General Certificate of Secondary Education
January 2013

Mathematics (Linear) B **4365**
Paper 2
Foundation Tier

Final

Mark Scheme

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

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' 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.

Set and published by the Assessment and Qualifications Alliance.

Glossary for Mark Schemes

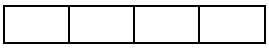
GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

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.
[*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.

Paper 2 Foundation Tier

Q	Answer	Mark	Comments
1(a)	4019	B1	
1(b)	700 or (7) hundred(s)	B1	Do not accept hundredths
2(a)	(Car) C or 12 590	B1	
2(b)	13 400 or 17 900 or 12 600	M1	20 or 40 or 10
	13 400 and 17 900 and 12 600	M1dep	20 and 40 and 10
	17 860 or 17 900 or Car B	A1	40
3(a)	Hexagon → 6 sides	B1	
	Quadrilateral → 4 sides	B1	
	Pentagon → 5 sides	B1	
3(b)	C or (square based) pyramid	B1	
4	Centimetres	B1	
	Litres	B1	
	Grams	B1	
5(a)	24 259 + 805	M1	
	25 064	A1	SC1 for 23 454 or 26 674 or 27 479
5(b)	805 × 8 or 805 × 0.08	M1	6440 (p) 64.4
	£64.40	Q1	Strand (i) correct notation

Q	Answer	Mark	Comments
6	IIII and ~~IIII~~ I	B1	
	9 and 12	B1	
	31	B1ft	ft from their frequencies
7	1 2 2 2 3	B2	Any order B1 for two conditions met eg 1 1 2 2 3 1 1 2 2 2 1 2 2 3 ... 1 2 2 3 4
8(a)	500	B1	
8(b)	1200 (grams) seen or implied or values with a total of 1.2	M1	Values must not exceed 0.8
	Values with a total of 1200	A1	Values must not exceed 800 eg 300 × 4 or 800 and 400
9	1500 ÷ 11 or 15 ÷ 0.11	M1	11 × 136 or 14.96 or 11 × 137 or 15.07 Condone 15 ÷ 11 or 1500 ÷ 0.11
	136.3(...) or 136.4	A1	11 × 136 = 14.96 or 11 × 137 = 15.07
	136	Q1ft	Strand (i) for rounding down correctly having used consistent units SC2 for 137

Q	Answer	Mark	Comments
10(a)	10	B1	
10(b)	Correct pattern drawn	B1	
10(c)	+3 seen or implied or 10 + 3 + 3 + 3 or 6 × 3 + 1 or 13 + 7 – 1	M1	eg (4, 7, 10) 13 or 16
	19	A1	
11	2 × 5 + 1 or 11 or 3 × 5 – 2 or 13 or 5 + 7 or 12	M1	oe
	(2 × 5 + 1 =) 11 and (3 × 5 – 2 =) 13 and (5 + 7 =) 12	A1	
	13	A1ft	ft their largest value
12	8 × 6.5 or 52 or 8 ÷ 2 or 4 or 6.5 ÷ 2 or 3.25	M1	780 ÷ 6.5 or 120 780 ÷ 8 or 97.5 or 780 × 2 or 1560
	their 52 ÷ 2 or their 4 × 6.5 or their 3.25 × 8 or 780 ÷ their 52 or 780 ÷ 4 or 780 ÷ 3.25	M1dep	their 120 ÷ 8 or their 120 × 2 or their 97.5 ÷ 6.5 or their 97.5 × 2 or their 1560 ÷ 8 or their 1560 ÷ 6.5
	26 or 15 or 195 or 240 or 182	A1	
	780 ÷ their 26 or their 15 × 2 or their 195 ÷ 6.5 or their 240 ÷ 8	M1	
	30	A1	

Q	Answer	Mark	Comments
13	(red, 1) red, 2 red, 3 blue, 1 blue, 2 blue, 3	B2	B1 for 4 correct B1 for 5 correct and 1 incorrect B0 for 5 correct and 2 incorrect B0 for 4 correct and 1 incorrect Ignore repeats (which may be reversed)
14(a)	Zoo	B1	Accept Z
14(b)	Hospital	B1	Accept H
14(c)	[063, 067]	B2	B1 for [63, 67] or 062 or 068 SC1 for [243, 247]
15(a)	$\frac{2}{5}$	B2	B1 for $\frac{8}{20}$ or $\frac{4}{10}$ or 2 out of 5 or 40% or 0.4 SC1 for $\frac{3}{5}$
15(b)	1 – 0.14	M1	oe
	0.86	A1	oe
16	$\frac{3}{4}$ × 180 or $\frac{1}{4}$ × 180 (× 3) (= 45 (× 3))	M1	oe
	135	A1	

Q	Answer	Mark	Comments
17(a)	5 × 2 or 500 ÷ 50 or 10 or 3 × 2 or 300 ÷ 50 or 6	M1	4 tiles per square metre or 5 × 3 or 15 or 500 × 300 or 150 000 or 0.5 × 0.5 or 0.25 or 50 × 50 or 2500
	their 10 × their 6	M1dep	oe 5 × 3 × 4 their 15 ÷ $\frac{1}{4}$ or their 15 ÷ their 0.25 or their 150 000 ÷ their 2500
	60	A1	
17(b)	46 × 5 + 25	M1	
	255	A1	
	No	Q1ft	oe strand (ii) for correct use of BIDMAS and decision to match their answer. Must score M1 to award Q mark.
Alt 17(b)	(250 – 25) ÷ 5	M1	oe Condone missing brackets
	45	A1	
	No	Q1ft	oe strand (ii) for correct use of BIDMAS from (250 – 25) ÷ 5 and decision to match their answer. Must score M1 to award Q mark.

