

Mathematics B (MEI)

General Certificate of Secondary Education

Unit **B291**: Paper 1 (Foundation – Modular)

Mark Scheme for June 2011

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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.

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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 awarded for a correct final 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 $180 \times (\textit{their '37'} + 16)$, or FT $300 - \sqrt{(\textit{their '5^2 + 7^2'})}$. Answers to part questions which are being followed through are indicated by eg FT $3 \times \textit{their (a)}$.

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).
 - **nfw** 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
 - (i) mark scheme says 'mark final answer' or 'cao'. Place the annotation ✓ next to the correct answer.
 - (ii) 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.
 - (iii) 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.

Section A

Question			Answer	Marks	Part marks and guidance	
1			chord radius (or sector) circumference (or sector) centre (or sector) tangent	5	B1 each correct answer	Allow sector once only
2			4 3 squares drawn 18 $2\frac{1}{4}$ squares drawn	4	B1 each correct answer	
3	(a)	(i)	$\frac{5}{12}$	1		
		(ii)	Two triangles/one square shaded	1		
	(b)		no, yes, yes, no	2	B1 for 2 or 3 correct	If just "yes" and blanks seen, assume blank = "no"
4	(a)		643	2	SC1 for one digit wrong by one Or M1 for correct method, evidence of carrying, or other method, eg two of $6 + 30 + 607$	
	(b)		6.50	3	B2 for 3.50 or 650 Or M1 for evidence of correct \times method, arithmetic slip only and B1 for 10 – <i>their 25k</i> , correct	
5	(a)		21	2	M1 for 3×7	

Question		Answer	Marks	Part marks and guidance													
	(b)	20	1														
6	(a)	63 to 67	1														
	(b)	Angle 143 to 147 drawn		Angle indicated if ambiguous													
7	(a)	7	1														
	(b)	10, 5, 9	1														
	(c)	At least (1, 9) to (9, 1) drawn	2	B1 for at least 2 points plotted (FT or correct)	May be implied by line (at least 1 diagonal in length)												
8	(a)	<table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr><td style="border-right: 1px solid black; padding: 2px 5px;">1</td><td style="padding: 2px 5px;">1 7</td></tr> <tr><td style="border-right: 1px solid black; padding: 2px 5px;">2</td><td style="padding: 2px 5px;">5 8 9</td></tr> <tr><td style="border-right: 1px solid black; padding: 2px 5px;">3</td><td style="padding: 2px 5px;">7 8</td></tr> <tr><td style="border-right: 1px solid black; padding: 2px 5px;">4</td><td style="padding: 2px 5px;">0 5 6 7</td></tr> <tr><td style="border-right: 1px solid black; padding: 2px 5px;">5</td><td style="padding: 2px 5px;">3 5</td></tr> <tr><td style="border-right: 1px solid black; padding: 2px 5px;">Key: 1</td><td style="padding: 2px 5px;">1 represents 11 miles</td></tr> </table>	1	1 7	2	5 8 9	3	7 8	4	0 5 6 7	5	3 5	Key: 1	1 represents 11 miles	2	B1 just one error	Stem in reverse order is OK 10, 20 etc in stem is one error Unordered is one error
1	1 7																
2	5 8 9																
3	7 8																
4	0 5 6 7																
5	3 5																
Key: 1	1 represents 11 miles																
	(b)	38	1														
9	(a)	64(%) nfw	2	M1 for $\frac{96}{150}(\times 100)$ or 0.64 OR attempt to get correct answer by breaking down into percentages	Complete method, arithmetic errors only												
	(b)	No, with correct arithmetic justification	3	M1 for $\frac{96}{240}(\times 100)$ A1 for 0.4 or 40% OR M1 for 96 said yes and 240-96 didn't A1 for 144 didn't A1 FT for YES or NO	Justification is 0.4, or 40% or 96 < 120 oe For M mark subtraction needed Justification will be 96 < 144												

Section A Total: 36

Section B

Question		Answer	Marks	Part marks and guidance	
10	(a)	12067	1		
	(b)	seven thousand eight hundred and nine	1		
	(c) (i)	3760	1		
	(ii)	4000	1		
11		317 angles at a point (add to 360)	1 1	360 soi by 317 or working	a whole circle (is 360)
12	(a)	100	1		
	(b)	4.5	1		
	(c)	82	2FT	FT 100 – 4×(b) B1 for 18 Or M1 for 4 × <i>their</i> (b) or for 100 – <i>n</i> × <i>their</i> (b) Or SC1 for 80 – 84	
13	(a)	57	2	B1 for 19 or 399 seen M1 for ÷7 and ×3	
	(b)	5.76	1		
	(c)	2.7	1	SC1 (b) = 144/25 and (c) = 27/10	
14	(a)	9	2	M1 for addition soi by 63 or for ÷7	at least three seen added
	(b)	Mean can't be more than highest number oe	1		eg 13 higher than all the numbers

Question		Answer	Marks	Part marks and guidance	
15	(a)	Correct plot	1		
	(b)	Correct plot	1		
16	(a)	26	2	B1 for 6 or 20 seen	not 6x or 20y
	(b)	$2c + 3d$ (final answer)	2	B1 for either correct	
17	(a)	60 is a factor of (divides into) 360	1	oe eg 6° per creature	not multiple, not "can be divided by 360"
	(b)	3 correct sectors ($\pm 2^\circ$) 4 labels	3 1	B2 for 2 correct sectors Or B1 for 1 correct sector Or M1 for list of angles: 60, 120, 150, 30 Condone 1 error	≤ 4 sectors intended
18		1.4	3	M2 $3.15 \div (1.5 \times 1.5)$ M1 for 1.5×1.5 soi by 2.25 OR M1 for $3.15 \div 1.5$	
19	(a)	284	1		
	(b)	$C = \frac{5}{9}(F - 32)$ oe	3	M1 $F - 32 = \frac{9}{5}C$ or $5F = 9C + 160$ M1 $9C = 5F - 160$ or $9C = 5(F - 32)$ SC1 for $\frac{5}{9}F$ or $kF - 32$	Accept $C = \frac{F - 32}{\frac{9}{5}}$ or $C = \frac{F - 32}{1.8}$ 3 marks Or: SC2 $C = \frac{F + 32}{\frac{9}{5}}$ or $C = F - 32 \div \frac{9}{5}$ or $C = \frac{5F}{9} - 32$
	(c)	175 or 177 or 176. (6.....)	1		

Section B Total: 36

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