GCSE

Application of Mathematics (Linked Pair Pilot)

93702F
Unit 2: Foundation Tier
Mark Scheme

9370
November 2013

Version 1.0 Final Mark Scheme

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

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.

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.
Q	Marks awarded for quality of written communication. (QWC)
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.
ft	Follow through marks. Marks awarded following a mistake in an earlier step.
SC	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
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.
25.3 …	Allow answers which begin 25.3 e.g. 25.3, 25.31, 25.378.
Use of brackets	It is not necessary to see the bracketed work to award the marks.

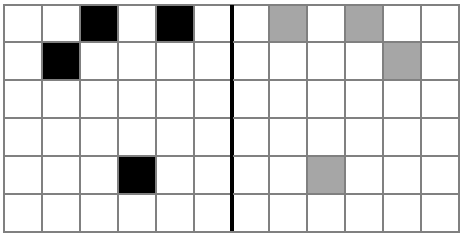
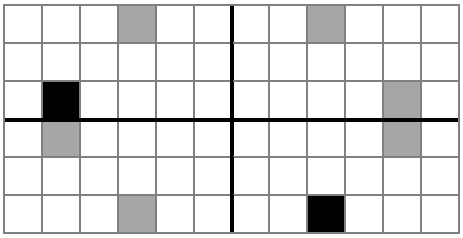
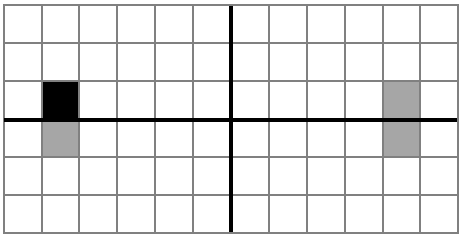
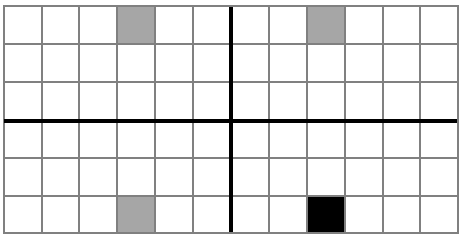
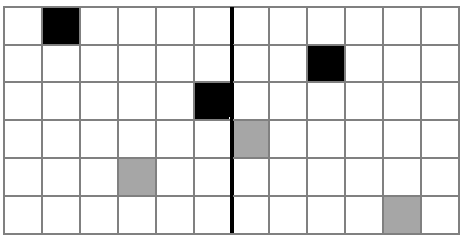
A2 Foundation Tier

Q	Answer	Mark	Comments
1	72 – 26 – 19	M1	oe eg 19 + 26 or 45 **and** 72 – their 45
	27	A1	
2(a)	160	B1	
2(b)	Fully correct explanation eg 1 (Measures) 300 (ml and then) 200 (ml) eg 2 (Uses) 250 (ml) twice	Q2	Q1 Partially correct explanation eg 1 Fills the jug and then adds some more eg 2 Uses the jug twice QWC strand (ii) SC1 No or no decision and two values less than 500 that add up to 500
3	False False False True	B4	B1 for each

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="2">4(a)</td><td>Set of coins that total £1.25 seen
or
Set of coins that total £2.75 seen
or
[(£)1 + (£)1 + 50(p) + 50(p) + 50(p) + 20(p) + 10(p) + 10(p) + 5(p) + 2(p) + 2(p) + 1(p)] – (£)2.75
or
(£)4 – (£)2.75
or
(£)1.25</td><td>M1</td><td>Allow if clearly identified on diagram

