AQA Qualifications

GCSE

Methods in Mathematics (Linked Pair Pilot)

93651F
Unit 1: Foundation Tier
Mark Scheme

9365
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.
M dep	A method mark dependent on a previous method mark being awarded.
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.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
Q	Marks awarded for quality of written communication.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special case. Marks awarded 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.

M1 Foundation Tier

Q	Answer	Mark	Comments
1(a)	(0).5	B1	Accept any number of zeros after the 5 or before the decimal point
1(b)	(0).4	B1	Accept any number of zeros after the 4 or before the decimal point Do not accept (0).4(0)%
1(c)	6324	B1	
1(d)	99 999	B1	
2	1, 2, 6	B2	B1 1, 2, n or 2, 1, n or n, 2, 6 or n, 6, 2 or n, 3, 5 or n, 5, 3 or n, 4, 4 where n is any number SC1 6, 2, 1 or makes correct totals with other numbers, eg 3, 0, 8
3(a)	(4, 5)	B1	
3(b)	Plots *B* at (2, 0)	B1	SC1 (5, 4) given as answer to part (a) and *B* plotted at (0, 2)
3(c)	Plots (x, y) where $x + y = 6$	B1	
4(a)	200 ÷ 12 or 16.6… or 16.7	M1	Build-up to within 12 of 200 with at most 1 error and correct answer for their working
	16	A1	
4(b)	8	B1ft	ft their answer to (a)

Q	Answer	Mark	Comments
5 **Alt 1**	24 ÷ 4 or 6	M1	
	Their 6 × 60	M1	
	360	A1	
	400 minutes with full method	Q1	Strand(iii) Correct decision for their fully valid method, even if there are arithmetic errors ft their values if M2 awarded
5 **Alt 2**	24 × 60 or 1440	M1	
	Their 1440 ÷ 4	M1	
	360	A1	
	400 minutes with full method	Q1	Strand (iii) Correct decision for their fully valid method, even if there are arithmetic errors ft their values if M2 awarded
5 **Alt 3**	24 ÷ 4 or 6	M1	
	400 ÷ 60 or 6.6… or 6.7 or 6 (hours) 40 (minutes)	M1	
	6 **and** 6.6… or 6.7 or 6 hours 40 minutes	A1	
	400 minutes with full method	Q1	Strand (iii) Correct decision for their fully valid method, even if there are arithmetic errors ft their values if M2 awarded
Mark Scheme for question 5 continues on the next page			

Q	Answer	Mark	Comments
5 **Alt 4**	24 × 60 or 1440	M1	
	400 × 4 or 1600	M1	
	1440 **and** 1600	A1	
	400 minutes with full method	Q1	Strand (iii) Correct decision for their fully valid method, even if there are arithmetic errors ft their values if M2 awarded
6	A C B	B3	B1 for each correct answer SC2 3 correct probabilities given instead of the letters SC1 2 correct probabilities given instead of the letters or writes in words '(very) unlikely', 'evens' and 'unlikely' in that order
7(a)	$x + 3$	B1	
7(b)	$x - 5$	B1	
7(c)	$2x$	B1	
8(a)	–1	B1	
8(b)	Correct line from (–2, –3) to (2, 5)	B2	B1 correct line not reaching one or both of (–2, –3) and (2, 5) or at least 3 points correctly plotted (including ft their point)

