GCSE
MATHEMATICS

Original Specimen Assessment Materials Paper 2 Foundation

Mark Scheme

8300/2F

Version 3.0

This mark scheme does not reflect in full the expected standard and requirements for GCSE mathematics in 2017 and is superseded by the new specimen mark scheme published in June 2015

Principal Examiners have prepared these mark schemes for specimen papers. These mark schemes have not, therefore, been through the normal process of standardising that would take place for live papers.

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 1.1 (1)	2500	B1	
2 1.2 (1)	$a \div b$	B1	
3 1.3a (1)	$x = 12$	B1	
4 1.1 (1)	$\frac{7}{10}$	B1	
5 1.3a (2)	1, 2, 3, 6, 9 and 18	B2	B1 for 4 or 5 correct (and 1 incorrect)
6 1.3b (4)	59×5 or 295	M1	
	6.95×3 or 20.85	M1	315.85 implies M2
	their 295 + their 20.85 + 12.5(0)	M1dep	
	328.35	A1	
7(a) 2.3a (1)	3	B1	
7(b) 2.3a (2)	2 + 5 + 4 + 6 + 2 + 1	M1	Allow one error or omission
	20	A1	
7(c) 2.1a (1)	6 – 1 or 1 – 6	B1	oe

Q	Answer	Mark	Comments
8(a) 2.3b (2)	<table><tr><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>1</td><td>0</td><td>1</td><td>2</td></tr><tr><td>2</td><td>1</td><td>0</td><td>1</td></tr><tr><td>3</td><td>2</td><td>1</td><td>0</td></tr></table>	B2	B1 for 5 or more correct
8(b) 2.5a (2)	No and suitable explanation.	B2ft	eg 10 ways to lose and only 6 to win More ways to lose ft their table in (a) B1 for No and a comment which is correct but not complete for example There are 6 ways to win Evens would be half each or Gives a full explanation but does not make a decision B1 for the chance is unlikely
9 1.3a (1)	$\frac{3}{11}$	B1	
10 1.3a (1) 2.1b (1)	[18, 22]	B2	B1 for [16, 18) or (22, 24] B1 for scale factor [9, 12]

Q	Answer	Mark	Comments
11(a) 1.3a (2)	–5 1 7 10	B2	B1 for 2 or 3 correct
11(b) 1.3a (2)	At least 2 of their points correctly plotted	M1	
	Straight ruled line drawn from (–3, –8) to (3, 10)	A1	
11(c) 1.3a (2)	Draws the line $y = x$ on the grid or $-2x = 1$ or $-1 = 2x$	M1	oe
	$-\frac{1}{2}$	A1	oe
12(a) 1.3a (2)	$315 \div 37.5$ or 8.4	M1	oe
	8.40	A1	
12(b) 3.4a (1) 3.5 (1)	No, her yearly pay is more and $4 \times 12 = 48$ and not 52	B2	oe B1 for partial working eg No, her yearly pay is more and $4 \times 12 = 48$ or 52 weeks = in a year or More than 4 weeks in a month
13 1.3a (2)	0.8^3 or 0.512 or $80 \times 80 \times 80$	M1	oe
	512 000	A1	
14 1.3b (1) 3.1b (2)	45 50 5	B3	Any order B2 three numbers with two of these criteria • a multiple of 15 • two numbers in the ratio 10: 1 • sum of 100 B1 a multiple of 15 or two numbers in the ratio 10:1 or three numbers with a sum of 100

Q	Answer	Mark	Comments

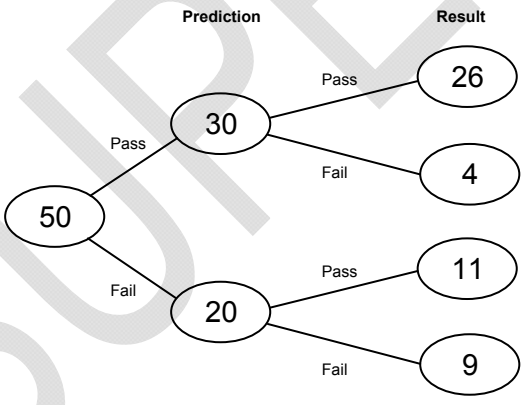
15 1.3b (1) 3.1d (1)	**Alternative method 1**		
	35.6 ÷ 40 or 0.89 or 3560 ÷ 40 or 89	M1	cost per song oe
	(66.75 ÷ their 0.89 =) 75	A1	
	Alternative method 2		
	66.75 ÷ 35.6 (× 40) or 1.875 or 6675 ÷ 3560 (× 40) or 1.875 or 40 ÷ 35.6 (× 66.75) or 1.12… or 40 ÷ 3560 (× 6675) or 0.0112…	M1	songs per £ oe
	75	A1	

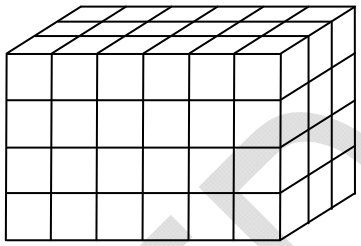
16 1.2 (1)	$\begin{pmatrix}6\\-1\end{pmatrix}$	B1	

17(a) 2.1a (1)	Between 8 cm and 13 cm	B1	
17(b) 1.3a (1)	20	B1	

18 3.1a (2)	13 or 31 or 79 or 97 or 103 or any other prime whose digits add up to a square number	B2	B1 any prime of 2 or more digits B1 any number of 2 or more digits whose digits add up to a square number

