OCR
RECOGNISING ACHIEVEMENT

GCSE

Mathematics B

General Certificate of Secondary Education

Unit **J567/02:** Paper 2 (Foundation Tier)

Mark Scheme for November 2012

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates 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 2012

Annotations used in the detailed Mark Scheme.

Annotation	Meaning
✓	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

1. **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 for a correct final answer, a partially correct 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 − √(*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.

    -   **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 and applies as a default.
    -   **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.   In questions with no final answer line, make no deductions for wrong work after an acceptable answer (ie **isw**) unless the mark scheme says otherwise, indicated for example by the instruction 'mark final answer'.

7.   In questions with a final answer line following working space,

      (i)   if the correct answer is seen in the body of working and the answer given on the answer line is a clear transcription error allow full marks unless the mark scheme says 'mark final answer'. Place the annotation ✓ next to the correct answer.

      (ii)   if the correct answer is seen in the body of working but the answer line is blank, allow full marks. Place the annotation ✓ next to the correct answer.

      (iii)   if the correct answer is seen in the body of working but a completely different answer is seen on the answer line, then accuracy marks for the answer are lost. Method marks could still be awarded. Use the M0, M1, M2 annotations as appropriate and place the annotation ✗ next to the wrong answer.

8.   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).

9.   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.

10.   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.

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.

Question			Answer	Marks	Part Marks and Guidance	
1			$\dfrac{5}{8}$, $\dfrac{6}{18}$ **oe**	2	**B1** for each	Ignore incorrect cancelling
2	**(a)**		unlikely	1		
	(b)		evens	1		
	(c)		impossible	1		
3	**(a)**		(3 , 4)	1		
	(b)		(⁻4, ⁻2)	1		
	(c)	**(i)**	C plotted at (3, ⁻2)	1		Accept C not labelled if clearly their intended point
		(ii)	Right angled or scalene	1		
4	**(a)**		Hexagon	1		Be generous with spelling, but do not accept hectagon
	(b)		Cuboid	1		Be generous with spelling
	(c)		2.8 to 3.2	1		If answer line blank accept answer on diagram if clear

Question			Answer	Marks	Part Marks and Guidance	
5	(a)		Bar height 5 drawn	1		Must be correct width sides and top drawn
	(b)	(i)	Football	1		
		(ii)	10	1		
		(iii)	2	1		
	(c)		46	2	**M1** for attempt to add all *their* 6 numbers (allow 1 error in heights) OR **SC1** for answer of 41 **IF** no bar drawn for netball.	
6	(a)		84 270	1		
	(b)		84 000	1		
	(c)		80 000	1		

Question			Answer	Marks	Part Marks and Guidance	
7			4.072, 4.079, 4.17, 4.7, 4.712	2	**B1** if 1 error OR **SC1** for all correct order but reversed	
8	(a)		2 4 6 3 4 2 3 3 1	2	**M1** for 1 error or omission in frequencies or all tallies correct OR **SC1** for all correct frequencies in tally column	
	(b)		3	1		
9	(a)	(i)	(4 + 3) × 8 − 13 = 43	1		Ignore superfluous brackets
		(ii)	(5 + 3)^2 × 2 ÷ 8 = 16	1		Ignore superfluous brackets
	(b)	(i)	338.56	1		
		(ii)	56	1		
		(iii)	0.591	2	**M1** for 0.59(0....)	

