GCSE
MATHEMATICS

NEW PRACTICE PAPER SET 2 Foundation Tier Paper 3
Mark Scheme (Published November 2015)

8300/3F

Version 1.0

In Spring 2015, students across the country took this set of practice papers as a Mock Examination. Principal Examiners have marked the papers and these mark schemes have, therefore, been through the normal process of standardisation. For some questions, Principal Examiners have written Additional Guidance based on responses seen.

Further copies of this Mark Scheme are available from aqa.org.uk

Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt.

M	Method marks are awarded for a correct method which could lead to a correct answer.
A	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
B	Marks awarded independent of method.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
M dep	A method mark dependent on a previous method mark being awarded.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
oe	Or equivalent. Accept answers that are equivalent. eg accept 0.5 as well as $\frac{1}{2}$
[*a*, *b*]	Accept values between *a* and *b* inclusive.
3.14 …	Allow answers which begin 3.14 eg 3.14, 3.142, 3.1416
Use of brackets	It is not necessary to see the bracketed work to award the marks.

Examiners should consistently apply the following principles

Diagrams

Diagrams that have working on them should be treated like normal responses. If a diagram has been written on but the correct response is within the answer space, the work within the answer space should be marked. Working on diagrams that contradicts work within the answer space is not to be considered as choice but as working, and is not, therefore, penalised.

Responses which appear to come from incorrect methods

Whenever there is doubt as to whether a student has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the student. In cases where there is no doubt that the answer has come from incorrect working then the student should be penalised.

Questions which ask students to show working

Instructions on marking will be given but usually marks are not awarded to students who show no working.

Questions which do not ask students to show working

As a general principle, a correct response is awarded full marks.

Misread or miscopy

Students often copy values from a question incorrectly. If the examiner thinks that the student has made a genuine misread, then only the accuracy marks (A or B marks), up to a maximum of 2 marks are penalised. The method marks can still be awarded.

Further work

Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.

Choice

When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

Work not replaced

Erased or crossed out work that is still legible should be marked.

Work replaced

Erased or crossed out work that has been replaced is not awarded marks.

Premature approximation

Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

Q	Answer	Mark	Comments
1(a)	78%	B1	
1(b)	$\frac{1}{3}$	B1	
2	–2 is greater than –6	B1	
3	could be odd or even	B1	
4	241.25 158.06 –6.70 39.30	B3	oe eg £6.70 overdrawn B2 4 correct values with incorrect money notation B2ft 3 correct values with correct money notation B1ft 3 correct values with incorrect money notation or 2 correct values with correct money notation ft their values SC2 39.30 in final cell with rest blank SC1 39.3 in final cell with rest blank SC1 110.85, 194.04, 358.80, 312.80
	Additional Guidance		
	Follow through their 241.25 – 83.19, their 158.06 – 164.76 and their –6.7(0) + 46 correctly evaluated		
	Ignore any units given and any extra values in credit/ debit column		
	241.25, 158.06. –6.7, 39.30 (four correct but some incorrect notation)		B2
	110.85, 27.66, –137.10, –91.10 (last three correct ft and all correct notation)		B2ft
	110.85, 27.66, –137.1, –91.10 (last three correct ft but incorrect notation)		B1ft
	110.85, 194.04, 29.28, 75.28 (last two correct ft and correct notation)		B1ft

Q	Answer	Mark	Comments
5(a)	–8.9	B1	
	–12.4	B1ft	ft their chosen card (+)8.3 → (+)4.8 (+)8.9 → (+)5.4 –8.3 → –11.8
	Additional Guidance		
	–12.4 must follow –8.9 or a blank card		B1B1 B0B1
5(b)	(+)8.9	B1	
	–12.4	B1ft	ft their chosen card (+)8.3 → –11.8 –8.9 → (+)5.4 –8.3 → (+)4.8
	Additional Guidance		
	–12.4 must follow (+)8.9 or a blank card		B1B1 B0B1

