gaps oe • Angles in a square = 90	Min for 1 mark sketch (any alignment) 
		No relevant working **or** Octagons (and squares) with gaps or overlaps and no relevant or correct angles marked or meaningful explanations.	**0**		0 mark sketches 

7		2 **A** 3 **B** 4 **D**	**2**	**B1** for any one correct	Condone 2 (for A) 1 (for B) 0 (for D)
8	**(a)**	1 Negative 2 Positive 3 Zero	**1** **1** **1**	Ignore comments about strong or weak in 1 and 2 Accept no correlation, none	
	(b)	(i) Three points correct	**2**	**1** mark for 2 correct points.	± ½ square in 1 or 2 directions.
		(ii) Line drawn within overlay	**1**	Intended straight	Line to lie wholly within or on lines of overlay and complete in range 60 to 340 (miles)
		(iii) 25 ± 0.5	**1FT**	Strict follow through from *their* line only If no line seen, accept 25 only.	
		(iv) Ring round (160, 25)	**1**		
9	**(a)**	Enlargement SF 3 (Centre) (–5, –1)	**B1** **B1** **B1**	Enlargement as the **only** transformation. Condone "(times) by 3"	eg 'enlargement and translation' does not score the 1st B mark times, multiply NOT bigger Condone missing brackets Do not accept column vector eg $\begin{pmatrix}-5\\-1\end{pmatrix}$ 'Centre of enlargement' implies the first mark if no other transformation given.
	(b)	Correct rotation	**2**	**B1** if wrong centre but correct angle	Condone freehand, mark vertices. Ignore any labels

10	**(a)**	(i) 13	**3**	**B2** for $12\frac{3}{4}$ or $\frac{51}{4}$ or 12. (…..) Or **M1** for $17\times\frac{3}{4}$ or $51 \div 4$ or 17×0.75 or 4.25×3 And **B1FT** for rounding **up** any non-integer answer >1 If ratio method used **B2** for 12 pizzas = 16 scouts Or **B1** for 3 pizzas = 4 scouts or better	$\frac{51}{68}$ implies M1 Calculation doesn't need to be attempted for M1 If 'counting on' used (eg 0.75, 1.5, 2.25 …) award B marks if 12 pizzas = 16 scouts or for 3 pizzas = 4 scouts are reached and recorded clearly
		(ii) 2.21	**3**	**M2** for 2.60 – *their* 15% Or 2.60×0.85 with attempt at long multiplication Or **M1** for 0.26 and 0.13 seen or other full method for getting 15% of 2.60 **SC2** 28.73 only from13 pizzas	Correct method for their 15% needed If *their* 13 pizzas considered allow FT for **M2** or **M1** provided method is clear. Eg 260 ÷ 100 x 15 without evaluation Condone confused units for M marks (eg 2.60- (26 + 13)) Also 221 implies **M2**.
	(b)	3240	**2**	**B1** for 100 used	Either x 100 or ÷ 100 (or 10^2)

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