Q	Answer	Mark	Comments
18	Bar showing 19 for GB	B1	
	16 + 10 + 15 + 9 + 6 + 10 (= 66) or 16 + 10 + 15 + 9 + 6 + 10 + 19 (= 85)	M1	Allow one error
	113 – their 66 – 19 or 113 – their 85	M1dep	
	28	A1	13 and 15 seen
	13 and 15 bars drawn correctly	B1ft	ft from two whole numbers that add up to their 28 and two more bronze than silver
19	8.3 × 3.6 or 29.88 or 29.9 or 30	M1	
	their 29.88 ÷ 8 | 8 × 4 or 32	M1	
	[3.735, 3.75] | 29.88 and 32	A1	
	Need 4 tins	B1ft	Rounding up their number of tins
	(£)23.96	A1ft	ft from their 4 × 5.99 if the first two M1 marks have been awarded If perimeter used can score M0M1A0B1ftA0
20(a)	$6x = 28 + 5$	M1	oe $\frac{28 + 5}{6}$
	5.5	A1	oe
20(b)	$2a + 7b$	B2	B1 for one correct term Do not ignore further work
21(a)	343	B1	
21(b)	Any two cube numbers from 8 or 27 or 64 or 125 or 216	M1	
	125 and 216	A1	Any order Accept 5^3 and 6^3 Accept 5 and 6

Q	Answer	Mark	Comments
22(a)	108	B1	
	Corresponding	Q1	strand (i) Mark is dependent on scoring B1
22(b)	180 – 117	M1	oe
	63	A1	
23(a)	(C =) $15x + 20y$ or (C =) $5(3x + 4y)$	B2	Accept $0.15x + 0.2y$ B1 for one correct term Do not ignore further work Do not accept $x15 + y20$
23(b)	150 × 15 or 90 × 20 or 150 × 0.15 or 90 ×0. 20	M1	150 ÷ 5 or 90 ÷ 5 or 15 ÷ 5 or 20 ÷ 5
	150 × 15 and 90 × 20 or 150 × 0.15 and 90 ×0. 20 or 2250 and 1800 or 4050 or 22.5 and 18 or 40.5	M1dep	150 ÷ 5 and 90 ÷ 5 or 15 ÷ 5 and 20 ÷ 5 or 30 and 18 or 3 and 4
	4050 ÷ 5 or 810 or 40.50 ÷ 5 or 8.10	M1dep	30 × 15 and 18 × 20 or 450 and 360 or 810 or 120 and 72 150 × 3 and 90 × 4 or 450 and 360 or 810 or 12 and 16
	4050 – 810 or 40.50 – 8.10 or 4050 ÷ 5 × 4 or 40.50 ÷ 5 × 4	M1dep	 150 × 12 + 90 × 16 or 1800 + 1440 or 3240
	32.40	A1	

Q	Answer	Mark	Comments
24	360 ÷ 4 or 90 seen	M1	Right angle symbol may be on diagram May be implied from symmetry line and 45
	360 – 90 – 36 (= 234)	M1dep	If symmetry used 90 ÷ 2 or 45 and 36 ÷ 2 or 18 seen or 63 seen If isosceles triangles used (180 – 90) ÷ 2 or 45 and (180 – 36) ÷ 2 or 72 seen
	their 234 ÷ 2 or 180 – 45 – 18 or 45 + 72	M1dep	Dependent on 1st two Method marks
	117	A1	
Alt24	360 × 4 – 360 or 6 × 180 or 1080	M1	oe
	their 1080 – 36 × 4 (= 936)	M1dep	
	their 936 ÷ 8	M1dep	
	117	A1	
25(a)	2 squares to the right **and** 3 up	B2	B1 for 2 squares to the right **or** 3 up
25(b)	Rotation	B1	
	90 clockwise or –90	B1	oe Accept $\frac{1}{4}$ of a turn clockwise
	(4, 3)	B1	
26	$x + x + 3 + x + x + 3$ (=37)	M1	oe $(2x + 3) \times 2$ condone missing brackets 37 – 6
	$4x + 6 = 37$ or $4x = 37 – 6$	M1dep	oe $\frac{37 - 6}{4}$
	(x =) 7.75	A1	oe

Q	Answer	Mark	Comments
27(a)	Midpoints seen or implied 5, 15, 25, 35, 45	B1	
	their Σ*fx* 5 × 5 + 15 × 22 + 25 × 28 + 35 × 21 + 45 × 4 or 25 + 330 + 700 + 735 + 180 or 1970	M1	This mark is for the sum of their midpoints × frequencies but condone one error 5 × 5 = 25 15 × 22 = 330 25 × 28 = 700 35 × 21 = 735 45 × 4 = 180
	their Σ*fx* ÷ 80	M1dep	their 1970 ÷ 80
	24.6(...)	A1	Accept 25 with working shown
27(b)	5 + 22 + 28 or 55	M1	21 + 4 or 25
	$\frac{5+22+28}{80} \times 100$	M1	$\frac{21+4}{80} \times 100$
	68(...)(%) or 69 and No	A1	31.(...)(%) and no
Alt 27(b)	5 + 22 + 28 or 55	M1	21 + 4 or 25
	$\frac{70}{100}$ × 80 or 56	M1	$\frac{30}{100}$ × 80 or 24
	55 and 56 and No or 56 is in the 30 – 40 group so No	A1	24 and 25 and No