Q	Answer	Mark	Comments
6(a)	$\frac{4}{6}$ or $\frac{2}{3}$	B1	oe fraction, decimal or percentage SC1 both fractions correct but given in words
	$\frac{2}{6}$ or $\frac{1}{3}$	B1	
	Additional Guidance		
	2 out of 3 and 1 out of 3		SC1
	Accept decimals or percentages rounded or truncated to 2 sf or better		
6(b)	All conditions met eg 3, 3, 4, 5, 6	B2	B1 five numbers with two conditions met eg 3, 3, 6, 6, 6 3, 3, 4, 4, 7 3, 3, 3, 6, 6
	Additional Guidance		
	Allow fractions or decimals eg 3, 3, 4.5, 4.5, 6		B2
	3, 3, 4, 5, 6 is the only correct answer using only integers		B2
7	8.7 ÷ 3 or 2.9	M1	
	their 2.9 × 4 or their 2.9 + 8.7	M1dep	
	11.6	A1	
8(a)	(9, 6) plotted	B1	Need not be labelled
8(b)	isosceles and right-angled	B2	B1 both correct and 1 incorrect or 1 correct (and 1 incorrect)
8(c)	1 : 4	B1	

Q	Answer	Mark	Comments
9(a)	$\frac{4}{5}$	B1	oe fraction
9(b)	their $\frac{4}{5} \times 20$ or $\frac{16}{20}$ or 4 : 5 and 16 : 20	M1	oe
	16	A1	SC1 25
	Additional Guidance		
	If their $\frac{4}{5} \times 20$ gives a non-integer number of boys, then either the correct method or full value must be seen for M1		
	The method mark may be implied by the correct ft integer value eg (a) $\frac{5}{20}$ (b) 5		B0M1A0
10	**Alternative method 1**		
	3.625×4 or 14.5	M1	
	their 14.5 – 5 or 9.5	M1	their 14.5 cannot be 3.625
	(their 9.5 + 4) ÷ 5 or 13.5 ÷ 5	M1	
	2.7	A1	SC3 –0.3
	Alternative method 2		
	$\frac{n+5}{4}$ = 3.625	M1	oe
	(n =) $3.625 \times 4 - 5$ or (n =) 9.5	M1	
	(their 9.5 + 4) ÷ 5 or 13.5 ÷ 5	M1	
	2.7	A1	SC3 –0.3
	Additional Guidance		
	Special case is for $((3.625 - 5) \times 4 + 4) \div 5$		SC3
	9.5 implies the first two marks		M1M1

Q	Answer	Mark	Comments
11	100 cm = 1 m and 1000 m = 1 km or 1 km = 100 000 cm or 2.5 × 200 000 or 500 000 or 200 000 ÷ 100 000 or 200 000 cm = 2 km	M1	
	5	A1	
12(a)	–5 and 4	B1	
12(b)	3	B1ft	ft provided at least one negative answer in (a)
	–1 next then all positive	B1ft	oe ft provided at least one negative answer in (a)
	Additional Guidance		
	If both terms are negative in (a) then must circle 'more than 4' in (b)		
	3 must follow –5 and 4 or be correct for their answers in (a)		
13	3 different mistakes identified	B3	B1 for each different mistake identified from It should be a straight line Point (0, 1) plotted incorrectly Two 3s on x-axis Axes not labelled Line not labelled ($y = x + 1$)
	Additional Guidance		
	Accept equivalent statements		

Q	Answer	Mark	Comments
14	$\pi \times 6.5^2$	M1	Accept [132.6, 132.75]
	$\pi \times 6.5^2 \div 4$ or 33.18…	M1dep	oe
	[33.16, 33.19] or 33.2 or 33	B1ft	Accept $\frac{169}{16}\pi$
	Additional Guidance		
	33 with no incorrect working		M1M1A1
15	800 × 0.02 or 16 or 800 × 1.02 or 816 or 2(%) × 3 = 6(%)	M1	oe
	800 × 0.02 × 3 or 16 × 3 or 800 × 0.06 or 848	M1	oe
	48	A1	
	Additional Guidance		
	Answer of 848 with or without 48 seen in working		M1M1A0
	Condone 800×1.02^3 or an answer of 49, 48.96, 48.97 or 48.9664 or 848.96, 848.9664 or 849 for the first mark		M1M0A0