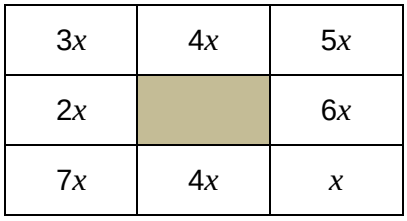
<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="3">9
Alt 1</td><td>25 – 17 or 8 or – 8</td><td>M1</td><td>oe</td></tr>
<tr><td>17 – their 8 ÷ 2 × 3 or
25 – their 8 ÷ 2 × 5</td><td>M1</td><td></td></tr>
<tr><td>5</td><td>A1</td><td>SC1 – 7</td></tr>
<tr><td rowspan="3">9
Alt 2</td><td>Difference of 4 seen or
9 or 13 or 21 in correct position on line</td><td>M1</td><td></td></tr>
<tr><td>9 and 13 in correct position or
3 subtractions of 4 from 17 with at most 1 error</td><td>M1</td><td></td></tr>
<tr><td>5</td><td>A1</td><td>SC1 – 7</td></tr>
<tr><td rowspan="3">10
Alt 1</td><td>Fills in grid with at least 4 correct totals</td><td>M1</td><td></td></tr>
<tr><td>Fully correct grid
<table><tr><td>+</td><td>1</td><td>3</td><td>7</td><td>8</td></tr><tr><td>2</td><td>3</td><td>5</td><td>9</td><td>10</td></tr><tr><td>5</td><td>6</td><td>8</td><td>12</td><td>13</td></tr><tr><td>6</td><td>7</td><td>9</td><td>13</td><td>14</td></tr><tr><td>9</td><td>10</td><td>12</td><td>16</td><td>17</td></tr></table></td><td>A1</td><td></td></tr>
<tr><td>7/16</td><td>B1ft</td><td>oe ft from their completed table</td></tr>
<tr><td colspan="4">Mark Scheme for question 10 continues on the next page</td></tr>
</table>

Q	Answer	Mark	Comments
10 **Alt 2**	Lists at least 4 pairs of numbers with correct totals	M1	
	All pairs of numbers with correct totals	A1	
	7/16	B1ft	oe ft their totals from 16 pairs
10 **Alt 3**	(0) (+) 1 (+) 3 (+) 3	M1	Number of cards which total more than 11 when added to 1, 3, 7 and 8 Allow 1 or 2 errors
	7	A1	May be implied by correct answer
	7/16	B1ft	oe ft their counting
10 **Alt 4**	(0) (+) 2 (+) 2 (+) 3	M1	Number of cards which total more than 11 when added to 2, 5, 6 and 9 Allow 1 or 2 errors
	7	A1	May be implied by correct answer
	7/16	A1ft	oe ft their counting
11	0.24 for D	B1	
	(1 – 0.12 – their 0.24) ÷ 2 or 0.64 ÷ 2 or 0.32	M1	
	0.32 for B and C	A1ft	ft their value for D SC2 correct values in wrong order
12	$9x - 5x$ or $4x$ or 22 + 6 or 8	M1	Correctly rearranges unknown or number
	$4x = 28$	A1	
	7	A1ft	ft their rearrangement with one error if M1 scored

Q	Answer	Mark	Comments
13(a)	40 in correct place	B1	
13(b)	27/100	B1	oe
13(c)	12/100	B1	oe SC1 27/60 oe in (b) and 12/60 oe in (c) or correct probabilities in words for (b) and (c)
14(a)	77	B1	
14(b)	Yes and 25	Q1	Strand (ii) Ticks correct box and gives satisfactory reason Accept all boxes blank provided 'yes' clearly implied by the correct reason
14(c)	100 ÷ 3 is not a whole number	B1	oe
15(a)	likely	B1	
15(b)	evens	B1	
15(c)	impossible	B1	
16	14	B1	
	(63 – 28) ÷ 5 or 7 or builds up in 5s from 28 to 63	M1	
	21	A1ft	ft their 14 SC1 A correct combination of 2p and 5p coins and total which gives 63p eg 24 2p and 3 5p coins = 27 coins

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td>17</td><td>Attempt to multiply 27 by 60 and 8
or
attempt to multiply 68 by 20 and 7</td><td>M1</td><td>For example:
27 × 68 = xxx, xxx0
68 × 27 = xxx, xxx0
<table><tr><td></td><td>20</td><td>7</td></tr><tr><td>60</td><td>xx00</td><td>xx0</td></tr><tr><td>8</td><td>xx0</td><td>xx</td></tr></table>where x represents a digit, so that:
xx represents a two digit number,
xx0 represents a three digit number ending in zero, etc
<table><tr><td colspan="2">2</td><td colspan="2">7</td><td></td></tr><tr><td>1</td><td>2</td><td>4</td><td>2</td><td>6</td></tr><tr><td>1</td><td>6</td><td>5</td><td>6</td><td>8</td></tr></table>12, 16, 42 and 56 are correctly entered into the grid</td></tr>
<tr><td></td><td>Adds all the required components</td><td>M1</td><td>27 × 68 = 216, 1620 +
68 × 27 = 476, 1360 +
At least 1 of the 2 values correct and added
<table><tr><td></td><td>20</td><td>7</td></tr><tr><td>60</td><td>1200</td><td>420</td></tr><tr><td>8</td><td>160</td><td>56</td></tr></table>At least 3 of the values correct and all 4 added
Napier’s Bones method:
At least three of 12, 16, 42 and 56 correct and all four numbers added in the correct manner</td></tr>
<tr><td></td><td>1836</td><td>A1</td><td></td></tr>
</table>