Allow one error or omission</td></tr>
<tr><td>£1 20p 5p</td><td>A1</td><td></td></tr>
<tr><td>4(b)</td><td>3 £10 notes
5 £5 notes</td><td>B2</td><td>B1 Any of these combinations of £10 notes and (£)5 notes
<table><tr><th>£10</th><th>£5</th></tr><tr><td>1</td><td>9</td></tr><tr><td>2</td><td>7</td></tr><tr><td>4</td><td>3</td></tr><tr><td>5</td><td>1</td></tr></table></td></tr>
<tr><td rowspan="3">5(a)</td><td>1 point → (2,1)</td><td>B1</td><td rowspan="3">SC1 All 3 points with coordinates transposed</td></tr>
<tr><td>2 points → (7,3)</td><td>B1</td></tr>
<tr><td>3 points → (3,6)</td><td>B1</td></tr>
<tr><td>5(b)</td><td>Plots (2,1) and (4,2) and (6,3) and (8,4) with no incorrect plots</td><td>B2</td><td>B1 Plots 4 correct points with at most one incorrect plot
or
Plots at least one point correctly with no incorrect plots
SC1 Plots 1,2) and (2,4) and (3,6) and (4,8) only
Ignore (0, 0) if plotted</td></tr>
</table>

Q	Answer	Mark	Comments
6(a)	Plots (10,45) and (20,90)	M1	Within half a square
	Joins points with straight line from origin	A1	
6(b)	12	B1ft	ft from their graph
6(c)	[132, 138]	B1ft	ft from their graph
7(a)	[7.8, 8.2]	B1	
7(b)	their 8×1.5	M1	
	12	A1ft	ft their 8
7(c)	[61, 65]	B1	
7(d)	their (c) **or** [61, 65]	B1ft	
7(e)	trapezium **and** quadrilateral selected **only**	B2	B1 trapezium **or** quadrilateral from **one** or **two** selected **or** trapezium **and** quadrilateral from **three** selected

Q	Answer	Mark	Comments
8(a)		B2	B1 exactly 3 (grey) squares shaded correctly with or without (any) other squares shaded **or** more than 4 squares shaded to give symmetry about the **given** line
8(b)		B2	B1 these three (grey) squares shaded correctly with or without (any) other squares shaded  **or** these three (grey) squares shaded correctly with or without (any) other squares shaded 
8(c)		B2	B1 at least one (grey) square shaded correctly with or without (any) other squares shaded

Q	Answer	Mark	Comments
9(a)	4.365(...)	B1	
9(b)	4.4	B1ft	ft their (a) if >1 dp
10(a)	48 ÷ 2 × 95	M1	oe
	(£)2280	A1	SC1 4560
10(b)	48 × 8 or (£)384	M1	
	0.15 × their 384 or (£)57.6(0)	M1	0.85
	their 384 – 0.15 × their 384	M1	0.85 × their 384
	(£)326.40	Q1	Strand (i) correct money notation 326.4 M3 Q0 SC2 345.60 SC1 345.6
10(b) Alt	0.15 × 8 or (£)1.2(0)	M1	0.85
	8 – 0.15 × 8 or (£)6.8(0)	M1	0.85 × 8 or (£)6.8(0)
	their 6.8(0) × 48	M1	
	(£)326.40	Q1	Strand (i) correct money notation 326.4 M3 Q0 SC2 345.60 SC1 345.6
11(a)	9	B1	
11(b)	13	B1ft	ft 4 + their (a)
	cm^3 or cubic cm	B1	

Q	Answer	Mark	Comments
11(c)	Yes **and** fully correct reason eg 1 Yes 15 + 14 = 29 eg 2 5 + 4 + 4 + 4 + 4 + 4 + 4 = 29 so yes eg 3 $n + n - 1 = 29$ $n = 15$ so yes eg 4 Yes (9) 13 17 21 25 29 eg 5 Yes with correct diagram	B2	B1 Yes **and** partially correct reason eg 1 Yes because if you keep on adding 4 you get 29 eg 2 Yes because you don't count the middle block twice eg 3 Yes, length 15 **or** Fully correct reason with no decision or incorrect decision
12	37 **or** 112 or 1 h 52 min	M1	 or [1.86, 1.87] h
	8 × their 37 or 296 or 4 h 56 min **or** 3 × their 112 or 336 or 5 h 36 min	M1	or 4.93(3...) h or 5.6 h
	632 **or** 10 h 32 min	A1	or 10.5(3 ...) h
	10 h 32 min or 10.5(3...) **and** No **or** 632 min and 600 min **and** No **or** 32 min or 0.5(3 ...) h **and** No	Q1ft	Strand (iii) M2 must be scored ft their 632 converted correctly into hours or hours and minutes with correct ft decision **or** ft their 632 compared to 600 with correct ft decision