Q	Answer	Mark	Comments
16	**Alternative method 1**		
	16.2 ÷ 3 or 5.4	M1	
	their 5.4 ÷ 3 or 1.8	M1dep	16.2 ÷ 9 scores M1M1
	their 5.4 × their 1.8 or 9.72	M1dep	
	145.8	A1	SC2 50.4
	Alternative method 2		
	16.2 ÷ 3 or 5.4	M1	
	their 5.4 ÷ 3 or 1.8	M1dep	16.2 ÷ 9 scores M1M1
	their 5.4 + their 1.8 + their 1.8 or 9	M1dep	
	145.8	A1	SC2 50.4
	Additional Guidance		
	Special case is for the perimeter which implies 1.8 used		SC2
17(a)	$(x - y)(x + y)$	B1	

Q	Answer	Mark	Comments
17(b)	$\frac{2x}{5} = 13 - 1$ or $\frac{2x}{5} = 12$ or $2x + 5 = 65$	M1	$(13 - 1) \times 5$ scores M1
	$2x$ = their 12×5 or $2x$ = their 65 – their 5 or $2x = 60$	M1	oe $(13 - 1) \times 5 \div 2$ scores M1M1
	30	A1	
	Additional Guidance		
	Embedded answer eg $\frac{2 \times 30}{5} + 1 = 13$ eg $\frac{60}{5} + 1 = 13$		M1M1A0 M1M0A0
18(a)	(∠PCD or ∠BAD =) $180 - 130$ or 50 or (∠CDA =) 130 or (∠APB =) 35 or (∠PDA or ∠DPC =) $180 - 100 - 35$ or 45	M1	May be on diagram
	(∠PCD =) $180 - 130$ or 50 and (∠DPC =) $180 - 100 - 35$ or 45 or (∠CDA =) 130 and (∠PDA =) $180 - 100 - 35$ or 45	M1	May be on diagram
	85	A1	
	Additional Guidance		
	The angle being calculated must be clear from the diagram or working		
18(b)	15	B1	

Q	Answer	Mark	Comments
19	$71.25 \leqslant t < 71.35$	B2	B1 1 correct bound
	Additional Guidance		
	Accept $71.34\dot{9}$ for 71.35		
20(a)	$\frac{3}{4}$	B1	oe
20(b)	**Alternative method 1**		
	$6 \div 4$ or 1.5 or $4 \div 6$ or $\frac{2}{3}$ or $4 \div 3$ or $\frac{4}{3}$ or $3 \div 4$ or $\frac{3}{4}$	M1	oe
	4.5	A1	
	Alternative method 2		
	$\frac{y}{6}$ = their $\frac{3}{4}$	M1	oe
	4.5	A1ft	ft their tan x from (a)

Q	Answer	Mark	Comments
20(b)	**Alternative method 3**		
	$\tan^{-1}$(their $\frac{3}{4}$) or [36.8, 36.9]	M1	This could be on the diagram or seen in part (a)
	4.5	A1ft	ft their tan x from (a)
	Additional Guidance		
	For M1, accept $\frac{2}{3}$ or $\frac{4}{3}$ given as a decimal truncated or rounded to 2dp or better		
	Award both marks for an answer of 8 in part (b) unless an incorrect statement is made; eg		M0A0
	in (a), tan $x = \frac{4}{3}$, in (b), $\frac{3}{4} = \frac{y}{6}$, answer 4.5		M1A1
	in (a), tan $x = \frac{4}{3}$, in (b), tan $x = \frac{6}{y}$ (incorrect), $\frac{4}{3} = \frac{6}{y}$, answer 4.5		M0A0
	in (a), tan $x = \frac{4}{3}$, in (b), tan $x = \frac{y}{6}$, $\frac{4}{3} = \frac{y}{6}$, answer 8		M1A1ft
	If the answer line is blank, but 4.5 is seen correctly embedded or as the correct length on the diagram, award only the method mark		M1A0
	In alt 2 and alt 3 their tan x must be a value for tan x and not a value for x		

