

**Mathematics B (MEI)**

General Certificate of Secondary Education

Unit **B292**: Paper 2 (Foundation – Terminal)

**Mark Scheme for January 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

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](mailto:publications@ocr.org.uk)

## Annotations

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.

**M** (method) marks are not lost for purely numerical errors.

**A** (accuracy) marks 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.

- 1 The following abbreviations are commonly found in GCSE Mathematics mark schemes.
  - i. Where you see **oe** in the mark scheme it means **or equivalent**.
  - ii. Where you see **cao** in the mark scheme it means **correct answer only**.
  - iii. Where you see **soi** in the mark scheme it means **seen or implied**.
  - iv. Where you see **www** in the mark scheme it means **without wrong working**.
  - v. Where you see **rot** in the mark scheme it means **rounded or truncated**.
  - vi. Where you see **seen** in the mark scheme it 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. Where you see **figs 237**, for example, this means any answer with only these digits. You should ignore leading or trailing zeros and any decimal point e.g. 237000, 2.37, 2.370, 0.00237 would be acceptable but 23070 or 2374 would not.
- 2 Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.
- 3 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).
- 4 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.
- 5 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.
- 6 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'. If the answer is missing, but the correct answer is seen in the body allow full marks. If the correct answer is seen in 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.
- 7 Ranges of answers given in the mark scheme are always inclusive.
- 8 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.
- 9 Where a follow through mark is indicated on the mark scheme for a particular part question, you must ensure that you refer back to the answer of the previous part question if this is not shown within the image zone. You may find it easier to mark follow through questions candidate by candidate rather than question by question by question.
- 10 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)	$\frac{1}{4}$ oe	1		
		(ii)	$\frac{1}{10}$ oe	1		
	(b)		425	3	<b>M2</b> for two from 250, 125 and 50 seen or <b>M1</b> for any one correct.	No score just for 85%
2	(a)	(i)	B,E	1		
		(ii)	D	1		
		(iii)	C	1		
		(iv)	Kite	1		condone quadrilateral
	(b)		correct reflection drawn	2	<b>M1</b> for vertical line continued down and horizontal line out to the right from its lowest point.	
3	(a)		arrow A just above impossible	1		Up to $\frac{1}{4}$ way
	(b)		arrow B just below certain	1		Down to $\frac{3}{4}$ way (or symmetrical with A and above $\frac{1}{2}$ way)
	(c)		arrow C at certain	1		
	(d)		arrow D at impossible	1		
4	(a)		15	1		
	(b)		$\frac{13}{20}, \frac{7}{10}, \frac{3}{4}$ , oe	2	<b>M1</b> for $\frac{14}{20}$ seen or two fractions in other equivalences.	
	(c)		$\frac{1}{10}$	2	<b>M1</b> evidence of use of common denominator or for any equivalent in wrong form eg 10%	
5	(a)	(i)	12	1		
		(ii)	9	1		Condone $\frac{9}{1}$

Question		Answer	Marks	Part Marks and Guidance	
	(iii)	-10	2	<b>M1</b> for $\frac{50-90}{4}$ or better or for $\frac{2 \times 5^2 - 90}{4}$ correctly enumerated	Condone $-\frac{10}{1}$
	(b)	2x+3 as final answer	2	<b>M1</b> for 2x seen or $x^2+3$ or $x=2x+3$ or answer seen in working then incorrectly simplified.	Condone x2 etc.
<b>6</b>	(a)	27	1		
	(b)	-4	1		
	(c)	7	1		
	(d) (i)	$10^8$	1		
	(ii)	$10^3$	1		
<b>7</b>	(a)	7128	1		
	(b)	16500	1		
<b>8</b>	(a)	45	2	<b>M1</b> for $360 \div n$ where $5 \leq n \leq 10$ , $n$ being their (implicit) number of sides. oe method Or for external angle found and shown on diagram but internal angle given.	
	(b)	66	3	<b>M2</b> for correct use of two from: <ul style="list-style-type: none"> <li>Vertically opposite or straight line</li> <li>Parallel lines</li> <li>Isosceles triangle</li> </ul> or <b>M1</b> for correct use of one of the above	Must be convincing, so not if all angles as 48
<b>9</b>	(a)	4 sectors correct	3	<b>B2</b> for 3 sectors correct or $86^\circ$ , $124^\circ$ , $102^\circ$ , $32^\circ$ , $16^\circ$ seen. or <b>M1</b> for $360 \div$ their total soi	+/- $2^\circ$
		labels	1	dep on 5 sectors of correct relative size.	condone one extra blank sector