Question			Answer	Marks	Part Marks and Guidance	
10	(a)	(i)	D4	1		Condone 4D
		(ii)	N (orth) E (ast…)	1		
		(iii)	Anticlockwise arrow marked	1		
		(iv)	330 − 335	1		
		(v)	92 − 124	2	**M1** for 23 – 31 or *their* number of squares × 4	Look on diagram for evidence of 23 – 31. Number of squares ≤ 49
	(b)	(i)	10.35	2	**M1** for 1.86 x 5 or 15 × 0.07 **oe** implied by 9.3 or 1.05 or 186 x 5 or 15 × 7 implied by 930 or 105	
		(ii)	260	4	**M1** for $\frac{3}{4}$ of 2l implied by 1500 or 1.5 **M1** for 62% of 2l implied by 1240 or 1.24 **M1** for subtraction of *their* values OR **M1** for 75(%) or 0.75 and 0.62 **M1** for 75 – 62 can be implied by 13 **M1** for (0).13 x 2 or 2000	0.26 **nfww** scores 3
	(c)		⁻4, ⁻2, 0 5 7	1		

Question			Answer	Marks	Part Marks and Guidance	
11	(a)	(i)	392	1		
		(ii)	40	2	**M1** for 104 − 32 **soi** (72)	
	(b)	(i)	8	1		Penalise embedded answers once
		(ii)	3	2	**M1** for $4x = 12$	
		(iii)	12	2	**M1** for $\dfrac{x}{2} = 6$	
12	(a)		$\dfrac{3}{20}$	1		In all parts accept fractions, decimals and percentages. If choice, mark worst, but only penalise incorrect form first time eg 3 out of 20, 3:20, 3 in 20, 3 to 20 etc Ignore additional words if not contradictory.
	(b)		$\dfrac{7}{20}$	1		
	(c)		$\dfrac{4}{5}$	2	**M1** for $\dfrac{16}{20}$ **oe**	

Question			Answer	Marks	Part Marks and Guidance	
13	**(a)**		1072.5(0)	2	**M1** for 650 × 1.65	
	(b)		86.92	2	**M1** for 0.06 × 82 **oe** implied by 4.92	Accept complete correct non-calculator methods, allow 1 error for **M1**
	(c)	**(i)**	127 – 130	1		
		(ii)	look at £50 and x 5 the $ value **oe**	1		Pound values used must not exceed 112
14	**(a)**	**(i)**	7*r* final answer	1		
		(ii)	13*s* − 2*t* final answer	2	**B1** for 13*s* or − 2*t*	
	(b)	**(i)**	5	1		
		(ii)	7	1		Do not accept 6^7
15			(38) 38 104 (38) 71 71	3	**B2** for 1 correct set of angles If 0 scored **B1** for any 2 angles the same in one triangle	Do not accept all 3 angles of 38
16	**(a)**		7134 or 7130	2	**M1** for $\frac{1}{2}$ × 164 × 87 or 82 × 87	May be done in stages
	(b)		281.6 or 282	2	**M1** for $\frac{1}{2}$ (14.8 + 20.4) × 16	May be done in stages

Question			Answer	Marks	Part Marks and Guidance	
17	**(a)**		0.14 **oe**	2	**M1** for 1 – (0.38 + 0.17 + 0.31) implied by 14 and [0].14	0.24 is **BOD** for **M1**
	(b)		2.48[....] or 2.5	3	**M1** for attempt at Σ*pf* or 278 **soi** by eg 3 of these 26, 76, 72, 64, 40 with an attempt to add or answer of 238.3[5…] **M1dep** for *their* '278' ÷ (*their* 'Σ*f*' or 112)	Look for the correct answer in working if the answer has been rounded too much Σ*f* implied by a number at the base of the frequency column not 5 or 15
18			Angle bisector of A correct and with two correct pairs of arcs **and** at least one line parallel to canal at a distance of 2 cm **and** at least one 5 cm horizontal line within a correct region	4	**B2** for ruled angle bisector of A correct and with two correct pairs of arcs OR **B1** for correct line but no construction or correct arcs with no correct line AND **B1** for straight line parallel to canal at a distance of 2 cm either to the right or left AND **B1** for straight 5 cm horizontal line within correct region	Tolerance is ± 2 mm for lengths and ± 2° for angles <u>Overlay</u>: **angle bisector** needs to lie on or within the red lines Mark <u>best</u> parallel **line** on or within the green lines Ignore semicircles at the ends of the canal Mark <u>best</u> **runway** use end circles as tolerance by eye