21(a)	4	B1	

21(b)	–5	B1	

22	4×31 or 124	M1	
	5×30 or 150	M1	
	their 150 – their 124	M1dep	dependent on M2
	26	A1	
	Additional Guidance		

Q	Answer	Mark	Comments
23(a)	0	B1	
23(b)	4×4 or 16	M1	May be implied from a diagram or as the denominator of a fractional answer
	12 (and 12) and 16 or 3	M1	May be shown by exactly 3 two-digit outcomes in a list, grid or table or as the numerator of a fractional answer
	$\frac{3}{16}$ or 0.1875 or 18.75%	A1	oe fraction, decimal or percentage
	Additional Guidance		
	For M1, their (sample space) diagram or table may be blank		
	A 4×4 grid with correct values for at least the 3 two-digit numbers seen or implied		M1M1
24	**Alternative method 1**		
	$\frac{\pi \times 15 \times 10}{4}$ or [117.7, 118]	M1	
	$\frac{\text{their } [117.7,118]}{15 \times 10}$ (× 100) or [0.785, 0.787] or 0.79	M1dep	
	[78.5, 78.7] or 79	A1	
	Alternative method 2		
	$\frac{\pi \times 15 \times 10}{4}$ or [117.7, 118]	M1	
	$\frac{150 - \text{their } [117.7,118]}{15 \times 10} \times 100$ or [21.3, 21.6] or 21	M1dep	
	[78.5, 78.7] or 79	A1	
	Additional Guidance		
	[0.784, 0.785) or [78.4, 78.5) implies M2 – the value may be outside the limits for A1 due to premature rounding		

Q	Answer		Mark	Comments
25	**Alternative method 1**			
	$3a$ (+) $4c$ (=) 23 and $3a$ (+) $15c$ (=) 45	$15a$ (+) $20c$ (=) 115 and $4a$ (+) $20c$ (=) 60	M1	oe eg works in pence Multiplies one or both equation(s) to equate coefficients of a or c Allow one error in multiplication
	$11c$ (=) 22	$11a$ (=) 55	M1	oe Subtracts equations to eliminate one variable Allow one error in subtraction
	(a =) 5 or (c =) 2		A1	
	(a =) 5 and (c =) 2		A1	
	Alternative method 2			
	$a = \frac{23 - 4c}{3}$ or $a = 15 - 5c$	$c = \frac{23 - 3a}{4}$ or $c = \frac{15 - a}{5}$	M1	oe Makes a or c the subject
	$\frac{23 - 4c}{3} = 15 - 5c$	$\frac{23 - 3a}{4} = \frac{15 - a}{5}$	M1	oe Correctly substitutes their expression to eliminate one variable
	(a =) 5 or (c =) 2		A1	
	(a =) 5 and (c =) 2		A1	
	Additional Guidance			
	Accept any letters, or ‘adult’ and ‘child’, as variables			
	To allow one error in the first mark of alt 1, the ‘equal’ coefficients must be the same. eg allow $3a + 4c = 23$ and $3a + 15c = 15$ but not $3a + 4c = 23$ and $3a + 5c = 45$			

Q	Answer	Mark	Comments
26	**Alternative method 1**		
	24 + 276 or 300	M1	
	$\frac{24}{\text{their } 300}$ or 0.08	M1	oe eg 8%
	8% and the doctor is correct or Two correct comparable values and The doctor is correct	A1	eg 0.08 and 0.16 $\frac{48}{300}$ and $\frac{24}{300}$ 48 : 300 and 24 : 300
	Alternative method 2		
	24 + 276 or 300	M1	
	$\frac{\text{their } 300}{24}$ or 12.5	M1	
	Two correct comparable values and The doctor is correct	A1	eg 12.5 and 6.25 $\frac{300}{48}$ and $\frac{300}{24}$ 300 : 48 and 300 : 24
	Alternative method 3		
	24 + 276 or 300	M1	
	0.16 × their 300	M1dep	
	48 from correct method and 24 and The doctor is correct	A1	
	Additional Guidance		
	In alt 2, 12.5% and 6.25% instead of 12.5 and 6.25 cannot get the accuracy mark		M1M1A0

SP/03/15