Question		Answer	Marks	Part Marks and Guidance	
	(b)	$\frac{113}{180}$ oe	2	ISW attempt to change form of answer <b>B1</b> for $\frac{51+x}{180}$ or $\frac{62+x}{180}$ oe soi or for correct answer with poor notation	62.8% oe includes their angles over 360.
10	(a)	(i) $5x - x^2$	1		
		(ii) $x^2 + 3x - 2x - 6$ or better as final answer	2	<b>B1</b> for 3 terms correct in workings or for 4 terms 'correct' with sign errors	
	(b)	(i) $x < 4\frac{1}{2}$ oe as final answer	2	<b>M1</b> for $6x - 4x < 9$	
		(ii) shading/arrow etc from $4\frac{1}{2}$ to left	1FT	line without arrow must go at least 4 across.	
11	(a)	16	2	<b>M1</b> for $40 \div 2.5$	division by addition must attempt to reach 40.
	(b)	408	2	<b>M1</b> $480 \times 85/100$ oe Or <b>M1</b> for 72 with evidence that they've found 85% off	
12	(a)	frequencies 3,5,3,2,1	2	<b>M1</b> for 3 correct tallies or frequencies	
	(b)	For correct x-axis labelled x-axis scaled y-axis labelled y-axis scaled equal width bars 5 correct heights	3	<b>M2</b> for 4 or 5 of details correct or <b>M1</b> for 2 or 3 of details correct  <b>FT</b> unless clearly not frequencies	No penalty for reverse axes  condone label of 'tally'  eg cum frequency or fx
	(c)	1st valid distribution comparison 2nd valid distribution comparison	1 1	eg <u>compares</u> average <u>compares</u> spread if 0, then <b>SC1</b> for Moira's mode and range given	Serious contradictions or error disqualify comparisons from scoring
13	(a)	M marked	1		
	(b)	(2,-1)	1		
	(c)	D marked	1		

Question			Answer	Marks	Part Marks and Guidance	
14			S, E, O, E,	3	M2 3 correct or M1 for 2 correct	
15	(a)	(i)	25	1		
		(ii)	100	1		
		(iii)	square(s/numbers)	1		
	(b)		pattern 15	1 1		
	(c)		5, 7, 9	2	M1 for attempts seen of $2n+3$ for any $n$	Can be implied by 1,5,13 or 5,13,29 or 3,5,7 or 2 in correct place
16	(a)		£11.90	1	cao not 11.9	
	(b)		2 pay 9.85, 1 pays 9.84.	1	accept 2 pay 9.84, 1 pays 9.86.	Or each gives 9.85 – comes to 1p too much. Or all give £10 and leave tip (if value of tip stated , must be 46p)
	(c)		£45 means tip of just over £2 10% is roughly £4 So 5%	1 1	Or 5% is roughly £2	Or in terms of each person's share
17	(a)		$\frac{1}{3}$ oe	1	decimal must be 0.33 or better	
	(b)	(i)	0.7 oe	1		
		(ii)	Roll the die lots of times. No. of successes / total throws	1 1	Condone 30+ times SC1 for 0.3 divided by 4 = (0.075) explained	
18			180, sum of angles in triangle (is 180) 180, sum of angles on a straight line (is 180) d	1,1dep 1,1dep 1	Dep on 180 implied Dep on 180 implied	Condone "it is a triangle" Condone "it is a line", not "half- circle"
19			circle centre Q radius 4 cm bisector of $\angle Q$ Correct region	1 1 1	compass drawn $\pm 0.2$ cm $\pm 2^\circ$ arcs not necessary FT if intentions clear for circle and bisector	



Question		Answer	Marks	Part Marks and Guidance	
20		ruled line from (0, 0) to (40, 8)	1	Penalise non-ruled lines once  indep	Tolerance of less than 1 small square
		ruled horizontals 10 and 60 mins	1		
		line from (50, 8) <b>FT</b> to (t, 20)	1		
		steeper than 1st line	1		
		straight line from their leaving point to (T, 0)	1		
		T = 'their leaving time' + 100	1		
21	(a)	Rotation, Reflection, Translation, Enlargement	2	<b>B1</b> for 2 correct and no extras	
	(b)	Rotation, Reflection, translation	1	no extras	
	(c)	Enlargement	1	no extras	

**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](mailto:general.qualifications@ocr.org.uk)

**[www.ocr.org.uk](http://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 2012