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td>18</td><td>240 ÷ 10 or 240 × 0.1 or 24
or 0.15 × 240</td><td>M1</td><td>oe
Correct method for finding 10% or 15%</td></tr>
<tr><td></td><td>36</td><td>A1</td><td></td></tr>
<tr><td></td><td>Yes and 36</td><td>Q1</td><td>Strand iii
ft fully correct method for 15% and a correct decision for their 36</td></tr>
<tr><td>19 (a)</td><td>3 × 9 (+) 2 × 7 or
27 (+) 14</td><td>M1</td><td></td></tr>
<tr><td></td><td>41</td><td>A1</td><td></td></tr>
<tr><td>19 (b)
Alt 1</td><td>68 – 3 × 20 or
68 – 60 or
8</td><td>M1</td><td></td></tr>
<tr><td></td><td>4</td><td>A1</td><td></td></tr>
<tr><td>19 (b)
Alt 2</td><td>$2g = 8$</td><td>M1</td><td></td></tr>
<tr><td></td><td>4</td><td>A1</td><td></td></tr>
<tr><td>19(c)</td><td>Correct values for f and g</td><td>B1</td><td>Some correct solutions are
<table><tr><th>f</th><th>g</th></tr><tr><td>0</td><td>11</td></tr><tr><td>2</td><td>8</td></tr><tr><td>4</td><td>5</td></tr><tr><td>6</td><td>2</td></tr><tr><td>8</td><td>–1</td></tr></table>Accept negative values
Accept non-integer values</td></tr>
</table>

Q	Answer	Mark	Comments
20(a)	45 ÷ 5 or 9 or $\frac{90}{5}$	M1	oe
	18	A1	
20(b)	$\frac{3 \times 4}{8 \times 9}$ or $\frac{12}{72}$ or Correct cancellation of 3 with 9 **and** 4 with 8	M1	oe
	1/6	A1	SC1 Fraction with numerator 12 or denominator 72 correctly simplified to its lowest terms
20(c)	(0).07	B1	oe
21	 Completely correct table	B3	B2 $4x$ and $5x$ on top row in that order or $7x$ and $4x$ on bottom row in that order B1 a row or column that adds to $12x$
22(a)	60 ÷ 3 or 60 ÷ 300 × 100	M1	
	20	A1	
22(b)	480 ÷ (1 + 3) or 480 ÷ 4 or 120	M1	
	120 : 360	A1	
23	1275 – 1 or 1274 or 1275 + 51 or 1326	M1	
	1325	A1	

Q	Answer	Mark	Comments
24	4/5 × 8/3 or 0.8 ÷ 0.375	M1	
	32/15 or 480/225 or $2.1\dot{3}$	A1	oe fraction
	$2\frac{2}{15}$	B1ft	oe mixed number eg $2\frac{30}{225}$ ft their improper fraction or decimal
25 **Alt 1**	$3x - 2 + x + 10$ or $4x + 8$	M1	
	$4x + 8 = 52$ or $4x = 44$	M1	
	11	A1	SC2 $3x - 2 + x + 10 = 52$ and one error in simplification, rearrangement and solution or $4x + 12 = 52$ and answer 10 or $4x - 12 = 52$ and answer 16 or $4x - 8 = 52$ and answer 15
25 **Alt 2**	52 – 10 + 2 or 44	M1	
	Their 44 ÷ 4	M1dep	
	11	A1	SC2 $3x - 2 + x + 10 = 52$ and one error in simplification, rearrangement and solution or $4x + 12 = 52$ and answer 10 or $4x - 12 = 52$ and answer 16 or $4x - 8 = 52$ and answer 15