Q	Answer	Mark	Comments
19 2.4a (2) 3.3 (1)	**Alternative method 1**		
	1.89 ÷ 4 or 3.99 ÷ 9	M1	unit cost of a roll
	1.89 ÷ 4 and 3.99 ÷ 9	M1	
	(0.)4725 and (0.)44…. and pack of 9	A1	
	Alternative method 2		
	4 ÷ 1.89 or 9 ÷ 3.99	M1	rolls per £
	4 ÷ 1.89 and 9 ÷ 3.99	M1	
	2.1... and 2.2… or 2.3 and pack of 9	A1	
	Alternative method 3		
	1.89 ÷ 4 or 0.4725	M1	equivalent cost of 9 rolls
	their 0.4725 × 9	M1	
	4.25(25) and pack of 9	A1	
	Alternative method 4		
	3.99 ÷ 9 or 0.44…	M1	equivalent cost of 4 rolls
	their 0.44… × 4	M1	
	[1.76, 1.78] and pack of 9	A1	
	Alternative method 5		
	1.89 × 9 or 3.99 × 4	M1	scaling to 36 rolls oe
	1.89 × 9 and 3.99 × 4	M1	oe
	17.01 and 15.96 and pack of 9	A1	oe

Q	Answer	Mark	Comments
20 1.3a (2)	**Alternative method 1**		
	4200×0.38 or 1596	M1	1.38 seen
	5796	A1	
	Alternative method 2		
	$4200 \div 10 \times 3 + 4200 \div 10 \div 2 + 4200 \div 100 \times 3$ or 1596	M1	
	5796	A1	
	Alternative method 3		
	$4200 \div 10 \times 4 - 4200 \div 100 \times 2$ or 1596	M1	
	5796	A1	
21 1.3a (2)	30 minutes or $\frac{1}{2}$ hour	B1	oe
	56 (miles)	B1	
22 2.3b (2)	Fully correct  	B2	B1 20 and 11 in correct positions

Q	Answer	Mark	Comments
23 1.3a (1) 2.3a (1)	3, 4 and 6 chosen	M1	Maybe implied from a diagram 
	72	A1	
24(a) 2.3a (1)	$2 \leqslant t < 4$	B1	
24(b) 2.4a (2)	**Alternative method 1**		
	$32 + 19 + 20$ or 71 and 80×0.9 or $(32 + 19 + 20) \div 80 \times 100$ or 88.75	M1	oe
	71 and 72 and No or 88(.75)(%) or 89(%) and No	A1	Accept 88(.75)(%) and Yes because it rounds to 90
	Alternative method 2		
	$7 + 2$ or 9 and 80×0.1 or $(7 + 2) \div 80 \times 100$ or 11.25	M1	oe
	9 and 8 and No or 11(.25)(%) or 12(%) and No	A1	

Q	Answer	Mark	Comments
25 1.3b (2) 3.1d (4)	7 and 75	B1	
	their 7 × 12 + their 75 × 1.50 or 84 + 112.50 or 196.50	M1	
	their 196.50 + 163 or 359.50	M1	
	their 359.50 ÷ 0.5 or their 359.50 × 2 or 719	M1	
	their 719 – their 7 – their 75	M1	
	637	A1	
26 1.3b (2)	$\begin{pmatrix}12\\15\end{pmatrix}$ or $\begin{pmatrix}10\\-4\end{pmatrix}$ or $\begin{pmatrix}-10\\4\end{pmatrix}$	M1	
	$\begin{pmatrix}2\\19\end{pmatrix}$	A1	SC1 Answer $\begin{pmatrix}2\\y\end{pmatrix}$ or $\begin{pmatrix}x\\19\end{pmatrix}$
27 1.3a (2)	2 (×) 140 or 5 (×) 56 or 7 (×) 40	M1	oe Correct product with at least one prime factor
	2 × 2 × 2 × 5 × 7	A1	oe
28 1.3a (2)	$y^2 - 4y + 5y - 20$	M1	Allow 1 error
	$y^2 + y - 20$	A1	

Q	Answer	Mark	Comments
29(a) 1.3a (2)	$\cos x = \frac{8}{11}$ or $\sin x = \frac{\sqrt{11^2 - 8^2}}{11}$ or $\tan x = \frac{\sqrt{11^2 - 8^2}}{8}$	M1	oe
	43(.3 ….)	A1	
29(b) 1.3a (2)	$\tan 40 = \frac{y}{37}$ or $\tan 50 = \frac{37}{y}$	M1	oe $x = 48.3\ldots$ and $37^2 + y^2 = 48.3^2$ 48.3 cos 50 or 48.3 sin 40
	31. (…)	A1	
30 1.3b (1) 3.1d (2) 3.3 (1)	$\pi \times 40^2 \times 150$	M1	753982 or 240000π [753600, 754080]
	their 753 982 ÷ 1000 or their 753 982 ÷ 1000 ÷ 0.2	M1	753.982 or 240π [753.600, 754.080] 3770 [3768, 3770.4]
	their 3770 ÷ 60 (÷ 60) or (60 × 60 =) 3600 or 0.2 × 60 × 60 or 720	M1dep	62.83… or 1.04… [62.8, 62.84] or [1.04, 1.05]
	[62.8, 62.84] and Yes or [1.04, 1.05] and Yes or 3600 and 3770 and Yes or 753.9 and 720 and Yes	A1	oe

Q	Answer	Mark	Comments
31 1.3b (3)	100(%) – 20(%) or 80(%) or 1 – 0.2 or 0.8	M1	Implied by 6400
	8000×0.8^5	M1	oe eg 8000 × 0.8 or 6400 and their 6400 × 0.8 or 5120 and their 5120 × 0.8 or 4096 and their 4096 × 0.8 or 3276(.80) and their 3276(.80) × 0.8
	2621(.44)	A1	Accept 2600 or 2620 with full method seen

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