Q	Answer	Mark	Comments
12 Alt	11×7 or 77 or 1 h 17 min	M1	or 1.28(3 ...) h
	8×30 or 240 min or $8 \times \frac{1}{2}$ or 4 h **or** 3×105 or 315 min or $3 \times 1\frac{3}{4}$ or 5 h 15 min **or** 555 min or 9 h 15 min or $9\frac{1}{4}$ h	M1	or 5.25 h or 9.25 h
	632 **or** 10 h 32 min	A1	or 10.5(3 ...) h or 45 and 77
	10 h 32 min or 10.5(3...) **and** No **or** 632 min and 600 min **and** No **or** 45 min and 77 min **and** No	Q1ft	Strand (iii) M2 must be scored ft their 632 converted correctly into hours or hours and minutes with correct ft decision **or** ft their 632 compared to 600 with correct ft decision
100 minute hours Those candidates who use 100 minute hours (eg 4 h 56 min = 4.56 h) can score M2 max.			

13(a)	22×15 (= 330)	M1	
	$0.4(0) \times$ their 330	M1	oe
	132	A1	SC2 198
13(b)	Two numbers that multiply to make their (a) **and** one number < 22 **and** other number < 15 eg 11 and 12 10 and 13.2	B2ft	B1ft two numbers that multiply to make their (a) **not** $1 \times$ their 132 Values can be rounded or truncated to 1 dp

Q	Answer	Mark	Comments
14	18 black triangles **or** 6 black rectangles **or** 18 grey triangles **or** 8 grey rectangles	B1	
	their 18 ÷ 4 (or 4.5 or 5) and their 6 ÷ 2 (or 3) **or** their 18 ÷ 4 (or 4.5 or 5) or their 8 ÷ 2 (or 4)	M1	Black tiles Grey tiles
	their 4.5 + their 3 (or 7.5 or 8) **or** their 4.5 + their 4 (or 8.5 or 9)	M1	Black tiles Grey tiles
	8 black **and** 9 grey	A2	A1 8 black **or** 9 grey **or** 9 black and 8 grey with B1 M2 seen **or** 7.5 black and 8.5 grey

15(a)	$2x + 420 = 650$		B1	
15(b)	650 – 420 **or** 230	$x + 210 = 325$	M1	If using their incorrect equation from (a), follow through for all 3 marks apart from equation with negative solution which can gain a maximum of M1 M1
	their 230 ÷ 2	their (325 – 210)	M1	
	115		A1	ft from their (a) only

Q	Answer	Mark	Comments
16(a)	90	B1	
16(b)	0.5 × 30 × 90	M1	oe eg 45 × 30
	1350	A1	
	1.35(0)	B1ft	ft their 1350 ÷ 1000
17(a)	7 × 40 **or** 8 × 4.5 **or** 7 × (40 + 4.5)	M1	280 **or** 36 **or** 311.5
	7 × 40 + 8 × 4.5 (= 316) **or** 7 × (40 + 4.5) + 4.5 (= 316)	A1	280 + 36 (= 316) **or** 311.5 + 4.5 (= 316) Condone 3.16

Q	Answer	Mark	Comments
17(b)	Attempt at n lots of 40 added to (n + 1) lots of 4.5 **or** (227 – 4.5) ÷ (40 + 4.5) (+ 1)	M1	$n \geq 3$ oe
	6 joists	A1	
	8 × 227 (× 4.5) **or** their 6 × 316 (× 4.5)	M1	1816 (× 4.5) (or 8172) **or** 1896 (× 4.5) (or 8532)
	1816 **and** 1896	A1ft	8172 **and** 8532 ft their 6 for their 1896 or 8532 their 6 → 5 1896 → 1580, 8532 → 7110 their 6 → 4 1896 → 1264, 8532 → 5688
	First way	A1ft	Any clear indication ft their 1816 and their 8172 or their 8172 and their 8532 Must have scored 2nd M1
18	120 ÷ (9 + 11) (or 6)	M1	
	11 × their 6	M1 dep	
	66	A1	SC2 Answer 54 (: 66)