GCSE

Mathematics B (MEI)

General Certificate of Secondary Education

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

Mark Scheme for June 2011

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 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 − √(*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.

Section A

Question			Answer	Marks	Part marks and guidance	
1	(a)		unlikely	1		
	(b)		evens	1		
2			3 × 1.49 4.50 /2 both added to 9.99 = 16.71	M1 M1 M1 A1	**soi** by figs 447 **soi** by figs 225 **soi** by their answer	
3	(a)		D at $\dfrac{3}{10}$	1		
			C at $\dfrac{7}{10}$	1		
			A at $\dfrac{12}{10}$	1		
			B at $\dfrac{15}{10}$	1		
					If zero, **SC1** for attempt to use equivalent fractions.	eg $\dfrac{3}{2} = 1\dfrac{1}{2}$
	(b)		$\dfrac{4}{10}$ oe $= \dfrac{2}{5}$	M1FT A1FT	**FT** is from '*their* C – D on number line' **FT** if same level of difficulty	**oe** includes decimal

Question			Answer	Marks	Part marks and guidance	
4	(a)	(i)	Rhombus	1		
		(ii)	Rectangle	1		
		(iii)	Trapezium	1		
		(iv)	Kite	1		
	(b)		Kite Rhombus	1 1		If 3 given, then 1 mark if 2 correct
5	(a)		$x = 3$	3	Condone embedded **M1** for $(29 =) 4x + 14 + 3$ or $29 -14 - 3$ $(= x+3x)$ **M1FT** for $4x = 12$	Accept flow diagram method
	(b)		$2g^3 - 3g^2$	2	**M1** for one term correct (including sign) – this may be (correctly) further simplified) or for answer seen in workings	eg $3g^2 - 3g^2 = 0$ gets **M1**
6	(a)	(i)	17	1		
		(ii)	−5	1		
		(iii)	48	1		
		(iv)	15	1		
	(b)	(i)	12	1		
		(ii)	Keeps repeating 3	1	Condone 'stays the same',	Condone '3,3,3…'

Question			Answer	Marks	Part marks and guidance	
7	(a)		88	2	**M1** for (55/5) × 8 oe	
	(b)		12	2	**M1** for (72/30) × 5 oe	Eg 30 ÷ 5 = 6, 72 ÷ 6
8	(a)		F	1		
	(b)		D	1		
	(c)		C	1		
	(d)		A	1		
9	(a)		3 apples cost 3*a* p and 5 bananas cost 5*b* p total cost = (£2) = 200p	1 1	Not '3 apples and 5 bananas'	
	(b)		4*a* + 2*b* = 164	1 1	ISW attempt to reach 2*a* + *b* = 82 **SC1** for 4*a* + 2*b* = 164 seen in working, then spoilt	
	(c)	(i)	Ruled line through (0, 82) and (41, 0)	2	**B1** for line through either (or other correct marked point) with negative gradient	
		(ii)	*a* and *b* read from their intersection	1+1	strict **FT** ± $\frac{1}{2}$ small square For **FT**, both coordinates must be positive non-zero If 0 **SC1** for 30, 22	
10	(a)		3 ×180 oe <u>and</u> 540 ÷ 5 = 108 or 360 ÷ 5 = <u>and</u> 180 − 72 = 108	2	**M1** for 3 ×180 oe or 360 ÷ 5 = <u>ext</u> angle OR '540 ÷ 5' or 180–'*their* ext angle' Ext angle can be implied by later work '*their* ext angle' from numerical errors only	Reverse method must be equally convincing NB 108 × 5 = 540 followed by 540 ÷ 5= 108 scores 0

Question			Answer	Marks	Part marks and guidance	
	(b)		9 with supporting working	**3**	**M1** for 360 – (90 + 108) or 90 + 72 **M1** for (180 – their 162)/2 **SC1** for 9 with no supporting working	

Section A Total: 50

Section B

Question			Answer	Marks	Part marks and guidance	
11	(a)		14	1		
	(b)		86	1		
	(c)		19.80	2	**M1** for (their 3.96) ×5 seen or 19.8	
	(d)		47	2	**M1** for (their distance / their time) or for 94 as their (implied) distance **and** 2 seen.	
12	(a)	(i)	$\frac{1}{4}$	1	oe fraction	
		(ii)	25%	1		
	(b)		$\frac{3}{4}$ m because it is 750 mm oe	2	**M1** for 1 helpful conversion eg 60 cm	For **M1**, units must be clear
	(c)		2000(g), 0.5(kg), $\frac{1}{4}$ (kg) oe	2	**M1** for 1 comparable conversion eg 500g	
13	(a)		(1, 2)	1	Penalise consistent wrong notation or reversal once only	
	(b)		(−1, 3)	1		
	(c)		point at (7, 3) point at (3, 1)	1 1	allow good attempt at alternative congruent triangles	Mark intent Point can be implied by triangle

Question			Answer	Marks	Part marks and guidance	
14	**(a)**		revolter and swirly	**1**		
	(b)	**(i)**	freq = 2, 2, 3, 5	**2**	**M1** for 3 correct frequencies, or one misplaced height.	accept just tallies for the **M1**
		(ii)	all three rides oe	**1**	eg 1.4m	
15	**(a)**		$\dfrac{1}{3}$	**1**	oe Penalise consistent wrong notation once only	
	(b)	**(i)**	RY,BR, BB, BY, YR, YB, YY	**2**	**M1** for at least 4 correct (ignore repeats)	
		(ii)	$\dfrac{1}{9}$	**2**	**M1** for n/9 or for their correct **FT** **FT** dep at least **M1** in part (i)	
		(iii)	$\dfrac{5}{9}$	**1FT**	**FT** dep at least **M1** in part (i)	
16	**(a)**		Always even times even is always even oe	**1** **1**	Or 'it's a multiple of 2/ divisible by 2'	'In the 2 times table'
	(b)		never (pos x pos) is pos and (neg x neg) is pos	**1** **1** **1**	Example of (pos)^2 **and** (neg)^2 in place of reason scores **1** out of **2**	
17	**(a)**		(0)45°	**1**	± 2°	
	(b)		500 m	**2**	±10m **M1** for 10 cm, or (their 10) × 50 soi	

Question			Answer	Marks	Part marks and guidance	
	(c)		position correct	3	**M1** for 175/50 (= 3.5) **M1** for correct bearing to 2° **M1** for (their 3.5) correct to 2mm	
18			0.181	2	**B1** for 0.18(0)............. seen Or **SC1** for correct rounding <u>seen</u> from their figures	Eg 2.7761..... to 2.776
19	**(a)**		p^{-3}	1	condone 1/ p^3	
	(b)		for $x^3 + x^2$: correct trial between 2 < x < 3 x = 2.5 as answer answer established	**M2** **B1** **A1**	**M1** for any correct trial by eg correct trial at x = 2.55	x = 2.55 gives 23.08
20	**(a)**		Triangle at (3, 7), (3, 1) , (6, 7)	3	**B2** for 2 points correct or enlargement sf 2 or with wrong centre **B1** for correct enlargement with other sf	
	(b)		Rotation 90° anticlockwise oe about (–1, 2)	1 1 1	Not 'turn' condone 'rotation(al) symmetry' **SC1** for a pair of transformations which include rotation 90˚ anti-clockwise oe	

Section B Total: 50

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