Question			Answer	Marks	Guidance
19*			This needs to be the correct answer of 24 with all correct unit conversions seen and all operations clearly communicated and with no errors.	5	Calculation : $$\frac{\textbf{figs 60}}{(80 \times 500 \times \textbf{figs 210} \times \textbf{figs 297}) \div (10^{6} \times 10^{3})} = 24.0500240\ldots$$
			This could be an answer of 24.05[…..] or incorrectly rounded with fully correct supporting working. or We need to see all 4 correct operations or 3 of the 4 correct operations **and** a correct unit conversion, eg 80 × 500 × [0].21[0] × [0].297 scores 4 marks as there are 3 correct operations and they have changed the mm^2 to m^2 by changing the two lengths correctly or [0].08[0] × 500 × 210 × 297 also scores 4 marks as they have correctly converted the g to kg and there are 3 of the 4 operations correct.	4 - 3	We need to see 3 of the 4 correct operations or 2 of the 4 correct operations **and** a correct unit conversion, eg 500 × [0].21[0] × [0].297 scores 3 marks because there are 2 correct operations and 1 correct unit conversion. or A final answer of 24 with insufficient correct working or no working.
			We need to see 2 of the 4 correct operations or 1 of the 4 correct operations **and** a correct unit conversion, eg [0].21[0] × [0].297 scores 2 marks because there is 1 correct operation and 1 correct unit conversion.	2 - 1	We need to see 1 of the 4 correct operations or a correct unit conversion, eg [0].210 **and** [0].297 seen scores 1 mark because there is 1 correct unit conversion, or 60 000 seen scores the mark or 80 × 500 scores 1 mark.
			No worthwhile work attempted.	0	Answer 24 from completely wrong work scores 0

Question			Answer	Marks	Part Marks and Guidance	
20	**(a)**		28	1		
	(b)		6n – 2 **oe** final answer	2	**B1** for 6n seen eg 6(n – 1)	Equivalents include 6(n - 1) + 4 Condone other letters and n6 and n × 6 for 6n
	(c)		118	1	Correct or **FT** *their* linear expression in (b)	
21			3 **nfww**	4	**M1** for 6 ÷ (1 + 3) or can be implied by 1.5 or 1500 **M1** for *their* '1.5' × 3 or 4.5 or 4500 seen **M1** for *their* '4.5' – *their* '1.5' can be implied	6l could be 6000 (ml) accept any correct method Allow 3000 **ml** as answer

Question			Answer	Marks	Part Marks and Guidance	
22			No with a complete argument eg (66 ÷ 12) = 5.5 leading to 100×5.5 = 550 which is compared to 520	3	**M1** for working out a valid scale factor between the two triangles or a ratio within one triangle (which can be implied) **M1dep** for working out another relevant scale factor or ratio, or using *their* first sf/ratio to find a comparable relevant length. **A1dep** on **M2** for stating "No" eg **M1** for (gradient =) 12 ÷ 100 (= 0.12) **M1** for 66 ÷ 520 (= 0.126 to 0.127 or 0.13) **A1** for No OR eg scale factor **M1** for 520 ÷ 100 (= 5.2) **M1** for 5.2 × 12 (= 62.4) **A1** for No OR eg common height **M1** for 100 × 11 (= 1100) **M1** for 520 × 2 (= 1040) **A1** for No OR any other correct method eg use of angle **M1** for (angle =) $\tan^{-1}(12 ÷ 100)$ (= 6.8[4…]) **M1** for $\tan^{-1}(66 ÷ 520)$ (= 7.2[3…]) **A1** for No	Mark to the candidate's advantage Allow equivalents such as percentages or fractions with a common denominator, also allow any correct method such as use of similar triangles or comparison of scale factors (eg 5.2 and 5.5)

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

OCR Customer Contact Centre

Education and Learning
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